OUTFALL SYSTEMS PLANNING OF WESTERLY CREEK DOWNSTREAM OF WESTERLY CREEK DAM

MARCH 17, 2022

Prepared by:

Bohannan Huston

Prepared for:

MHFD
MILE HIGH FLOOD DISTRICT

AURORA

DENVER
THE MILE HIGH CITY

OUTFALL SYSTEMS PLANNING

OF

WESTERLY CREEK DOWNSTREAM OF WESTERLY CREEK DAM

MARCH 2022

Project Sponsors:

MILE HIGH FLOOD DISTRICT

CITY OF AURORA

CITY AND COUNTY OF DENVER

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February 10, 2022

Mark Schutte, P.E.
Mile High Flood District
2480 W. 26th Avenue, Suite 156B
Denver, Colorado 80211

Re: Outfall Systems Planning Study for Westerly Creek Downstream of Westerly Creek Dam

Dear Mr. Schutte,

We are pleased to submit the final Outfall Systems Plan for acceptance by the Mile High Flood District, the City of Aurora, and the City and County of Denver. The report herein provides an overview of the analysis required to support the development of the conceptual design completed by Bohannan Huston, Inc. (BHI) to mitigate flooding risk in the Westerly Creek watershed.

We would like to express our appreciation to you, the District, and our other partners, for your guidance and assistance with this developing this final submittal and look forward to our continued work together.

Sincerely,

Craig Hoover, P.E.
Principal-in-Charge

RW/ab

cc: Rifka Wine, P.E., CFM, BHI

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ABBREVIATIONS INDEX

ac	acre
AF/ac-ft	acre-feet
BRT	Bus Rapid Transit
CCD	City & County of Denver
cfs	cubic feet per second
COA	City of Aurora
CUHP	Colorado Urban Hydrograph Procedure
DEM	digital elevation map
DRCOG	Denver Regional Council of Governments
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHAD	Flood Hazard Area Delineation
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
HECP	horizontal elliptical concrete pipe
LiDAR	light detection and ranging
LOMR	Letter of Map Revision
MDP	Major Drainageway Plan
MHFD	Mile High Flood District
NAD	North American Datum
NAVD	North American Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NRI	National Risk Index
OSP	Outfall Systems Plan
RCB	reinforced concrete box
RCP	reinforced concrete pipe
SDMP	Storm Drainage Master Plan
SoVI	Social Vulnerability
SWMM	Storm Water Management Model
USGS	United States Geological Survey

EXECUTIVE SUMMARY

ES.1 PURPOSE AND SCOPE

The Mile High Flood District (MHFD), in partnership with the City of Aurora (hereafter referred to as Aurora) and City and County of Denver (hereafter referred to as Denver), contracted Bohannan Huston, Inc. (BHI) to develop an Outfall Systems Plan (OSP) for Westerly Creek downstream of the Westerly Creek Dam. The purpose of this study was to determine potential flooding, drainage, and water quality deficiencies in the Westerly Creek watershed. Per the direction of MHFD, additional outfalls within the Easterly Creek catchment were also included in this OSP due to recurring flooding issues near the Easterly Creek outfall to Westerly Creek. This OSP aimed to mitigate potential flood damages in the study area by recommending upgrades to the existing stormwater infrastructure, including new or improved conveyances and detention facilities. Additionally, this OSP aimed to determine the feasibility of increasing the conveyance of Westerly Creek via the replacement of below-ground conveyances with open channels, where possible.

ES.2 PLANNING PROCESS

The recommendations made as part of this study impact both Denver and Aurora, as well as MHFD. Therefore, it was important that stakeholders from both municipalities and MHFD be involved in the planning process. The project sponsors provided valuable feedback throughout this study. Multiple progress meetings were held between BHI and the project sponsors to ensure that goals and expectations of all project sponsors were being met. The specific goals of this OSP included:

- Evaluating existing studies and being mindful of their original intent;
- Identifying drainage system deficiencies, specifically where flooding is in excess of one foot;
- Identifying and planning upgrades to the existing stormwater system facilities and proposing new improvements that meet the drainage/flooding criteria, including new conveyances and the daylighting of storm drains where possible;
- Preserving or enhancing existing or new open space, if open space is evaluated for stormwater management;
- Prioritizing stormwater projects;
- Improving water quality in dense, urbanized areas; and
- Developing a conceptual design for the Selected Plan.

A project kickoff meeting as well as progress meetings during both the alternatives analysis and conceptual design phases were held. During the alternatives analysis phase progress meeting, the project stakeholders collaborated to prioritize at-risk flood areas and select alternatives for further analysis. A progress meeting was held during the conceptual design phase where project sponsors weighed in on the development of a recommended plan for future drainage improvements.

Due to the occurrence of the COVID-19 pandemic, in-person engagements with project stakeholders were not possible throughout this study. Therefore, all interactions were held in a virtual setting. BHI also maintained a website, which included details about the project status, meeting minutes and stakeholder contact information, to allow for further engagement with stakeholders and members of the public.

Meeting minutes from all phases of this study are provided in Appendix A. Project participants are listed in Table ES-1.

Table ES-1 – Project Participants

Name	Organization	Project Role
Mark Schutte	MHFD	Project Manager
Morgan Lynch	MHFD	Watershed Manager
Craig Hoover	BHI	Principal-in-Charge
Rifka Wine	BHI	Project Manager
Casey Bangs	BHI	Project Engineer
Madeline Olivas	BHI	Project Engineer
Elizabeth Lefebvre	Aurora	Senior PIO, Aurora Water
Sam Miller	Aurora	Local Sponsor, Aurora Water
Vern Adam	Aurora	Local Sponsor, Aurora Water
Craig Perl	Aurora	Floodplain Administrator
Tony Tran	Aurora	Stormwater Engineer, Aurora Water
Gary Burke	Aurora	Stormwater Superintendent
Tracy Young	Aurora	Parks, Recreation, and Open Space
Curtis Bish	Aurora	Parks, Recreation, and Open Space
Chris Best	Denver	Senior Engineer – IPM Wastewater
David Morrisey	Denver	Senior Engineer - Floodplain Administration
Kevin Lewis	Denver	Local Sponsor
Cincere Eades	Denver	Senior Planner

ES.3 PROJECT AREA DESCRIPTION

This OSP study area covers approximately seven square miles, including both the western portion of Aurora and the eastern portion of Denver downstream of the Westerly Creek Dam. The Westerly Creek watershed is highly urbanized and is comprised of a mix of industrial and residential areas. Several storm drain systems have been previously constructed in the Westerly Creek watershed. However, many of the storm drain systems do not have capacity to convey the 100-year flood and are therefore considered undersized for the purposes of this study. The upstream limits of this study begin at Westerly Creek Dam at an approximate elevation of 5,380 feet. Runoff flows south to north to the outfall to Sand Creek in the Central Park area at an elevation of 5,255 feet.

The Easterly Creek outfall with Westerly Creek is located at 19th Avenue, within the study area of this OSP. There has historically been significant overland flooding in this area due to the undersized pipe network that currently conveys Easterly Creek. Given the significant flooding in this area and the proximity to Westerly Creek, select outfalls within the Easterly Creek catchment were also analyzed, including the 19th Avenue, 22nd Avenue, and 23rd Avenue outfalls.

The study area of this OSP was divided into nine subbasins. The subbasin boundaries and naming conventions are based on the *Original Aurora Stormwater Master Plan* and *Denver SDMP.* Basins 1-7 are based on the *Original Aurora Stormwater Master Plan*. Basins 4401-01, 4401-02, and 4401-03 are based on the *Denver SDMP* subbasins. Basin boundaries from both studies were adjusted as needed to meet the analysis needs of this study. See Figure ES-1 for the Study Area of the Westerly Creek watershed downstream of the Westerly Creek Dam.

ES.4 ALTERNATIVES ANALYSIS

The goal of the alternatives analysis was to identify flooding areas that do not meet Denver and Aurora criteria to determine which improvements best mitigate flooding depths. The primary alternatives assessed as part of this OSP are as follows:

- Replacement of existing storm drains;
- Construction of new storm drains;
- Construction of open-channel conveyances; and
- Construction of detention facilities.

One of the goals of this OSP was to be mindful of the several prior master planning studies that have been completed for the project area. Previously recommended improvements were therefore assessed and revised as part of this OSP. Prior to analysis of any alternatives, a pre-screening matrix was used to determine which types of alternatives were feasible to implement in drainage basins with identified flooding problem areas. Due to the highly urbanized nature of the Westerly Creek watershed, there are few opportunities to implement open channel conveyances or new detention facilities in most basins.

High peak runoff rates generated by the Easterly Creek and Westerly Creek watersheds required a combination of several alternatives to be implemented to sufficiently reduce street flooding depths. Several alternatives were determined to be critical to mitigating flooding issues. These alternatives were selected as Base Alternatives. Six Alternative Plans were developed to include all Base Alternatives and additional alternatives that were not eliminated during the pre-screening matrix or initial modeling phases.

The project sponsors were involved throughout the alternatives assessment process to ensure that all the alternatives being assessed were appropriate with regard to planning, construction and jurisdictional criteria. A Recommended Plan was provided by BHI and was approved by all project sponsors.

ES.5 MASTER PLAN SUMMARY

The Selected Plan essentially follows the Recommended Plan as outlined in Chapter 6 of this report. Minor modifications were made to the Recommended Plan based on additional analysis completed during the Conceptual Design phase. The primary goal of the conceptual design is to reduce street 100-year street flooding depth to within jurisdictional criteria. This was accomplished through a combination of storm drain improvements and improved detention facilities. The recommended improvements are summarized by drainage basin in Sections ES.5.1 to ES.5.4 and are shown schematically in Figure ES.1.

ES.5.1 BASIN 3

Stormwater originating in the Easterly Creek watershed is conveyed into Basin 3 by Del Mar Parkway. New storm drains along E 22nd Avenue and E 23rd Avenue are recommended to alleviate street flooding in this area. Both storm drains would collect street flows and convey them to Westerly Creek at new outfalls. Both the E 22nd Avenue and E 23rd Avenue storm drains are currently planned by Aurora through partnership with private development and were incorporated into this OSP.

ES.5.2 BASIN 5

The Easterly Creek watershed contributes to significant street flooding in the vicinity of E 22nd Avenue, E 23rd Avenue and along Del Mar Parkway. Aurora currently has plans for improvements to the Havana Park Pond as well as minor storm drain improvements along Del Mar Parkway. These planned improvements were incorporated into this OSP. The pond should be improved to increase storage volume to reduce peak flows throughout the Easterly Creek watershed.

The Chesapeake Townhomes Pond is an existing privately-owned detention facility. Overflows from the pond flow into the High Line Canal (HLC). However, these overflows are currently assumed to overtop the canal and flow through the Westerly Creek watershed. It is recommended that stormwater overflow into the HLC be formalized, allowing for overflows to be conveyed out of the watershed.

A relief storm drain is also recommended along E 17th Avenue. The storm drain would divert flows out of the existing storm drain that runs along Del Mar Parkway, allowing for greater interception of stormwater downstream of E 17th Avenue.

ES.5.3 BASIN 7

Overland flows originating from the Easterly Creek watershed, Basin 6, and Basin 4401-03 are conveyed to E 11th Avenue, causing street flooding issues in the vicinity of Alton Street and Beeler Street. A new storm drain is recommended to capture street beginning at the intersection of Beeler Street and E 11th Avenue to a new outfall to Westerly Creek at Colfax Avenue. The recommended improvement will reduce 100-year street flooding depths to criteria in this area.

ES.5.4 BASIN 4401-02

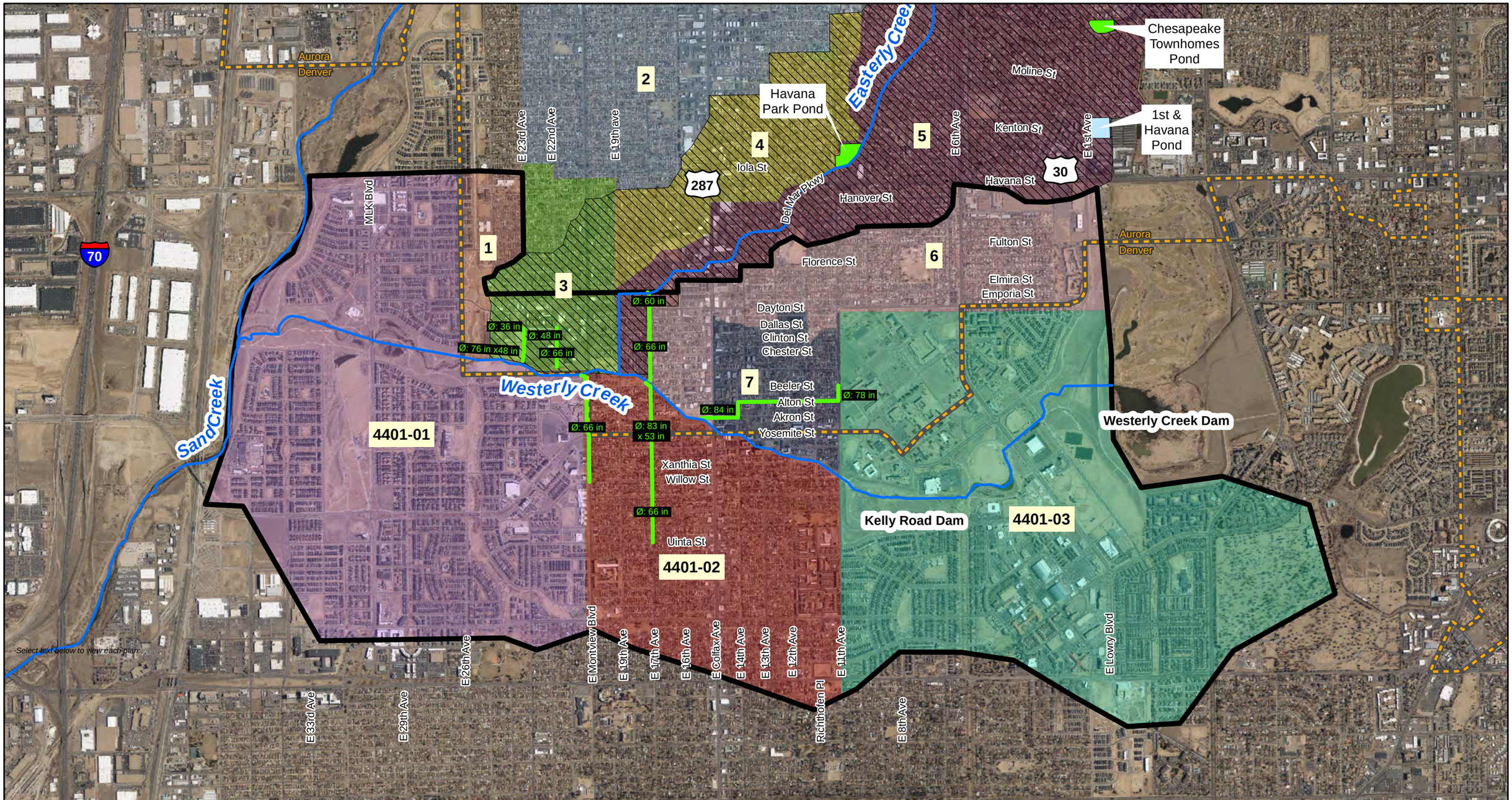
A large portion of Basin4401-02 drains to Montview Boulevard, which does not have sufficient capacity to convey 100-year flows. A relief storm drain along E 17th Avenue is recommended to divert flows out of the existing storm drain system that conveys flows to Montview Boulevard. Replacement of a portion of the existing Montview Boulevard storm drain is also recommended. These improvements will collectively reduce 100-year street flooding depths to criteria within Basin 4401-02.

ES.6 MASTER PLAN COST ESTIMATE

Improvement costs, including capital, operation and maintenance, right-of-way acquisition, and contingencies costs for each alternative component were estimated using the MHFD Cost Estimator for Master Planning (UD-MP Cost Version 2.2). A summary of the final costs by drainage basin is provided in Table ES-2.

Table ES-2 – Summary of Master Plan Costs

Basin ID	Jurisdiction	Item	Total Capital Improvement Cost	Annual O&M
Basin 3	Aurora	E 22nd Avenue Storm Drain	$1,375,272	$1,152
	Aurora	E 23rd Avenue Storm Drain	$1,857,314	$2,016
Basin 5	Aurora	Chesapeake Townhomes Detention Pond	$2,245,115	$6,726
	Aurora	Havana Park Pond & Del Mar Parkway Improvements	$2,650,000	$17,936
	Aurora	Alternative Component 5.4: E 17th Avenue Relief Storm Drain (Aurora)	$3,567,932	$7,776
Basin 7	Aurora	Alternative Component 7.3: Alton Street Storm Drain	$6,971,591	$16,560
Basin 4401-02	Denver	Alternative Component 4401-02.1: E 17th Avenue Relief Storm Drain (Denver) & Montview Boulevard Storm Drain	$8,683,215	$8,220
		Aurora Subtotal	**$18,667,224**	**$52,166**
		Denver Subtotal	**$8,683,215**	**$8,220**
		Total	**$27,350,439**	**$60,386**



Legend

- Proposed Storm Drains
- Streams
- Study Area Boundary
- Jurisdictions
- Easterly Creek Catchment
- Proposed Detention Facility
- 4 Basin ID
- Existing Detention Facility

MILE HIGH FLOOD DISTRICT

DENVER THE MILE HIGH CITY

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E N S W

0 2,000 4,000 Feet

1 Inch = 2,000 Feet

Westerly Creek OSP

Figure ES.1 - Study Area & Recommended Improvements

P:\20210239\WR\Calculations\Programs\ArcGIS\Maps\FigureES_StudyArea_RecmdImprovements.mxd
Author: cbangs

October 2021

1 INTRODUCTION

1.1 AUTHORIZATION

The Mile High Flood District (MHFD), in partnership with the City of Aurora (hereafter referred to as Aurora) and City and County of Denver (hereafter referred to as Denver), has contracted Bohannan Huston, Inc. (BHI) to develop an Outfall Systems Plan (OSP) for Westerly Creek downstream of the Westerly Creek Dam. The project (Project No. 108064) was completed in accordance with Agreement Number 20-10.18, dated October 15, 2020.

1.2 PURPOSE AND SCOPE

The purpose of this study was to determine potential flooding, drainage, and water quality deficiencies in the Westerly Creek watershed. Per the direction of MHFD, additional outfalls within the Easterly Creek catchment were also included in this OSP due to recurring flooding issues near the Easterly Creek outfall to Westerly Creek. This OSP aimed to mitigate potential flood damages in the study area by recommending upgrades to the existing stormwater infrastructure, including new or improved conveyances. Additionally, this OSP aimed to determine the feasibility of increasing the conveyance of Westerly Creek via the replacement of below-ground conveyances with open channels, where possible.

This study was completed in three phases: baseline hydrology, alternatives analysis, and conceptual design. During the baseline hydrology phase, the project team collected data and conducted necessary analysis to determine the peak stormwater discharges during the 100-year flood event. This OSP was completed concurrently with the *Westerly Creek Lower Flood Hazard Area Delineation (FHAD)* (by others), which recently developed baseline discharges for Westerly Creek downstream of the Westerly Creek Dam. A detailed hydrologic study was therefore not included in this study, since peak discharges developed during the *Westerly Creek Lower FHAD* were available. However, the *Westerly Creek Lower FHAD* hydrology was revised to include additional stormwater detention due to the construction of the Easterly Creek Detention Pond near at 1st and Havana (hereafter referred to as the 1st and Havana Pond). The peak discharges obtained from the revised *Westerly Creek Lower FHAD* were used to develop alternative solutions that align with both criteria and policies of the project sponsors and reduce flood risk in the project area. Based on feedback from the project sponsors, select alternatives were further analyzed in development of the final conceptual design.

1.3 PLANNING PROCESS

The recommendations made as part of this study impact both Denver and Aurora, as well as MHFD. Therefore, it was important that stakeholders from both municipalities and MHFD be involved in the planning process. The project sponsors provided valuable feedback throughout this study. Multiple progress meetings were held between BHI and the project sponsors to ensure that goals and expectations of all project sponsors were being met. The specific goals of this OSP included:

- Evaluating existing studies and being mindful of their original intent;
- Identifying drainage system deficiencies, specifically where flooding is in excess of 1 foot;
- Identifying and planning upgrades to the existing stormwater system facilities and proposing new improvements that meet the drainage/flooding criteria, including new conveyances and the daylighting of storm drains where possible;
- Preserving or enhancing existing or new open space, if open space is evaluated for stormwater management;
- Prioritizing stormwater projects;
- Improving water quality in dense, urbanized areas; and
- Developing a conceptual design.

A project kickoff meeting as well as progress meetings during both the alternatives analysis and conceptual design phases were held. During the alternatives analysis phase progress meeting, the project stakeholders collaborated to prioritize at-risk flood areas and select alternatives for further analysis. A progress meeting was also held during the conceptual design phase where project sponsors weighed in on the development of a recommended plan for future drainage improvements.

Due to the occurrence of the COVID-19 pandemic, in-person engagements with project stakeholders were not possible throughout this study. Therefore, all interactions were held in a virtual setting. BHI also maintained a website, which included details about the project status, meeting minutes and stakeholder contact information, to allow for further engagement with stakeholders and members of the public.

Meeting minutes from all phases of this study are provided in Appendix A.

1.4 MAPPING AND SURVEYS

Topographic Information

BHI received 2013 DRCOG DEM from MHFD as part of the conception design phase of this OSP.

Aerial Photography

Three-inch resolution aerial photography, dated 2018, was obtained from DRCOG.

Base Mapping

Base mapping data was obtained either from project sponsors or from sponsor-maintained open GIS databases, including:

- Roads;

- Jurisdictional Boundaries;
- Westerly Creek Subcatchments;
- Existing Storm Drain Systems (Aurora);
- Existing Storm Drain Systems (Denver);
- Storm Sewer Inlets (Denver); and
- Existing Sanitary Sewer Mains (Denver).

Coordinate System and Datum

- Coordinate System: Colorado State Plane Central, Zone 0502;
- Vertical Datum: NAVD 88; and
- Horizontal Datum: NAD 83.

1.5 DATA COLLECTION

BHI received several previous studies and other relevant project data from project sponsors, which were reviewed in the development of this study. Table 1-1 provides a summary of additional data obtained by BHI for reference in this study.

Table 1-1 – Summary of Data Collection

Document Type	Description	Date	Source
Report	LOMR #19-08-0731 - Westerly Creek (23rd Avenue to Colfax Avenue) (2020)	Received 11/24/2020	MHFD
Report	Denver East Area Plan (2020)	Received 09/16/2020	MHFD
Report	Original Aurora Stormwater Master Plan (2019)	Received 09/16/2020	MHFD
Report	Denver SDMP (2019)	Received 09/16/2020	MHFD
Report	East Colfax Building Healthy Places Report (2019)	Received 09/16/2020	MHFD
Report	Easterly Creek OSP (2012)	Received 09/16/2020	MHFD
Report	Westerly Creek Greenway Master Plan (2011)	Received 09/16/2020	MHFD
Report	Westerly Creek MDP (2010)	Received 09/16/2020	MHFD
Report	Stapleton OSP (1995)	Downloaded 09/16/2020	MHFD
Report	Colfax BRT Concept	Received 09/16/2020	MHFD
Report	Westerly Creek Lower FHAD Hydrology Acceptance	Received 09/16/2020	MHFD
Report	Easterly Creek Pond as-built drawings	Received 09/16/2020	MHFD
Hydrologic Data	SWMM Model, FLO-2D Model, CUHP hydrographs for the Westerly Creek Watershed	Received 09/16/2020	MHFD
Hydrologic Data	2019 Denver SDMP SWMM Model	Received 09/28/2020	Denver

1.6 ACKNOWLEDGEMENTS

This OSP had representation from a diverse group of project sponsors. BHI would like to acknowledge all project sponsors from Aurora, Denver, and MHFD. Table 1-2 provides a complete list of the project participants and their respective roles.

Table 1-2 – Project Participants

Name	Organization	Project Role
Mark Schutte	MHFD	Project Manager
Morgan Lynch	MHFD	Watershed Manager
Craig Hoover	BHI	Principal-in-Charge
Rifka Wine	BHI	Project Manager
Casey Bangs	BHI	Project Engineer
Madeline Olivas	BHI	Project Engineer
Elizabeth Lefebvre	Aurora	Senior PIO, Aurora Water
Sam Miller	Aurora	Local Sponsor, Aurora Water
Vern Adam	Aurora	Local Sponsor, Aurora Water
Craig Perl	Aurora	Floodplain Administrator
Tony Tran	Aurora	Stormwater Engineer, Aurora Water
Gary Burke	Aurora	Stormwater Superintendent
Tracy Young	Aurora	Parks, Recreation, and Open Space
Curtis Bish	Aurora	Parks, Recreation, and Open Space
Chris Best	Denver	Senior Engineer – IPM Wastewater
David Morrisey	Denver	Senior Engineer - Floodplain Administration
Kevin Lewis	Denver	Local Sponsor
Cincere Eades	Denver	Senior Planner

2 STUDY AREA DESCRIPTION

2.1 PROJECT AREA

This OSP study area covers approximately seven square miles, including both the western portion of Aurora and the eastern portion of Denver downstream of the Westerly Creek Dam. The Westerly Creek watershed is highly urbanized and is comprised of a mix of industrial and residential areas. Several storm drain systems have been previously constructed in the Westerly Creek watershed. Based on the results of the analysis associated with this project, many of the storm drain systems do not have capacity to convey the 100-year flood and therefore are categorized as undersized for the purposes of this study. The upstream limits of this study begin at Westerly Creek Dam at an approximate elevation of 5380 feet. Runoff flows south to north to the outfall to Sand Creek in the Central Park area at an elevation of 5255 feet.

The Easterly Creek outfall with Westerly Creek is located at 19th Avenue, within the study area of this OSP. There has historically been significant overland flooding in this area due to the undersized pipe network that currently conveys Easterly Creek. Given the significant flooding in this area and the close proximity to Westerly Creek, select outfalls within the Easterly Creek catchment were also analyzed, including the 19th Avenue, 22nd Avenue, and 23rd Avenue outfalls. See Figure 2-1 for the Study Area and Vicinity map of the Westerly Creek watershed downstream of the Westerly Creek Dam.

2.2 LAND USE

Three distinct development areas are included in the study area for this OSP: the Lowry redevelopment area, the East Colfax/North Aurora neighborhood, and the Central Park area.

Following the decommissioning of the Lowry Air Force Base in 1994, redevelopment began to convert the Lowry area for residential and commercial use. The Lowry area is bound by 11th Avenue to the north and Alameda Avenue in the south along Westerly Creek. The area is now fully developed, including a mix of residential and commercial uses as well as open spaces and golf courses. During development, the floodplain was preserved and is dedicated as a multi-use space. Two major flood detention facilities were constructed in the Lowry area to mitigate downstream flooding risk. The Kelly Road Dam was constructed in the 1950's and provides stormwater detention up to the 100-year event. Additional stormwater detention capacity was added to the Lowry area in 1991 with the completion of the Westerly Creek Dam, which has a 500-year stormwater detention capacity.

Immediately downstream of the Lowry area, extending from 11th Avenue up to Montview Boulevard, are the East Colfax neighborhood (located in Denver) and the North Aurora neighborhood (located in Aurora). This area is primarily residential, including a mix of single-family housing, multi-family duplexes, and apartment buildings. Commercial and retail developments are also present in this area, primarily along arterial roadways. Few lots remain undeveloped in the Montview neighborhood, many of which will likely be developed in the near future. There are also high-density redevelopments planned in the Colfax Arts District, Fitzsimons/Peoria, and Stanley Marketplace/Montview Plaza areas, which will provide opportunities for future stormwater management improvements in the Montview neighborhood.

The Central Park area begins at Montview Boulevard, extending north to the Westerly Creek confluence with Sand Creek and is the location of the former Stapleton Airport. The Stapleton Airport was decommissioned in 1995 and redevelopment of the area began in 2001. Today, the Central Park area is mostly built-out and the area is predominantly residential. Much of the Central Park area, including the floodplain, has been preserved as public park space.

The Westerly Creek watershed is highly urbanized and mostly built-out. Redevelopment of the Stanley Marketplace, near E 23rd Avenue, for mixed use or commercial purposes may occur in the future. Additionally, redevelopment along Colfax Avenue consistent with the *Colfax BRT* plan may occur. Other changes to land use in Aurora are primarily development of infill lots to multi-family or commercial lots. BHI utilized the future conditions land use hydrologic model prepared as part of the *Westerly Creek Lower FHAD* for this study. See the *Westerly Creek Lower FHAD* for a more detailed analysis of the land usage in the Westerly Creek watershed as well as existing and future land use maps.

2.3 OUTFALL DESCRIPTION

The study area of this OSP was divided into nine subbasins. The subbasin boundaries and naming conventions are based on the *Original Aurora Stormwater Master Plan* and *Denver SDMP.* Basins 1-7 are based on the *Original Aurora Stormwater Master Plan*. Basins 4401-01, 4401-02, and 4401-03 are based on the *Denver SDMP* subbasins. Basin boundaries from both studies were adjusted as needed to meet the analysis needs of this study.

The outfalls of interest located within each basin are described in the following sections. A map of outfall locations and basin boundaries is provided in Figure 2.2.

2.3.1 BASIN 1 OUTFALLS

There are no storm drain outfalls located within Basin. However, surface flow along E 25th Avenue is diverted to the Park Creek Tributary, which conveys stormwater through Basin 1 westward towards Westerly Creek. The channel outfalls to Westerly Creek through a drop structure.

2.3.2 BASIN 2 OUTFALLS

There are no outfalls located within Basin 2. This basin was included to remain consistent with the *Original Aurora Stormwater Master Plan* basin delineation. However, no analysis was completed within

this basin since it does not directly outfall to Westerly Creek or contribute to other basins which outfall to Westerly Creek.

2.3.3 BASIN 3 OUTFALLS

Two major storm drain systems outfall to Westerly Creek within Basin 3. The E 23rd Avenue storm drain extends from Iola Street to Westerly Creek. The E 23rd Avenue storm drain systems collects additional local flows through storm drains located along Hanover Street, E 22nd Avenue and Dallas street. The *Easterly Creek OSP* previously recommended improvements to this outfall to mitigate street flooding depths along E 23rd Avenue.

The Montview Boulevard storm drain system also collects local flows within Basin 3 along Montview Boulevard, beginning at Fulton Street. Beginning approximately 200 feet west of Chester Street, the storm drain conveys flows to the north to an outfall near the E 23rd Avenue outfall. Storm drain flows originating in Basin 4 drain into the Montview system via a storm drain along Elmira Street.

Surface flows originating in Basins 4 and 5 are conveyed by roads into Basin 3 causing street flooding in the vicinity of E 23rd Avenue, E 22nd Avenue, Dallas Street and Dayton Street. The goal of any outfall improvements within Basin 3 would be to intercept these overflows to mitigate street flooding depths.

2.3.4 BASIN 4 OUTFALLS

There are no outfalls located within Basin 4. Local flows collected within Basin 4 are conveyed through storm drains to the Montview Boulevard storm drain system.

2.3.5 BASIN 5 OUTFALLS

Easterly Creek is conveyed through Basin 5 along Del Mar Parkway, which roughly follows the creek's historic flow path. The creek is conveyed through a storm drain from Del Mark Parkway to E 19th Avenue, where it outfalls to Westerly Creek. Local flows within Basin 5 are collected via several separate storm drains that convey stormwater to Easterly Creek storm drain.

The existing storm drain that conveys Easterly Creek is undersized. Flooding in Basin 5 has been reported, primarily along Del Mar Parkway. Improvements to the E 19th Avenue portion of the Easterly Creek storm drain were proposed as part of the *Easterly Creek OSP* to mitigate street flooding caused by Easterly Creek overflows.

2.3.6 BASIN 6 OUTFALLS

There are three storm drain systems that outfall within Basin 6. Local flows along E 17th Avenue between Beeler Street and Chester Street are collected by a small storm drain that conveys flows to an outfall at E 17th Avenue. An additional outfall is located at E 16th Avenue. The E 16th Avenue storm drain system collects local flow within Basin 6 and conveys it to Westerly Creek. Additional stormwater is collected by storm drains along Dayton Street, E 14th Avenue and Emporia Street, which drain into the E 16th Avenue system. The final within Basin 6 is located at Colfax Avenue and discharges stormwater collected along Colfax Avenue, beginning at Emporia Street.

Street flooding within Basin 6 is minimal. The goal of any outfall improvements located in Basin 6 would be to intercept Easterly Creek overflows from the eastern portion of Basin 6 and from Basin 5. Re-directing surface flows through Basin 6 via storm drains would mitigate downstream flooding in Basin 5.

2.3.7 BASIN 7 OUTFALLS

The E 14th Avenue storm drain system collects stormwater beginning at Clinton Street. Additional stormwater is collected through storm drains along Alton Street, E 13th Avenue, Beeler Street and Clinton Street, which drain into the E 14th Avenue storm drain. The E 14th Avenue storm drain system outfalls to a below-ground portion of Westerly Creek at E 14th Avenue.

Overflows originating in adjacent basin 4401-03 have been known to cause street flooding issues within Basin 7. The goal of any improvements to the E 14th Avenue outfall would be to intercept these overflows and reduce flooding within Basin 7.

2.3.8 BASIN 4401-01 OUTFALLS

The majority of this basin is in Denver and drainage infrastructure has been built to convey the 100-year storm event or has been otherwise accounted for in the redevelopment of Central Park. There are multiple storm drain systems that collect local flows in the basin. Each storm drain outfall in this basin is routed through a water quality basin before entering Westerly Creek. These water quality basins for storm drains to the west of Westerly Creek are located at 23rd Avenue, 26th Avenue, 29th Avenue, Martin Luther King Jr. Boulevard, and 33rd Avenue. Storm drains to the east of Westerly Creek, within Denver City limits, outfall at 29th Avenue and Martin Luther King Jr. Boulevard. The *Denver SDMP* indicates that all drainage issues in Basin 4401-01 had been accounted for as part of the Stapleton redevelopment. The redevelopment implemented recommended improvements from the 1995 *Stapleton OSP*, including construction of regional water quality basins and the replacement of existing Westerly Creek storm drains with an open channel corridor. Due to the construction of 100-year conveyance within this basin as well as the fact that there have been no flooding problem areas reported within this basin, no Basin 4401-01 outfalls were assessed as part of this OSP.

The portion of the basin in Aurora has undersized storm drains directed north to Bluff Lake and not to Westerly Creek. Street flows are directed to the Park Creek Tributary along 26th Avenue that outfalls to Westerly Creek and has capacity for the 100-year event.

2.3.9 BASIN 4401-02 OUTFALLS

Local flows are collected in various storm drains throughout the basin and routed to outfalls along Westerly Creek at Richthofen Place, E 13th Avenue, E 14th Avenue and Montview Boulevard. Westerly Creek has both above ground and below ground segments in this basin. The Montview Boulevard, E 16th Avenue and Richthofen Place storm drains are undersized for the 100-year event, resulting in street flooding depths greater than one foot along their alignments. Improvements to the E 17th Avenue, E 16th Avenue, E 13th Avenue, and Richthofen Place storm drains and outfalls were recommended as part of the *Denver SDMP.*

2.3.10 BASIN 4401-03 OUTFALLS

The portion of this basin within Denver is a part of the Lowry redevelopment area which included the construction of storm drains with sufficient capacity for the 100-year event. The Westerly Creek Dam and Kelly Road Dam are at the upstream and downstream ends of this basin, respectively. Westerly Creek flows in an open channel between the detention facilities with multiple storm drain outfalls contributing. These storm drains outfall to Westerly Creek at 6th Avenue (from East and West), Yosemite Street, 8th Avenue, and 11th Avenue downstream of Kelly Pond. Due to the construction of 100-year conveyance within this basin as well as the fact that there have been no flooding problem areas reported within this basin, no Basin 4401-03 outfalls were assessed as part of this OSP.

2.4 FLOOD HISTORY

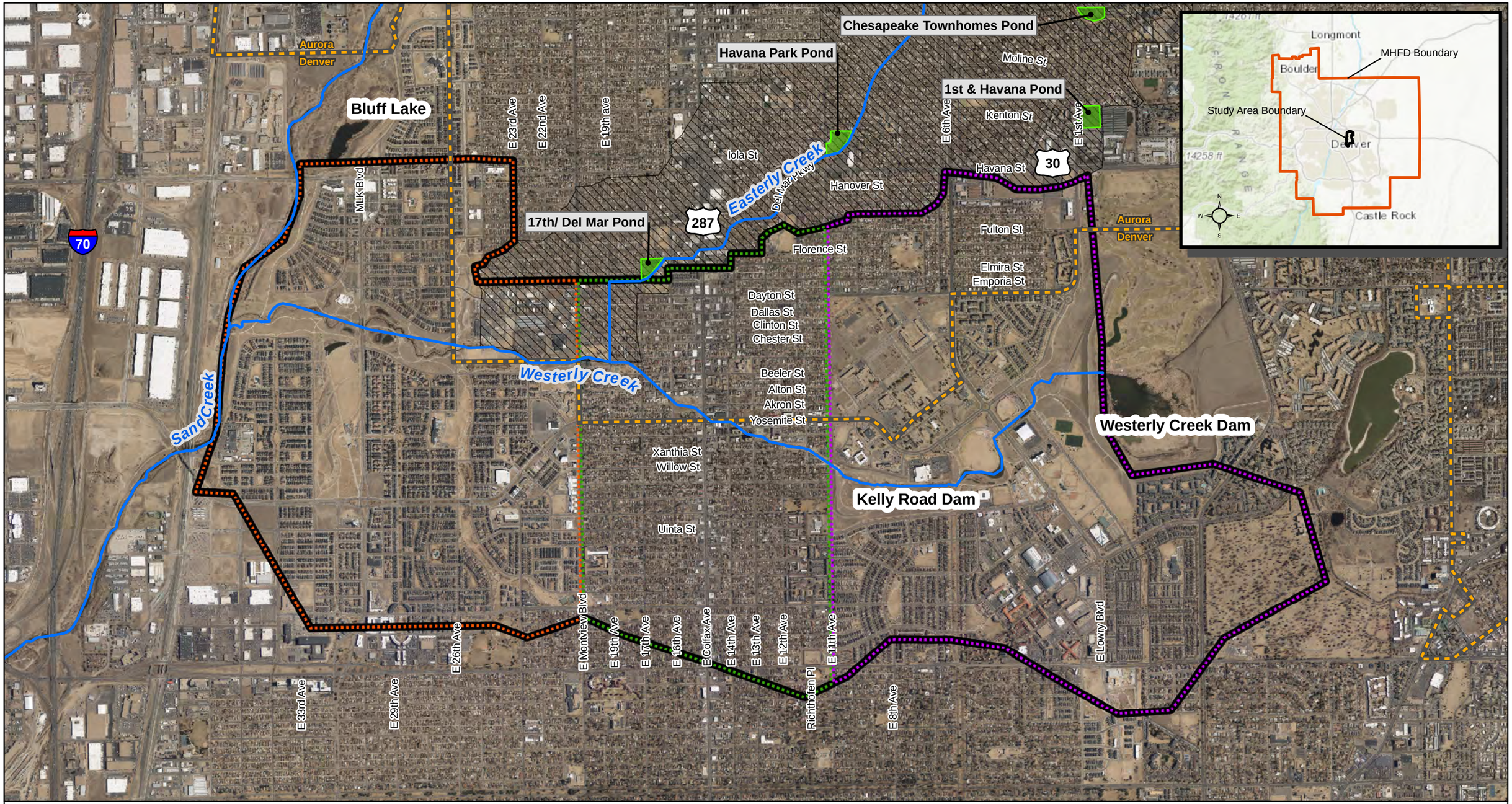
The 1977 *Westerly Creek Lower FHAD* identified five flood events occurring between 1945 and 1973 based on stream gage data for nearby Toll Gate Creek. The storm frequencies for these floods ranged from 40 to 65 years, producing approximately two to three inches of total rainfall each. Flood depths up to four and a half feet were reported during these events, particularly in the East Colfax area, which impacted both traffic flow and some homes. Construction of the Kelly Road Dam in the 1950's has had a significant impact on stormwater flow through the Westerly Creek watershed. The pond is capable of attenuating the 100-year storm event, mitigating downstream flood impacts.

Prior to the construction of 10-year flood conveyance stormwater systems by MHFD in the early 1980's, much of the area surrounding Westerly Creek experienced near-annual flooding. Street flooding depths of up to three feet were commonly reported during that time. The drainage improvements constructed by MHFD extended from 11th Avenue to the former Stapleton Airport and significantly reduced the occurrence of street flooding along Westerly Creek. Stormwater management in the Westerly Creek watershed was again improved with the completion of the Westerly Creek Dam, which has a 500-year stormwater detention capacity.

More recent accounts of flooding in the Westerly Creek Basin include the July 7th, 2011 and September 2013 flood events. During the 2011 storm, total rainfall in the Westerly Creek basin exceeded three inches. Street inundation was reported in various locations throughout Denver and Aurora. However, local newspaper reporting from the Central Park area indicated that creek flooding was contained within the channel and street flooding was minimal. The 2013 Colorado flood, which began on September 11th, brought historic flooding to much of the Colorado Front Range. Aurora reported 500-year flows during the peak flow of this event, which caused widespread street flooding in Denver and Aurora. MHFD operates a stage gages located at Kelly Road Dam and near the Westerly Creek crossing of Montview Boulevard. Peak discharges of approximately 879 cfs and 980 cfs, respectively were reported at this site on September 12th, 2013.

2.5 ENVIRONMENTAL ASSESSMENT

The environmental assessment was completed as part of the *Westerly Creek Lower FHAD*. BHI did not complete any additional environmental assessment during development of this OSP. See the *Westerly Creek Lower FHAD* for all additional details related to environmental assessment.



MILE HIGH FLOOD DISTRICT

DENVER THE MILE HIGH CITY

Bohannan Huston
www.bhinc.com 800.877.5332

Legend

- Existing/Proposed Detention Sites
- MHFD Boundary
- Study Area Boundary
- Easterly Creek Catchment

Development Areas

- Central Park
- Lowry
- East Colfax/North Aurora

N E S W

0 2,000 4,000 Feet

1 Inch = 2,000 Feet

Westerly Creek OSP

Figure 2.1
Study Area and Vicinity Map

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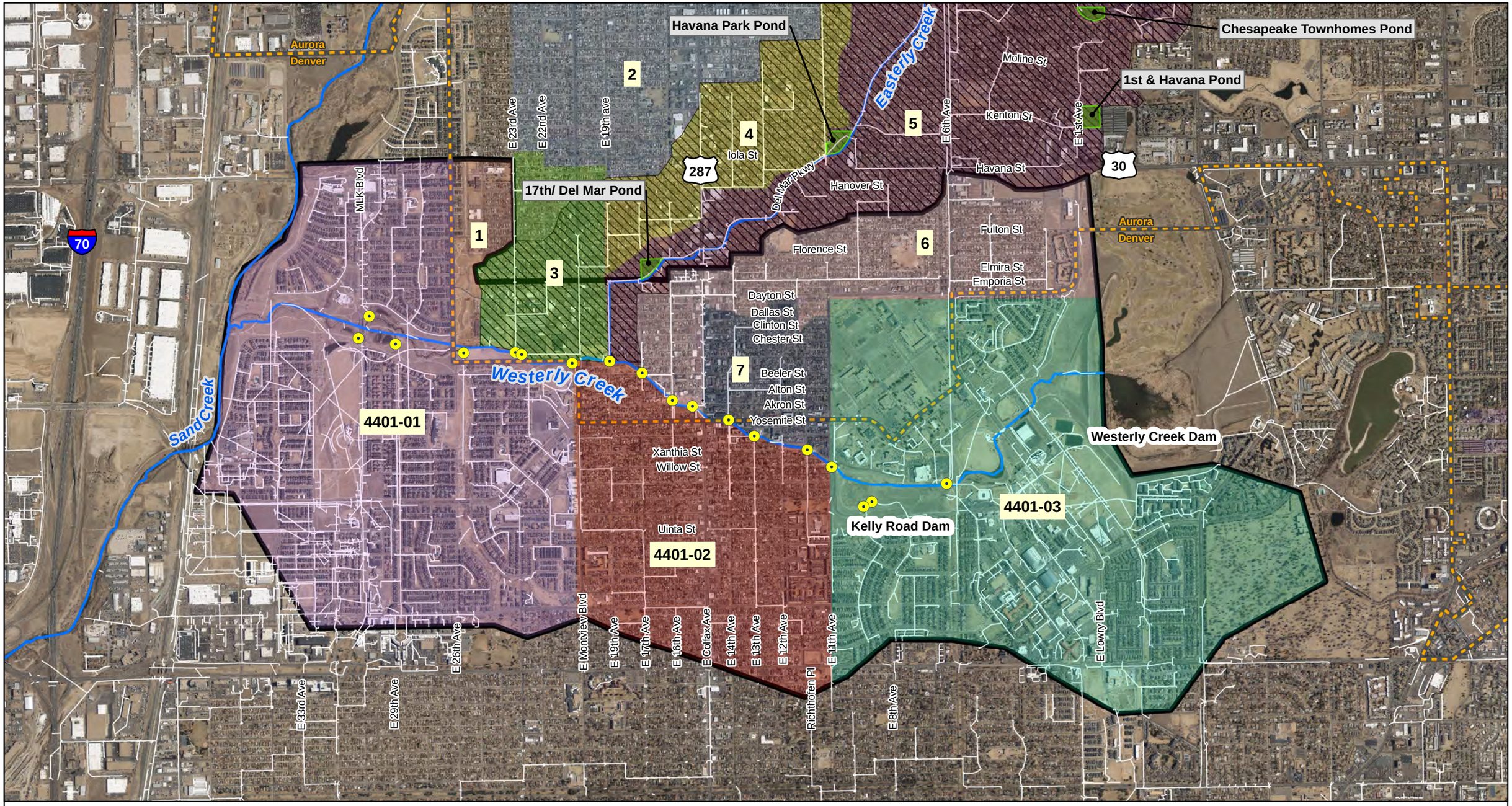
Author: sthompson

June 2021



MHFD MILE HIGH FLOOD DISTRICT

DENVER THE MILE HIGH CITY

Bohannan Huston
www.bhinc.com 800.877.5332

Legend

- Major Outfalls
- Existing Storm Drains
- Study Area Boundary
- Jurisdictions
- Easterly Creek Catchment
- Existing/Proposed Detention Sites
- 4 Basin ID

N E S W

0 2,000 4,000 Feet

1 Inch = 2,000 Feet

Westerly Creek OSP

Figure 2.2
Basin and Outfall Map

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Author: sthompson

June 2021

3 HYDROLOGIC ANALYSIS

3.1 OVERVIEW

The *Westerly Creek Lower FHAD*, was being completed by Matrix Design Group concurrently with this OSP. The *Westerly Creek Lower FHAD* baseline hydrology for the lower Westerly Creek watershed was complete at the time of this OSP, including the area of interest for this study, which is Westerly Creek beginning downstream of the Westerly Creek Dam and extending to the confluence with Sand Creek. The *Westerly Creek Lower FHAD* developed hydrographs using Colorado Urban Hydrograph Procedure (CUHP) v. 1.5.2.b and used Storm Water Management Model (SWMM) v. 5.1 for hydrograph routing. Split flow analysis was conducted using FLO-2D to develop rating curves at key locations. The baseline hydrology was accepted by MHFD on 07/17/2017. Due to the availability of the updated hydrology produced as part of the *Westerly Creek Lower FHAD*, additional hydrologic analysis was not included in the scope of this OSP. However, minor modifications to the *Westerly Creek Lower FHAD* SWMM model were made by BHI to incorporate the recently constructed 1st/Havana Pond. The revised SWMM model was used to develop baseline hydrology for the 2-year, 5-year and 100-year storm events.

3.2 DESIGN RAINFALL

The design rainfall was determined as part of the *Westerly Creek Lower FHAD* and was derived from NOAA Atlas 14 rainfall depths. BHI did not modify the design rainfall during the hydrologic analysis of this OSP. Point rainfall depths for the 2-year, 5-year, and 100-year storm events are provided in Table 3-2. See the rainfall correction factors table in the *Westerly Creek Lower FHAD*.

3.3 SUBWATERSHED CHARACTERISTICS

The subwatershed characteristics were determined as part of the *Westerly Creek Lower FHAD*. BHI did not modify the subwatershed characteristics during the hydrologic analysis of this OSP. See the *Westerly Creek Lower FHAD* for all additional materials related to subwatershed delineation and characteristics.

3.4 DETENTION

Regional detention was assessed as part of the *Westerly Creek Lower FHAD* and was included in the SWMM model developed by Matrix. One exception was the Easterly Creek detention pond (1st/Havana pond) located south of East 1st Avenue, approximately 1,000 feet east of Havana Street. The pond, owned by Aurora, was constructed after the completion of the *Westerly Creek Lower FHAD* baseline hydrology. BHI incorporated the pond into the *Westerly Creek Lower FHAD* SWMM model. The pond geometry was modeled using a depth-area rating curve and outflows utilized a head-outflow rating curve. BHI also incorporated the newly-constructed 48-inch RCP storm drain that runs along East 1st Avenue, which drains into the 1st/Havana pond. The depth-storage curve for design storm intervals was developed using the pond design table located in the as-built drawing for the 1st/Havana Pond that were provided by MHFD. The as-built contours were used to approximate the depth-storage relationship for pond depths that were not provided in the pond design table. The head-outflow curve for the pond was developed from the 100% design report for the 1st/Havana Pond. See Table B-1 and Table B-2 in Appendix B for the 1st/Havana pond detention rating curve and head-outflow rating curve included in this SWMM model. The remaining detention rating curves can be found in the *Westerly Creek Lower FHAD*. A SWMM schematic prepared as part of the *Westerly Creek Lower FHAD* has been annotated to include the Havana pond and is included in Figure B.1.

3.5 HYDROGRAPH ROUTING

SWMM v. 5.1 was used to route hydrographs as part of the *Westerly Creek Lower FHAD*. BHI modified the SWMM hydrograph routing to include the 1st/Havana pond. See Figure B.1 and Figure B.2 in Appendix B for the full *Westerly Creek Lower FHAD* SWMM model schematic and the revised SWMM model schematic.

3.6 PREVIOUS STUDIES

BHI reviewed several previous studies of the Westerly Creek watershed when preparing this OSP with the intent of incorporating previously recommended improvements where applicable. Hydrologic analyses were also reviewed and incorporated into this study where applicable. The reviewed materials include:

- *Westerly Creek Lower FHAD* (ongoing);
- *FEMA FIS, City and County of Denver* (Rev. 9/4/2020);
- *LOMR #19-08-0731P - Westerly Creek (23rd Avenue to Colfax Avenue)* (2020);
- *Original Aurora Stormwater Master Plan* (2019);
- *Denver East Area Plan* (2020);
- *Denver SDMP* (2019);
- *East Colfax Building Healthy Places Report* (2019);
- *Easterly Creek OSP* (2012);
- *Westerly Creek Greenway Master Plan* (2011);
- *Westerly Creek MDP* (2010);
- *Lowry MDP* (1998);
- *Stapleton OSP* (1995);

- *LOMR #92-08-009P - Westerly Creek, Montview Boulevard to Kelly Road Dam* (1991); and
- *Colfax BRT Concept* (No date).

Other studies of Westerly Creek that were not incorporated into this OSP are provided in the list below. These studies have been superseded by the previously mentioned studies and were therefore not pertinent to this OSP.

- *UDFCD Westerly Creek Lower FHAD* (1977); and
- *UDFCD Drainage Master Plan* (1976).

The *Westerly Creek Greenway Master Plan* included efforts to reduce flood hazard in Aurora and Denver by proposing flood mitigation projects along Westerly Creek between 11th and 23rd Avenues. Included in these efforts was the goal to daylight Westerly Creek where possible. The study identified three opportunities for daylighting existing 10-year capacity culverts, including: the north side of 12th Avenue to the south side of 13th Avenue, the north side of 13th Avenue to the south side of Colfax Avenue, and the north side of 16th Avenue to the south side of 17th Avenue. The *Denver East Area Plan* was another comprehensive plan that provided some recommendations for better stormwater management. BHI noted that the study also recommended daylighting Westerly Creek where possible. Opportunities for green stormwater infrastructure like regional detention ponds, enhanced riparian zones and green streets were also included in the *Denver East Area Plan*. The *East Colfax Building Healthy Places Report* was reviewed by BHI and included recommendations to re-align Westerly Creek between Colfax Avenue and 16th Street to its natural flow path to the west. The intent of this re-alignment is to allow for further development of community open space to the east of the creek. The *Colfax BRT* was also reviewed in preparation of this OSP. However, the conceptual design did not have an impact on drainage or outfalls in the study area. BHI took the recommendations from these studies into consideration to build upon the existing knowledge of the project area and recommend improvements that both reduce flooding and are consistent with previous studies of the area.

Several outfalls in the Central Park area were not included in this OSP because the *Denver SDMP* indicated that all drainage issues in the area had been accounted for as part of the Stapleton redevelopment. The redevelopment implemented recommended improvements from the 1995 *Stapleton OSP*, including construction of regional water quality basins and the replacement of existing Westerly Creek storm drains with an open channel corridor. Similarly, the *Denver SDMP* indicated that all drainage systems in the Lowry area had been designed to convey flows from the 100-year storm. Therefore, additional improvements to outfalls in the Lowry area were also not considered.

The *Original Aurora Stormwater Master Plan, Denver SDMP,* and *Easterly Creek OSP* used as reference during this study provided recommended improvements for several outfalls along Westerly Creek. The studies also included hydrologic analysis of the Westerly Creek and Easterly Creek drainage areas. However, their hydrologic analyses were not incorporated into the BHI's baseline hydrology due to the availability of the more recently completed *Westerly Creek Lower FHAD* hydrology. The *Westerly Creek Lower FHAD* study area included the study area for this OSP from the Westerly Creek Dam to the Creek's outfall at Sand Creek and was therefore utilized for analysis of many of the outfalls in the study area

The FEMA-effective hydrology, for the area, is based on the 1991 *Westerly Creek, Montview Boulevard to Kelly Road Dam* LOMR that was completed to include revisions to peak discharges due to the construction of the Westerly Creek Dam. The *Westerly Creek (23rd Avenue to Colfax Avenue)*LOMR was completed by Muller Engineering in 2020 to revise the effective floodplain for Westerly Creek between 23rd Avenue and Colfax Avenue. The LOMR revised the effective hydraulics to include the newly constructed pedestrian bridge downstream of Montview Boulevard, the replacement of the existing pedestrian bridge at 19th Avenue crossing of Westerly Creek, and the replacement of the Montview Boulevard box culvert with a higher capacity bridge. Also included in the LOMR were improvements to the channel between 17th Avenue and 23rd Avenue. The LOMR revised the effective hydrology, incorporating discharges from the *Westerly Creek Lower FHAD*. Since this OSP also utilized the *Westerly Creek Lower FHAD* hydrology, the Muller LOMR did not affect BHI's baseline hydrology.

As noted earlier, the hydrologic study completed as part of the *Westerly Creek Lower FHAD* used CUHP v. 1.5.2b and point rainfall depths derived from NOAA Atlas 14 to develop hydrographs and SWMM v. 5.1 to route the hydrographs. In general, the FHAD peak discharges were less than the FEMA peak discharges due to decreases in the most recent NOAA 14 1-hour rainfall depth in this area. A comparison between the *Westerly Creek Lower FHAD* discharges and the FEMA-effective discharges is provided in Table 3-1. A comparison between the NOAA Atlas 14 point rainfall depths used in the *Westerly Creek Lower FHAD* and the NOAA Atlas 2 point rainfall depths used to develop the FEMA-effective flows is provided in Table 3-2.

Table 3-1 – Westerly Creek Hydrology

Location	FEMA	2017 FHAD
Outfall	6,900	4,424
33rd Avenue	6,000	4,335
MLK Blvd	5,300	4,300
29th Avenue	-	4,056
26th Avenue	4,700	3,809
23rd Avenue	4,580	3,469
Montview Blvd (D/S)	2,310	2,403
Montview Blvd (U/S)	-	2,034
19th Avenue (D/S)	-	2,019
19th Avenue (U/S)	-	1,819
17th Avenue	-	1,818
16th Avenue (D/S)	2,140	1,778
16th Avenue (U/S)	-	1,480
Colfax Avenue	1,000	1,345
14th Avenue	-	1,200
13th Avenue	830	507
12th Avenue	-	413
11th Avenue	-	258
Kelly Road Outflow	100	95
Kelly Road Inflow	1,630	1,590
6th Avenue	-	1,264
Lowry Blvd	475	473
W.C. Dam Outflow	98	50

Table 3-2 – NOAA Point Rainfall Depth Comparison

Source	Duration	100-year Depth	5-year Depth	2-year Depth
NOAA Atlas 14	1-Hour	2.40	1.13	0.86
	6-Hour	3.56	1.71	1.32
NOAA Atlas 2	1-Hour	2.58	1.37	0.95
	6-Hour	3.46	1.96	1.43

3.7 RESULTS OF ANALYSIS

The SWMM model from the *Westerly Creek Lower FHAD* was revised during this study to include additional stormwater detention, as noted previously. Peak discharges were assessed and compared at multiple design points in the baseline hydrology revised SWMM model for the 2-, 5-, and 100-year storm events. As expected, the addition of the 1st Avenue and Havana Street pond decreased peak discharges at several of the design points within the Westerly Creek watershed compared to the original *Westerly Creek Lower FHAD* hydrology, as shown in Table 3-3.

Table 3-3 – Peak Flow and Volume Comparisons at Key Locations

Location	Design Point	Peak Discharge (cfs)						Volume (ac-ft)					
		100-year FHAD NOAA 14 SWMM	100-year OSP Revised SWMM*	5-year FHAD NOAA 14 SWMM	5-year OSP Revised SWMM*	2-year FHAD NOAA 14 SWMM	2-year OSP Revised SWMM*	100-year FHAD NOAA 14 SWMM	100-year OSP Revised SWMM*	5-year FHAD NOAA 14 SWMM	5-year OSP Revised SWMM*	2-year FHAD NOAA 14 SWMM	2-year OSP Revised SWMM*
Havana St/E 6th Ave	D_03b	50	50	0	0	0	0	2	2	0	0	0	0
Kenton St/Oakland Ct/E 6th Ave	D_05c	616	472	135	84	63	34	53	41	8	5	3	1
Moline St/Oakland Ct/ E 6th Ave	D_06b	350	350	58	58	17	17	24	24	5	2	2	0
Colfax Ave/Florence St	D_10d	1078	934	43	43	27	27	89	78	12	5	5	3
E 17th Ave/Del Mar Pkwy	D_10_13	769	670	0	0	0	0	61	53	0	0	0	0
Hanover St/E Colfax Ave	D_12a	253	243	70	70	46	46	30	30	9	9	6	6
E 11th Ave/Beeler St	DIV72	548	548	76	76	33	33	38	38	3	3	1	1
E 19th Ave/Fulton St	D_14a	264	264	112	112	75	75	38	38	14	14	9	9
Montview Blvd/Del Mar Pkwy	J_15	740	651	0	0	0	0	60	53	0	0	0	0
Emporia St/E 6th Ave	DIV399	509	509	226	226	177	177	62	70	30	32	23	23

*See Table B-4 in Appendix B for complete results.

The largest decreases in 100-year peak flow (144 cfs) were observed at the intersection of Kenton Street and East 6th Avenue and the intersection of Colfax Avenue and Florence Street, respectively. Both design points are located in the Easterly Creek catchment to the north of the new Havana pond, indicating that the pond has a significant effect on the drainage of the Easterly Creek watershed along this north-south flowline. Total volumes generally decreased at the downstream design points, with the exception of the DIV399 located at the intersection of Emporia Street and East 6th Avenue. Due to the discharge of stormwater attenuated by the pond, the inflow to this design point exceeded the *Westerly Creek Lower FHAD* NOAA 14 model over the recession limb of the inflow hydrograph. This indicates that additional stormwater is being routed to DIV399 through the storm drains, which otherwise would have flowed overland away from that location. Hydrographs comparing the 2-year, 5-year and 100-year *Westerly Creek Lower FHAD* flows and revised flows at design points as well as the 100-year drainageway centerline profiles are also provided in Figures B.3 - B.32 and Figure B.33, respectively. SWMM inputs are provided in Table B-3 and outputs for the 2-year, 5-year and 100-year storms are provided in Table B-4 of Appendix B.

4 HYDRAULIC ANALYSIS

4.1 EVALUATION OF EXISTING FACILITIES

Existing drainage infrastructure was evaluated using a combination of EPA SWMM and FLO-2D analysis software. In general, storm drains larger than 48" in diameter were included in the SWMM model. Additional pipes smaller than 48" in diameter were also included in the model as needed to evaluate systems where flooding problem areas were identified. Overflow links with transects representative of simplified street sections were applied to analyze the extent of street flooding in areas with capacity limited storm drain infrastructure. Transects in streets with preliminary flooding depths greater than 2-feet were replaced with transects cut from the DEM provided by MHFD to more accurately assess street flooding.

BHI developed dynamic wave SWMM models to assess existing roadway and storm drain drainage capacities within Aurora. The switch from the kinematic wave models, used in development of the baseline hydrology, to the dynamic wave models was made to better represent pressure flow conditions that may occur in storm drains during a flood. The large number of modeled roads and storm drains in the kinematic wave SWMM models developed for the baseline hydrology made converting the existing models to dynamic wave impractical. The dynamic wave models were therefore developed only for previously identified street flooding problem areas within the project area. Inflow hydrographs from the kinematic wave baseline hydrology SWMM models were added to the new dynamic wave models at critical locations to accurately represent the 100-year flooding conditions in areas of interest.

Dynamic wave SWMM models created for the *Denver SDMP* were also used for evaluating drainage capacities within Denver. CUHP v. 2.0.0 was used to calculate inflow hydrographs for the *Denver SDMP* SWMM models. The Denver SWMM models were revised to include inflow hydrographs developed as part of the *Westerly Creek Lower FHAD*, which used CUHP v. 1.5.2.b.

In the existing conditions, Verbena Park acts as an unofficial stormwater detention facility. Subcatchment flows are routed to Verbena Park and are attenuated before overflowing the park and flowing to E 12th Avenue. The *Denver SDMP* SWMM models originally assumed that there was no storage in Verbena Park and that all subcatchment flows were directed down Richthofen Place to Westerly Creek. The existing conditions SWMM routing developed as part of the *Denver SDMP* was refined to include storage in Verbena Park and stormwater overflows to E 12th Avenue. Due to the modeled split flow between E 12th Avenue and Richthofen Place, the resulting existing conditions street flooding depths along E 12th Avenue and Richthofen Place are within street flooding criteria. Therefore, no additional improvements are required at Richthofen Place even though Richthofen Place was identified in the *Denver SDMP* as a street flooding problem area.

Additional analysis was completed to determine the impact of re-grading Verbena Park on adjacent street flooding depths. Due to the limited existing storage capacity in Verbena Park, it was determined that eliminating storage in the park would not cause street flooding issues in adjacent streets. Therefore, formalizing detention in Verbena Park through an adequate assurances agreement to ensure future improvements to the park do not impact stormwater storage is not necessary.

There were no existing crossing structures assessed as part of this study. Existing detention facilities within the project area include the Kelly Road Dam Pond and Havana Park Pond. These detention facilities were modeled as part of the *Westerly Creek Lower FHAD* and were not modified by this study in existing conditions modeled scenarios. Designed improvements to Havana Park Pond at the time of this study are discussed in the Conceptual Design portion of this report and were included in the Conceptual Design hydraulic modeling.

The redevelopment of the Central Park and Lowry areas included 100-year storm drain conveyances. Storm drains located outside of the Central Park and Lowry areas are generally undersized for the 100-year storm event.

4.2 FLOOD HAZARDS

Primary flood hazards in the study area are street flooding resulting from undersized storm drain infrastructure. Evaluation of road crossings, channel capacity and other flood hazards along the main stem of Westerly Creek were not included as part of this study. Future conditions 100-year flood hazards are broken down by outfall system in each section below. Based on SWMM modeling completed as part of this OSP, several streets in Aurora have 100-year street flooding depths greater than one foot, exceeding the street flooding criteria for the City. Additionally, several streets in Denver experience 100-year street flooding depths greater than one foot for non-arterial streets and greater than one half-foot for arterial streets, exceeding Denver street flooding criteria depth. A summary of the street modeled street flooding depths is provided in Table 4-1, below. Some of these problem areas had been identified in previous studies and improvements were recommended to address flooding in these areas. Some additional problem areas were identified by BHI as part of this OSP. Therefore, BHI identified additional areas for assessment where stormwater management improvements may be necessary. The SWMM street flooding areas, previous recommendations, and additional areas for assessment are summarized in Figure 4.1 - Drainage Problem Areas Map.

Table 4-1 – Street Flooding Problem Area Depths

Street Name	From Street	To Street	Existing Conditions (feet)
E 23rd Ave	Dallas St	Clinton St	1.92
Dallas St	E 22nd Ave	E 23rd Ave	1.82
E 22nd Ave	Dallas St	Dayton St	1.80
Dayton St	Montview Blvd	E 22nd Ave	1.80
Del Mar Pkwy	Montview Blvd	E 17th Ave	1.58
E 11th Avenue	Beeler St	Alton St	1.56
Alton St	E 11th Ave	E 12th Ave	1.56
Alton St	E 12th Ave	E 14th Ave	1.56
E 14th Ave	Alton St	Yosemite St	1.58
Uinta St	E 17th Ave	E 19th Ave	1.82
E 19th Ave	Uinta St	Verbena St	1.26
Verbena St	E 19th Ave	Montview Ave	1.26
Montview Ave	Uinta St	Willow St	1.22
Montview Ave	Willow St	Beeler St	1.32

4.2.1 BASIN 3 FLOOD HAZARDS

The E 23rd Avenue storm drain is approximately 4,300 LF and extends from Iola Street to Westerly Creek. The E 22nd Avenue storm drain connects to the E 23rd Avenue storm drain at Dallas Street. The E 23rd Avenue storm drain was modeled downstream of the intersection of E 22nd Avenue and Dallas Street. Overflows from Easterly Creek travel down Del Mar Parkway, crossing Montview Boulevard and continuing to E 23rd Avenue by Clinton Street, Dallas Street, and Dayton Street. The Easterly Creek overflows cause street flooding depths greater than one foot along E 23rd Avenue, Dallas Street, E 22nd Avenue, and Dayton Street. The existing storm drains are undersized for the future conditions 100-year event.

4.2.2 BASIN 5 FLOOD HAZARDS

Easterly Creek is conveyed primarily through a series of storm drains through the Easterly Creek catchment. The existing storm drains that convey Easterly Creek follow the Del Mar Parkway alignment beginning at Del Mar Circle to E 19th Avenue. The storm drain continues down E 19th Avenue to an outfall at Westerly Creek. The existing storm drain is undersized for the 100-year storm event, causing street flooding primarily located along the Easterly Creek/Del Mar Parkway alignment. Overflows from Easterly Creek diverge from the Easterly Creek storm drain alignment and continue along Del Mar Parkway past E 19th Avenue to Montview Boulevard. The Easterly Creek overflows cause street flooding depths greater than one foot in Basin 3, specifically in the vicinity of Dayton Street, Dallas Street, E 22nd Avenue, and E 23rd Avenue.

4.2.3 BASIN 7 FLOOD HAZARDS

Within Aurora, 100-year overflows originating from Lowry Community Park and the Community College of Aurora – Lowry Campus cause street flooding greater than one foot along Beeler Street, E 12th Avenue, Alton Street, and E 14th Avenue.

4.2.4 BASIN 4401-02 FLOOD HAZARDS

The storm drain system connected to the Montview Boulevard outfall was modeled along Uinta Street between E 17th Avenue and Montview Boulevard and along Montview Boulevard from Uinta Street to the outfall at Westerly Creek. Existing storm drains are undersized for the future conditions 100-year event, resulting in street flooding depths greater than one foot along Uinta Street, E 19th Avenue, Verbena Street, and Montview Boulevard.

4.3 PREVIOUS ANALYSES

Hydraulic analysis of the existing drainage facilities in the study area has been previously performed as part of the *Denver SDMP*, the *Original Aurora Stormwater Master Plan*, and the *Easterly Creek OSP*, *Westerly Creek MDP,* and *Westerly Creek Lower FHAD.* All previous studies utilized SWMM for storm drain hydraulics calculations. The *Original Aurora Stormwater Master Plan, Easterly Creek OSP*, *Westerly Creek MDP,* and *Westerly Creek Lower FHAD* utilized kinematic wave routing SWMM to model storm drain flows. An external Manning's calculation was completed to determine storm drain capacities. Dynamic wave models of these previously modeled areas were developed as part of the alternatives analysis of this OSP. Therefore, external Manning's capacity calculations were not necessary for the analysis of alternatives completed as part of this OSP.

The *Denver SDMP* also used dynamic wave SWMM to model storm drain flows. These SWMM models were modified to include *Westerly Creek Lower FHAD* inflow hydrographs.

A comparison of existing storm drain capacities calculated in the *Denver SDMP, Easterly Creek OSP and Original Aurora Stormwater Master Plan* to existing conditions storm drain capacities calculated as part of this OSP is provided in Table 4-2, below.

Table 4-2 – Comparison of Existing Conditions Storm Drain Capacities

Location	Westerly Creek OSP Existing		Denver SDMP		Easterly Creek OSP			Original Aurora SWMP	
	SWMM Link	100-year Peak Flow (cfs)	SWMM Link	100-year Peak Flow (cfs)	SWMM Link	Capacity (cfs)	100-year Peak Flow (cfs)	SWMM Link	100-year Peak Flow (cfs)
16th Ave Outfall	773411STMN	96	773411STMN	112	-	-	-	-	-
19th Ave Outfall	C_13a_2	121	-	-	-	-	-	Link 56	106
Montview Outfall East	C_15a	246	-	-	C_15a	237	398	Link 31	305
Montview Outfall West	19071STMH	266	19071STMH	314	-	-	-	-	-
Dallas Street	C_15_b	30	-	-	-	-	-	Link 3	52
23rd Ave Outfall	C_15_a	92	-	-	-	-	-	Link 58	112

Aurora
Denver
Havana Park Pond
Chesapeake
Townhomes Pond
1st & Havana Pond
Easterly Creek
Moline St
Kenton St
Havana St
Hanover St
Del Mar Pkwy
Iola St
17th/ Del Mar Pond
287
30
E 23rd Ave
E 22nd Ave
E 19th ave
E 6th Ave
E 1st Ave
MLK Blvd
70
1
2
3
4
5
6
7
Florence St
Fulton St
Elmira St
Emporia St
Dayton St
Dallas St
Clinton St
Chester St
Beeler St
Alton St
Akron St
Yosemite St
Aurora
Denver
Westerly Creek
Sand Creek
4401-01
Xanthia St
Willow St
Uinta St
4401-02
Kelly Road Dam
4401-03
Westerly Creek Dam
E Montview Blvd
E 19th Ave
E 17th Ave
E 16th Ave
E Colfax Ave
E 14th Ave
E 13th Ave
E 12th Ave
E 11th Ave
E 26th Ave
E 29th Ave
Richthofen Pl
E 8th Ave
E Lowry Blvd

*City of Aurora Storm Drainage & Technical Criteria Manual: The maximum depth of water over gutter flowline shall not exceed 12” for local, collector or arterial streets.
Denver Storm Drainage & Technical Criteria Manual: The maximum depth of water over gutter flowline shall not exceed 12” for local and collector streets. Flow depths on arterial streets shall not exceed the street crown.

MHFD MILE HIGH FLOOD DISTRICT
DENVER THE MILE HIGH CITY
Bohannan Huston
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Legend

- *Street Flooding Exceeds Criteria
- Additional Areas for Assessment
- Study Area Boundary
- Easterly Creek Catchment
- 4 Basin ID

Previous Recommendations

- Denver SDMP Conveyance
- Easterly Creek OSP Conveyance
- Original Aurora Stormwater Master Plan Conveyance
- Easterly Creek OSP Detention
- Original Aurora Stormwater Master Plan Detention
- Proposed/In Design Detention

N E S W

0 2,000 4,000 Feet

1 Inch = 2,000 Feet

Westerly Creek OSP

Figure 4.1
Drainage Problem Areas Map

P:\20210239\WR\Calculations\Programs\ArcGIS\Maps\Figure4.1_DrainageProblemAreasMap_REV.mxd
Author: sthompson

June 2021

5 ALTERNATIVES ANALYSIS

5.1 ALTERNATIVES DEVELOPMENT PROCESS

Previously proposed alternatives from the *Denver SDMP, Original Aurora Stormwater Master Plan,* and the *Easterly Creek OSP* were the basis for developing alternative plans for the study area. Base alternative hydraulic models were created to evaluate the effectiveness of the previously proposed improvements under the updated hydrologic conditions. It was determined that some improvements recommended by the *Denver SDMP* were no longer necessary because street flooding depths were already compliant with flooding criteria under existing conditions. This discrepancy is due to the previously mentioned changes to the CUHP version and basin delineation used in this OSP compared to the *Denver SDMP*. Improvements to the E 13th Avenue storm drain, E 16th Avenue storm drain, and Xanthia Street outfall were therefore not included as alternatives in this OSP. Additionally, the Richthofen Place storm drain that was recommended in the *Denver SDMP* was not included as an alternative in this OSP because it was determined that flow from Verbena Park overflows to E 12th Avenue and not Richthofen Place, as it was modeled in the *Denver SDMP*. The hydraulic analysis indicates that both E 12th Avenue and Richthofen Place meet criteria under existing conditions.

The improvement recommendations were modified as needed to meet street flooding criteria. Additional alternatives that were not recommended in previous studies were also assessed to address street flooding concerns. It was determined that some basins did not require any improvements, so alternatives were only developed for basins where problem areas were identified. Alternatives were also not developed to address flooding problem areas located outside of the project area limits. However, some alternatives located outside of the study area boundary were assessed due to their impact on downstream flooding within the limits of the study area.

5.2 CRITERIA AND CONSTRAINTS

Alternatives were developed with primary consideration to street flooding during the simulated 100-year event. Street flooding was evaluated based on street classification according to the criteria from section 3.32 of the *City of Aurora Storm Drainage & Technical Criteria Manual*¸ and Table 7.2 from the *Denver Storm Drainage & Technical Criteria Manual*. Under these criteria, local and collector streets throughout the study area shall have depths of less than one foot over the gutter flow line. Arterial streets within Aurora are also permitted to have flow depths of up to one foot over the gutter flow line. Within Denver jurisdiction, flow depths on arterial streets are not to exceed the street crown.

5.3 ALTERNATIVE CATEGORIES

Multiple alternative categories were considered for basins with identified problem areas. The alternative categories were:

- Status Quo
- Conveyance Improvements
- Daylighting Storm Drains
- Detention and/or Water Quality Basins

A pre-screening matrix was used to determine which alternatives should be further analyzed. The pre-screening matrix is provided in Table 5-1.

Table 5-1 – Alternatives Pre-Screening Matrix

	Study Area			
	Basin 3	**Basin 5**	**Basin 7**	**Basin 4401-02**
Existing Conditions	Easterly Creek overflows from Basins 4 and 5 cause street flooding within this basin. Several roads do not meet 100-year street flooding depth criteria.	Easterly Creek overflows along Del Mar Parkway cause street flooding within this basin. Several roads do not meet 100-year street flooding depth criteria.	Overflows originating from Basin 4401-03 cause street flooding in this basin. Several roads do not meet 100-year street flooding depth criteria.	Several storm drains within this basin are undersized for the 100-year storm event, causing multiple roads to not comply with 100-year street flooding depth criteria.
Conveyance Improvements	Improvements to storm drains along E 22nd Avenue, E 23rd Avenue, and/or Dayton Street will mitigate street flooding depths.	Improvements to storm drains along Del Mar Parkway, Colfax Avenue, E 17th Avenue, and/or E 19th Avenue will mitigate street flooding depths.	Improvements to storm drains along Beeler Street, E 12th Avenue, Alton Street, E 14th Avenue, and/or Akron Street will mitigate street flooding depths.	Improvements to several existing storm drains within this basin will mitigate street flooding depths.
Daylighting	This area is highly urbanized and there are not any opportunities for daylighting existing storm drains.	This area is highly urbanized and there are not any opportunities for daylighting existing storm drains.	Construction of a new open channel along E 11th Avenue would mitigate street flooding depths.	This area is highly urbanized and there are not any opportunities for daylighting existing storm drains.
Detention or Water Quality	There are no opportunities for water quality or detention ponds in this basin. If Aurora plans to create any new open spaces or parks within this basin in the future, they should be considered as potential locations for water quality/detention ponds.	Improvements to the Chesapeake Townhomes Pond would mitigate street flooding depths along Del Mar Parkway and in downstream basins.	There are no opportunities for water quality or detention ponds in this basin. If Aurora plans to create any new open spaces or parks within this basin in the future, they should be considered as potential locations for water quality/detention ponds.	There are no opportunities for water quality or detention ponds in this basin. If Denver plans to create any new open spaces or parks within this basin in the future, they should be considered as potential locations for water quality/detention ponds.

Table 5-1 Legend	
	The alternative is feasible and should be considered further.
	The alternative is feasible and should be considered further, but there are barriers to project completion.
	The alternative is not feasible and should not be considered further.

5.4 ALTERNATIVE HYDRAULICS

Each alternative component that passed the pre-screening matrix was modeled in SWMM to evaluate the related impacts on problem areas throughout the study area. As previously mentioned, recommendations from the *Denver SDMP, Original Aurora Stormwater Master Plan,* and the *Easterly Creek OSP* were assessed as part of this study. The *Denver SDMP* used SWMM dynamic wave routing to model storm drain and street flows. The dynamic wave SWMM models created as part of the *Denver SDMP* were modified to include the *Westerly Creek Lower FHAD* hydrology. All recommended storm drain improvements from the *Original Aurora Stormwater Master Plan* and *Easterly Creek OSP*, as well as additional improvements within Aurora that were developed by BHI to address street flooding in problem areas, were modeled using a combination of kinematic and dynamic wave SWMM models. Kinematic wave SWMM models were used to determine the impact of proposed detention facilities located within the Easterly Creek catchment. Dynamic wave SWMM models were developed to model all proposed storm drain improvements in Aurora. Dynamic wave SWMM models were necessary for analysis of existing and proposed storm drains because they account for pressurized pipe flow, which is a better representation of hydraulic conditions during a flood compared to kinematic wave routing. The cumulative impacts of detention and storm drain improvements in Aurora were determined by adding the kinematic wave hydrographs into the dynamic wave models at critical points upstream of the proposed storm drain improvements.

Elements from the alternatives were combined into alternative plans to achieve applicable criteria restrictions. Inlet capacities were not analyzed in detail but it was assumed that storm drain conveyance was limited by pipe capacity. This assumption is consistent with the analysis completed in the *Original Aurora Stormwater Master Plan*.

5.5 ALTERNATIVE COSTS

The capital, operation and maintenance, right-of-way acquisition, and contingencies cost of each alternative component were estimated using the MHFD Cost Estimator for Master Planning (UD-MP Cost Version 2.2). Unit costs used in the UD-MP spreadsheet are provided in Table 5-2. The costs of each alternative component were summed to estimate the total cost of each alternative plan. The following assumptions were made in development of the cost estimate:

- A storm drain lateral consisting of 20 LF of 18” RCP was required for each inlet.
- Asphalt removal and replacement were estimated assuming the width of asphalt to be replaced is equal to the pipe diameter plus 8 feet for pipes smaller than 48”. For pipes larger than 48” located along local streets, it was assumed that the entire road will be replaced. For pipes larger than 48” located along arterial streets, it was assumed that one lane of the road will be replaced. A unit cost of $85/SY was assumed for asphalt removal and replacement. The CDOT average 2021 bid item costs for hot mix asphalt and aggregate base course were converted to a unit price per square yard and added to the unit cost for asphalt removal to determine this estimated combined unit cost.
- Traffic control consisted of 3-7% of total capital improvement costs depending on the street classification.
- Utility coordination/relocation consisted of 5% of total capital improvement costs for local/collector streets and 10% for arterial streets. Utility coordination/relocation in areas with known utility conflicts, including E 22nd Avenue and E 23rd Avenue, was assumed to be 15% of total capital improvement costs. Utility coordination/relocation for improvements along Colfax Avenue was assumed to be 30% due to known utility conflicts.
- Easement/ROW acquisition costs total $11/SF for residential property and $21/SF for industrial property. These unit costs are based on average 2021 appraised land values for Arapahoe County. The unit prices were inflated by 30% to better represent current sale prices in Aurora.

Table 5-2 – Unit Cost Data

Item	Unit	Unit Cost 2012 Q1	Adjusted Unit Cost 2021 Q3
Circular Pipes			
12-inch	LF	$36.00	$52.00
18-inch	LF	$54.00	$78.00
24-inch	LF	$72.00	$104.00
30-inch	LF	$90.00	$130.00
36-inch	LF	$108.00	$156.00
42-inch	LF	$126.00	$182.00
48-inch	LF	$144.00	$208.00
54-inch	LF	$216.00	$312.00
60-inch	LF	$240.00	$347.00
66-inch	LF	$264.00	$382.00
72-inch	LF	$360.00	$521.00
78-inch	LF	$390.00	$564.00
84-inch	LF	$420.00	$608.00
90-inch	LF	$450.00	$651.00
96-inch	LF	$480.00	$694.00

Item	Unit	Unit Cost 2012 Q1	Adjusted Unit Cost 2021 Q3
102-inch	LF	$714.00	$1,033.00
108-inch	LF	$756.00	$1,094.00
120-inch	LF	$840.00	$1,215.00
Flared End Sections			
12-inch	EA	$710.00	$1,027.00
18-inch	EA	$920.00	$1,331.00
24-inch	EA	$970.00	$1,403.00
30-inch	EA	$1,570.00	$2,271.00
36-inch	EA	$1,610.00	$2,329.00
42-inch	EA	$1,700.00	$2,459.00
48-inch	EA	$2,060.00	$2,980.00
Manholes and Inlets			
Manhole, 4' Dia. (Pipe Dia. < 36"), Depth > 15-feet)	EA	$2,900.00	$4,195.00
Manhole, 5' Dia. (Pipe Dia. 36" - 42"), Depth > 15-feet)	EA	$3,900.00	$5,642.00
Manhole, 6' Dia. (Pipe Dia. , Depth > 15-feet)	EA	$4,300.00	$6,221.00
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)	EA	$12,000.00	$17,360.00
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)	EA	$15,000.00	$21,701.00
Storm Inlet, Type R/Type 14, 5-foot, 10-foot deep avg.	EA	$4,600.00	$6,655.00
Hydraulic Structures			
Grouted Boulders, 36-inch	CY	$190.00	$275.00
Soil Riprap, Type M	CY	$70.00	$101.00
Excavation, Complete-in-Place	CY	$11.00	$16.00
Bedding, Granular Type II	CY	$58.00	$84.00
Grout	CY	$240.00	$347.00
Check Structure, Concrete	LF	$270.00	$391.00
Channel Improvements			
Boulder Edging, 12" High	LF	$60.00	$87.00
Boulder Edging, 24" High	LF	$75.00	$109.00
Boulder Edging, 36" High	LF	$90.00	$130.00
Concrete Low Flow Channel	LF	$40.00	$58.00
Grouted Boulders, 12"	SY	$130.00	$188.00
Grouted Boulders, 18"	SY	$150.00	$217.00
Grouted Boulders, 24"	SY	$170.00	$246.00
Grouted Boulders, 36"	SY	$190.00	$275.00
Grouted Boulders, 48"	SY	$200.00	$289.00
6-inch Riprap, Type VL	CY	$45.00	$65.00
9-inch Riprap, Type L	CY	$55.00	$80.00
12-inch Riprap, Type M	CY	$60.00	$87.00
18-inch Riprap, Type H	CY	$80.00	$116.00
24-inch Riprap, Type VH	CY	$85.00	$123.00
Soil Riprap, Type VL	CY	$50.00	$72.00
Soil Riprap, Type L	CY	$60.00	$87.00
Soil Riprap, Type M	CY	$70.00	$101.00
Soil Riprap, Type H	CY	$80.00	$116.00
Soil Riprap, Type VH	CY	$90.00	$130.00
Excavation, Low Range	CY	$11.00	$16.00
Excavation, Mid Range	CY	$24.00	$35.00
Excavation, High Range	CY	$31.00	$45.00
Detention/Water Quality Facilities			
Excavation, Low Range	CY	$11.00	$16.00
Excavation, Mid Range	CY	$24.00	$35.00
Excavation, High Range	CY	$31.00	$45.00
Outlet Works	EA	User Defined	User Defined
Water Quality Appurtenances	EA	User Defined	User Defined
Detention (Complete-in-Place)	AC-FT	$45,600.00	$65,970.00
Landscaping and Recreation Improvements			
Wetlands Plantings	ACRE	$25,000.00	$36,168.00
Reclamation & seeding (native grasses)	ACRE	$1,000.00	$1,447.00
Trail/Path, Concrete (10' Width)	LF	$44.00	$64.00
Trail/Path, Crusher Fines (10' Width)	LF	$11.00	$16.00
Removals			
Removal of culvert pipe (D<48")	LF	$20.00	$29.00
Removal of culvert pipe (48"<D<84")	LF	$50.00	$72.00
Removal of culvert pipe (D>84")	LF	$75.00	$109.00
Concrete Box Culvert	LF/CELL	$100.00	$145.00
Land Acquisition			
Temporary Easements	EA	User Defined	User Defined
Easement/ROW Acquisition	ACRE	User Defined	User Defined
Concrete and Steel			
Concrete	CY	$600.00	$868.00
Steel	LB	$0.90	$1.00
Operation and Maintenance			
Culvert Maintenance	LF	$1.00	$1.00
Manhole and Inlet Maintenance	EA	$50.00	$72.00
Hydraulic Structure Maintenance	EA	$500.00	$723.00
Channel Maintenance	LF	$2.00	$3.00
Detention/WQ Maintenance	ACRE	$1,500.00	$2,170.00
Mowing	ACRE	$50.00	$72.00
Trail Maintenance	LF	$5.00	$7.00

5.6 ALTERNATIVE PLANS

Several problem areas have been identified in the Aurora and Denver portions of the Westerly Creek watershed. A high percent imperviousness as well as overflows from Easterly Creek within Aurora cause significant street flooding in Aurora and Denver. Due to the severity of street flooding within these problem areas, a combination of multiple alternatives is required to reduce street flooding depths to comply with street flooding criteria. The alternatives assessed within basins of interest are described in sections 5.6.1 to 5.6.4. An interactive map of alternative components assessed within each basin in provided in Figure 5.1. Alternative plans are presented in section 5.6.5. These alternative plans combine multiple alternative components from both Aurora and Denver to meet street flooding criteria.

5.6.1 BASIN 3 ALTERNATIVES

5.6.1.1 *Alternative Component 3.1: E 22nd Avenue Storm Drain*

A 48" RCP and Type-R inlets connecting Dallas Street to Westerly Creek along E 22nd Avenue were recommended as part of the *Original Aurora Stormwater Master Plan*. The recommendation also included a new outfall to Westerly Creek at E 22nd Avenue. This project was to be completed along with the 12'x6' RBC along E 17th Avenue to mitigate street flooding depths in the vicinity of E 22nd Avenue, Dallas Street, and E 23rd Avenue.

The *Original Aurora Stormwater Master* Plan recommendation was superseded by storm drain improvements along E 22nd Avenue currently planned by Aurora. The planned improvements include a 60" RCP along E 22nd Avenue from Dallas Street to Westerly Creek. The proposed E 22nd Avenue design was incorporated into this alternative.

Issues Addressed

1. The proposed storm drain along E 22nd Avenue would convey approximately 170 cfs to Westerly Creek. This would mitigate street flooding along E 22nd Avenue, Dallas Street, and E 23rd Avenue, which do not meet minimum street flooding depth criteria under existing conditions.

Issues Remaining

The E 22nd Avenue storm drain will reduce street flooding along E 22nd Avenue, Dallas Street, and E 23rd Avenue. However, additional improvements are required to sufficiently reduce 100-year street flooding depths to less than one foot throughout the Westerly Creek watershed. Therefore, Alternative Component 3.3: E 23rd Avenue Storm Drain and Alternative Component 5.4: E 17th Avenue Relief Storm Drain (Aurora) must also be constructed. Additionally, either Alternative Component 5.1: Chesapeake Townhomes Pond, or Alternative Component 5.3: Colfax Avenue Relief Storm Drain paired with Alternative Component 3.2: Dayton Street Storm Drain, must be constructed to achieve 100-year street flooding criteria.

Maintenance Requirements

The E 22ndAvenue storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Aurora and any owners of existing utilities that may conflict with this storm drain.

Total Cost

Total Capital Cost: $1.93 million

Annual O&M Cost: $3,000

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.1.2 *Alternative Component 3.2: Dayton Street Storm Drain*

A 30” storm drain beginning at the intersection of Montview Boulevard and Del Mar Parkway and running along Dayton Street to E 22nd Avenue, then along E 22nd Avenue to Dallas Street is proposed. This storm drain will connect to the 60” RCP along E 22nd Avenue, which is proposed in Alternative Component 3.1. Therefore, the E 22nd Avenue storm drain will need to be constructed prior to this project. The alignment down Dayton Street was selected based on FLO-2D modeling, which showed the majority of flow in this area being conveyed by Dayton Street.

Issues Addressed

1. The proposed storm drain along Dayton Street would convey approximately 25 cfs to the E 22nd Avenue storm drain. This would mitigate 100-year street flooding along Dayton Street, which currently does not meet minimum street flooding depth criteria.

Issues Remaining

The Dayton Street storm drain will reduce street flooding. However, additional improvements are required to sufficiently reduce 100-year street flooding depths to less than one foot throughout the Westerly Creek watershed. Therefore, Alternative Component 3.1: E 22nd Avenue Storm Drain, Alternative Component 3.3: E 23rd Avenue Storm Drain, Alternative Component 5.3: Colfax Avenue Relief Storm Drain, and Alternative Component 5.4: E 17th Avenue Relief Storm Drain (Aurora) must also be constructed.

Maintenance Requirements

The Dayton Street storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Aurora and any owners of existing utilities that may conflict with this storm drain.

Total Cost

Total Capital Cost: $1.02 million

Annual O&M Cost: $1,600

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.1.3 *Alternative Component 3.3: E 23rd Avenue Storm Drain*

Aurora is planning to construct an additional storm drain to run parallel to the existing 48" RCP that begins at the intersection of Dallas Street and E 23rd Avenue and outfalls to Westerly Creek. The proposed storm drain consists of a 36" RCP, which up-sizes to 48" RCP, and finally to a 76"x48" HECP. The proposed storm drain outfalls to Westerly Creek north of the existing E 23rd Avenue outfall. The proposed storm drain was assessed as an alternative as part of this OSP.

Additional improvements to the E 23rd Avenue storm drain are proposed as part of the capital improvement plan for Aurora. The parallel E 23rd Avenue storm drains will eventually be extended to the west, where they will be combined into an 83"x53" HECP to a new outfall further to the west. This will be done to accommodate the re-alignment of Westerly Creek that is proposed as part of the capital improvement plan. This final condition of the E 23rd Avenue storm drains was not assessed as part of this OSP.

Issues Addressed

1. The proposed parallel storm drains along E 23rd Avenue would convey approximately 130 cfs to Westerly Creek. This would mitigate street flooding along E 23rd Avenue, which currently does not meet minimum street flooding depth criteria.

Issues Remaining

The E 23rd Avenue storm drain would address known flooding issues in the vicinity of E 23rd Avenue, so there are no remaining issues associated with this component.

Maintenance Requirements

The E 23rd Avenue storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Aurora and any owners of existing utilities that may conflict with this storm drain.

Total Cost

Total Capital Cost: $2.70 million

Annual O&M Cost: $3,900

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.2 BASIN 5 ALTERNATIVES

5.6.2.1 *Alternative Component 5.1: Chesapeake Townhomes Detention Pond*

Due to the highly urbanized nature of the Easterly Creek watershed, opportunities for stormwater detention are limited. However, *the Easterly Creek OSP* identified the existing privately-owned Chesapeake Townhomes Pond as a possible location for a water quality pond. The OSP recommendation was later revised to recommend a detention facility at this location.

A conceptual design was completed by RESPEC in 2017 as part of the *Easterly Creek OSP* revision. The conceptual design includes the addition of a second storm trunk line along S Moline Street and E 1st Avenue and a bubble-up diversion manhole to divert flows to the 1st/Havana Pond. These improvements have already been constructed as part of the 1st/Havana Pond project. The existing pond would be re-graded and a new outlet structure would be installed.

The proposed improvements to the Chesapeake Townhomes Pond would increase the existing pond capacity to provide approximately 19 acre-feet of stormwater detention during a 100-year storm event. The pond would utilize the existing 24" storm drain outfall, which conveys flow from the pond to S Moline Street. Flow is then carried through the existing storm drain to E 1st Avenue, where it is directed through a bubble-up diversion manhole. The bubble-up manhole allows the majority of flow to be directed to the existing 1st/Havana Pond during larger storm events, while flows during smaller storm events continue through the existing storm drain to Kenton Street.

Hydraulic analysis of the Chesapeake Townhomes Pond was completed as part of the RESPEC conceptual design and indicated that approximately 360 cfs would overflow from the pond to the High Line Canal (HLC) during a 100-year storm event. However, this hydraulic analysis was based on the *Easterly Creek OSP* hydrology, which produced much greater inflows than the *Westerly Creek Lower FHAD* hydrology. Preliminary modeling completed during this study based on *Westerly Creek Lower FHAD* hydrology indicates that approximately 150 cfs would overflow to the HLC. Overflows from the existing Chesapeake Townhomes Pond enter the HLC. Denver Water no longer uses the HLC for irrigation purposes downstream of the Chesapeake Townhomes Pond. An agreement with Denver Water will be necessary to allow overflow to the HLC. If the maximum rate of overflow (discharge) to the HLC is problematic it appears there may be an opportunity to increase the size of the Chesapeake Townhomes Pond. The pond could potentially be expanded to the northeast to encompass the vacant land between E. 1st Avenue and the HLC. Still further to the northeast, there is an adjacent large parking lot that appears to be underutilized. Perhaps this private property, or a portion of it, could be obtained and converted into an expansion of the Chesapeake Townhomes Pond. Expanding the pond may eliminate overflow into the HLC and thus the need for an agreement to formalize flow into the HLC.

Issues Addressed

1. Construction of the Chesapeake Townhomes Pond will attenuate flows that would otherwise contribute to Easterly Creek overflows. This has a significant impact on downstream street flooding depths during a 100-year storm event in both the Easterly Creek and Westerly Creek basins.

Issues Remaining

The attenuation of stormwater by the Chesapeake Townhomes Pond will mitigate downstream street flooding depths by attenuating surface flow that contributes to Easterly Creek overflows. However, several downstream street flooding depths would still be greater than one foot. Therefore, additional drainage improvements will need to be constructed to meet street flooding drainage criteria. Potential expansion of the Chesapeake Townhomes Pond as described herein could help reduce the downstream areas with flooding depths greater than one foot.

Maintenance Requirements

Maintenance will include routine inlet and pipe cleaning and inspections. The pond will also require long-term sediment, debris, and trash removal. Regular mowing as well as weed and tree removal will also be required.

ROW/Property Acquisition

The Chesapeake Townhomes Pond is currently owned and operated by the Chesapeake Townhomes Homeowner's Association. The pond and surrounding area will need to be acquired from the current owners. A portion of the Denver Water ROW surrounding the HLC will also need to be acquired. Acquisition of the parking lot, or a portion of it, located north east of the Chesapeake Townhomes Pond immediately southeast of the HLC may be beneficial to optimize the Chesapeake Townhomes Pond downstream system including the outfall to Westerly Creek.

Required Coordination

Coordination will be required between Aurora and the Chesapeake Townhomes Homeowner's Association. Additionally, any changes to existing stormwater discharge from the pond will require an Intergovernmental Agreement between Aurora and Denver Water.

Total Cost

Total Capital Cost: $2.25 million

Annual O&M Cost: $13,500

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.2.2 *Alternative Component 5.2: Havana Park Pond & Del Mar Parkway Improvements*

Improvements to the existing Havana Park Pond have been proposed and are in the 90% design phase at the time of this OSP. The proposed improvements include:

- Re-grading the park/pond to increase stormwater detention;
- Creation of a water quality treatment and bioswale;
- New inlets and 60" RCP along Del Mar Parkway to divert flow into the pond;
- New inlet structure and forebay into the pond;
- New outlet structure and micropool; and
- Replacement of a portion of the existing 42" storm drain downstream of the proposed project with a 36" storm drain to allow a lowering of the proposed bottom of the pond.

Issues Addressed

1. The proposed re-grading of the park/pond will increase the total detention volume of the pond, alleviating downstream flooding.
2. The proposed pond will provide stormwater treatment and improve downstream water quality.

Issues Remaining

The pond will fully contain the 10-year storm event. During a 100-year storm event, there is still a significant amount of surface flow that is not captured by the pond and continues down Del Mar Parkway.

Maintenance Requirements

Maintenance will include routine inlet and pipe cleaning and inspections. The pond will also require long-term sediment, debris, and trash removal. Regular mowing as well as weed and tree removal will also be required.

ROW/Property Acquisition

Havana Park is currently owned and operated by Aurora. The proposed storm drain improvements are also located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Aurora and any owners of existing utilities that may conflict with this storm drain.

Total Cost

Total Capital Cost: $2.65 million

Annual O&M Cost: $17,900

- A cost estimate was prepared as part of the 90% design of the Havana Park Pond and Del Mar Improvements. The annual operation and maintenance costs for the pond were estimated using UDMP Cost Version 2.2.

5.6.2.3 *Alternative Component 5.3: Colfax Avenue Relief Storm Drain*

A 60" RCP is proposed to replace the existing 36" RCP that currently runs along E Colfax Avenue. The storm drain would be extended to connect to the existing 48" storm drain that runs along Del Mar Parkway. The new storm drain would divert flows out of the existing Del Mar Parkway storm drain, allowing for additional interception of Easterly Creek overflows downstream of E Colfax Avenue.

Issues Addressed

1. Constructing a relief storm drain to the existing 48" RCP along Del Mar Parkway will allow for greater interception of Easterly Creek overflows along Del Mar Parkway downstream of E Colfax Avenue and will mitigate downstream street flooding depths during a 100-year storm event. The proposed storm drain will convey approximately 200 cfs along Colfax Avenue to Westerly Creek.

Issues Remaining

The interception of stormwater by the E Colfax Avenue storm drain will reduce downstream street flooding depths. However, several downstream 100-year street flooding depths will still be greater than one foot. Therefore, this alternative component will need to be constructed in conjunction with other components for downstream streets to meet 100-year street flooding criteria. Combined alternative plans are discussed in Section 5.6.5, below.

Maintenance Requirements

The E Colfax Avenue storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Aurora and any owners of existing utilities that may conflict with this storm drain.

Total Cost

Total Capital Cost: $7.79 million

Annual O&M Cost: $11,200

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.2.4 *Alternative Component 5.4: E 17th Avenue Relief Storm Drain (Aurora)*

Construction of a new storm drain along E 17th Avenue was recommended as part of the *Original Aurora Stormwater Master Plan*. The proposed 12'x6' RBC would also provide an outfall for the detention facility located at the intersection of E 17th Avenue and Del Mar Parkway that was recommended as part of the *Original Aurora Stormwater Master Plan*.

A new storm drain and Type-R inlets along E 17th Avenue was still considered as an alternative as part of this OSP. The recommendations made in the *Original Aurora Stormwater Master Plan* were revised to act as a relief system to the existing 54" RCP that runs along Del Mar Parkway. The proposed storm drain would include a 60" RCP along E 17th Avenue and would tie-in to the existing 54" RCP that runs along Del Mar Parkway via diversion manhole. The proposed storm drain will direct stormwater out of the existing Del Mar system and down E 17th Avenue to a new outfall to Westerly Creek. Additional inlets along Del Mar Parkway and E 19th Avenue are also proposed to divert additional surface flows into the existing 54" storm drain. This revision to the *Original Aurora Stormwater Master Plan* recommendation was made to reduce the required size of the E 17th Avenue storm drain by utilizing the existing storm drains in Del Mar Parkway and E 19th Avenue.

Issues Addressed

1. Constructing a relief storm drain to the existing 54" RCP along Del Mar Parkway will allow for greater interception of Easterly Creek overflows along Del Mar Parkway and E 19th Avenue and will mitigate downstream street flooding depths during a 100-year storm event. The proposed storm drain will convey approximately 200 cfs along E 17th Avenue to Westerly Creek.
2. The proposed storm drain will also alleviate street flooding depths along E 17th Avenue. Street flooding in the residential block between Chester Street and Boston Street will also be reduced during a 100-year storm event.
3. The proposed storm drain will allow for greater capacity in the proposed water quality pond located at E 17th Avenue and Del Mar Parkway.

Issues Remaining

The interception of stormwater by the E 17th Avenue storm drain will reduce downstream street flooding depths. However, additional improvements are required to sufficiently reduce 100-year street flooding depths to less than one foot throughout the Westerly Creek watershed. Therefore, Alternative Component 3.1: E 22nd Avenue Storm Drain and Alternative Component 3.3: E 23rd Avenue Storm Drain must also be constructed. Additionally, either Alternative Component 5.1: Chesapeake Townhomes Pond, or Alternative Component 5.3: Colfax Avenue Relief Storm Drain paired with Alternative Component 3.2: Dayton Street Storm Drain, must be constructed to achieve 100-year street flooding criteria.

Maintenance Requirements

The E 17th Avenue storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Aurora and any owners of existing utilities that may conflict with this storm drain.

Total Cost

Total Capital Cost: $3.41 million

Annual O&M Cost: $7,600

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.2.5 *Alternative Component 5.5: East 19th Avenue Storm Drain*

Replacement of the existing 54" RCP that begins at the intersection of Del Mar Parkway and E 19th Avenue and outfalls to Westerly Creek with a new 60" RCP was recommended as part of the Easterly Creek OSP. The recommended 60" RCP was also assessed as part of this study.

Issues Addressed

1. The proposed storm drain along E 19th Avenue would convey approximately 200 cfs. This would mitigate street flooding along Del Mar Parkway downstream of E 19th Avenue, which does not meet minimum street flooding depth criteria.

Issues Remaining

The interception of stormwater by the E 19th Avenue storm drain would reduce downstream street flooding depths. However, several downstream street flooding depths would still be greater than one foot. Therefore, additional drainage improvements will need to be constructed to meet street flooding drainage criteria.

Maintenance Requirements

The E 19th Avenue storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Aurora and any owners of existing utilities that may conflict with this storm drain.

Total Cost

Total Capital Cost: $4.02 million

Annual O&M Cost: $5,000

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

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5.6.3 BASIN 7 ALTERNATIVES

5.6.3.1 *Alternative Component 7.1: E 11th Avenue Storm Drain*

A 78" storm drain with Type-R inlets are proposed to carry stormwater along E 11th Avenue, beginning at Beeler Street, to a new outfall located at E 11th Avenue.

Issues Addressed

1. The proposed storm drain along E 11th Avenue would convey approximately 310 cfs to Westerly Creek. This would mitigate street flooding along Beeler Street, E 12th Avenue, Alton Street, and E 14th Avenue, which currently do not meet street flooding depth criteria.

Issues Remaining

The addition of stormwater flows to Westerly Creek at E 11th Avenue may cause downstream flooding problems along Westerly Creek. The *Westerly Creek MDP* notes that the Richthofen Place crossing structure over Westerly Creek overtops during the 10-year storm. If this alternative is selected, the impact of adding an additional outfall at E 11th Avenue will need to be considered.

Maintenance Requirements

The proposed storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

The proposed storm drain will extend through both Aurora and Denver. Coordination between Aurora and Denver will be required. Additional coordination with the owners of existing utilities that may conflict with this storm drain will also be required.

Total Cost

Total Capital Cost: $5.61 million

Annual O&M Cost: $14,100

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.3.2 *Alternative Component 7.2: E 11th Avenue Open Channel*

An open channel extending from Beeler Street to Westerly Creek is proposed. Two double barrel 9'x4' box culverts are proposed to convey flows beneath Yosemite Street and E 11th Avenue to a new hydraulic drop structure at Westerly Creek. The box culverts were sized using HY-8 using 100-year peak flows generated by SWMM for the proposed channel and assuming a 0.5% channel slope.

This alternative was modeled as a trapezoidal channel with a depth of 4.5', 8' bottom width, and 4:1 side slopes. If this alternative is selected for construction, it will need to be designed according to MHFD's High-Functioning Lower-Maintenance Stream Framework. This will require more land to be acquired compared to a straight trapezoidal channel.

The maximum channel size is limited by the available space within the ROW and by the amount of land that can be acquired from private parties. The channel will also be adjacent to the Lowry Community Park. Per discussion with project sponsors, the limits of construction for the channel will need to be located outside of the park. Additionally, re-alignment of existing sidewalks along E 11th Avenue may also be required in completion of this project.

Issues Addressed

1. The proposed open channel would convey approximately 300 cfs to Westerly Creek. This would mitigate downstream street flooding along Beeler Street, E 12th Avenue, Alton Street, and E 14th Avenue, which currently do not meet street flooding depth criteria.

Issues Remaining

The addition of stormwater flows to Westerly Creek at E 11th Avenue may cause downstream flooding problems along Westerly Creek. The *Westerly Creek MDP* notes that the Richthofen Place crossing structure over Westerly Creek overtops during the 10-year storm. If this alternative is selected, the impact of adding an additional outfall at E 11th Avenue will need to be considered.

Maintenance Requirements

The open channel will require long-term sediment, debris, and trash removal as well as regular mowing and weed removal.

ROW/Property Acquisition

A portion of the proposed channel that is located west of Yosemite Street is on land that is not owned by the City of Aurora. The land will need to be acquired or an agreement with property owners will need to be made to allow for construction of the channel.

Required Coordination

Coordination with landowners will be required to allow construction of the proposed channel. The proposed storm drain will extend through both Aurora and Denver. Coordination between Aurora and Denver will be required. Additional coordination with the owners of existing utilities that may conflict with this storm drain will also be required.

Total Cost

Total Capital Cost: $2.46 million

Annual O&M Cost: $6,100

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.3.3 *Alternative Component 7.3: Alton Street Storm Drain*

A 78" storm drain and Type-R inlets are proposed beginning at the intersection of E 11th Avenue and Beeler Street. The storm drain will convey stormwater west along E 11th Avenue to Alton Street, then north along Alton Street to E 14th Avenue. The storm drain will continue west down E 14th Avenue until turning north to Akron Street. The proposed storm drain will cross Colfax Avenue to a new outfall to be located near the existing Colfax Avenue outfall. This storm drain alignment was selected to avoid utility conflicts including sanitary sewer, storm sewer, and water lines located in Beeler Street.

The existing E 14th Avenue storm drain will drain into the new Alton Street system and the existing E 14th Avenue outfall will be abandoned.

Issues Addressed

1. The proposed storm drain would convey approximately 360 cfs to Westerly Creek. This would mitigate street flooding depths along Beeler Street, E 12th Avenue, Alton Street and E 14th Avenue, which currently do not meet street flooding criteria.
2. The existing E 14th Avenue outfall is located in a below-ground portion of Westerly Creek, which is flowing full during the 100-year storm. Relocating the outfall to Colfax Avenue will reduce Westerly Creek overflows in the vicinity of E 14th Avenue.

Issues Remaining

The Alton Street storm drain will address 100-year street flooding issues.

Maintenance Requirements

The proposed storm drains will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

The northeast corner of Yosemite Street and E Colfax Avenue was as a potential location for redevelopment and greenway beautification as part of the *East Colfax Building Healthy Places Report.* The proposed outfall would be located within the *East Colfax Building Healthy Places Report* study area. Coordination between potential developers regarding this outfall would be required.

Total Cost

Total Capital Cost: $6.53 million

Annual O&M Cost: $16,700

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

5.6.4 BASIN 4401-02 ALTERNATIVES

5.6.4.1 *Alternative Component 4401-02.1: E 17th Avenue Relief Storm Drain (Denver) & Montview Boulevard Storm Drain*

Construction of a new 66" storm drain along E 17th Avenue to act as a relief system for the existing Montview Boulevard storm drain was recommended as part of the *Denver SDMP*. The storm drain would connect to the existing Montview Boulevard storm drain system at Uinta Street and extend to Westerly Creek.

This recommended improvement was revised as part of this OSP. The revised alternative consists of two segments along E 17th Avenue. The first segment of 66" RCP would extend from Uinta Street to Willow Street. The 66" RCP would upsize to a 72" RCP at Willow Street, which then outfalls to Westerly Creek.

Construction of the E 17th Avenue relief storm drain will reduce street flooding depths along Montview Boulevard. However, additional improvements to the existing Montview Boulevard storm drain are required to reduce street flooding to within criteria. Therefore, a 66" storm drain is proposed to replace the existing 53"-60" storm drain that runs along Montview Boulevard from Willow Street to Westerly Creek. The proposed improvements to the Montview Boulevard storm drain were not recommended as part of any previous studies, but were deemed necessary due to additional analysis completed as part of this OSP.

Issues Addressed

1. The proposed E 17th Avenue relief storm drain would convey approximately 220 cfs to Westerly Creek. The Montview Boulevard would convey an additional 190 cfs to Westerly Creek. 100-year street flooding at the crown Montview Boulevard will be eliminated west of Willow Street.
2. 100-year street flooding depth along portions of Uinta Street, E 19th Avenue, and Verbena Street will be reduced to less than one foot. 100-year street flooding at the crown Montview Boulevard will be eliminated east of Willow Street.

Issues Remaining

The proposed improvements will address street flooding issues in the vicinity of Montview Boulevard.

Maintenance Requirements

The proposed storm drain will require regular cleaning and inspection of pipes and inlets.

ROW/Property Acquisition

The proposed improvements are located within the public ROW. No additional land acquisition is required for this project.

Required Coordination

Coordination will be required between Denver and any owners of existing utilities that may conflict with this storm drain.

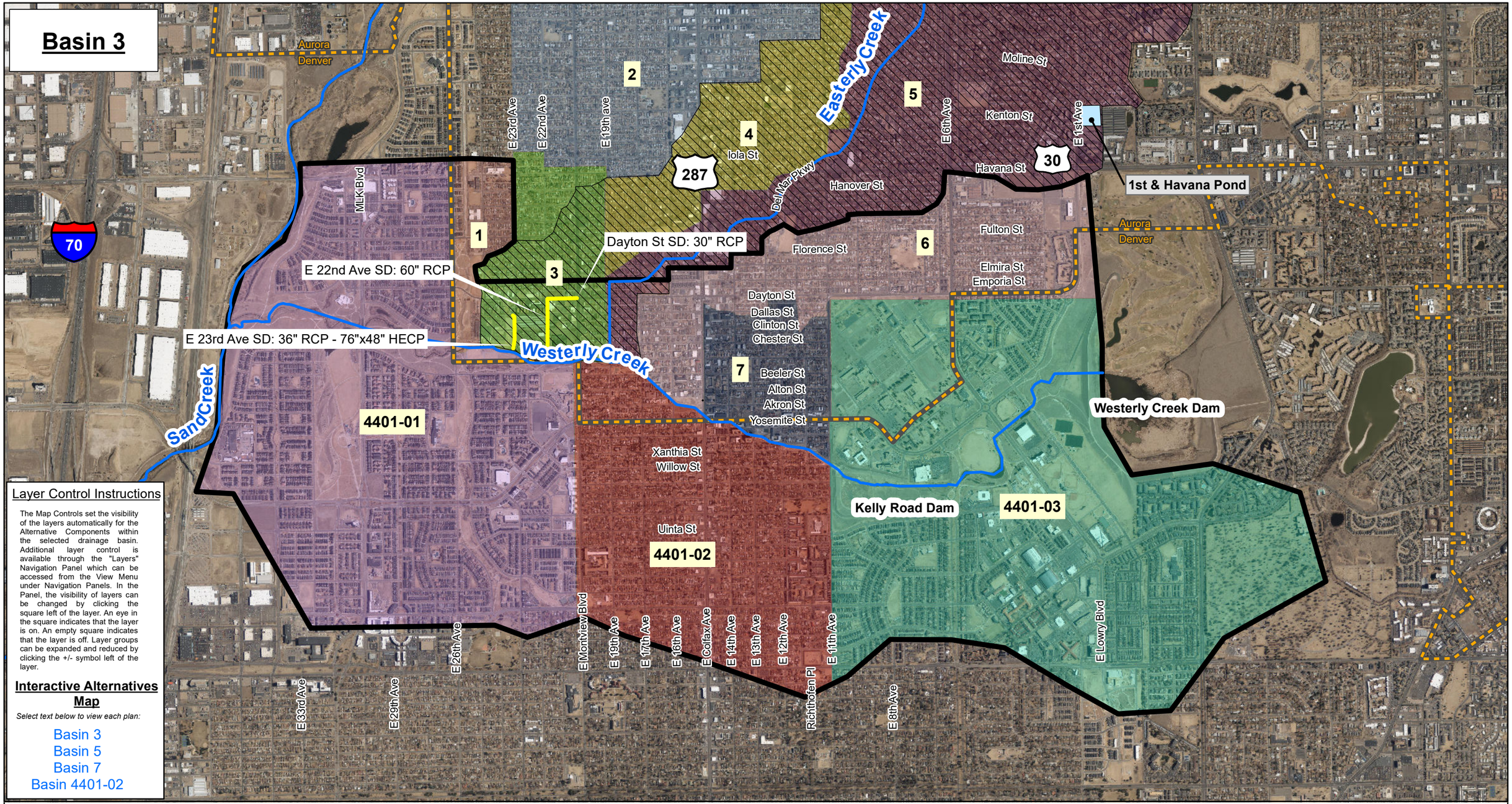
Total Cost

Total Capital Cost: $8.42 million

Annual O&M Cost: $7,200

- The total capital cost and annual operation and maintenance costs associated with this project were estimated using UDMP Cost Version 2.2. A cost estimate summary is provided in Appendix E.

Basin 3



Layer Control Instructions

The Map Controls set the visibility of the layers automatically for the Alternative Components within the selected drainage basin. Additional layer control is available through the "Layers" Navigation Panel which can be accessed from the View Menu under Navigation Panels. In the Panel, the visibility of layers can be changed by clicking the square left of the layer. An eye in the square indicates that the layer is on. An empty square indicates that the layer is off. Layer groups can be expanded and reduced by clicking the +/- symbol left of the layer.

Interactive Alternatives Map

Select text below to view each plan:

Basin 3
Basin 5
Basin 7
Basin 4401-02

Legend

- Streams
- Alternative Component: Storm Drain
- Alternative Component: Open Channel
- Alternative Component: Detention Facility
- Existing Detention Facility
- Study Area Boundary
- Easterly Creek Catchment
- Basin ID
- Jurisdictions

N E S W

0 2,000 4,000 Feet

1 Inch = 2,000 Feet

MHFD MILE HIGH FLOOD DISTRICT

DENVER THE MILE HIGH CITY

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Westerly Creek OSP

Figure 5.1 - Interactive Alternative Components Map

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Author: cbangs

June 2021

5.6.5 COMBINED ALTERNATIVES PLANS

Hydraulic analysis was completed using SWMM v. 5.1 to determine the impact on flood depths of each of the alternative components. Based on this preliminary analysis, the following alternative components were eliminated from further consideration:

1. Alternative Component 5.5: E 19th Avenue Storm Drain
   Hydraulic analysis of the 60" storm drain proposed along E 19th Avenue had minimal impact on downstream street flooding depths. The preliminary analysis indicated that improvements located further upstream such as the E 17th Avenue Relief Storm Drain (Aurora), Colfax Avenue Relief Storm Drain and/or Chesapeake Townhomes Pond would provide significantly better reduction in street flow depths.
2. Alternative Component 4401-02.1: Verbena Park Pond
   Hydraulic analysis completed in SWMM on the stormwater storage in Verbena Park indicated that the existing storage capacity in the park has negligible impact on street flooding depths along E 12th Avenue and Richthofen Place. Therefore, preserving the existing storage of the park is not necessary.

Due to the significant street flooding during the 100-year storm event, a combination of multiple alternative components is required to sufficiently reduce street flooding depths. The remaining alternative components were combined into six alternatives plans, which reduce street flooding within the project area to within local criteria. The alternative plans include base alternatives and a combination of additional alternative components. Base alternatives are improvements that are required in all plans to meet street flooding criteria. A map of the status quo, base alternative, and six combined alternative plans is provided in Figure 5.2.

Base Alternatives:

The following alternative components are included in all alternative plans:

1. Alternative Component 3.1: E 22nd Avenue Storm Drain
2. Alternative Component 3.3: E 23rd Avenue Storm Drain
3. Alternative Component 5.2: Havana Park Pond & Del Mar Parkway Improvements
4. Alternative Component 5.4: E 17th Avenue Relief Storm Drain (Aurora)
5. Alternative Component 4401-02.1: E 17th Avenue Relief Storm Drain (Denver) & Montview Boulevard Storm Drain

5.6.5.1 *Combined Alternatives Plan 1*

The alternative components included in this plan are as follows:

1. All Base Alternatives
2. Alternative Component 5.1: Chesapeake Townhomes Detention Pond
3. Alternative Component 7.1: E 11th Avenue Storm Drain

5.6.5.2 *Combined Alternatives Plan 2*

The alternative components included in this plan are as follows:

1. All Base Alternatives
2. Alternative Component 5.1: Chesapeake Townhomes Detention Pond
3. Alternative Component 7.2: E 11th Avenue Open Channel

5.6.5.3 *Combined Alternatives Plan 3*

The alternative components included in this plan are as follows:

1. All Base Alternatives
2. Alternative Component 5.1: Chesapeake Townhomes Detention Pond
3. Alternative Component 7.3: Alton Street Storm Drain

5.6.5.4 *Combined Alternatives Plan 4*

The alternative components included in this plan are as follows:

1. All Base Alternatives
2. Alternative Component 3.2: Dayton Street Storm Drain
3. Alternative Component 5.3: Colfax Avenue Relief Storm Drain
4. Alternative Component 7.1: E 11th Avenue Storm Drain

5.6.5.5 *Combined Alternatives Plan 5*

The alternative components included in this plan are as follows:

1. All Base Alternatives
2. Alternative Component 3.2: Dayton Street Storm Drain
3. Alternative Component 5.3: Colfax Avenue Relief Storm Drain
4. Alternative Component 7.2: E 11th Avenue Open Channel

5.6.5.6 *Combined Alternatives Plan 6*

The alternative components included in this plan are as follows:

1. All Base Alternatives
2. Alternative Component 3.2: Dayton Street Storm Drain
3. Alternative Component 5.3: Colfax Avenue Relief Storm Drain
4. Alternative Component 7.3: Alton Street Storm Drain

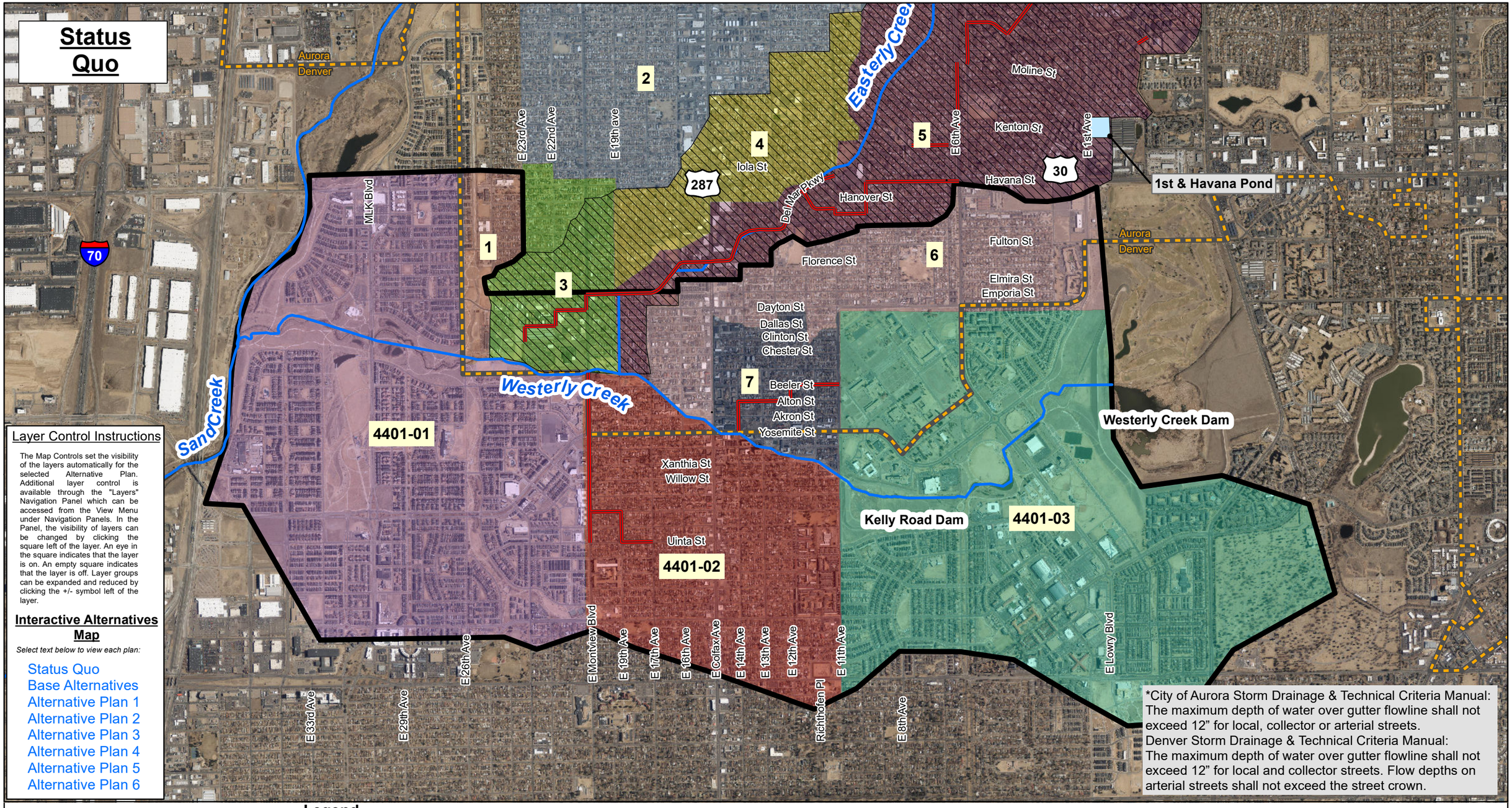
A summary of the 100-year street flooding depths for each known problem areas is provided in Table 5-3, below.

Table 5-3 – 100-year Street Flooding Depths Comparison

Street Name	From Street	To Street	SWMM Link	Existing Conditions (feet)*	Base Alternatives (feet)	Alternative Plan 1 (feet)	Alternative Plan 2 (feet)	Alternative Plan 3 (feet)	Alternative Plan 4 (feet)	Alternative Plan 5 (feet)	Alternative Plan 6 (feet)
E 23rd Ave	Dallas St	Clinton St	S_15_a	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dallas St	E 22nd Ave	E 23rd Ave	S_15_b	1.82	0.61	0.00	0.00	0.00	0.00	0.00	0.00
E 22nd Ave	Dallas St	Dayton St	S_15_c	1.80	1.28	0.96	0.96	0.96	0.96	0.96	0.96
Dayton St	Montview Blvd	E 22nd Ave	S_15_c	1.80	1.28	0.96	0.96	0.96	0.96	0.96	0.96
E 17th Ave	Del Mar Pkwy	Beeler St	S_10_13	0.88	0.77	0.57	0.57	0.57	0.63	0.63	0.63
Del Mar Pkwy	Montview Blvd	E 17th Ave	S_13b2	1.58	1.12	0.84	0.84	0.84	0.87	0.87	0.87
E 11th Avenue	Beeler St	Alton St	S_AR1_c	1.56	1.56	0.95	0.90	0.80	0.95	0.89	0.81
Alton St	E 11th Ave	E 12th Ave	S_AR1_c	1.56	1.56	0.95	0.90	0.80	0.95	0.89	0.81
Alton St	E 12th Ave	E 14th Ave	S_AR1_c	1.56	1.56	0.95	0.90	0.80	0.95	0.89	0.81
E 14th Ave	Alton St	Yosemite St	S_AR1_a	1.58	1.58	0.96	0.91	0.69	0.96	0.90	0.70
Uinta St	E 17th Ave	E 19th Ave	36939STGM-OF	1.82	0.84	0.84	0.84	0.84	0.84	0.84	0.84
E 19th Ave	Uinta St	Verbena St	37673STGMF-OFE	1.26	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Verbena St	E 19th Ave	Montview Ave	37673STGMF-OFE	1.26	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Montview Ave	Uinta St	Willow St	37759STGM-OF	1.22	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Montview Ave	Willow St	Beeler St	37764STGM-OF	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*Existing conditions SWMM input and output data included in Appendix E

Status Quo



Layer Control Instructions

The Map Controls set the visibility of the layers automatically for the selected Alternative Plan. Additional layer control is available through the "Layers" Navigation Panel which can be accessed from the View Menu under Navigation Panels. In the Panel, the visibility of layers can be changed by clicking the square left of the layer. An eye in the square indicates that the layer is on. An empty square indicates that the layer is off. Layer groups can be expanded and reduced by clicking the +/- symbol left of the layer.

Interactive Alternatives Map

Select text below to view each plan:

Status Quo
Base Alternatives
Alternative Plan 1
Alternative Plan 2
Alternative Plan 3
Alternative Plan 4
Alternative Plan 5
Alternative Plan 6

*City of Aurora Storm Drainage & Technical Criteria Manual: The maximum depth of water over gutter flowline shall not exceed 12" for local, collector or arterial streets.
Denver Storm Drainage & Technical Criteria Manual: The maximum depth of water over gutter flowline shall not exceed 12" for local and collector streets. Flow depths on arterial streets shall not exceed the street crown.

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Legend

- Streams
- Base Component: Storm Drain
- Base Alternative: Detention Facility
- Alternative Component: Storm Drain
- Alternative Component: Open Channel
- Alternative Component: Detention Facility
- *Street Flooding Exceeds Criteria
- Problem Area Flooding Depths Reduced to Criteria
- Problem Area Flooding Depths Reduced
- Study Area Boundary
- Jurisdictions
- Easterly Creek Catchment
- Basin ID
- Existing Detention Facility

N E S W

0 2,000 4,000 Feet

1 Inch = 2,000 Feet

Westerly Creek OSP

Figure 5.2 - Interactive Alternatives Map

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Author: cbangs

June 2021

5.7 EVALUATION OF ALTERNATIVES

Alternative plans were assessed based on the following criteria:

1. Adherence to street flooding criteria.
2. Magnitude of street flooding depth reduction.
3. Need for private property acquisition.
4. Benefit-cost ratio.

Combined Alternatives Plans 1, 2, and 3 include the Chesapeake Townhomes detention pond. The attenuation of stormwater by this pond, along with the E 17th Avenue relief storm drain reduce street flooding depths to less than one foot within the study area. However, the acquisition of land needed to construct the Chesapeake Townhomes Pond is a possible barrier to implementing these alternatives plans. Additionally, any changes to the existing pond's overflows to the High Line Canal will require an Intergovernmental Agreement with Denver Water. Aurora is currently planning on obtaining an Intergovernmental Agreement for the High Line Canal for reasons unrelated to the recommendations of this OSP. Therefore, any recommendations including use of the High Line Canal should be in conformance with any imminent Intergovernmental Agreements.

The differences between Combined Alternatives Plans 1, 2, and 3 are the alternative components used to alleviate street flooding along Beeler Street, E 12th Avenue, Alton Street, and E 14th Avenue. The total cost of constructing Alternative Plan 2 is significantly lower due to the inclusion of Alternative Component 7.2 (E 11th Avenue open channel) rather than similar storm drain projects required in Alternatives 1 and 3. However, construction of the E 11th Avenue open channel would require acquisitions of private land, which may be a significant barrier to implementation of Alternative Plan 2.

Combined Alternatives Plans 4, 5, and 6 do not include Alternative Component 5.1 (Chesapeake Townhomes Pond), which was replaced with Alternative Component 5.3 (E Colfax relief storm drain). The benefit of the E Colfax relief storm drain over the Chesapeake Townhomes Pond is that it does not require the acquisition of land or any potential Intergovernmental Agreements related to the discharge of stormwater. However, the E Colfax relief storm drain is not as effective at intercepting overflows from Easterly Creek as the Chesapeake Townhomes Pond. The result is that Combined Alternatives Plans 4, 5, and 6, as well as Alternative Plans 1, 2, and 3, do not reduce flooding downstream of E 17th Avenue. An additional storm drain along Dayton Street (Alternative Component 3.2) is therefore required in Alternative Plans 4, 5, and 6 to meet street flooding criteria.

Combined Alternative Plans 1, 2, 4, and 5 include the addition of an outfall (either open channel or storm drain) immediately downstream of E 11th Avenue. The increase in stormwater discharge upstream of the Richthofen Place crossing structure may cause flood hazards along Westerly Creek between E 11th Avenue and Colfax Avenue. In contrast, Alternative Plans 3 and 6, which include the Alton Street storm drain rather than the E 11th Avenue storm drain, or E 11th Avenue open channel, decreases stormwater flows to this portion of Westerly Creek by re-locating the E 14th Avenue outfall to downstream of Colfax Avenue.

Damage reduction due to street flooding was quantified for select alternative components. Since 100-year street flooding depths were reduced to within criteria for all alternative plans, damage reduction was only calculated for alternative components that significantly reduce damage without needing to be constructed in combination with other alternative components. The damage reduction was based on the number of structures that each alternative component removed from one foot flooding areas. The damage reduction value was used to quantify the benefit- cost ratio for each alternative component. The damage reduction calculations are provided in Appendix E. A comparison between the benefit-cost ratios for Alternative Plans as well as the total costs, need for private property acquisition, and rank of street flooding depth reduction is provided in Table 5-4.

When evaluating Alternatives Plans, the ability of a particular plan to reduce 100-year street flooding in the project area was the primary consideration. All Alternative Plans are compliant with street flooding criteria in the project area and therefore scored the same in this category. The magnitude of street flooding depth reduction was the secondary consideration. The Alternative Plans were ranked from 1st to 6th based on the magnitude of street flooding depth reduction. The third consideration was the plan land acquisition need. The final consideration was the benefit-cost ratio for applicable alternative components within each Alternative Plan.

Table 5-4 – Qualitative Evaluation of Alternative Plans

Combined Alternatives Plan Number	Plan Land Acquisition Need	100-year Street Flooding Depth Reduction Rank	Alternative Component	Cost	Benefit-Cost Ratio	Total Plan Cost
1	Medium	3	Base Alternatives	$19,103,267	N/A	$26,956,550
			Alternative Component 5.1: Chesapeake Townhomes Detention Pond	$2,247,691	4.73	
			Alternative Component 7.1: E 11th Avenue Storm Drain	$5,605,592	0.23	
2	High	2	Base Alternatives	$19,103,267	N/A	$23,807,414
			Alternative Component 5.1: Chesapeake Townhomes Detention Pond	$2,247,691	4.73	
			Alternative Component 7.2: E 11th Avenue Open Channel	$2,456,456	0.53	
3	Medium	1	Base Alternatives	$19,103,267	N/A	$27,877,159
			Alternative Component 5.1: Chesapeake Townhomes Detention Pond	$2,247,691	4.73	
			Alternative Component 7.3: Alton Street Storm Drain	$6,526,201	0.20	
4	Low	6	Base Alternatives	$19,103,267	N/A	$33,524,066
			Alternative Component 3.2: Dayton Street Storm Drain	$1,022,925	N/A	
			Alternative Component 5.3: Colfax Avenue Relief Storm Drain	$7,792,282	N/A	
			Alternative Component 7.1: E 11th Avenue Storm Drain	$5,605,592	0.23	
5	Medium	5	Base Alternatives	$19,103,267	N/A	$30,374,930
			Alternative Component 3.2: Dayton Street Storm Drain	$1,022,925	N/A	
			Alternative Component 5.3: Colfax Avenue Relief Storm Drain	$7,792,282	N/A	
			Alternative Component 7.2: E 11th Avenue Open Channel	$2,456,456	0.53	
6	Low	4	Base Alternatives	$19,103,267	N/A	$34,444,675
			Alternative Component 3.2: Dayton Street Storm Drain	$1,022,925	N/A	
			Alternative Component 5.3: Colfax Avenue Relief Storm Drain	$7,792,282	N/A	
			Alternative Component 7.3: Alton Street Storm Drain	$6,526,201	0.20	

5.8 RECOMMENDED PLAN

Alternative Plan 3 is selected as the recommended plan. Despite the challenges related to changing the hydrology of the High Line Canal, which is no longer used by Denver Water for irrigation, Alternative Plan 3 is preferred due to the high reduction in 100-year flood damages achieved by attenuating stormwater in the upper portion of the Easterly Creek catchment. Expansion of the pond will be assessed as part of the conceptual design to determine if overflows to the High Line Canal can be eliminated, thus removing the requirement for an Intergovernmental Agreement. The inclusion of the Chesapeake Townhomes Pond also significantly reduces the total cost compared to alternative plans that include the Colfax Relief Storm Drain and Dayton Street Storm Drain.

The Alton Street storm drain included in Alternative Plan 3 is also preferable to the E 11th Avenue storm drain and E 11th Avenue open channel included in other Alternative Plans. The Alton Street storm drain mitigates street flooding in the vicinity of E 11th Avenue, Beeler Street, E 14th Avenue, and Akron Street, and does not pose additional flood risk along any reaches of Westerly Creek. The E 11th Avenue open channel and E 11th Avenue storm drain also mitigate street flooding in the vicinity of E 11th Avenue, Beeler Street, E 14th Avenue, and Akron Street. However, they may pose additional flood risk to properties located along Westerly Creek between E 11th Avenue and Colfax Avenue, which is why they were not selected.

The cost of implementing Alternative Plan 3 is summarized in Table 5-5. The legal opinion provided by MHFD is included in Appendix A.

Table 5-5 – Selected Plan Cost Summary

Item	Total Capital Improvement Cost	Annual O&M Cost
Alternative Component 3.1: E 22nd Avenue Storm Drain	$1,934,574	$3,024
Alternative Component 3.3: E 23rd Avenue Storm Drain	$2,695,970	$3,888
Alternative Component 5.1: Chesapeake Townhomes Detention Pond	$2,247,691	$13,452
Alternative Component 5.2: Havana Park Pond & Del Mar Parkway Improvements	$2,650,000	$17,936
Alternative Component 5.4: E 17th Avenue Relief Storm Drain (Aurora)	$3,407,134	$7,632
Alternative Component 7.3: Alton Street Storm Drain	$6,526,201	$16,704
Alternative Component 4401-02.1: E 17th Avenue Relief Storm Drain (Denver) & Montview Boulevard Storm Drain	$8,415,589	$7,212
Total:	**$27,877,159**	**$69,848**

Note: The Havana Park Pond & Del Mar Parkway Improvements were provided by MHFD. All other costs were developed using UDMP-Cost v. 2.2.

6 CONCEPTUAL DESIGN

6.1 PLAN DEVELOPMENT OVERVIEW

The Recommended Plan, as presented in Section 5.8, was discussed with project sponsors and selected for conceptual design per notice from MHFD on July 26, 2021 (see Appendix A). Storm drain improvements outlined in the Recommended Plan (hereafter referred to as Selected Plan) were modified as necessary based on additional analysis and in consideration of achievable cover depths and nearby below-ground utilities as part of the conceptual design of this OSP. Additionally, due to the potential challenges related to reducing or eliminating overflows from the existing Chesapeake Townhomes Pond to the High Line Canal (HLC), supplemental sub-alternatives for the Chesapeake Townhomes Pond were assessed as part of the conceptual design of this OSP. The intent of these sub-alternatives was to determine if overflows to the HLC from the Chesapeake Townhomes Pond could be eliminated.

Conceptual plans were developed for improvements included in the Selected Plan with the goal of reducing 100-year street flooding depths to within jurisdictional criteria. An additional goal of this OSP was to evaluate previous studies to be mindful of their intent and create a comprehensive outfall systems plan for the Westerly Creek watershed downstream of Westerly Creek Dam. Several recommended improvements had already been designed based on recommendations from previous studies or were under design at the time of this OSP. Therefore, BHI only created conceptual design plans for improvements that were not previously designed. See Figure 6.1 for a schematic layout of all recommended improvements included in the conceptual design. Design sheets and documentation for the following improvements, by others, have been included in Appendix G:

1. Chesapeake Townhomes Pond (completed by RESPEC, February 2017)
2. Havana Park Pond and Del Mar Improvements (completed by Enginuity, January 2021)
3. E 22nd Avenue Storm Drain (completed by Kimley Horn, May 2021)
4. E 23rd Avenue Storm Drain (completed by Ware Malcomb, September 2021)

Table 6-1 summarizes the peak flows used for development of the Master Plan and Table 6-2 summarizes key characteristics of detention facilities. Master Plan costs were updated using a 2021 Q1 CCI as part of the Conceptual Design. A summary of Master Plan costs is provided in Table 6-3.

Table 6-1 – Master Plan Peak Flow Summary Table

Location	Design Point	100-year Peak Flow Rate (cfs)	5-year Peak Flow Rate (cfs)	2-year Peak Flow Rate (cfs)
E 22nd Avenue SD	D_16c	148*	26	19
E 23rd Avenue SD	J_15b	223*	20	14
E 17th Avenue (Aurora) SD	D_10_13_b	202	41	28
Alton Street SD	J_AR1_d	428	74	30
E 17th Avenue (Denver) SD	20861STMH	200	91	61
Montview Boulevard SD	19111STMH	159	30	16

*100-yr flow rates for improvements under design obtained from design plans.

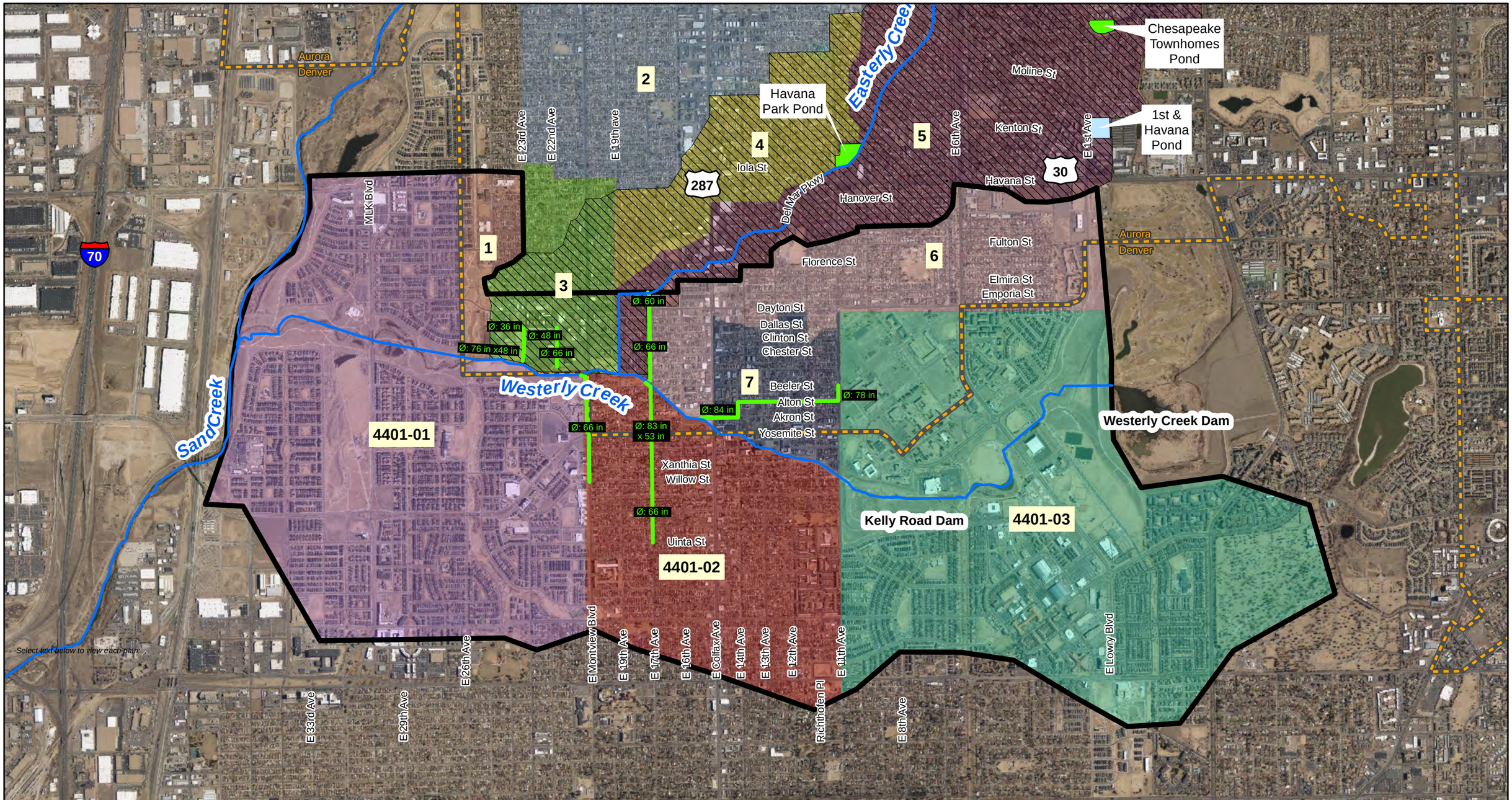
Table 6-2 – Master Plan Proposed Detention Pond Summary Table

Name	Q100 inflow (cfs)	Q100 outflow (cfs)	V100 (ac-ft)	WQCV (ac-ft)	Outlet Type	Surface Area (sq ft)	Max Ponding Depth (ft)
Chesapeake Townhomes Pond	771.94	Pipe: 16.77 Weir: 149.78	19.18	3.8	Weir & Pipe (w/ Circular Orifice Plate)	112,551	11
Havana Park Pond	185.36	Pipe: 47.92 Wier: 135.06	12.14	Linear rate-based water quality treatment utilizing a bioswale	Weir & Pipe (w/ Circular Orifice Plate)	109,000	9

Table 6-3 – Summary of Master Plan Costs

Basin ID	Jurisdiction	Item	Total Capital Improvement Cost	Annual O&M
Basin 3	Aurora	E 22nd Avenue Storm Drain	$1,375,272	$1,152
	Aurora	E 23rd Avenue Storm Drain	$1,857,314	$2,016
Basin 5	Aurora	Chesapeake Townhomes Detention Pond	$2,245,115	$6,726
	Aurora	Havana Park Pond & Del Mar Parkway Improvements	$2,650,000	$17,936
	Aurora	Alternative Component 5.4: E 17th Avenue Relief Storm Drain (Aurora)	$3,567,932	$7,776
Basin 7	Aurora	Alternative Component 7.3: Alton Street Storm Drain	$6,971,591	$16,560
Basin 4401-02	Denver	Alternative Component 4401-02.1: E 17th Avenue Relief Storm Drain (Denver) & Montview Boulevard Storm Drain	$8,683,215	$8,220
		Aurora Subtotal	**$18,667,224**	**$52,166**
		Denver Subtotal	**$8,683,215**	**$8,220**
		Total	**$27,350,439**	**$60,386**

Note: The Havana Park Pond & Del Mar Parkway Improvements were provided by MHFD. All other costs were developed using UDMP-Cost v. 2.2.



Legend

- Proposed Storm Drains
- Streams
- Study Area Boundary
- Jurisdictions
- Easterly Creek Catchment
- Proposed Detention Facility
- 4 Basin ID
- Existing Detention Facility

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N E S W

0 2,000 4,000 Feet

1 Inch = 2,000 Feet

Westerly Creek OSP

Figure 6.1 - Conceptual Design Schematic

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Author: cbangs

October 2021

6.2 MASTER PLAN DESCRIPTION

6.2.1 E 22ND AVENUE STORM DRAIN

Street flows originating in the Easterly Creek catchment are conveyed down Dayton Street to E 22nd Avenue. Overland flows are conveyed down E 22nd Avenue, causing street flooding problem areas in the vicinity of E 22nd Avenue, Dallas Street, and E 23rd Avenue. A new storm drain along E 22nd Avenue will alleviate street flooding along E 22nd Avenue, Dallas Street, and E 23rd Avenue. As previously mentioned in Section 5.6.5, through partnership with private development adjacent to the project, Aurora was planning to construct a 60" storm drain. However, those plans were revised after completion of the Alternatives Analysis of this OSP. The final plans developed by Aurora were revised to include a 66" storm drain rather than a 60" storm drain. The proposed 66" storm drain extends from Dallas Street to an outfall at Westerly Creek and was included in the conceptual design of this OSP. The proposed plan and profile sheets completed by Kimley Horn are provided in Appendix G. A summary of peak flows for the proposed E 22nd Avenue storm drain is provided below in Table 6-4, with the 100-year peak flow rate from the design plans and the 5-year and 2-year from this OSP conceptual design SWMM model.

Table 6-4 – E 22nd Avenue Storm Drain Peak Flows

Improvement Section	100-year Peak Flow Rate (cfs)	5-year Peak Flow Rate (cfs)	2-year Peak Flow Rate (cfs)
E 22nd Avenue SD	148	26	19

CLICK HERE TO VIEW E 22ND AVENUE STORM DRAIN DESIGN SHEETS

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP		
DRAINAGEWAY :	Basin 3		
REACH :	22nd Ave		
JURISDICTION :	Aurora		
REACH ID:	B3-Reach22nd Ave	Casey Bangs	DATE : 2/9/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
66-inch	807	1	807	L.F.	$382.00	$308,274.00	
18-inch	20	5	100	L.F.	$78.00	$7,800.00	
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
66-inch	Yes	1	1	EA	$2,505.80	$2,506.00	
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
66-inch		1	1	EA	$14,866.55	$14,867.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			3	EA	$17,360.00	$52,080.00	
Storm Inlet, Type R/Type 14, 5-foot			5	EA	$6,655.00	$33,275.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		3228	S.Y.	$85.00	$274,380.00	

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$418,802.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$0.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$274,380.00
Subtotal Capital Improvement Costs				**$693,182.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$34,659.00
Traffic Control	$20,795.46	L.S.		$20,795.00
Utility Coordination/Relocation	$103,977.30	L.S.		$103,977.00
Stormwater Management/Erosion Control	5%			$34,659.00
Subtotal Additional Capital Improvement Costs				**$194,090.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$133,091.00
Legal/Administrative	5%			$44,364.00
Contract Admin/Construction Management	10%			$88,727.00
Contingency	25%			$221,818.00
Subtotal Other Costs				**$488,000.00**
Total Capital Improvement Costs				**$1,375,272.00**

Master Plan Operation and Maintenance Cost Summary				
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	8	EA	$72.00	$1,152.00
Total Annual Operation and Maintenance Cost				**$1,152.00**
Effective Interest Rate				4.00%
Total Operation and Maintenance Costs Over 50 Years				**$24,747.00**

6.2.2 E 23RD AVENUE STORM DRAIN

Overland flows from the Easterly Creek catchment are conveyed down Dayton Street, E 22nd Avenue, and Dallas Street to E 23rd Avenue. With private partnership, Aurora is planning to construct an additional storm drain to run parallel to the existing 48" RCP that begins at the intersection of Dallas Street and E 23rd Avenue and outfalls to Westerly Creek. The proposed storm drain consists of a 36" RCP, which up-sizes to 48" RCP, and finally to a 76"x48" HECP. The proposed storm drain outfalls to Westerly Creek north of the existing E 23rd Avenue outfall. The proposed storm drain was under design at the time of this OSP. The proposed plan and profile sheets completed by Ware Malcomb are provided in Appendix G. A summary of peak flows for the proposed E 23rd Avenue storm drain is provided below in Table 6-5, with the 100-year peak flow rate from the design plans and the 5-year and 2-year from this OSP conceptual design SWMM model.

Table 6-5 – E 23rd Avenue Storm Drain Peak Flows

Improvement Section	100-year Peak Flow Rate (cfs)	5-year Peak Flow Rate (cfs)	2-year Peak Flow Rate (cfs)
E 23rd Avenue SD	223	20	14

CLICK HERE TO VIEW E 23rd AVENUE STORM DRAIN DESIGN SHEETS

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 3			
REACH :	23rd Ave			
JURISDICTION :	Aurora			
REACH ID:	B3-Reach23rd Ave	Casey Bangs	DATE :	2/9/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
36-inch	59	1	59	L.F.	$156.00	$9,204.00	
48-inch	208	1	208	L.F.	$208.00	$43,264.00	
120-inch	424	1	424	L.F.	$1,215.00	$515,160.00	76" x 48" HECP
18-inch	20	7	140	L.F.	$78.00	$10,920.00	
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
120-inch	Yes	1	1	EA	$4,649.12	$4,649.00	
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
120-inch		1	1	EA	$35,257.46	$35,257.00	
Manholes and Inlets							
Manhole, 5' Dia. (Pipe Dia. 36" - 42")			2	EA	$5,642.00	$11,284.00	
Manhole, 6' Dia. (Pipe Dia. = 48")			4	EA	$6,221.00	$24,884.00	
Storm Inlet, Type R/Type 14, 5-foot			7	EA	$6,655.00	$46,585.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		2764	S.Y.	$85.00	$234,940.00	

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains			$701,207.00	
Concrete Box Culverts			$0.00	
Hydraulic Structures			$0.00	
Channel Improvements			$0.00	
Detention/Water Quality Facilities			$0.00	
Removals			$0.00	
Landscaping and Maintenance Improvements			$0.00	
Special Items (User Defined)			$234,940.00	
Subtotal Capital Improvement Costs			**$936,147.00**	
Additional Capital Improvement Costs				
Dewatering		L.S.	$0.00	
Mobilization	5%		$46,807.00	
Traffic Control	$28,084.41	L.S.	$28,084.00	
Utility Coordination/Relocation	$140,422.05	L.S.	$140,422.00	
Stormwater Management/Erosion Control	5%		$46,807.00	
Subtotal Additional Capital Improvement Costs			**$262,120.00**	
Land Acquisition Costs				
ROW/Easements			$0.00	
Subtotal Land Acquisition Costs			**$0.00**	
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%		$179,740.00	
Legal/Administrative	5%		$59,913.00	
Contract Admin/Construction Management	10%		$119,827.00	
Contingency	25%		$299,567.00	
Subtotal Other Costs			**$659,047.00**	
Total Capital Improvement Costs			**$1,857,314.00**	

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	14	EA	$72.00	$2,016.00	
Total Annual Operation and Maintenance Cost				**$2,016.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$43,308.00**	

6.2.3 CHESAPEAKE TOWNHOMES DETENTION POND

Overland flows originating in the upper portion of the Easterly Creek catchment are conveyed to the existing Chesapeake Townhomes Pond. Overflows from the existing conditions pond enter the High Line Canal (HLC), which is assumed to overtop, contributing to street flooding in the lower portion of the Easterly Creek catchment as well as the Westerly Creek watershed. Due to challenges related to changing the existing overflows from the Chesapeake Townhomes Pond, additional analysis was completed as part of this OSP to determine if the HLC is capable of conveying stormwater out of the Westerly Creek watershed or if overflows from the pond to the HLC could be eliminated. Additional sub-alternatives related to improvements to the Chesapeake Townhomes Pond were included in the scope of conceptual design for this OSP. The sub-alternatives assessed are as follows:

1. Regrade the pond and increase its capacity with the goal of eliminating overtopping to the HLC.
2. Add new, additional land to the northeast of the pond and increase its capacity with the goal of eliminating overtopping to the HLC.
3. Formalize overflows from this pond into the HLC with the goal of eliminating flooding above criteria downstream in the Westerly Creek watershed.

Discussion of the analysis completed, and results are provided in Sections 6.2.3.1 to 6.2.3.3.

6.2.3.1 Regrade Chesapeake Pond to Increase Storage Capacity

The revision to the *Easterly Creek OSP* completed in 2017 by RESPEC proposed regrading the Chesapeake Townhomes Pond to increase the storage capacity of the pond to approximately 19 acre-feet. The objective of this sub-alternative was to optimize the storage of the 2017 RESPEC conceptual design for the Chesapeake Townhomes Pond to eliminate 100-year overflows to the HLC. Eliminating flows to the HLC is desirable because it would eliminate the need for Intergovernmental Agreements related to changes in HLC discharges, which are a potential barrier to the implementation of the pond improvements. Based on the analysis completed during the Alternatives Analysis portion of this OSP, approximately 150 cfs would enter the HLC from the Chesapeake Townhomes Pond. Increasing the pond volume to approximately 26 acre-feet is necessary to eliminate flow to the HLC.

Analysis of the RESPEC conceptual design showed that lowering the pond invert to increase storage is not possible. This is due to the shallow slope of the pond outfall storm drain. The existing outfall storm drain was constructed with a 0.5% slope, according to the as-constructed drawings obtained from Aurora (drawing no. 1980-037SS). Lowering the pond invert would be costly due to the need to construct a new storm drain outfall and may inhibit the pond from draining to the existing Moline Street storm trunkline.

Increasing pond storage by constructing an earthen berm surrounding the pond was also considered. The pond grading proposed by RESPEC was extended using the 4:1 maximum allowable pond side slope per Aurora storm drainage criteria. Modifying the RESPEC design in this way would require a 100-year WSE of 5464 feet to eliminate overflow to the HLC. The RESPEC design proposed an emergency overflow spillway crest elevation of 5460 feet NAVD88. Due to the close proximity of the HLC and nearby homes to the Chesapeake Townhomes Pond, construction of a berm of this size is not feasible.

The vertical and horizonal limitations of the Chesapeake Townhomes Pond limit possibilities to expand the pond volume, making the elimination of overflow to the HLC not feasible under this sub-alternative.

6.2.3.2 Expand Chesapeake Pond to Northeast Lot

During the Alternatives Analysis of this OSP, BHI identified two lots to the northeast of the Chesapeake Townhomes Pond that appear to be under-utilized. The parcels are owned by US Communications and the Lyn Meadows Homeowner Association. Construction of an additional pond on these lots was assessed. The intent of this sub-alternative was to provide enough storage in the potential expansion area to eliminate overflows to the HLC. This sub-alternative was assumed to be constructed in addition to the improvements to the Chesapeake Townhomes Pond proposed by RESPEC. The two ponds were assumed to be connected by an equalization pipe, allowing stormwater from the Chesapeake Townhomes Pond to flow to the new pond to the northeast.

Upon further analysis it was determined that due to the proximity of nearby homes, the HLC, and E 1st Avenue, there is limited space available on these parcels to construct a new pond. Additionally, the existing ground surface of the parcels is slightly uphill from the existing Chesapeake Townhomes Pond. Therefore, the maximum achievable storage on the parcels is approximately one acre-foot. Constructing the new pond would result in a total storage of the Chesapeake Townhomes Pond facility of approximately 20 acre-feet, requiring approximately six acre-feet to be discharge to the HLC with a peak overflow of approximately 140 cfs during a 100-year storm.

Since the additional pond area has minimal impact on storage volume and would be expensive to construct, this sub-alternative was not considered to be a feasible option for eliminating overflows to the HLC.

6.2.3.3 Formalize Overflows to the High Line Canal

Hydrologic modeling completed as part of the *Westerly Creek Lower FHAD* assumed that the HLC did not convey flows out of the Westerly Creek watershed. As a result, overflows from the Chesapeake Townhomes Pond were assumed to overtop the canal and were routed through the Easterly Creek

watershed via Oswego Street, Park East Road, and an overflow path located to the north of the HLC. The alternatives assessment SWMM modeling completed as part of this OSP was based on the same assumption as the *Westerly Creek Lower FHAD* hydrology. Additional analysis was necessary to determine the impact of utilizing the HLC as conveyance on downstream street flooding depths.

BHI obtained additional SWMM modeling for the HLC that was completed by RESPEC as part of the 2018 *High Line Canal Stormwater and Operations Master Plan.* The 2018 RESPEC SWMM model includes the existing conditions Chesapeake Townhomes Pond, which provides approximately 10 acre-feet of storage. BHI modified the RESPEC SWMM model to include the improvements to the Chesapeake Townhomes Pond, as proposed in the 2017 RESPEC conceptual design that would increase the pond storage capacity to approximately 19 acre-feet. Based on this analysis, the HLC has sufficient capacity in both existing and proposed conditions to convey 100-year overflows from the Chesapeake Townhomes Pond. In the proposed conditions, approximately 260 cfs overflows to the HLC from the Chesapeake Townhomes Pond based on the *High Line Canal Stormwater and Operations Master Plan* SWMM model that BHI modified as part of this OSP. This calculated overflow is a conservative estimation. As previously mentioned, SWMM modeling completed by BHI as part of the Alternatives Assessment of this OSP indicates that approximately 150 cfs will enter the HLC. This discrepancy is due to the more detailed analysis completed as part of this OSP, which allows for flows to be collected by Moline Street and routed out of the basin, contributing to the Chesapeake Townhomes Pond. The Alternatives Assessment SWMM model includes existing storm drain to route basin flows to the pond, rather than assuming the entire basin contributes to the pond. A summary of the 100-year HLC depths and overflows from the Chesapeake Townhomes Pond is provided in Tables 6-6 and 6-7, respectively.

Table 6-6 – Comparison of 100-year HLC Depths

SWMM Link*	RESPEC HLC Study		2018 HLC Stormwater and Operations Master Plan	
	100-year Depth (ft)	Freeboard (ft)	100-year Depth (ft)	Freeboard (ft)
HLC_80692_oc	3.71	3.38	3.55	3.54
HLC_FS_WQ411_oc	3.46	3.63	3.29	3.80
HLC_78921_oc	3.33	3.76	3.15	3.94

Note: Visit highlinecanalcolorado.com for HLC Stormwater and Operations Master Plan interactive online map.

Table 6-7 – Comparison of 100-year HLC Overflows from Chesapeake Townhomes Pond

RESPEC HLC Study (cfs)	2018 HLC Stormwater and Operations Master Plan (cfs)	Westerly Creek OSP (2021) (cfs)
341	257	151

The kinematic wave SWMM model developed as part of the Alternatives Assessment of this OSP was modified, assuming that overflows from the Chesapeake Townhomes Pond would be conveyed out of the Easterly Creek watershed by the HLC rather than being routed through the Westerly Creek watershed as previously mentioned. Due to the attenuation of stormwater in the Chesapeake Townhomes Pond, peak overflows from the proposed pond were not coincident with peak flows in neighboring portions of the Easterly Creek watershed. Peak overflows from the proposed conditions pond were also lower in magnitude than peak flows at downstream analysis points. Figure 6.2 compares peak flow rates downstream at Del Mar Parkway and 12th Avenue to illustrate the differences in peak timing within the study area. Routing those lower, later flows out of the Easterly Creek watershed through the HLC does not have a significant impact on (reduction of) downstream peak flows or street flooding depths compared to the Chesapeake Pond alternative that was included in the Recommended Plan.

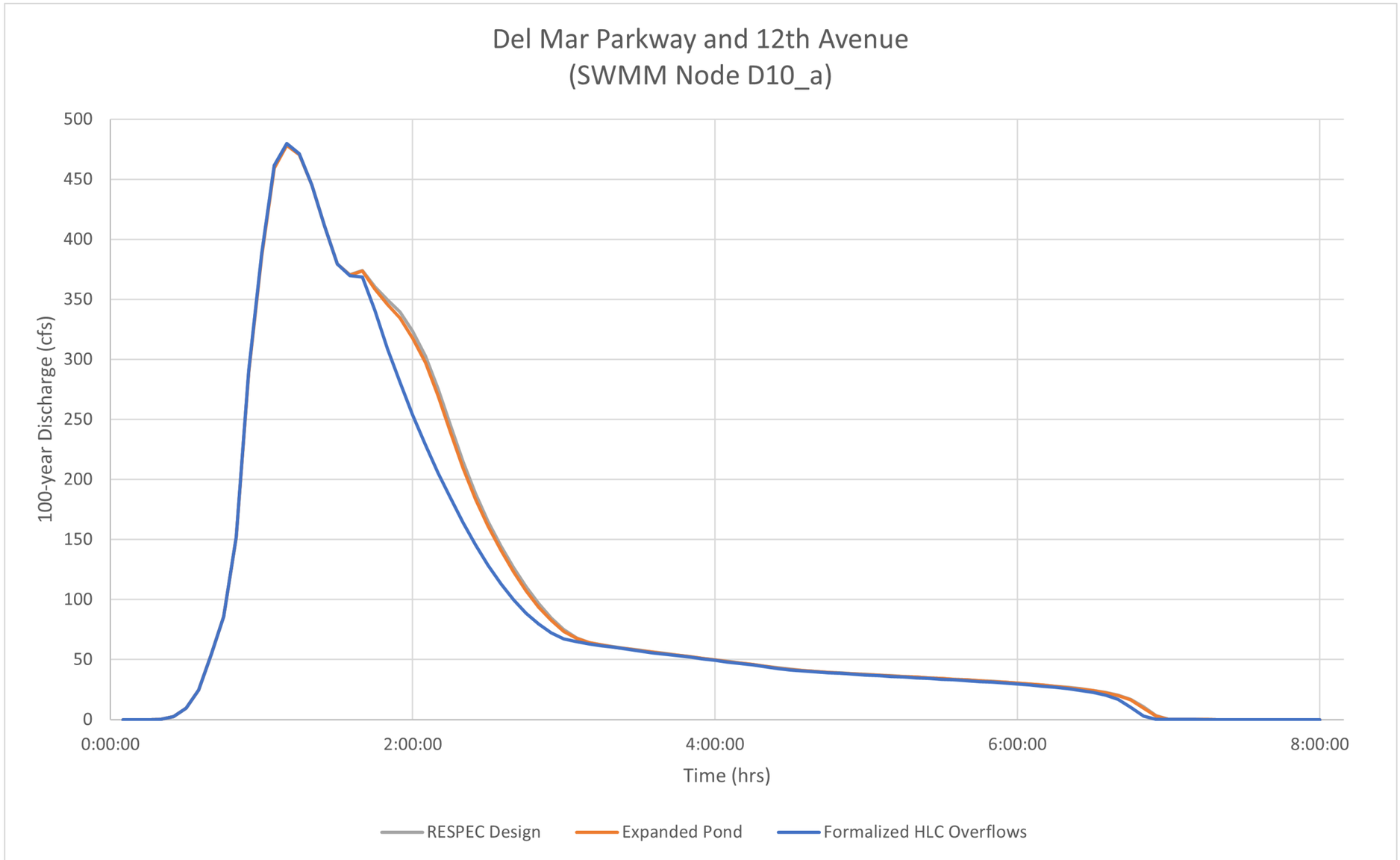

Figure 6.2 – Del Mar Parkway and 12th Avenue Peak Flow Rates

6.2.3.4 *Results of Chesapeake Townhomes Pond Sub-Alternative Assessment*

Independent of other drainage improvements, none of the three above sub-alternatives bring street flooding depths within criteria for the 100-year return event within the study area due to differences in peak timing, as illustrated above in Figure 6.2. Eliminating overflow to the HLC by increasing the Chesapeake Townhomes Pond storage volume through optimization of the RESPEC conceptual design or by creating supplementary storage to the northeast of the pond is not possible. As part of this OSP, hydrologic analysis from the *High Line Canal Stormwater and Operations Master Plan* was updated to include the 2017 RESPEC conceptual design for expansion of the Chesapeake Townhomes Pond and assess the capacity of the HLC to convey the overflows from the pond. The updated analysis indicates that improvements to the Chesapeake Townhomes Pond as outlined in the 2017 RESPEC conceptual design will reduce overflows to the HLC, which has sufficient capacity to convey overflows from the pond in both existing and proposed conditions. At the time this report was written, formalizing overflows to the HLC through an intergovernmental agreement was a viable option. If an intergovernmental agreement can be reached without any improvements to the Chesapeake Townhomes Pond, that is the preferred option. However, if formalizing flows to the HLC is dependent on reducing 100-year peak overflows to the canal, the pond may need to be improved as outlined in the RESPEC conceptual design. The pond is currently owned by the Chesapeake Homeowners Organization and has an appraised value of $3,135. Aurora will pursue further negotiation for purchasing the land at the time of the project. A summary of the RESPC Chesapeake Townhomes Pond is provided in Table 6-8, below.

Table 6-8 – Chesapeake Townhomes Pond Summary (100-year)

Peak Volume (ac-ft)	WQCV (ac-ft)	HLC Overflow (cfs)	Outfall Flow (cfs)	WSE (ft)
19.18	3.8	149.78	16.77	5460.62

CLICK HERE TO VIEW CHESAPEAKE TOWNHOMES POND DESIGN SHEETS

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 5			
REACH :	Chesapeake Pond			
JURISDICTION :	Aurora			
REACH ID:	B5-ReachChesapeake Pond	Casey Bangs	DATE :	2/9/2022

DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Detention/Water Quality Facilities						
Detention (Complete-in-Place)						
Detention Facility 1 (Complete-in-Place)		19	AC-FT	$65,970.00	$1,253,430.00	
Landscaping and Maintenance Improvements						
Reclamation & seeding (native grasses)		3	ACRE	$1,447.00	$4,341.00	
Land Acquisition						
Easement/ROW Acquisition		3.00	ACRE	$1,045.00	$3,135.00	Arapahoe County appraised value

Master Plan Capital Improvement Cost Summary					
Capital Improvement Costs					
Pipe Culverts and Storm Drains					$0.00
Concrete Box Culverts					$0.00
Hydraulic Structures					$0.00
Channel Improvements					$0.00
Detention/Water Quality Facilities					$1,253,430.00
Removals					$0.00
Landscaping and Maintenance Improvements					$4,341.00
Special Items (User Defined)					$0.00
Subtotal Capital Improvement Costs					**$1,257,771.00**
Additional Capital Improvement Costs					
Dewatering			L.S.		$0.00
Mobilization		5%			$62,889.00
Traffic Control			L.S.		$0.00
Utility Coordination/Relocation		$62,888.55	L.S.		$62,889.00
Stormwater Management/Erosion Control		5%			$62,889.00
Subtotal Additional Capital Improvement Costs					**$188,667.00**
Land Acquisition Costs					
ROW/Easements					$3,135.00
Subtotal Land Acquisition Costs					**$3,135.00**
Other Costs (percentage of Capital Improvement Costs)					
Engineering		15%			$216,966.00
Legal/Administrative		5%			$72,322.00
Contract Admin/Construction Management		10%			$144,644.00
Contingency		25%			$361,610.00
Subtotal Other Costs					**$795,542.00**
Total Capital Improvement Costs					**$2,245,115.00**

Master Plan Operation and Maintenance Cost Summary					
Description		**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**
Detention/WQ Maintenance (e.g. sediment & debris removal, mucking out, tree & weed removal, stru		3	ACRE	$2,170.00	$6,510.00
Mowing (e.g. channels, ponds, etc.)		3	ACRE	$72.00	$216.00
Total Annual Operation and Maintenance Cost					**$6,726.00**
Effective Interest Rate					4.00%
Total Operation and Maintenance Costs Over 50 Years					**$144,489.00**

6.2.4 HAVANA PARK POND & DEL MAR PARKWAY IMPROVEMENTS

Overland flows from the Easterly Creek catchment are conveyed down Del Mar Parkway into the Westerly Creek watershed. Stormwater from the Easterly Creek catchment is detained in the existing Havana Park Pond. Improvements to the Havana Park Pond, its collection system and outfall were under design at the time of this OSP. The intent of these improvements is to increase the pond detention capacity and improve storm drain conveyance into and out of the pond. These improvements will reduce downstream street flooding along Del Mar Parkway and will therefore reduce street flooding depths within the Westerly Creek watershed. However, independent of other drainage improvements, this project does not bring street flooding depths within criteria for the 100-year return event. Appreciable reduction in street flooding is primarily realized only in smaller return events. The 90% design of the Havana Park Pond and Del Mar Improvements was completed by Enginuity and is included in Appendix G. A summary of the proposed Havana Park Pond is provided in Table 6-9, below.

Table 6-9 – Havana Park Pond Summary (100-year)

Peak Volume (ac-ft)	WQCV (ac-ft)	Del Mar Parkway Overflow (cfs)	Outfall Flow (cfs)	WSE (ft)
12.14	N/A	135.06	47.92	5385

CLICK HERE TO VIEW HAVANA PARK POND & DEL MAR IMPROVEMENTS DESIGN SHEETS

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 5			
REACH :	Havana Park Pond			
JURISDICTION :	Aurora			
REACH ID:	B5-ReachHavana Park Pond	Casey Bangs	DATE :	2/9/2022

DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Special Items (User Defined)						
Pond Improvements	<----User Defined Items	1	LS	$1,554,250.77	$1,554,251.00	Schutte) based on 90% design estimate. Unit cost adjusted to reach target total

Master Plan Capital Improvement Cost Summary					
Capital Improvement Costs					
Pipe Culverts and Storm Drains					$0.00
Concrete Box Culverts					$0.00
Hydraulic Structures					$0.00
Channel Improvements					$0.00
Detention/Water Quality Facilities					$0.00
Removals					$0.00
Landscaping and Maintenance Improvements					$0.00
Special Items (User Defined)					$1,554,251.00
Subtotal Capital Improvement Costs					**$1,554,251.00**
Additional Capital Improvement Costs					
Dewatering			L.S.		$0.00
Mobilization		5%			$77,713.00
Traffic Control			L.S.		$0.00
Utility Coordination/Relocation			L.S.		$0.00
Stormwater Management/Erosion Control		5%			$77,713.00
Subtotal Additional Capital Improvement Costs					**$155,426.00**
Land Acquisition Costs					
ROW/Easements					$0.00
Subtotal Land Acquisition Costs					**$0.00**
Other Costs (percentage of Capital Improvement Costs)					
Engineering		15%			$256,452.00
Legal/Administrative		5%			$85,484.00
Contract Admin/Construction Management		10%			$170,968.00
Contingency		25%			$427,419.00
Subtotal Other Costs					**$940,323.00**
Total Capital Improvement Costs					**$2,650,000.00**

Master Plan Operation and Maintenance Cost Summary					
Description		**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**
Detention/WQ Maintenance (e.g. sediment & debris removal, mucking out, tree & weed removal, struct		4	ACRE	$2,170.00	$17,360.00
Mowing (e.g. channels, ponds, etc.)		4	ACRE	$72.00	$576.00
Total Annual Operation and Maintenance Cost					**$17,936.00**
Effective Interest Rate					4.00%
Total Operation and Maintenance Costs Over 50 Years					**$385,304.00**

6.2.5 E 17TH AVENUE RELIEF STORM DRAIN (AURORA)

Overland flow originating from the Easterly Creek catchment is conveyed down Del Mar Parkway into the Westerly Creek watershed, causing street flooding issues in several locations. An existing 54" storm drain collects stormwater along Del Mar Parkway before turning down E 19th Avenue to Westerly Creek. A 60" storm drain along E 17th Avenue is proposed to act as a relief system to the existing 54" Del Mar storm drain. The storm drain upsizes to a 66" RCP at Dayton Street. Upsizing the pipe at Dayton Street was not part of the previous recommendation from the alternatives analysis, however, was determined to be necessary based on more-detailed hydraulic modeling completed during the conceptual design phase of this OSP.

This improvement would allow for additional capture of surface flows along Del Mar Parkway downstream of E 17th Avenue, reducing street flooding depths in the vicinity of E 22nd Avenue, E 23rd Avenue, Dayton Street, and Dallas Street, which have been identified as street flooding problem areas. A conceptual design of the proposed storm drain has been prepared as part of this OSP and is included in Appendix G. A summary of peak flows for the proposed E 17th Avenue storm drain is provided in Table 6-10, below.

Table 6-10 – E 17th Avenue Relief Storm Drain (Aurora) Peak Flows

Improvement Section	100-year Peak Flow Rate (cfs)	5-year Peak Flow Rate (cfs)	2-year Peak Flow Rate (cfs)
E 17th Avenue (Aurora) SD	202	41	28

CLICK HERE TO VIEW E 17TH AVENUE RELIEF STORM DRAIN (AURORA) MAP

CLICK HERE TO VIEW E 17TH AVENUE RELIEF STORM DRAIN (AURORA) PROFILE

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 5			
REACH :	17th Ave			
JURISDICTION :	Aurora			
REACH ID:	B5-Reach17th Ave	Casey Bangs	DATE :	2/9/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
60-inch	372	1	372	L.F.	$347.00	$129,084.00	
66-inch	1566	1	1566	L.F.	$382.00	$598,212.00	
18-inch	20	46	920	L.F.	$78.00	$71,760.00	
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
66-inch	Yes	1	2	EA	$2,505.80	$5,012.00	
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
66-inch		1	2	EA	$14,866.55	$29,733.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			5	EA	$17,360.00	$86,800.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			3	EA	$21,701.00	$65,103.00	
Storm Inlet, Type R/Type 14, 5-foot			46	EA	$6,655.00	$306,130.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		7752	S.Y.	$85.00	$658,920.00	36-foot width

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$1,291,834.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$0.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$658,920.00
Subtotal Capital Improvement Costs				**$1,950,754.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$97,538.00
Traffic Control	$58,522.62	L.S.		$58,523.00
Utility Coordination/Relocation	$97,537.70	L.S.		$97,538.00
Stormwater Management/Erosion Control	5%			$97,538.00
Subtotal Additional Capital Improvement Costs				**$351,137.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$345,284.00
Legal/Administrative	5%			$115,095.00
Contract Admin/Construction Management	10%			$230,189.00
Contingency	25%			$575,473.00
Subtotal Other Costs				**$1,266,041.00**
Total Capital Improvement Costs				**$3,567,932.00**

Master Plan Operation and Maintenance Cost Summary				
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	54	EA	$72.00	$7,776.00
Total Annual Operation and Maintenance Cost				**$7,776.00**
Effective Interest Rate				4.00%
Total Operation and Maintenance Costs Over 50 Years				**$167,045.00**

6.2.6 ALTON STREET STORM DRAIN

Stormwater originating from portions of Basin 6 and Basin 4401-03 are conveyed overland to E 11th Avenue, where flows continue north along Beeler Street and Alton Street. Street flooding depths in this area do not meet 100-year street flooding criteria. A 78" storm drain is proposed to begin at the intersection of E 11th Avenue and Beeler Street. The storm drain will convey flows west down E 11th Avenue to Alton Street. The storm drain will upsize to and 84" RCP at E 13th Avenue. Stormwater will continue down Alton Street before turning west down E 14th Avenue. The storm drain will continue west down E 14th Avenue until turning north to Akron Street. A new outfall will be constructed near the existing Colfax Avenue outfall. A summary of peak flows for the proposed Alton Street storm drain is provided in Table 6-11, below.

Table 6-11 – Alton Street Storm Drain Peak Flows

Improvement Section	100-year Peak Flow Rate (cfs)	5-year Peak Flow Rate (cfs)	2-year Peak Flow Rate (cfs)
Alton Street SD	428	74	30

CLICK HERE TO VIEW ALTON STREET STORM DRAIN MAP

CLICK HERE TO VIEW ALTON STREET STORM DRAIN PROFILE

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 7			
REACH :	Alton St			
JURISDICTION :	Aurora			
REACH ID:	B7-ReachAlton St	Casey Bangs	DATE :	2/9/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
78-inch	1946	1	1946	L.F.	$564.00	$1,097,544.00	
84-inch	1621	1	1621	L.F.	$608.00	$985,568.00	
18-inch	20	106	2120	L.F.	$78.00	$165,360.00	
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
84-inch	Yes	1	1	EA	$3,266.84	$3,267.00	
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
84-inch		1	1	EA	$19,281.64	$19,282.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			5	EA	$17,360.00	$86,800.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			4	EA	$21,701.00	$86,804.00	
Storm Inlet, Type R/Type 14, 5-foot			106	EA	$6,655.00	$705,430.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		7784	S.Y.	$85.00	$661,640.00	

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$3,150,055.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$0.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$661,640.00
Subtotal Capital Improvement Costs				**$3,811,695.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$190,585.00
Traffic Control	$114,350.85	L.S.		$114,351.00
Utility Coordination/Relocation	$190,584.75	L.S.		$190,585.00
Stormwater Management/Erosion Control	5%			$190,585.00
Subtotal Additional Capital Improvement Costs				**$686,106.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$674,670.00
Legal/Administrative	5%			$224,890.00
Contract Admin/Construction Management	10%			$449,780.00
Contingency	25%			$1,124,450.00
Subtotal Other Costs				**$2,473,790.00**
Total Capital Improvement Costs				**$6,971,591.00**

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	115	EA	$72.00	$16,560.00	
Total Annual Operation and Maintenance Cost				**$16,560.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$355,745.00**	

6.2.7 E 17TH AVENUE RELIEF STORM DRAIN (DENVER) & MONTVIEW BOULEVARD STORM DRAIN

Stormwater originating in Basin 4401-02 is currently collected via several storm sewer trunklines and conveyed to an existing 60” storm drain that runs along Montview Boulevard. The existing storm drain system does not have sufficient capacity, resulting in 100-year street flooding depths that exceed criteria along Montview Boulevard. A new 66” storm drain is proposed, extending from Uinta Street to Willow Street. A 72” RCP was proposed to extend from Willow Street to a new outfall at Westerly Creek as part of the Alternatives Assessment of this OSP. Additional analysis of this system completed during conceptual design revealed that upsizing this storm drain to a 72” RCP was not necessary. However, due to shallow longitudinal slopes along E 17th Avenue, a 83” x 53” HECP extending from Willow Street to a new outfall at Westerly Creek is recommended. The HECP will provide sufficient capacity and allow for greater cover depths along E 17th Avenue.

The intent of the E 17th Avenue storm drain is to divert flows from the existing storm drain system in Basin 4401-02, allowing for additional capture of the existing storm drain downstream of the intersection of E 17th Avenue and Uinta Street. However, additional improvements are required to reduce street flooding along Montview Boulevard to within criteria. A 66” storm drain is proposed to replace the existing Montview Boulevard storm drain from Willow Street to the existing outfall at Westerly Creek. A summary of peak flows for the proposed E 17th Avenue storm drain and Montview Boulevard storm drain is provided in Table 6-12, below.

Table 6-12 – E 17th Avenue Relief Storm Drain & Montview Boulevard Storm Drain Peak Flows

Improvement Section	100-year Peak Flow Rate (cfs)	5-year Peak Flow Rate (cfs)	2-year Peak Flow Rate (cfs)
E 17th Avenue (Denver) SD	197	91	61
Montview Boulevard SD	159	30	16

CLICK HERE TO VIEW E 17TH AVENUE RELIEF STORM DRAIN (DENVER) & MONTVIEW BOULEVARD STORM DRAIN MAP

CLICK HERE TO VIEW E 17TH AVENUE RELIEF STORM DRAIN (DENVER) PROFILE

CLICK HERE TO VIEW MONTVIEW BOULEVARD STORM DRAIN PROFILE

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP
DRAINAGEWAY :	Basin 4401-02
REACH :	17th Montview
JURISDICTION :	Denver
REACH ID:	4401-02-Reach17th Montview

Casey Bangs | DATE : 2/9/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
66-inch	3450	1	3450	L.F.	$382.00	$1,317,900.00	E 17th Ave SD (66" RCP and 53"x83" HECP)
18-inch	20	6	120	L.F.	$78.00	$9,360.00	E 17th Ave inlet laterals.
66-inch	2329	1	2329	L.F.	$382.00	$889,678.00	Montview Blvd SD
18-inch	20	8	160	L.F.	$78.00	$12,480.00	Montview Blvd inlet laterals.
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
66-inch	Yes	1	1	EA	$2,505.80	$2,506.00	
66-inch	Yes	1	1	EA	$2,505.80	$2,506.00	
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
66-inch		1	1	EA	$14,866.55	$14,867.00	
66-inch		1	1	EA	$14,866.55	$14,867.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			17	EA	$17,360.00	$295,120.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			6	EA	$21,701.00	$130,206.00	
Storm Inlet, Type R/Type 14, 5-foot			14	EA	$6,655.00	$93,170.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		23116	S.Y.	$85.00	$1,964,860.00	

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains			$2,782,660.00	
Concrete Box Culverts			$0.00	
Hydraulic Structures			$0.00	
Channel Improvements			$0.00	
Detention/Water Quality Facilities			$0.00	
Removals			$0.00	
Landscaping and Maintenance Improvements			$0.00	
Special Items (User Defined)			$1,964,860.00	
Subtotal Capital Improvement Costs			**$4,747,520.00**	
Additional Capital Improvement Costs				
Dewatering		L.S.	$0.00	
Mobilization	5%		$237,376.00	
Traffic Control	$142,425.60	L.S.	$142,426.00	
Utility Coordination/Relocation	$237,376.00	L.S.	$237,376.00	
Stormwater Management/Erosion Control	5%		$237,376.00	
Subtotal Additional Capital Improvement Costs			**$854,554.00**	
Land Acquisition Costs				
ROW/Easements			$0.00	
Subtotal Land Acquisition Costs			**$0.00**	
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%		$840,311.00	
Legal/Administrative	5%		$280,104.00	
Contract Admin/Construction Management	10%		$560,207.00	
Contingency	25%		$1,400,519.00	
Subtotal Other Costs			**$3,081,141.00**	
Total Capital Improvement Costs			**$8,683,215.00**	

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	37	EA	$72.00	$5,328.00	
Hydraulic Structure Maintenance (e.g. debris removal, erosion, structural repairs, etc.)	2	EA	$723.00	$2,892.00	
Total Annual Operation and Maintenance Cost				**$8,220.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$176,584.00**	

6.3 PRIORITIZATION AND PHASING

Master Plan improvements should be prioritized and phased to maximize benefit to public health and safety. Master plan phasing should also take planned roadway and redevelopment projects into consideration. Improvements recommended in this OSP should coincide with adjacent capital improvement projects when possible.

Consideration was also given to both the vulnerability of communities within the study area and the availability of resources that allow for greater resiliency from events that would affect public health and safety. FEMA's National Risk Index (NRI) for Social Vulnerability (SoVI) was used to inform a high-level review of the study area The census tracts within the study area have a similar level of quantified social vulnerability ranging between 30.62 and 37.94. The Colorado Average is 30.13 and the National Average is 31.89. The census tract level data is not provided at a small enough scale to differentiate between the street-by-street level improvements included in this plan. Therefore, the SoVI did not impact the prioritization and phasing for this plan.

Prioritization and phasing have been broken into the following groups:

Priority 1: The E 23rd Avenue Storm Drain and E 22nd Avenue Storm Drain should be prioritized due to the severe flooding issues caused by Easterly Creek and the planned redevelopment of the Stanley Marketplace.

The Havana Park Pond and Del Mar Parkway improvements should also be prioritized since they are under design at the time of this OSP and reduce flooding depths in the vicinity of E 22nd Avenue, E 23rd Avenue and Del Mar Parkway.

Priority 2.a: The Alton Street Storm Drain should be prioritized to coincide with future capital improvements. Flooding depths and peak discharges in the vicinity of Beeler Street, Alton Street and E 11th Avenue are not impacted by any of the improvements listed in Priority 1. The Alton Street Storm Drain is not dependent on any additional drainage improvements and currently there are no other planned capital improvement projects in this area.

Priority 2.b: The E 17th Avenue Relief Storm Drain (Denver) & Montview Boulevard Storm Drain improvements should be prioritized to address flooding problem areas in Denver contained within Basin 4401-02. These improvements are not impacted by any other improvements recommended in this OSP and should therefore be prioritized to coincide with future capital improvements.

Priority 2.c: The E 17th Avenue Relief Storm Drain (Aurora) alleviates flooding in the vicinity of E 22nd Avenue, E 23rd Avenue and Del Mar Parkway. This improvement is not currently planned but should be prioritized to coincide with future capital improvements.

Priority 3: The Chesapeake Townhomes Pond should be improved if formalizing overflow into the HLC cannot be achieved.

6.4 WATER QUALITY IMPACTS

Improvements to the Chesapeake Townhomes Pond and Havana Park Pond will increase the total storage volume of these facilities, thereby increasing the WQCV compared to existing conditions. Increasing WQCV will result in greater sediment capture and removal of non-point source pollutants from stormwater prior to being discharged to Westerly Creek. Additionally, reducing overland stormwater flow via below-ground conveyances will limit sediment transport, erosion potential, and conveyance of contaminants by stormwater within the watershed.

6.5 OPERATIONS AND MAINTENANCE

All proposed storm drain improvements will require regular cleaning and inspection of pipes, inlets, and outfalls. Maintenance related to the Havana Park Pond and Chesapeake Townhomes Pond will include routine inlet and pipe cleaning and inspections. The ponds will also require long-term sediment, debris, and trash removal as well as vegetation and weed management.

6.6 ENVIRONMENTAL AND SAFETY ASSESSMENT

As previously mentioned, the Westerly Creek watershed is highly urbanized. The proposed storm drain improvements would be constructed along existing roads or otherwise through previously developed land. These improvements would be located below-ground and would therefore not impact wildlife, plant life, or wetland areas. However, the improved conveyance of stormwater will improve quality of life by reducing risk to human health and safety and property during a flood.

Improvements are recommended at the existing Chesapeake Townhomes Pond and Havana Park Pond. Improvements to these ponds will benefit surrounding communities by increasing sediment capture and removal of non-point source pollutants while ensuring flood waters are properly managed through a combination of detention and engineered overflow.

7 REFERENCES

1. *Building Healthy Places Workshop Report: The East Colfax Gateway into Aurora,* Urban Land Institute, 2018.
2. *Colfax BRT Concept,* Author Unknown, Date Unknown.
3. *Clinton Street Subdivision Filing No.1 Construction Documents,* Kimley Horn, 2021.
4. *Original Aurora Stormwater Master Plan,* Calibre Engineering, 2018.
5. *East Area Plan,* Denver Community Planning & Development, 2020.
6. *Easterly Creek Outfall Systems Plan,* SHE, 2012.
7. *Easterly Creek Detention Pond Havana Automotive Park #1B1 and Olde Towne #2B2,* RESPEC, 2018.
8. *Easterly Creek Detention Pond Havana Automotive Park #1B1 Maintenance Site Plan,* RESPEC, 2020.
9. *Easterly Creek Detention Pond Improvements 100% Design Report,* RESPEC, 2018.
10. *FEMA National Risk Index Map,* FEMA, https://hazards.fema.gov/nri/map
11. *Flood Hazard News,* Vol. 41, No.1, Mile High Flood District, 2011.
12. *Flood Insurance Study, City and County of Denver, Colorado,* Federal Emergency Management Agency, 2020.
13. *High Line Canal Stormwater and Operations Master Plan – Final Report*, RESPEC, 2018.
14. *High Line Canal Stormwater and Operations Master Plan - Operational Model Website* http://highlinecanalcolorado.com/
15. *Memorandum – Westerly Creek Lower FHAD Hydrology Acceptance,* Mile High Flood District, 2017.
16. *Preliminary Drainage Report: Havana Park Pond and Del Mar Parkway Improvements,* Enginuity, 2021.
17. *Revision to the Easterly Creek Outfall Systems Plan (2012) Regarding the Chesapeake Townhomes Detention Pond,* RESPEC, 2017.
18. *Sanitary Sewer Mains,* Open Data Catalog, City & County of Denver, https://www.denvergov.org/opendata.
19. *Stanley Market Place Subdivision 2&3, Block 1, F1 Amendment No. 1 Storm Plan & Profile,* Ware Malcomb, 2021.
20. *Streamflow/Water Levels Annual & Record Peaks,* Mile High Flood District, Downloaded February 2021.
21. *Storm Drainage Master Plan,* City & County of Denver, 2019.
22. *Stormwater Outfall Systems Plan: Stapleton Area,* McLaughlin Water Engineers, Ltd., 1995.
23. *Storm Drainage Collection System Boundaries Shapefile*, *Storm Inlets Shapefile,* Open Data Catalog, City & County of Denver, https://www.denvergov.org/opendata.
24. *Storm Inlets Shapefile,* Open Data Catalog, City & County of Denver, https://www.denvergov.org/opendata.
25. *Storm Manholes*, Open Data Catalog, City of Aurora, https://ags.auroragov.org/aurora/rest/services/OpenData/MapServer/101.
26. *September 2013 Flood, Initial Report,* City of Aurora, 2013.
27. *SWMM v. 5.1,* Environmental Protection Agency, 2020.
28. *Westerly Creek (23rd Avenue to Colfax Avenue) LOMR #19-08-0731P Report,* Muller Engineering Company, Inc., 2020.
29. *Westerly Creek Greenway Master Plan*, Westerly Creek Connection Planning Team, 2011.
30. *Westerly Creek (Lower) Drainageway Update: Major Drainageway Planning,* Kiowa Engineering Corporation, 2010.
31. *Westerly Creek, Montview Boulevard to Kelly Road Dam LOMR #91-08-009P Report,* Love & Associates, Inc., 1991.

APPENDIX A – PROJECT CORRESPONDENCE

BHI Project Kickoff Meeting Agenda

Date: November 23, 2020
BHI Project Name: Westerly Creek OSP

1. Introduction of Meeting Participants & Project Team

a. Roles and Responsibilities

Project Team & Roles			**Attendance at Meeting:* ☒		
Name		**Project Responsibilities**	**Name**		**Project Responsibilities**
Sam Miller	☒	*Aurora Water – Local Sponsor*	*Chris Best*	☒	*WCPM Project Manager – Local Sponsor*
Vern Adam	☒	*Aurora Water – Local Sponsor*	*David Morrisey*	☒	*City and County of Denver – Senior Engineer - Floodplain Administration*
Craig Perl	☒	*City of Aurora – Floodplain Administrator*	*Kevin Lewis*	☒	*City and County of Denver – Local Sponsor*
Tony Tran	☒	*Aurora Water – Stormwater Engineer*	*Cincere Eades*	☒	*Denver Parks and Recreation – Senior Planner*
Gary Burke	☒	*City of Aurora – Stormwater Superintendent*	*Mark Schutte*	☒	*MHFD Project Manager*
Tracy Young	☒	*City of Aurora – Parks, Recreation and Open Space*	*Morgan Lynch*	☒	*MHFD Watershed Manager*
Curtis Bish	☒	*City of Aurora – Parks, Recreation and Open Space*	*Rifka Wine*	☒	*BHI Project Manager*
Elizabeth Lefebvre	☒	*Aurora Water Senior PIO*	*Craig Hoover*	☒	*BHI PIC*
			Casey Bangs	☒	*BHI Drainage Engineer*

b. Roles of Sub-consultants with Point(s) of Contact
None

c. Client Contact Information and Protocol
MHFD – Mark Schutte

d. Other Key Team Members with Point(s) of Contact
MHFD – Morgan Lynch
City and County of Denver – Chris Best
City of Aurora – Sam Miller

e. Other agencies/stakeholders
None

BHI Project Kickoff Meeting Agenda

2. Project Objectives and Goals

The ultimate goal is to complete OSP for the Westerly Creek area downstream of Westerly Creek Dam to:

- Evaluate existing studies and be mindful of their original intent
- Identify drainage system deficiencies, specifically where flooding is in excess of 1 ft
- Identify and plan upgrades to the existing stormwater system facilities and propose new improvements including new conveyances, including the addition of surface flow where possible (daylight)
- Develop improvement alternatives to meet the drainage/flooding criteria, including water quality
- If open space is going to be evaluated for stormwater management, preserve or enhance existing or new open space
- Conceptual design
- Prioritize stormwater projects
- Any efforts to daylight Westerly Creek in this area, include sections of trail along tributaries to the Creek.
- Formalizing some of the previous studies, improve water quality in dense, urbanized areas.

3. Scope Overview

a. Project Planning and Management
   1. Progress Meetings
      i. Progress reports/check-ins as needed/outlined in schedule
      ii. Meeting with sponsors during each phase
   2. Public Outreach and Meetings – additional care and thought may be needed at this time (due to COVID, public involvement will be somewhat fluid)
      i. One during alternatives analysis phase
      ii. One during conceptual design phase
      i. Website – e-mail out to the group when it is up and running, keep Elizabeth involved
   b. Invoice

b. Survey, Site Visits, and Existing Conditions Inspection and Review
   1. Existing Resources
      i. Reports
         1. Denver East Area Plan (2020)
         2. City and County of Denver SDMP (2019) – BHI to double-check for outfalls in Central Park area, notify Morgan if additional data needs to be requested
         3. Original Aurora SDMP (2018) ends at 23rd
         4. Easterly Creek OSP (2012)

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5. Westerly Creek Greenway Master Plan (2011)

ii. Models
1. FHAD SWMM
2. FHAD FLO-2D
3. C&C Denver SWMM
4. Montview LOMR FLO-2D (more recent than FHAD FLO-2D – would impact proposed improvements, not hydrology)

i. Surveys
ii. GIS
iii. Data Requests
1. GIS data for existing storm drain infrastructure – available from Sponsors' websites:
   a. https://www.denvergov.org/opendata
   b. https://ags.auroragov.org/aurora/rest/services/OpenData/MapServer/101
2. GIS data or maps for existing utilities (water, gas, electric, etc) – likely unavailable, assume all major roadways have existing utilities in them.
3. Lowry MDP Report
4. 10 minute walk gap shapefile. Cincere requested a focus area boundary to extract data in project area.
5. Community master plans will be sent to MHFD to incorporate in drainage improvements. Sponsors do not want a master plan that cannot be implemented due to conflicting projects.

iv. Site investigation
1. BHI to visit site and assess critical outfalls

c. Phase 1 - Baseline Hydrology – baseline hydrology report will be included in FHAD Report by Matrix. OSP will only update FHAD hydrology as necessary to account for recently constructed facilities.
1. Hydrologic studies
   i. Add 1st/Havana pond and Havana Park Pond (currently under design with City of Aurora) to baseline hydrology
2. Draft Report including Problem Area Map
3. Review Meeting to discuss Problem Area Map and stakeholder comments

d. Phase 2 - Alternative Analysis
1. 23rd Ave outfall – nothing additional at this time. MHFD will let BHI know what is decided so it can be included in the Alternatives Analysis Phase.
2. Havana Park Pond will be included
3. Specific areas of concern
   i. Colfax/Yosemite – probably in MDP – check Denver SWMP proposed improvements
      1. Update on changes to Creek

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2. Is assessing flooding in this area in scope? – not improvements in creek, but if SWMP/MDP improvements can help flooding, consider it.

ii. East of Westerly Creek, South of Easterly Creek alignment
1. Easterly Creek overflows are causing flooding in Westerly Creek area. Need to evaluate what we can do to address flooding areas between Easterly and Westerly Creeks. Easterly Creek MDP was only a 5-yr design storm plan. Continue to coordinate with MHFD as to the limits of our study in this area.

iii. Park areas in Denver near 16th Ave
1. Any park areas that should not be evaluated for stormwater detention? Parks are already pretty confined, difficult to provide detention. Explore potential daylighting of existing storm drains throughout the study area.

iv. Montview Park – hesitant to recommend anything here, recently renovated. Morgan requested plans from Curtis.
v. Retain Beeler site use.
vi. Alternative alignments for storm drains included in Denver SWMP
vii. Others?
1. Flooding where structures are impacted outside street ROW. Anything to reduce that risk would be helpful

v. Remaining alternatives analysis
1. An alternative evaluation matrix was discussed. David suggests evaluation matrix early in the process. Include ideas that were thought of but discarded for various reasons. Get stakeholder input on scoring criteria and weighting prior to scoring alternatives. Morgan expressed concerns that Aurora already has a prioritization matrix, and Denver is developing one. MHFD already has the BCA. The concern is first and foremost reducing flooding. Suggest tabling the development of matrix until we are further along.

e. Phase 3 - Conceptual Design
1. Other Discussion items

f. Project Schedule
1. Attached.
2. Give MHFD one-week notice prior to submitting deliverables.
3. BHI to provide schedule updates to stakeholders as the project progresses.

4. Project Execution

a. Immediate action items
1. Project kickoff meeting – today's meeting
2. Prepare project work plan
   i. Updated schedule

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3. Design study criteria
    i. Maximum 1 ft flooding in any streets
4. Assumptions
    i. Exclude storm drains with diameter less than 48" unless they are deemed a critical system – smaller pipes may be critical.
    ii. The existing FLO-2D area from the FHAD will be sufficient to assess the street flooding – may need to add areas north and south. BHI to review SWMM model and determine if information needs to be added to FLO-2D model. Denver wants to expand extents of their FLO-2D model and could add additional funds to the project if needed, for example, to evaluate the East Colfax area. There is currently no need to expand the FLO-2D model into the Central Park area.
5. Existing Resources
    i. Drainage reports
    ii. Development Plans
    iii. GIS files

b. Action Items within next month

1. BHI
    i. Download storm sewer and sanitary sewer data from sponsor websites
    ii. Send Cincere focus area to get clipped GIS data
    iii. Launch website
    iv. Add contacts to BHITracker
    v. Review additional information
    vi. Work on baseline hydrology report
2. MHFD
    i. Provide Montview LOMR data to BHI – received 11/24/2020
    ii. Provide Montview Park renovation information to BHI

5. Questions
6. Recap/Summary

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MEETING MINUTES

Project Name: Westerly Creek OSP
Meeting Date: March 4, 2021
Location/Time: Microsoft Teams, 1:00 PM
Organizer: Rifka Wine, BHI
Attendees:

Morgan Lynch, MHFD
Mark Schutte, MHFD
Sam Miller, Aurora Water
~~Vern Adam, Aurora Water~~
Tony Tran, Aurora Water
Craig Perl, COA
~~Gary Burke, COA~~
Tracy Young, COA
Curtis Bish, COA
Chris Best, CCD
David Morrisey, CCD
Kevin Lewis, CCD
Cincere Eades, CCD
Craig Hoover, BHI
Casey Bangs, BHI
Rifka Wine, BHI

Project Progress Meeting

Meeting Purpose: Review Problem Areas and Discuss Alternatives Analysis

I. Review Problem Areas Map – Morgan suggested team have input on alternatives.
    a. At the kickoff meeting, project sponsors previously requested a pre-screening matrix to document why certain alternatives were/were not considered. This was not discussed further at this meeting.
    b. Include 2201 Stanley in alternatives
    c. BHI will clarify on problem areas map which problem areas are previous recommendations vs. areas where flooding criteria are not met.
        i. Areas that meet flooding criteria, but have storm drain improvements recommended by previous studies will remain in the problem areas map per request from CCD.
            1. Problem area 7 is an example of this. It was proposed to reduce flows routed through the Montview Blvd system. BHI will review the Montview area to determine if it is meeting flooding criteria.
        ii. Problem area descriptions will be shifted to live on the same sheet as the map for clarity.
    d. David Morrisey provided links to 2D inundation limits for CCD. Morgan does not want conflicting information in two studies, so these will be reviewed in conjunction with the SWMM models and, if appropriate, added to the problem areas map to show additional areas where potential street inundation is greater than one foot.

i. https://geospatialdenver.maps.arcgis.com/apps/webappviewer/index.html?id=12500a3b06b34bfcb2c297697a64c4de

ii. https://www.arcgis.com/apps/webappviewer/index.html?id=f19121d3f89d42b9876a8364718a529a

e. Problem area 13 is probably based on 2012 FLO-2D model and does not reflect current land use. This problem area could probably be eliminated since that area has been re-developed and includes stormwater detention.

II. Discuss Alternatives Analysis

a. Havana Park Pond 0

b. Colfax corridor

i. Project team to consider using this OSP to guide the redevelopment of the Colfax corridor.

c. Pond at 17th and Del Mar from Original Aurora Stormwater Master Plan

i. Currently reflected as WQ pond in CIP slated for 2030.

d. Community College of Aurora – Lowry Campus

i. The campus has a lot of undeveloped land, which could be considered for potential detention pond locations.

ii. Project sponsors would like to consider contacting the college to see if they would be open to the idea of adding detention facilities to their campus.

e. Potential additional pond locations

i. Several Aurora Public Schools may be closing and could potentially be considered for detention pond locations.

ii. City of Aurora does not support using any existing parks for detention.

1. Instead, project team should identify properties that could be redeveloped into some joint use could be considered as part of this study.

~~iii. COA – Lowry Community Park (11th Ave/Dayton St)~~

~~1. This park is dedicated land from the Federal Government, so building a pond here is not feasible.~~

~~2. There is environmental contamination on this site.~~

~~iv. COA - Park at E 17th Ave and Dayton St~~

~~1. This is City Park – not a feasible location to build a pond.~~

~~v. COA - Fletcher Park (11th Ave/Akron St)~~

~~vi. COA - McMullen Park (E 3rd Ave/Dayton St)~~

vii. CCD - Verbena Park (E 12th Ave/Verbena St)

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1. About to do a large project there, including playground, walks, regrading center field (design has already started). So the addition of a detention pond is probably not feasible.
2. Already an overflow location and has some detention. The site takes overflow from Kelly Road Dam (informal). Chris asked if we want to formalize it and include it in hydrology alternatives to see if the existing grading has a benefit. The pond maintenance would also need to be formalized.
3. Morgan recommends formalizing the detention at the park with an Adequate Assurances Agreement so it can be included in this OSP and to ensure that any park improvements don't decrease the current detention capacity.
4. The grading design should be careful that it does not remove storage to avoid worsening flooding downstream.
5. Cincere: Very limited in adding to it because we don't want to change the use of the park/ lessen the amenities in this neighborhood. Cannot expand detention, but can potentially keep as-is.
6. There are also vertical constraints at this site, which make drainage design difficult.

viii. CCD - McNichols Park (Syracuse St/E 19th Ave)

1. This park is not located in an area with flooding.

ix. CCD - City of Ulaanbaatar Park (E 6th Ave/ Syracuse St)

1. This is a sister cities park and is special to that community. Adding detention facilities is therefore not possible.

x. The following sites were not discussed at the meeting, but the project team will follow up on feasibility of detention if appropriate:

1. CCD - Crescent Park (E 8th Ave/Roslyn St)
2. CCD - Lot near Yosemite St/Severn Pl
3. CCD - Park near Spruce St/E 25th Ave
4. CCD - Vacant lot near E Bayaud Ave/S Ulster St
5. CCD - Denison Park (Richthofen/Quebec St)
6. CCD - Park near Spruce St/E 28th Pl
7. CCD - Park near E 28th Pl/E 28th Dr

xi. Denver PROS mentioned that they may have identified some new park/open space opportunities in the ten minute walk gap data that should be considered in the alternatives.

f. Upsizing pipes

i. None discussed during this meeting. However there are several recommendations from previous studies included in the problem areas map, which will be considered.

g. Potential to daylight pipes
   i. 6th Ave & Dayton ball field
      1. Community college property. The COA used to lease it but does not anymore.
      2. There is potential to daylight here and potentially in areas to the west of this location. Should at least do basic calculations (4:1 max side slope) to see if daylighting here would alleviate flooding.
   ii. 6th Ave northern buffer between Havana and Dayton
      1. Comes with a lot of restrictions (previously federal land). Addition of right-hand turn lane took 3 years to get approved.
      2. Not feasible for addition of channel.
   iii. Redevelopment along Colfax
      1. Project team should consider including recommendations for when the Colfax area is redeveloped.
   iv. Consider land acquisition for daylighting.
      1. This has not really been done. People don't want to see an "X" on their house.

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MEETING AGENDA

Project Name: Westerly Creek OSP
Meeting Date: June 17, 2021
Location/Time: Microsoft Teams, 8:00 AM
Organizer: Rifka Wine, BHI
Attendees:

Morgan Lynch, MHFD
Mark Schutte, MHFD
Sam Miller, Aurora Water
Vern Adam, Aurora Water
Tony Tran, Aurora Water
Craig Perl, COA
Gary Burke, COA
~~Tracy Young, COA~~
~~Curtis Bish, COA~~
Chris Best, CCD
~~David Morrisey, CCD~~
~~Kevin Lewis, CCD~~
~~Cincere Eades, CCD~~
~~Craig Hoover, BHI~~
Casey Bangs, BHI
Rifka Wine, BHI

Alternatives Analysis Review Meeting

Meeting Purpose: Review sponsor comments to Draft Alternatives Analysis. Discuss updates to Alternatives Analysis.

I. Draft Alternatives Analysis Report
   a. Comments received 05/27/2021.
      i. Comments received from all sponsors and the District.
   b. Outstanding comments:
      i. Per David's comment, is it necessary to create a figure for each alternative?
         1. For each alternative and component, have a zoomed in figure in the body of the report.
         2. Colors should be consistent between all the figures.
      ii. Discuss Verbena Park Pond SWMM model.
         1. Alternative 1: Upsize pipe in Richthofen is not fixing the flooding. In reality, flows are also going down 12th Ave. If goal is to stay under criteria, it may not be worth upsizing pipe in 12th Ave. BHI will add street section for 12th Ave to the SWMM model at the park and downstream and split the flows between 12th and Richthofen to assess the flooding in Richthofen and in 12th and update the alternative based on that more detailed analysis.

2. Alternative 2: Account for storage in park with adequate assurances agreement, do not upsize pipe
    a. Modeling to account for storage
3. Not all flow enters 15" storm drain, overtopping flows leave the park at the low point at the northeast corner along 12th Ave
    a. Include zoomed in figure of park, show where grading would need to happen to contain flows from overtopping down 12th Ave (if the overtopping down 12th Ave is not meeting criteria).
    b. Look at alternative to account for street flow in 12th Ave and 24" storm drain under 12th Ave.

iii. Discuss dynamic wave modeling for Aurora alternatives.
1. We have added in the 22nd and 23rd Storm Drains based on the latest construction site plan.
2. With Dynamic Wave modeling, now Alternative Plan 6 (pipes only, no Chesapeake Pond) also meets criteria.
    a. This pond may have enough downstream impact to justify purchasing pond
    b. Will need more detailed information for Chesapeake Pond and the reduction in upsizing pipes, and Verbena Pond to determine a selected plan
    c. IGA with Denver Water is possible in the future. This may mean that eliminating Chesapeake Pond overflows to the High Line Canal may not be necessary. The High Line Canal could potentially be used for detention/conveyance in the future.
    d. Dynamic Wave modeling – why is it necessary? Being consistent with other analysis in the area (Denver SDMP and 22nd/23rd outfall design analysis). More detailed look at the area of interest.
    e. Chesapeake Townhomes Pond sub-alternatives
        i. BHI has only modeled the RESPEC conceptual design in this alternative.
        ii. In conceptual design phase, look at more detailed alternatives, e.g., formalizing adding High Line Canal as long detention pond, expanding Chesapeake Townhomes Pond to the vacant lot to the northeast.

iv. Do we want to eliminate flooding altogether when we move into conceptual design? All pipe sizing currently is based on meeting criteria of no flooding greater than 1' depth in the streets.
1. No, criteria for conceptual design will be no flooding greater than 1' depth in the streets.

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v. Is Denver okay with Cost-Benefit Analysis?
1. Add more detail to the body of the report explaining how the benefit was calculated, add the damage reduction calculations to the appendix.

vi. Chris Best asked about UD-MP-Cost and the approach to escalate the 2012 costs. Is there more up-to-date information? Compared to bids recently (real data from last 2-3 years), costs would potentially be 2-3 times higher than shown here.
1. We cannot adjust the unit prices. If we take a different approach, bump up contingencies to match these higher prices.
2. What are Aurora's thoughts on the costs?
    a. Sam indicated they have their own factor of safety for costs.

vii. Add 30-40% contingency to the UD-MP-Cost workbooks in the appendix. Add a sentence regarding this contingency in the cost section for each alternative.

viii. Add more quantitative discussion of how close we are to meeting criteria with each alternative and provide more discussion on benefits of Chesapeake Pond vs. Colfax SD.

II. Schedule
a. Revised Alternatives Analysis two weeks from today – July 1.
b. Public outreach. – Once revised alternatives are provided, sponsors will review, discuss selected plan, see what public outreach is needed prior to alternative plan selection. Include for discussion on outreach with Sam: Meg Allen, Elizabeth Lefebvre, Vern Adam, Craig Perl, Jeremy Hamer, David Morrissey. Mark will send out Doodle Poll. Morgan wants to discuss the message that we want to get out.
c. Select Alternative Plan.
d. Submit draft conceptual design.

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MEETING AGENDA

Project Name: Westerly Creek OSP
Meeting Date: September 29, 2021
Location/Time: Microsoft Teams, 2:00 PM
Organizer: Rifka Wine, BHI
Attendees:

Morgan Lynch, MHFD
Mark Schutte, MHFD
Sam Miller, Aurora Water
Clint Weisz, Aurora Water
~~Swirvine Nyirenda, Aurora Water~~
~~Craig Hoover, BHI~~
Casey Bangs, BHI
Rifka Wine, BHI
Madeline Olivas, BHI

Project Progress Meeting

Meeting Purpose: Discuss Chesapeake Pond Sub-alternatives.

I. Regrade Chesapeake Pond to Increase Storage Capacity
   a. This alternative sought to maximize storage at Chesapeake Pond with the goal of eliminating overflows to the High Line Canal.
   b. This alternative does not eliminate the overflows to the High Line Canal, therefore it was decided that it not be pursued further.

II. Expand Chesapeake Pond to Northeast Lot
   a. This alternative sought to maximize storage at Chesapeake Pond with the goal of eliminating overflows to the High Line Canal.
   b. This alternative does not eliminate the overflows to the High Line Canal, therefore it was decided that it not be pursued further.

III. Formalize Overflows to the High Line Canal
   a. This is still a viable alternative.
   b. The subtraction of this overflow from flow headed downstream in Westerly Creek watershed would not impact peak discharges or flooding depths in the Westerly Creek watershed, not would it change proposed improvements to handle pluvial flooding downstream.
   c. Downstream storm drain was constructed assuming Chesapeake Pond would be a future phase.

IV. Status of Conceptual Design
   a. Clint would like to see what the cost comparison is with and without building the pond. Without building the pond, there is no cost associated with formalizing the overflows to the High Line Canal.

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   b. COA would still like to leave this sub-alternative analysis discussion in conceptual design section of OSP report.
   c. Is there something actionable to include the pond in the conceptual design? If possible, formalizing the flows to the High Line Canal are the best option, as there is no associated cost. If an IGA is not signed, then the pond improvements as proposed by RESPEC are a viable option.
   d. Aurora Water is signing an IGA with Denver Water to use the canal for flood control benefit, because of the overflow. At this time, it is available to use for this purpose, and that this the assumption that will be included in the OSP.

V. Public Outreach
   a. Does COA need more from MHFD to facilitate targeted outreach in areas of known pluvial flooding? Sam will follow up with others at COA.
   b. MHFD will follow up with Denver to see if they have any opinions/additional questions on public outreach.

VI. Action Items
   a. BHI will complete the draft OSP for submittal on 10/7
   b. Sam will follow up with others at COA on public outreach needs from MHFD.

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MEETING MINUTES

Project Name: Westerly Creek OSP
Meeting Date: November 17, 2021
Location/Time: Microsoft Teams, 2:00 PM
Organizer: Rifka Wine, BHI
Attendees:

Morgan Lynch, MHFD
Mark Schutte, MHFD
Sam Miller, Aurora Water
Chris Best, Denver DOTI
Craig Hoover, BHI
Madeline Olivas, BHI
Rifka Wine, BHI

Project Progress Meeting

Meeting Purpose: Discuss Comments on Draft Conceptual Design Report

I. Montview Cross Section
   a. Update section w/ DEM (existing conditions, conceptual design models).
      i. Montview, Unita, Verbena
      ii. Update sections – scope change?

II. Community Vulnerability Considerations
   a. SoVI Index
   b. National Risk Index – refer audience to this on the Aurora side
   c. Add Denver's risk map to the references.
   d. Qualitative discussion in prioritization section, use Denver's equity map
   e. Denver and MHFD to provide guidance on NRI or DRI.

III. Havana Park Pond
   a. Wait on SWMM model, include final SWMM model info in our SWMM model, PDFs in our PDF – Morgan will make sure we get paid for any effort that is not covered.

IV. Chesapeake Townhomes Pond

V. Status of Conceptual Design

VI. Public Outreach
   a. Morgan reached out to marketing firm.

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MEETING MINUTES

Project Name: Westerly Creek OSP
Meeting Date: January 25, 2022
Location/Time: Microsoft Teams, 3:00 PM
Organizer: Rifka Wine, BHI
Attendees:

Morgan Lynch, MHFD
Mark Schutte, MHFD
Sam Miller, Aurora Water
Chris Best, Denver DOTI
~~Craig Hoover, BHI~~
Rifka Wine, BHI

Project Progress Meeting

Meeting Purpose: Discuss Public Outreach and Comments on Draft Conceptual Design Report

I. **Outstanding Comments on Draft Conceptual Design Report**
   a. Havana Park Pond plans – Mark expects to send another PDF in the next couple of days.
   b. Havana Park Pond WQCV – do not include WQCV for this pond in the report. Bioswale is providing flow-based water quality
   c. Cost Inflation Factor – CDOT Q3 2021
   d. Chesapeake Pond Land Acquisition – refer to Sam's e-mail from 11/29 – last negotiated number from the townhomes organization in 2018 - $12,000

II. **Outstanding Comments on Website:**
   a. Denver Comments:
      i. Clearly this is related to WC OSP, so the message is to see the WC OSP website. That makes sense, but there is nothing on that site that identifies areas of potential urban flooding. It seems that we might want to direct people to resources that are available to see mapping of known urban flooding (https://geospatialdenver.maps.arcgis.com/apps/webappviewer/index.html?id=12500a3b06b34bfcb2c297697a64c4de). Any need to update the FAQ on the project website to include some more info/resources RE urban flood risk (and ways to be protected)? An old PowerPoint with some photos of flooding (for project website?) can be found here: \\nas01p\shared_dirs\WMD\wcpm\Planning\MHFD\Westerly Creek OSP\References\.

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ii. We just want to ensure home/business owners are provided links to up to date information to understand their risks and what they can do whether that is through the OSP website or other online resources. For example, under "What can you do?" It says "Consider home flooding safety precautions". I assume there is going to be a link to a site that would provide detailed information on precautions a homeowner could take given their risk.

iii. In regards to languages, I reached out to our Office of Community and Business Engagement that has recently developed language thresholds for providing translation. We'll definitely want to include Spanish and another language may pass the threshold such as Burmese in this area. I follow up with yall once I hear back.

iv. Our Floodplain group has a phone number the public can contact: 720-865-3215

v. Website: https://www.denvergov.org/Government/Agencies-Departments-Offices/Agencies-Departments-Offices-Directory/Department-of-Transportation-and-Infrastructure/Programs-Services/Flood-Information

b. Aurora Comments:

i. There is a disconnect between the mailer postcard and the website. The mailer asks citizens to learn how to protect themselves and their property and the website talks about the Westerly Creek OSP, or what someone else is doing.

ii. Also, the website and attachments should be edited for content and errors. You said this was a work in progress and a new website was under construction so I didn't look at everything with the eye of a proofreader.

iii. Mentioning the process of identifying a hazard through the OSP then additionally stressing that the City is aware and planning to mitigate it.

III. Additional Public Outreach Discussion

a. Website – more outward facing effort

i. Additional figures (public display versions) for website were discussed:

1. Problem areas maps (potentially a smaller tile on the splash page that users click to see larger)
2. Conceptual Design maps – not necessary, too technical, instead of saying that there is a specific design that is currently planned, include general list of components, e.g., detention basins, upsizing storm sewers
3. The more visual, the better

ii. Zoom out to define everything - consolidate the tabs into the following:

1. Planning Study
2. Public Resources
   a. What homeowners and renters can do

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3. Links to FEMA resources

iii. Google Translate widget use acceptable with disclaimer

1. Potentially get professional translation service to translate – there are fewer than 300 homes, but a variety of languages (e.g., Burmese is a big one in this neighborhood, but not included in Google Translate).
2. Spanish and Nepali are covered by MHFD staff
3. Vietnamese is required on Aurora side
4. Amharic is required on Denver side
5. Burmese is the main concern
6. On the Westerly Creek LOMR, translations included five languages, professional translation service was used

iv. Include photos from 2013 flood in the area – MHFD/Aurora/Denver to look for photos

1. The main outreach concern in this area is education about the dangers of street flooding. MHFD does not want members of the public getting sucked into inlets.
2. BHI to send MHFD street flooding depths from hydraulic modeling so MHFD can find photos of similar flooding depths.

v. Website Accessibility Standards

1. Visual Impairment
2. Colorblind

b. Pamphlet and Website need to agree better

i. Website must explain MHFD role

ii. Craig Perl wants to be the main contact for Aurora

iii. Aurora Public Works General number should be a second contact

iv. Change url – seeing bhinc.com may cause some pause. People may not want to go to an unfamiliar website from a company if they see that url on a pamphlet.

v. Be consistent with terminology compared to FEMA website, Aurora website, Denver website, LOMR

IV. Action Items

a. Send PDF of final Havana Park Pond plans – MHFD
b. Finish Final Report - BHI
c. Follow up on professional translation service - BHI
d. Provide proposal for additional services to cover website efforts – BHI
e. Follow up on website accessibility requirements – Aurora, Denver

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   i. Subsequent to meeting, Chris Best provided link to https://www.denvergov.org/Accessibility for reference

f. Look for photos of street flooding in the area – Aurora, Denver, MHFD

Figure A.1 – Baseline Hydrology Comments and Responses

Outfall Systems Planning of Westerly Creek Downstream of Westerly Creek Dam
Comments and Responses
Report dated December 2020. Comments dated January 2021.

Items	PDF Page	Page Number	Reviewer	Comments	Responses
1	1	Cover	MSCHUTTE	Please provide actual modified model run for this report.	Addressed.
2	1	Cover	MLYNCH	Not necessary until final approval, but please add image to cover.	Addressed.
3	1	Cover	DMORRISEY	Signature blocks can be on the first inside page of report, not on cover.	Addressed.
4	4	i	DMORRISEY	Update acronyms for acre-feet and Flood Insurance Study.	Addressed.
5	4	i	MSCHUTTE	I recommend not using this acronym as it may be confusing for some folks. SWMP typically stands for Stormwater Management Plan.	Addressed.
6	6	2	DMORRISEY	The FHAD developed discharges for Westerly Creek downstream of the Westerly Creek Dam.	Addressed.
7	6	2	DMORRISEY	Is "addition of surface flow" intended to mean opening up existing piped flow to be open channels?	Yes. Addressed in text.
8	6	2	DMORRISEY	Alternatives analysis rather than alternatives assessment?	Addressed.
9	6	2	DMORRISEY	The City of Denver (or DRCOG) may be able to share aerial imagery with coverage of the study area.	Updated aerial imagery to 2018 DRCOG.
10	6	2	MSCHUTTE	Is this describing the daylighting of channels?	Yes. Addressed in text.
11	6	2	MLYNCH	Is this (4th bullet) the same as the third bullet?	Addressed. Combined the two bullets.
12	6	2	MLYNCH	"Formalizing previous studies" Similar to 1st bullet?	Addressed. Removed the "formalizing previous studies" bullet.
13	6	2	MSCHUTTE	Note modifications to the FHAD hydrology that were completed with this study?	Addressed.
14	6	2	MSCHUTTE	While you all did not obtain this information, we should still reference the topographic information obtained for the FHAD hydrology here. This info was included along with these comments.	Addressed.
15	6	2	MLYNCH	Not sure I fully understand this statement, detention?	This was referencing daylighting Westerly Creek channels. Clarified in text.
16	7	3	DMORRISEY	Please be more specific describing the SWMM model for CCD in Table 1.1.	Addressed.
17	7	3	DMORRISEY	Please check. Chris' project role is WCPM Project Manager.	Addressed.
18	7	3	DMORRISEY	Update project role for David Morrisey to "Senior Engineer - Floodplain Administration"	Addressed.
19	7	3	MSCHUTTE	Is this the Original Aurora Stormwater Master Plan? If so, please state it that way. Again, avoid the SWMP acronym.	Addressed.
20	7	3	MSCHUTTE	Westerly Creek MDP should be dated 2010?	Addressed.
21	7	3	MSCHUTTE	Change organization for Sam Miller, Vern Adam, Tony Tran to Aurora Water.	Addressed.
22	7	3	CBEST	Change Denver Parks and Recreation to CCD to be consistent.	Addressed.
23	7	3	SMILLER	Change the organization for Elizabeth Lefebvre to COA. Change her project role to "Senior PIO, Aurora Water"	Addressed.
24	8	4	DMORRISEY	Is it 2-3 inches of rainfall total or 2-3 inches per hour in Flood History section?	Total rainfall. Addressed in text.

25	8	4	DMORRISEY	Can you reference any documents for the stormwater systems constructed by MHFD?	Some outfalls (Montview, 23rd Ave, 19th Ave) were reconstructed or had riprap added to them as part of the channel construction, but were not a ocus of the overall project. The record drawings are available on the MHFD resource library.
26	8	4	DMORRISEY	Did total rainfall exceed 3 inches or did rainfall intensity exceed 3 inches per hour for the 2011 storm?	Total rainfall. Addressed in text.
27	8	4	MLYNCH	Should we include this information since we are not studying Westerly Creek? I would be interested in what is going on in the watershed	Addressed.
28	8	4	MLYNCH	Seems like we have good flood history data? There is also a gage at WCD.	Addressed. There are no USGS stream gages on Westerly Creek.
29	8	4	CBEST	I'm unfamiliar with the Montview Neighborhood. Within Denver, this is called the East Colfax neighborhood. Is it called the Montview neighborhood in Aurora? I'd like to call out East Colfax neighborhood separately.	Addressed. Text and figures updated to show that area as the East Colfax/North Aurora neighborhoods.
30	9	5	CBEST	Is Environmental Assessment in a future submittal?	An Environmental Assessment will not be completed as part of this OSP. It was included in the FHAD.
31	10	6	DMORRISEY	Is there a better way to identify ECC?	Addressed.
32	10	6	DMORRISEY	Suggest using jurisdictional boundary line in addition to color.	Addressed.
33	10	6	DMORRISEY	Please turn off parcel layer. The aerial image is either of bad quality or is partially obscured by coloration (jurisdiction) or both. I would be inclined to find a better background image.	No parcel layer is included is included in these figures. The transparency of the roads layer was increased to make the figure easier to read. The aerial imagery was replaced with 2018 DRCOG aerial.
34	10	6	MSCHUTTE	The study area boundary is a little off because it includes the Westerly Creek Dam. I believe we have a shapefile that excludes the dam area. If we haven't already sent it to you, let me know.	Addressed.
35	10	6	MSCHUTTE	It's difficult to see the boundaries jurisdiction and neighborhood - recommend making lines more bold or perhaps screening the background a bit	Addressed.
36	10	6	MSCHUTTE	Development Area Jurisdictions and Boundaries?	Addressed.
37	11	7	DMORRISEY	Please be consistent/specific with reference to LOMRs. Identify LOMRs using FEMA case number.	Addressed.
38	11	7	DMORRISEY	The FIS was not previously mentioned, but should be and it should be noted that the current effective FIS is revised 9/4/20. Include among references.	Addessed.
39	11	7	MSCHUTTE	BHI did not modify the hydrograph routing except for the new storm sewer and added detention?	Yes. Addressed in text.
40	11	7	MLYNCH	Confirm the size of SS improvements, i thought they were box culverts.	Confirmed. Per as-built drawings, the SS is a 48" RCP.
41	11	7	CBEST	BRT = Bus Rapid Transit; I didn't see it defined elsewhere.	Addressed.
42	11	7	SMILLER	Original Aurora Master Plan (the Aurora Stormwater Master Plan is a different living document) typ.	Addressed.
43	12	8	DMORRISEY	Typo - "area".	Addressed.
44	12	8	MLYNCH	It is not necessary to include modifications to channel and crossings from the Muller LOMR.	Addressed.

45	12	8	CBEST	The Denver East Area Plan does overlap with the study area of this OSP.	Addressed.
46	13	9	DMORRISEY	Paragraph edits: "attenuated by", "over the recession limb of the inflow hydrograph", "that location".	Addressed.
47	13	9	MLYNCH	Does this mean structures are inundated or just flow exceeds the ROW?	The other areas of concern included both flow exceeding the ROW and areas where structures are inundated. Report updated for clarity.
48	13	9	CBEST	A couple other drainage deficiencies were noted in the 2019 CCD SDMP. The systems along Richthofen Pl. & Montview were noted as deficient and improvements were proposed. Were these areas looked at when evaluating the problem areas?	Addressed. All storm drains noted in previous studies as requiring improvements or recommended new systems were added to the map.
49	14	10	DMORRISEY	Can "Other Areas of Concern" be labeled or annotated with descriptions or IDs that correlate with the discussion in the text of the report?	Addressed.
50	18	14	DMORRISEY	Format citations so that the title is first, followed by author and date.	Addressed.
51	18	14	DMORRISEY	Cite the information or documents obtained from COA and CCD open data catalog.	Addressed.
52	18	14	DMORRISEY	The list of references does not seem to be complete. Please check for any documents cited in text and add to this list. Add an entry for the Matrix FHAD (or at least the Matrix Hydrology Memo) and include applicable dates and not that the FHAD is ongoing. Include appropriate references for H&H software programs used and for the source of rainfall data (NOAA Atlas 14). Include the FEMA case number for "Montview" LOMR.	Addressed. Did not include NOAA 14 reference because it was not part of this study. However, the report text does say to see the Westerly Creek FHAD for precipitation data.
53	14	10	MLYNCH	Is this street flooding exceeds 1 ft?	Addressed.
54	14	10	MLYNCH	Can we more specifically describe other areas of concern? Please specify flooding criteria used and provide more info on the other areas of concern - given there are only 6, could possibly just have callouts on each	Addressed.
55	20	APPENDIX A	DMORRISEY	Update David Morrisey's project role.	
56	23	APPENDIX B	MLYNCH	Include location/ design drawings/ something to back up the table provided. I would call this Pond at 1st and Havana since there is another pond at Havana Park	Addressed.
57	23	APPENDIX B	MSCHUTTE	Please provide the head - outflow rating curve, as well. And please include design documents/reports to support the ratings curves.	Addressed.
58	24	APPENDIX B	DMORRISEY	Properly credit the author for this source information. Use of this figure as a background should be by permission.	Addressed.
59	24	APPENDIX B	DMORRISEY	The interactive map functionality is disabled. Please remove these instructions or note that this functionality is disabled.	Addressed.
60	24	APPENDIX B	DMORRISEY	Ensure naming convention of SWMM model is being followed consistently.	Addressed.
61	24	APPENDIX B	DMORRISEY	The convention of this figure is to have a design point that is the input for the sub-basin inflow only. Routing C_04a and Ex_SD into DP E-J-04, violates that convention. By doing so, output from SWMM will not report the inflow from sub-basin.	Addressed. SWMM mode was revised so E-J-04 and has nothing routed into it.

62	24	APPENDIX B	DMORRISEY	Clarify what D_04a and C_04a are. As shown, they are crossing over existing storm pipes. Are there newer pipes that run east-west. Are any existing (green) pipes removed?	C_04a (renamed to C_04b) is the new storm drain, which drains to the pond. D_04a is a divider to split flow from the road to the new storm drain. The existing pipes were not removed.
63	24	APPENDIX B	DMORRISEY	If necessary, show the revised area in a blow-up that enlarges this area to a scale that allows for the correct routing to be shown more clearly. Document what is removed and what new facilities have been added (if any). Use the same conventions as are defined in this figure, or include a legend to define new graphical elements (existing storm pipes should be green lines, etc.).	Addressed.
64	24	APPENDIX B	MSCHUTTE	I think it would be helpful to provide a secondary figure that shows just this specific adjustment. The overall map is needed, but it would be helpful to have a standalone of the change.	Addressed.
65	25	APPENDIX B	DMORRISEY	Provide descriptive information to identify the location of design points.	Addressed.
66	26	APPENDIX B	DMORRISEY	Extend hydrograph to show node drain.	Addressed.
67	28	APPENDIX B	DMORRISEY	For any model output, use a font that has a uniform character width and spacing, such as courier new, so that columnar data is aligned with column headings and adjacent rows of data. Ensure that an appropriate font size is used so that a row of data does not wrap.	Addressed.
68	28	APPENDIX B	DMORRISEY	If this is a revised model, can the scenario ID be revised to reflect correct, current information?	Addressed.
69	28	APPENDIX B	DMORRISEY	Is 23 hours sufficient time for the entire storm event to have completely passed through the system?	Addressed. Increased run time to allow storm to completely pass through system.
70	28	APPENDIX B	MLYNCH	Is there a better way to print to easily read?	Addressed.
71	67	APPENDIX B	DMORRISEY	It is really hard to read this data.	Addressed.
72	73	APPENDIX B	DMORRISEY	Please add divider page to separate the excerpted content from the Matrix FHAD from the previous sections of the report. Is this an appendix? If so, add a page that identifies the following information as being and appendix. The page that identifies the following as an appendix should indicate what is included.	Addressed.
73	76	APPENDIX B	SMILLER	This is SO SMALL I just happened to see that this should be 2017. My eye just happened to focus here, not the biggest deal.	Referenced figure is part of Hydrology Acceptance, not materials from this study. No action made.
74	28	APPENDIX B	DMORRISEY	Is this 100-year future or existing event?	It is future conditions. Addressed
75	6	2	MSCHUTTE	(Additional comment submitted 03/19/2021) Revise text to "in the Westerly Creek Watershed" since this in an OSP.	Addressed.
76	7	3	MSCHUTTE	(Additional comment submitted 03/19/2021) Include LOMR number.	Addressed.
77	11	7	MSCHUTTE	(Additional comment submitted 03/19/2021) David noted that the FEMA FIS was revised 9/4/2020.	Addressed.
78	12	8	MSCHUTTE	(Additional comment submitted 03/19/2021) "Denver Stormdrain Master Plan" should be "Denver SDMP" to be consistent.	Addressed.
79	29	APPENDIX B	MSCHUTTE	(Additional comment submitted 03/19/2021) Please include design report to back up data in Table B.1 and B.2.	Addressed.

80	23	APPENDIX B	DMORRISEY	(Additional comment submitted 03/19/2021) The depth increments of the 1st/Havana pond rating curve are not uniform. Please develop data at each foot or half-foot depth. Provide some descriptive information for depths that are associated with some notable geometric feature Note maximum storage depth and top of pond depth.	Addressed.
81	57	APPENDIX B	DMORRISEY	(Additional comment submitted 03/19/2021) Where in the system is the volume being stored? It is recommended to extend the model duration so that all storm runoff that enters the system is allowed to leave the system. Also check that there is not storage in any node/element where storage is not supposed to occur.	Volume is primarily stored in the Kelly Road Dam and Westerly Creek Dam pond storage nodes. Model run-time increased to 25-days to allow for node drainage.

Figure A.2 – Alternatives Analysis Comments and Responses

Outfall Systems Planning of Westerly Creek Downstream of Westerly Creek Dam
Alternatives Analysis Comments and Responses
Report dated May 2021. Comments dated May 2021.

Items	PDF Page	Page Number	Reviewer	Comments	Responses
2	9	3	mschutte	Typo - "Mark"	Addressed.
56	9	3	cbest	Since our group is no longer WCPM and to be consistent, please change to "Senior Engineer - IPM Wastewater"	Addressed.
3	10	4	mschutte	Section 2.3.1 - Rename "Central Park" to "Park Creek Tributary".	Addressed.
57	10	4	cbest	I think a brief discussion of what land use changes are expected in future conditions would be helpful. It is stated that the watershed is mostly built out so where is development anticipated in the future?	Addressed.
58	10	4	cbest	Lowry is bounded by Alameda Ave. to the south. Peoria is further to the east. Westerly Creek runs through Lowry. It does not bound it.	Addressed.
76	10	4	smiller	Do we have design documents stating they were designed for smaller events?	This statement is based on our analysis. Several storm drains systems still result in 100-year street flooding greater than one foot in the street. I believe many of the storm drains were designed for the 2-10 year event. However, the design event for many storm drains is not easily accessible without finding the design report/as builts, etc.
4	11	5	mschutte	Typo - "Within"	Addressed.
5	11	5	mschutte	Section 2.3.8 - Rename "Central Park" to "Park Creek Tributary".	Addressed.
59	11	5	cbest	I know this is a minor thing but to me this reads as though there is one outfall per basin. I suggest removing the word or making it plural.	Addressed.
6	12	6	mschutte	The Lowry storm drains in Section 2.3.10 are not on the map. Are they not major outfalls?	Addressed.
7	12	6	mlynch	I have some flood photos if you want them.	Noted.
8	12	6	mlynch	MHFD estimated peak flow rates of 879 cfs at 11th and 980 at Montview. https://mhfd.maps.arcgis.com/apps/webappviewer/index.html?id=b28d3b634a3c434db1b6200634228d4f	Addressed.
60	12	6	cbest	I think inclusion of the construction of the Kelly Road dam and Westerly Creek dam would be important to the Flood History section.	Addressed.
9	13	7	mlynch	Would a dot feature be useful for 1st and Havana Pond?	Addressed.
10	13	7	mlynch	It just occurred to me it might be nice for the jurisdiction boundary to be white or some other color that isn't red. It distracts the eye a bit when the flooding line work pops up on later maps.	Addressed.
11	14	8	mschutte	Add general symbol for basin labels to legend	Addressed.
12	14	8	mlynch	Outfalls are hard to see? Maybe a different color from the stream polyline?	Addressed.
13	14	8	mlynch	Ex. Storm drains are hard to see. Maybe a different color?	Addressed.
77	14	8	smiller	Basin 4 and 5 are similar colors.	Addressed.

14	15	9	mlynch	Add point rainfall depths for the 2year and 5year event. Reference point rainfall table or include it here in the text.	Addressed.
83	15	9	dmorrisey	Is there a current, ongoing WC FHAD, or does this refer to the work by Matrix?	The FHAD is currently being completed by Matrix.
84	15	9	dmorrisey	Re-arrange sentence in Section 3.1.	Addressed.
85	15	9	dmorrisey	If the recently constructed stormwater detention facilities is a single facility, please identify that here.	Addressed.
62	16	10	cbest	It might be useful to have this discussion about Central and Lowry outfalls restated in section 2.3.	Addressed.
86	17	11	dmorrisey	...and compared?	Addressed.
15	18	12	mlynch	Should this include OSP? Or year? It took me awhile to figure out what was what.	Addressed.
87	18	12	dmorrisey	144 cfs rather than apx. Cfs.	Addressed.
88	18	12	dmorrisey	…downstream?	Addressed.
89	18	12	dmorrisey	Please also provide digital model files.	All model files are provided in the Technical Appendix.
16	19	13	mschutte	The way this reads, it sounds like the hydraulic analysis for this study used kinematic wave. As I recall from our discussions, you weren't planning to use dynamic models for the alternatives since the hydrology used kinematic, but instead would analyze alternatives with 2D modeling? If 2D models were used for hydraulic alternatives, it is not clear from this statement. External manning's calcs are mentioned - will 2D be used for conceptual?	Kinematic wave was originally used to identify problem areas. Dynamic wave models were later developed and superseded the kinematic models. The report has been updated to reflect this change.
63	19	13	cbest	Suggest revising Section 4.1 to state more specifically why those areas were of interest. I want to avoid any perception that certain areas/neighborhoods are more valued than others.	Addressed.
64	19	13	cbest	Suggest adding the general criteria to Section 4.2 for determining flood hazard locations.	Addressed.
65	19	13	cbest	What about existing conditions 100-year event? This basin is currently built out so the difference b/w existing & future won't likely be significant but it would be helpful to address that here if it just applies to this basin or at the beginning of this section if it applies to all basins.	Addressed.
90	19	13	dmorrisey	The previous section indicates that the SWMM models were those from the Matrix FHAD with the only change being the incorporation of the Havana Pond (1st and Havana).	Dynamic wave models have since been developed. The text has been revised to clarify that the new models were used.
91	19	13	dmorrisey	Were Denver SDMP hydraulic models used, or models developed by Matrix? This sounds like conflicting information.	The SDMP models used to assess existing conditions in Denver.
92	19	13	dmorrisey	...along the Westerly Creek drainageway	The statement is correct. There are no open channel conveyances within the Westerly Creek watershed that were assessed. No crossing structures were assessed as part of this study.

93	19	13	dmorrisey	Is that because the flooding is due to major drainage capacity issues? If so, note that. Improvements along the WC drainageway were completed by MHFD in 2019. Did these improvements alleviate some of the flooding? It is unlikely that any improvements will be made to the "Kelly Pond," that improve local flooding in this location.	The referenced statement was removed from the report. The SDMP did not provide specifics as to why this area was identified as a flood risk. It appears to be a conveyance issue with Westerly Creek, which is outside the scope of this project.
94	19	13	dmorrisey	How were Basin 4401-02 hazards modeled?	Addressed.
17	20	14	mschutte	Manning's calc for now - 2D for conceptual, or should 2D modeling be completed now?	Dynamic wave SWMM models were developed for alternatives assessment, so no external Manning's calculations are necessary.
18	20	14	mlynch	…"to these previous studies."	Addressed.
95	20	14	dmorrisey	Please add citation to listed references.	All listed texts are included in the references section.
96	20	14	dmorrisey	There are certainly differences, but there could still be a comparison at some locations, which could have some value.	Addressed.
19	21	15	mschutte	Denver Criteria is to not exceed the street crown, do we need to specify that separately from the Aurora criteria? Same linework is fine, but maybe a note to specify what criteria is used where?	Addressed.
20	21	15	mlynch	How this is shown it is hard to determine if there is also street flooding with the OSP assessment.	The line styles were revised to improve readability.
21	21	15	mlynch	Maybe shading for the basins should not be added to the map? It is hard to see the problem areas, which is the main objective of the map.	Replacing the shading with outlines was attempted, but made the figures less legible. The color schemes were updated to help with legibility.
66	21	15	cbest	What does additional areas for assessment mean?	These were problem areas identified by BHI that were not included in previous studies. Section 4.2 was revised to clarify this.
22	22	16	mlynch	I would be specific here, is it the basin delineation, CUHP version? All of it.	Addressed.
23	22	16	mschutte	Typo - "Constraints"	Addressed.
24	23	17	mlynch	Formalizing detention through an adequate assurance agreement...	Addressed.
25	23	17	mlynch	I like this table, I would use a lighter shade of red, hard to read.	Addressed.
78	23	17	smiller	Are improvements to the Chesapeake pond proposed or a new pond?	Addressed.
26	24	18	mlynch	I am not sure I agree with this statement. One had the goal of informing hydrologic routing, the other has the goal of sizing storm sewer. I would recommend dynamic wave or 2D modeling at specific problem areas. Or do we at least know the difference?	Kinematic wave was originally used to assess alternatives. Dynamic wave models were later developed and superseded the kinematic models. The report has been updated to reflect this change.
27	24	18	mlynch	Should utility coordination be scaled based on street classification?	Utility coordination set to 5% for local/collector and 10% for arterial.
28	24	18	mlynch	What are acquisition unit costs based on?	Acquisition unit costs were updated to be based on average 2021 Arapahoe County land appraisal values. This was clarified in the report.

67	24	18	cbest	Just wanted to share that our CCD WW recent cost data shows unit costs sometimes 2 to 3 times the adjusted 2020 Q4 cost. I know unit costs can be higher for Denver projects but that's quite a big difference. Perhaps there's a big difference in the M&Ps? For example, our median bid for 18" RCP over the last 3 years is $201/elf. Median for 36" RCP is $315/lf.	Noted. Per discussion with MHFD and sponsors, the unit prices will be left as-is.
68	24	18	cbest	Does MHFD have more recent cost data they can use?	Per discussion with MHFD, unit prices cannot be adjusted.
29	26	20	mschutte	General note - it would be helpful to have capacities notes with each alternative. Some mentioned the flow that can be carried, others don't. Also maybe some detail on the worst case street flood depths, where applicable? And flow reductions for detention. Mention this info where appropriate with each alternative.	Addressed.
30	26	20	mschutte	It would be good to know if storm sewer in Clinton vs Dallas vs Dayton is most effective in reducing street depths here - of course, dependent on the planned storm sewer capacity downstream. This is a spot where 2D models may be helpful?	Addressed. FHAD FLO-2D modeling (revised by BHI) shows the greater street flooding depths in Dayton than Dallas or Clinton.
31	26	20	mschutte	RCBC? I've heard both. Choose one and define in table at beginning.	Addressed.
32	26	20	mschutte	The 23rd improvements are also planned at this point. We will get you more information on this to include as a base component.	Addressed.
33	26	20	mlynch	City of Aurora, not MHFD for 22nd Ave improvements.	Addressed.
34	26	20	mschutte	Your proposed condition shows to Dayton. To be clear - the portion that is currently planned is from WC to Clinton. We can show improvements east of Clinton , but just want to distinguish between what is planned for construction and what is additionally proposed here.	The provided by MHFD extend to Dallas. The text for this alternative was updated to clarify that the existing plans extend to Dallas, but this alternative would extend to Dallas.
79	26	20	smiller	Can we include information about this project that is underway? current designs... etc?	Addressed.
97	26	20	dmorrisey	It would be helpful to have figure showing this area here.	Additional figures at a smaller scale were added to the text to better display the proposed alternatives.
98	26	20	dmorrisey	Should these designations be named so as to be better coordinated with the Basin, i.e., Alternative Component 5-1, etc?	Addressed.
35	27	21	mschutte	Remind me to give you the plans we have for this! Plan is: replace existing 48" from Dallas to Westerly Creek with new 48" in 23rd and a private 48"/60" system running parallel north of 23rd. These two systems combine into a 53" x 83" HERCP for about 130' to outfall in one location at WC.	The plans noted here are for the full capital improvement plan for Westerly Creek. The storm drains in the plans provided by MHFD do not combine with the existing storm drains. The interim plans provided by MHFD were used to develop this alternative.
80	27	21	smiller	This pond does exist and is privately owned (stated above) so could this language be more clear to describe the proposed pond improvements? proposed pond increase in capacity? proposed pond regrading?	Addressed.

81	27	21	smiller	can we add an explicit detail to the narrative if increasing the pond to include the new private parcels will eliminate the overtopping entirely? also... have we looked at formalizing more flow to be discharged into the canal and then using the canal as a WQ benefit? I understand Im now asking to really transport water out of the Basin and over to WTG creek.. and maybe this doesn't end up in the report, but its looking like were signing an agreement with DW soon for this corridor and having a beneficial project that comes "district approved" may be helpful. In essence - I think were looking at 3 sub-alternatives: regrade the pond and increase its capacity, add new land to the NE and increase pond capacity (would this eliminate all flow to the canal?), and then formalize more flow into the canal (would this eliminate all downstream flooding below criteria?)	It is unclear if expanding the pond will eliminate discharge to the canal. Per discussion on 6/24/21, this alternative will be included in the selected plan. The sub-alternatives discussed here will be assessed doing conceptual design.
36	29	23	mschutte	This solution (along with Basin 3 components) does not meet criteria? Are there any solutions that do? If a combination with other improvements achieves criteria, mention those specifically here.	Addressed.
82	29	23	smiller	Was the Colfax SD previously proposed too?	This improvement was not previously proposed, but was included because this area may be redeveloped in the future.
99	29	23	dmorrisey	Please modify the format of these to simply be: Total Capital Cost: $##,###; Annual O&M Cost: $##,### It is fine to add a sentence below noting that costs are determined using UDMP Cost Version 2.2 (which would be redundant), and that A cost summary is provide in an appendix.	Addressed.
37	30	24	mlynch	This is hard to understand, the WC OSP is recommending at 60" RCP?	Addressed.
100	30	24	dmorrisey	It would be helpful to have figure showing this area here.	Additional figures at a smaller scale were added to the text to better display the proposed alternatives.
38	31	25	mlynch	Will 90" SD fit or is a box needed?	The size of this storm drain was reduced to 78" due to dynamic wave modeling. This should fit with the other utilities located along the proposed alignment.
39	32	26	mlynch	"adequate assurances agreement to not alter inadvertent storage."	Addressed.
40	32	26	mlynch	Verbena Park pond is not included in the existing hydrology, what is the reduction in flow if it is included?	The reduction of flow is less than 1 cfs with the pond included in the model.
41	32	26	mschutte	Just a thought - we could truth check these costs relative to their SDMP, since it was relatively recent?	Our costs were low compared to the SDMP. Per discussion with sponsors, costs estimate approach was not changed.
69	32	26	cbest	Our GIS shows an existing 15" storm drain along Richthofen.	Addressed.
70	32	26	cbest	I personally support formalizing the detention in the park and including it in the hydraulic modeling for the storm drain. Does this currently assume the detention area is not contributing flow to the storm drain?	Verbena Park was added to the SWMM model. The detention pond contributes to the Richthofen storm drain. An additional weir overflow was added to divert flows from Verbena Park to E 12th Ave. This is a better representation of flows in the basin, compared to having all of the basin flows routed down Richthofen.

71	32	26	cbest	I'm curious, does it just barely exceed a foot or is it much greater? I'm just curious if there is an existing concern about flood extents reaching houses. Did the street cross sections in the SWMM links extend beyond curb? beyond ROW?	After reviewing the flows in this basin, street flooding is no longer an issue in this area. Flow is split along Richthofen and E 12th and both streets meet criteria.
72	32	26	cbest	Was Montview intended or is that a typo? I'm not sure how Richthofen improvements would resolve issues around Montview.	This was a typo. Addressed.
73	32	26	cbest	May require coordination with DPR if detention is formalized in Verbena Park	Addressed.
42	33	27	mschutte	The way this is stated it is hard to tell if the WC OSP is also recommending this improvement? Maybe just say what is recommended that is consistent with previous studies	Addressed.
43	35	29	mschutte	This kind of confused me when I compared the text to this map. Base components aren't mentioned until the recommended plan. It probably makes sense to explain what is meant by base component before this map OR just show everything as alternatives on this figure.	Addressed.
44	35	29	mlynch	Would recommend calling out pipe sizes on this figure.	Addressed.
101	35	29	dmorrisey	Maps at this scale present information so abstractly, that a lot of detail cannot be recognized and understood. It is recommended to provide separate figures for each area at a scale that allows for better understanding of the proposed improvements.	Additional figures at a smaller scale were added to the text to better display the proposed alternatives.
45	36	30	mschutte	As mentioned before, take a look at the final planned configuration for E23rd Ave SD - it may make a difference (more capacity)	Addressed. The 23rd SD is now included as a base alternative since it is likely to be constructed.
46	36	30	mlynch	Do all the alternatives meet flood depth criteria for the 100-year storm event? Should the summary table information also be stated here in Section 5.6.6?	After completing additional dynamic wave modeling, all alternative plans meet the 100-year criteria. This is clarified in the text, so a comparison table should not be necessary.
47	36	30	mschutte	To Morgan's note: maybe we could have a summary of the impact to flooding for each combination? Based on the combined options, I do not see any that achieve criteria everywhere, is that correct? I should say - there is always some flooding within the Easterly creek watershed. Might be worth noting that in this explanation to avoid confusing. After reading the next section - this information could be appropriate there instead - I'm fine with either	After completing additional dynamic wave modeling, all alternative plans meet the 100-year criteria. This is clarified in the text and a comparison table is provided.
74	36	30	cbest	Which upstream improvements provide better reduction than 23rd Ave and 19th Ave SD?	Addressed.
48	37	31	mschutte	I don't see the problem area flooding lineworks on the base alternatives tab... this misled me into thinking somehow just the base components solved everything! I think we need to show what flooding looks like with just the base components?	Addressed.
75	39	33	cbest	How was benefit quantified?	Benefit was equal to the calculated damage reduction by each alternative component. That had been clarified in the report text.
102	39	33	dmorrisey	It is unclear how the alternatives are scored, the criteria weighted and valued, etc.	This was clarified in the report text. Addressed.
61	14	8	cbest	Would there be a way to better indicate which basin each outfall is serving? How is a major outfall defined? There are 15" outfalls labeled as major while larger outfalls are not. Aren't there major outfalls in the upstream and downstream basins?	The original intent of this map was to identify the outfalls of interest for this OSP (there were none in Lowry and Central Park because no flooding areas have been identified there). The figure was revised to identify all outfalls in the basin.

103	61	Appendix B	dmorrisey	Please provide copies of digital files, including hydrologic and hydraulic models input and drawing files in CAD and/or GIS.	Easterly Creek Pond was only change to the SWMM model. The data related to this change is provided in Appendix B. The SWMM models are provided in the technical appendix.
104	74	Appendix B	dmorrisey	Where is this? It would be helpful to note the location in terms that are readily understood, nearby intersection, etc.	Addressed.
105	74	Appendix B	dmorrisey	Are the FHAD and revised hydrographs coincident? If so, use linetypes that work for lines that are coincident (dashed).	Addressed.
49	311	Appendix E	mschutte	60" pipe quantity seems a bit low, or is some of the length included in the Dayton sat alignment? Please verify. (22nd Ave SD)	Some of the pie quantity was originally included in the Dayton Street alternative. This alternative was updated to extend to Dayton Street rather than Dallas. The pipe quantities were updated.
50	311	Appendix E	mschutte	I would increase utility coordination cost some knowing the utility issues down here. (22nd Ave SD)	Utility coordination increased to 15%.
51	312	Appendix E	mschutte	54" pipe quantity seems high. Please verify. (Dayton St SD)	This alternative originally extended down a portion of E 22nd. The alternative was revised to only include Dayton St. The pipe quantity was updated.
52	313	Appendix E	mschutte	I would bump this up some due to known utility issues. (23rd Ave SD).	Utility coordination increased to 15%.
53	318	Appendix E	mschutte	I would increase utility coordination considerably for working in Colfax.	Utility coordination increased to 30%.
54	320	Appendix E	mschutte	I know we probably won't go with this alternative, but please verify that this is enough space. The footprint of the channel will have a large impact on the cost, not just for land acquisition.	A large portion of this alternative would be constructed in the ROW. This value was increased to allow for a larger buffer between the channel and adjacent parcels.
55	321	Appendix E	mschutte	Seems high based on the line work. Please verify length. (Alton St SD)	The storm drain length is correct.
106	311	Appendix E	dmorrisey	Please use 11 x 17 landscape to improve readability.	Addressed.
107	313	Appendix E	dmorrisey	Manhole and inlet maintenance is double QTY*Unit Cost	It is not shown in the table, but maintenance is assessed twice yearly, which accounts for this discrepancy.
108	314	Appendix E	dmorrisey	Verify land acquisition cost for Chesapeake pond.	The unit price for land acquisition was changed from $4/SF to $11 SF to better represent the current price.
109	315	Appendix E	dmorrisey	Typo - $2,650,000	Addressed.
110	215	Appendix E	dmorrisey	Does the cost provided include contingency?	Yes - comment on cost estimate was updated for clarity.

Selected Plan for the Westerly Creek Downstream of Westerly Creek Dam Outfall Systems Plan

7/26/2021

The *Selected Plan* for Westerly Creek Downstream of Westerly Creek Dam agreed upon by the City and County of Denver (*Denver*), City of Aurora (Aurora), and the Mile High Flood District (*MHFD*) (hereinafter *Denver*, *Aurora* and *MHFD* shall jointly be referred to as "*Sponsors*") to be shown by Bohannan Huston Inc. (*BHI)* in the final *Westerly Creek Downstream of Westerly Creek Dam Outfall Systems Plan* report (hereinafter called "*Final Report*") is described in general and specific terms below.

SELECTED PLAN AND DIRECTLY RELATED ISSUES

Unless specifically directed otherwise below, this *Selected Plan* to be shown in the *Final Report* essentially follows the recommendations made by *BHI* in the *Westerly Creek Downstream of Westerly Creek Dam Alternatives Analysis Report* dated July 2021 (hereinafter called "*Alternatives*") based on the following principal elements, goals and objectives:

- Evaluating existing studies and being mindful of their original intent;
- Identifying drainage system deficiencies, specifically where flooding is in excess of 1 foot;
- Identifying and planning upgrades to the existing stormwater system facilities and proposing new improvements that meet the drainage/flooding criteria, including new conveyances and the daylighting of storm drains where possible;
- Preserving or enhancing existing or new open space, if open space is evaluated for stormwater management;
- Prioritizing stormwater projects; and
- Improving water quality in dense, urbanized areas.

BHI is asked to address all items that are specified to be addressed in the *Final Report* as described in the agreement between *MHFD* and *BHI* for this project, which includes developing, describing and showing a conceptual design based on the Recommended Plan in the *Alternatives*, with the following exceptions:

1. Address any outstanding comments from the Alternatives Analysis report in the following Conceptual Design Report.
2. Related to the Chesapeake Townhomes Pond, provide three sub-alternatives to this design.
    a. Regrade the pond and increase its capacity with the goal of eliminating overtopping to the Highline Canal.
    b. Add new, additional land to the northeast to the pond and increase its capacity with the goal of eliminating overtopping to the Highline Canal.

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c. Formalize more flow spill from this pond into the Highline Canal with the goal of eliminating flooding above criteria downstream in the Westerly Creek watershed.

Also show and describe all recommended facilities, costs and actions on a reach-by-reach of the drainageway. In general, the *Final Report* shall provide, show, and recommend the following:

1. Under a section in the *Final Report* titled "General Recommendations," recommend:

   a) That Sponsors and any other jurisdiction having land use control powers in this watershed require new land development, redevelopment, and publicly funded projects to reduce and also treat stormwater runoff to the maximum extent practicable prior to stormwater runoff entering Waters of the State. This includes the following:

      i) Provide stormwater runoff reduction (i.e., minimize directly connected impervious areas and employ infiltrating BMPs or Stormwater Control Measures (SCMs)) whenever site conditions permit.

      ii) Provide SCMs that treat stormwater runoff prior to entering Waters of the State.

      iii) Evaluate and implement source control SCMs to prevent pollutants from mixing with stormwater.

   b) That all jurisdiction having land use control powers in this watershed continue to implement their floodplain management regulations, including regulation of the 100-year floodway and floodplain.

      Recommend that these jurisdictions adopt a policy, if not already done so, of preserving the defined floodplains as open spaces to the maximum extent possible and that at least 1-foot freeboard be provided for the lowest floor above the 100-year flood elevation shown on the latest flood hazard area delineation or FIRM maps for all human occupied structures built adjacent to, or within, the defined 100-year floodplains.

   c) That all jurisdiction having land use control powers in this watershed continue to participate in FEMA's flood insurance Community Rating System and public education programs.

2. List on the plan view and profile sheet of the conceptual design, where appropriate, the recommended wetland mitigations that will be needed to implement recommended improvements, if any.

3. Show on appropriate plan and profile sheets facilities to arrest the vertical degradation of the low-flow channel of natural and man-made waterways and to help rehabilitate, as much as possible their stable function and habitat.

4. Recommend rehabilitating eroded and degraded banks where needed and desired to arrest the horizontal erosion along natural waterways using bio-engineered methods that combine buried soil riprap and revegetation with native species of riparian and dryland vegetation.

5. Show on plan view and profile sheet the needed buttressing of critical utilities and other structures that may be endangered by stream erosion.

6. Using the input from stakeholders and the public, work with *Sponsors* and affected other local jurisdictions to prioritize the recommended facilities and actions that are listed in the *Final Report* and clearly articulate them in that document.

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7. Describe the recommended type and schedule of maintenance activities for all improved facilities recommended in the *Final Report*.
8. Consider the various functions of all natural waterways in the study watersheds and their floodplain, including flood conveyance, riparian habitat, open space, aesthetics, recreation, urban development, water quality, utility crossing, transportation and other features.
9. Acknowledge in the *Final Report*, that land-use changes to the contributing watersheds affect the flood hazard nature (i.e., runoff rates, volumes and depths), the transport of sediment, and the water quality of the receiving natural waterways. The *Final Report*, under "General Recommendations" shall suggest that Sponsors and any other jurisdiction having land use control powers in these watersheds monitor land-use changes and whenever the land-use changes result in imperviousness ratios that exceed the projections identified in the *Final Report*, these jurisdiction take steps to further limit increases in stormwater runoff through the use of additional on-site detention, infiltrating BMPs and Control Measure Design Standard BMPs, thereby reducing the runoff rates, volumes and future damage potentials to the *Final Report* levels.

EXECUTIVE SUMMARY

Include an Executive Summary in the *Final Report* written in plain, non-technical language, which is directed primarily at the general public and elected officials. This summary should, at the minimum, contain the following as well as other items listed in *MHFD's* checklist for preparation of the final major drainageway plan conceptual design report:

1. A brief summary of the planning process including numbers of progress and public meetings.
2. A brief description of the decisions made by project sponsors during this project.
3. A brief summary of all design criteria specifically developed for this plan.
4. A brief summary of the following sections of the *Final Report*: Purpose and Scope, Study Area Description, Alternative Evaluation, Recommended Plan, and Conceptual Design.
5. A map showing the area and all recommended improvements.
6. Tabular and narrative summaries of costs showing costs for capital improvements, engineering/administrative/contingencies, and land values, all sorted by drainageway, reach, tributary, and by jurisdiction. The reach length (miles), tributary catchment area (square miles), and their totals should also be included in the table.

Incorporate the following notes on each drawing:

> "*This drawing is for master planning purposes and represents preliminary and conceptual engineering. Alternatives to this outfall system will be considered by local agencies and the Mile High Flood District provided the alternative offers an equivalent intent of the plan, including hydraulic capacity, water quality, stream stability and natural waterway features. The alternative must comply with all requirements of the local jurisdiction and the Mile High Flood District. In addition, there may be State and Federal requirements that will need to be considered and met. This drawing does not provide a final design and shall not be used for construction purposes."*

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"Local Cities, Towns, and Counties manage and regulate all land use change, development and redevelopment activities within and adjacent to the 100-year floodplains in order to prevent, to a maximum extent possible, future flood damages to buildings and structures from the 100-year flood and to minimize damages from larger floods. The recommendations of this plan provide a set of options subscribed to by Cities, Towns and Counties in carrying out their floodplain management and regulatory responsibilities and obligations."

"Many activities that occur in or affect ditches, drainages, creeks, ponds or wetlands require a Section 404 Permit Authorization from the US Army Corps of Engineers. During preliminary design, and prior to final design or starting work, contact the Corps' Denver Regulatory Office at 303-979-4120 for appropriate permit authority to avoid compromising and delaying the completion of the project."

ADDITIONAL DIRECTION

1. Unit costs should be updated to reflect the most current costs available using the UD-MP Cost worksheet.
2. Include an Acknowledgements section listing all participants and stakeholders in this study. Include in the list their name, organization and function in the planning process.
3. Show all maintenance access routes along all reaches. To the extent feasible, the alignment of these routes shall be coordinated with existing and planned recreational trails identified using input provided by Sponsors, special districts and other local stakeholders.
4. Summarize cost estimates of improvements by jurisdiction where those improvements are located, by the reach in which the improvements are located and overall project totals.
5. Report estimated costs for maintenance of all facilities, including detention ponds, storm sewer outfall points, grade control structures, etc. reported in the *Final Report.*

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Outfall Systems Planning of Westerly Creek Downstream of Westerly Creek Dam
Conceptual Design Comments and Responses
Report dated October 2021. Comments dated November 2021.

Items	PDF Page	Page Number	Reviewer	Comments	Responses
111	3	i	mlynch	Does this have to be an image? It would be nice to just add the text to the page for clarity.	Addressed
112	4	i	mschutte	Link to each section/table/figure	Addressed
113	8	ES-2	mlynch	by Aurora through partnership with private development	Addressed
114	8	ES-2	mlynch	minor	Addressed
115	13	3	mlynch	Westerly Creek Lower FHAD (please change throughout)	Addressed
116	13	3	mschutte	Previous comment from Sam Miller: Is this due to their age? or do we have design documents stating they were designed for smaller storm events? Your response to this comment stated it was based on your analysis. Please state as such in the text.	Text clarifed.
117	21	11	mlynch	It is unclear what SWMM output is provided in Table B-3 and B-4 in the Appendix. It would be great to relate those outputs to the descriptions in this table	Addressed
118	30	20	mschutte	Shift text or image on page so that each alternative section is all shown on one page? Typical, continuing.	Addressed
119	35	25	mschutte	Please describe or reference the what additional drainage improvements will need to be constructed to meet criteria.	Added reference to combined alternative plans section (Section 5.6.5) where this is discussed.
120	44	34	mlynch	Since this flooding depth is so significant along Montview, can we pull an actual cross-section from the DEM and update the SWMM model to verify the depth, or run a normal depth calc to confirm? Open for discussion.	Per discussion with MHFD, idealized street transects replaced with cross-sections from the DEM for where applicable. Table updated.
121	49	39	mschutte	I would move Table 6-10 up to this page and have Figure 6.1 on the following page.	Addressed
122	49	39	mschutte	Include a Master Plan Peak Flow Summary Table, updated table from Section 3	Table added
123	49	39	mschutte	checklist says proposed detention pond summary table is provided but I don't see it.	Table added
124	50	40	mlynch	Aurora is completing this improvement with partnership from the adjacent development, I think it is good to mention that.	Text added
125	50	40	mlynch	This table is hard to read, can the image be inserted at a higher quality. (throughout)	Addressed
126	50	40	mschutte	doesn't seem like this link is working (make sure it works on all sheets, typical throughout)	Addressed
127	51	41	mlynch	With private partner partnership	Text added

Report dated October 2021. Comments dated November 2021.

Items	PDF Page	Page Number	Reviewer	Comments	Responses
128	52	42	smiller	As a point of clarification, when we had the meeting with BHI over the Chesapeake Townhomes Pond sub-alternatives, I remember we determined that the level of effort we put in for any of the options didn't have an appreciable effect on downstream flooding because the model has to always assume the canal is full. Did I misunderstand their findings? It makes sense at a high level that the designed alternatives (going with RESPECs 60% design or expanding to the parking lot) would not eliminate overtopping and have significant barriers, so formalizing the flow would be preferable – but if that doesn't actually show flood reduction in the model, that would be important to note.	In modeling the Chesapeake Townhomes Pond sub-alternatives, the HLC is not considered full when modeling flormalized overflows to the canal. Additional figure to illustrate results and text added about pond sub-alternatives not brining street flooding within criteria within the study area added to text.
129	53	43	mlynch	It might be helpful to show the hydrographs at these points? or more detail about where this information is taken from? What node?	Added hydrographs from D_10a at Del Mar Parkway and 12th Ave to illustrate and additional text to clarify
130	55	45	mlynch	Is this true? I thought the pond did not have an impact much different from existing 100-year condition? I do think it is worth mentioning the impact in the lower storm events.	Text added to clarify.
131	55	45	mschutte	Given the recent discussions that may impact the amount of detention here. Would it be useful acknowledging the fact "at the time of this study" what is provided here is the approach, or discuss the fact that a reduced detention provided doesn't impact criteria flooding? "Enginuity is revising their design to a 13 ac-ft pond that I would like to reflect in this plan. Let's discuss as a team for clarification. " - mlynch reply	Enginuity's 90% design included in this analysis and table updated.
132	59	49	mlynch	Should we consider the vulnerability of the community and the ability to recover from an event? See the SoVI index for reference or we could reference the National Risk Index by FEMA	Per stakeholder direction, NRI was used to inform a qualitative discussion of the social vulnerability of the study area. Discussion added to text.
133	59	49	mschutte	let's not encourage regular mowing just say vegetation and weed management.	Addressed
134	59	49	mschutte	Provide sub-total rows for Aurora and Denver and an overall total row	Addressed
135	336	Appendix E	cperl	Recheck assumptions and unit costs. This is a very high number for paving. (All cost estimate pages)	Unit costs changed to equivalent remove and replace cost per square yard based on CDOT 2021 average unit bid items for applicable items.
136	339	Appendix E	cperl	Since the land is already in use as a detention pond, and Aurora would be doing the owner a favor by taking it over, why would we pay for the land? "May need additional conversation with Aurora"- mlynch reply	Acquitision cost updated to assessed value of parcel - which is less than the value negotiated with Townhomes organiztion in 2018 - and text added to the report to reflect the possibility of future negotiations.
137	614	Appendix G	mlynch	I would recommend still showing the proposed alignment for 22nd and 23rd with this descriptive text and reference the design sheets. Sorry, i meant leave a box in the profile sheet.	Proposed alignments added to plan view map
138	631	Appendix G	mlynch	Havana Park Pond Plans should have a draft stamp and we will need to update with the new design.	Updated plans included

APPENDIX B – HYDROLOGIC ANALYSIS

Bohannan Huston

Table B.1 – Detention Rating Curve for Pond at 1st and Havana

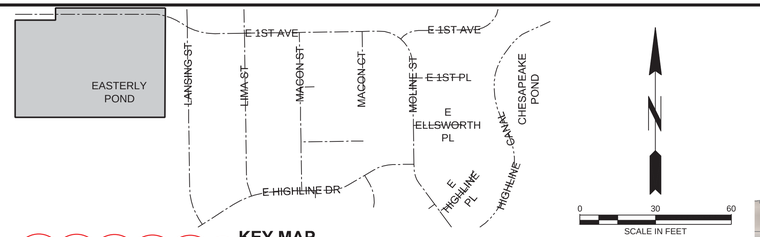
Design Event	WSE (NAVD 88)	AREA (SQFT)	AVG. AREA (AC)	HEIGHT (FT)	VOLUME (AC-FT)	TOTAL VOLUME (AC-FT)
	5436.00	243	-	0.00	0.00	0.00
	5437.00	2900	0.04	1.00	0.04	0.04
	5438.00	8449	0.13	1.00	0.13	0.17
	5439.00	14051	0.26	1.00	0.26	0.42
	5440.00	21357	0.41	1.00	0.41	0.83
WQCV	5440.10	30011	0.59	0.10	0.06	0.89
	5441.00	41059	0.82	0.90	0.73	1.62
EURV	5441.64	55020	1.10	0.64	0.71	2.33
	5442.00	62505	1.35	0.36	0.49	2.82
	5443.00	74534	1.57	1.00	1.57	4.39
	5444.00	76138	1.73	1.00	1.73	6.12
	5445.00	78504	1.78	1.00	1.78	7.89
	5446.00	82354	1.85	1.00	1.85	9.74
100-yr	5446.34	86880	1.94	0.34	0.66	10.40
100-yr + 1/2 EURV	5446.85	111275	2.27	0.51	1.16	11.56
	5447.00	119000	2.64	0.15	0.40	11.96
	5448.00	127116	2.83	1.00	2.83	14.78
Top of Pond	5449.00	135520	3.01	1.00	3.01	17.80

Table B.2 – Head-Outflow Rating Curve for Pond at 1st and Havana

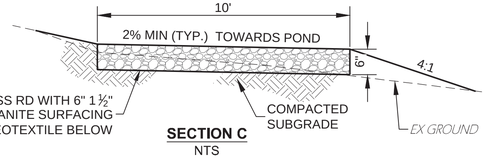
Head (ft)	Outflow (cfs)
0	0.00
1	0.09
2	0.20
3	0.32
4	0.43
5	0.83
6	2.68
7	3.63
8	4.37
9	4.99
10	5.55
11	23.64
12	87.08

Note: See the following pages for the 100% Design Report and as-built drawings used to calculate pond rating curves.

As-Built Data for Pond at 1st Avenue and Havana Street

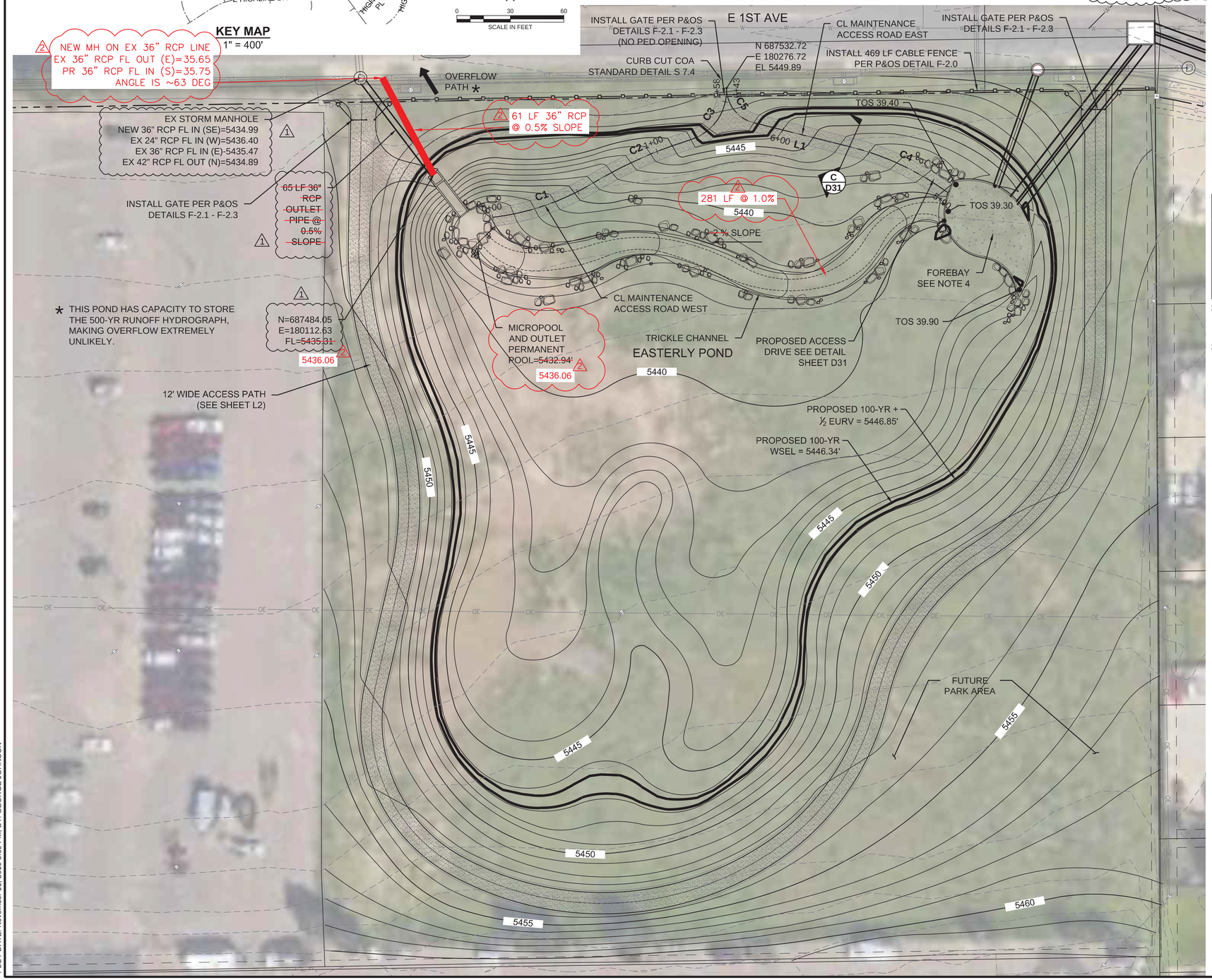


KEY MAP
1" = 400'



SECTION C
NTS

NOTES:
1. SEE SHEET S1-S6 FOR FOREBAY AND OUTLET STRUCTURAL DETAILS.
2. SEE SHEETS L1-L4 FOR LANDSCAPE PLANS.
3. RAILING SHALL BE ADDED ALONG THE ENTIRE LENGTH OF THE FOREBAY HEADWALL. SEE S6 FOR RAILING DETAIL.
4. FOREBAY TOP OF SLAB (TOS) SHALL BE GRADED TO DRAIN TO TRICKLE CHANNEL BETWEEN DESIGNATED TOS CALLOUTS. FOREBAY END WALL SHALL EXTEND 12" ABOVE FOREBAY TOS EXCEPT AT TRICKLE CHANNEL WHERE THERE WILL BE A GAP IN THE WALL OF 14 LF TO ALLOW THE FOREBAY TO DRAIN. ENDS OF FOREBAY WALL SHALL BE VERTICAL AT THE EDGES OF THIS GAP.
5. CRUSHER FINES MAY BE BROWN OR GRAY BUT SHALL BE UNIFORM IN COLOR. 1



MAINTENANCE ACCESS ROAD WEST CL

NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	DELTA
C1	59.43'	140.00'	N71° 12' 34.02"E	24.32°
C2	60.26'	250.00'	N65° 57' 14.15"E	13.81°
C3	38.14'	28.87'	N35° 00' 21.91"E	75.71°

STA 0+00.00 AT N=687460.20 , E=180145.66 , EL=5436.08

MAINTENANCE ACCESS ROAD EAST CL

NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	DELTA
C4	60.61'	154.75'	N64° 43' 41.33"W	22.44°
L1	56.27'		N75° 56' 55.40"W	
C5	26.51'	20.00'	N37° 58' 27.70"W	75.95°

STA 5+00.00 AT N=687473.94 , E=180400.91 , EL=5439.96

SLOPE OF ACCESS ROADS SHALL BE A MAXIMUM OF 10%

COA REQUIRED NOTES:
1. THE DEVELOPER SHALL HAVE A LICENSED PROFESSIONAL ENGINEER CERTIFY EACH STORMWATER DETENTION POND AND/OR WATER QUALITY BMP IS BUILT ACCORDING TO THE APPROVED PLANS AND SPECIFICATIONS AND THE REQUIRED DETENTION VOLUME, INCLUDING THE WQCV WHEN USED, IS MET. THE CERTIFICATION SHALL ALSO VERIFY ALL PERTINENT DIMENSIONS, ELEVATIONS, REQUIRED OUTLET ORIFICE PLATES FOR DETENTION AND WQCV AND OTHER PERMANENT BMPS REQUIREMENTS ARE INSTALLED PER THE APPROVED PLANS AND SPECIFICATIONS, AND SHALL SHOW THE AS-BUILT VOLUMES FOR THE 100-YEAR, 10-YEAR STORM EVENTS, AND FOR THE WQCV AND OTHER PERTINENT DIMENSIONS, ELEVATIONS AND CAPACITY REQUIREMENTS ASSOCIATED WITH THE WQ BMP USED. THE CERTIFICATION SHALL BE PROVIDED TO THE CITY OF AURORA ENGINEERING CONTROL SECTION SENIOR ENGINEER BEFORE A CERTIFICATE OF OCCUPANCY WILL BE ISSUED.
2. ENSURE THAT THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS ARE UPHELD.

POND DESIGN TABLE

	VOLUME	OUTFLOW	INFLOW	WSEL
	(AC-FT)	(CFS)	(CFS)	(FT)
100-YR + 1/2 EURV	11.56	N/A	N/A	5446.85
100-YR	10.4	20.07	163.18	5446.34
5-YR	9.98	13.71	68.39	5446.15
EURV	2.33	N/A	N/A	5441.64
WQCV	0.89	N/A	N/A	5440.10

BENCHMARK: COA BENCHMARK IS A 3" BRASS CAP (STAMPED COA/BM J-012.5) (COA ID 4S6711SW004) LOCATED ON THE TOP OF CURB AT THE NE INTERSECTION OF E 1ST AVE & "FIRST AVENUE" TOWNHOMES ENTRANCE. ELEV=5450.43', NAVD88.

RESPEC
WATER & NATURAL RESOURCES
720 S COLORADO BLVD.
SUITE 410S
DENVER, CO 80246
PHONE (303) 757-3655

REVISION	
1 BID SET REVISION	08/28/18
2 AS BUILT	11/06/19

DESIGNED	THT	
DRAWN	ACT	
CHECKED	JHN	
DATE	9/8/16	

STAMP

Know what's below. Call before you dig.

CITY OF AURORA
15151 EAST ALAMEDA PKWY
AURORA, COLORADO 80012
303-739-7370

EASTERLY CREEK DETENTION POND
HAVANA AUTOMOTIVE PARK
#1B1 AND OLDE TOWNE #2B2

EASTERLY POND

SHEET NUMBER:
D31
SHEET 25

NAME: Z:\CITY OF AURORA\02823_EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-EAST-POND.DWG
PLOT DATE: November 11, 2019 3:09 PM, BY: GEORGE JOHNSON

100% Design Report Calculations for Pond at 1st Avenue and Havana Street

Easterly Creek Detention Pond

Easterly Creek Pond Stage Storage Curve and Outlet Discharge Curve

Proposed Easterly Creek Detention Pond Stage-Storage Curve

Depth (ft)	Elevation (NAVD 88) (ft)	Description	Surface Area (sf)	Incr. Depth (ft)	Volume (cf) (A+B+(A*B)^0.5)/3*H	Cumulative Vol. (cf)	Cumulative Vol. (ac-ft)	Cumulative Vol. (cy)
0.00	5435.44		257	0	0	0	0	0
0.56	5436.0		1066.4	0.6	345	345	0.0	13
1.56	5437.0		3047.8	1.0	1972	2317	0.1	86
2.56	5438.0		6386.9	1.0	4616	6933	0.2	257
3.56	5439.0		10626.0	1.0	8417	15350	0.4	569
4.56	5440.0		29808.1	1.0	19410	34760	0.8	1287
4.67	5440.1	WQCV	31235.6	0.1	3303	38063	0.9	1410
5.03	5440.5	1/2 EURV	36047.2	0.4	12261	50324	1.16	1864
5.56	5441.0		42998.6	0.5	20802	71126	1.6	2634
6.20	5441.6	EURV	48593.2	0.6	29514	100640	2.3	3727
6.56	5442.0		51674.1	0.4	17801	118441	2.7	4387
7.56	5443.0		61864.8	1.0	56693	175134	4.0	6486
8.56	5444.0		76476.3	1.0	69042	244176	5.6	9044
9.56	5445.0		87085.6	1.0	81724	325899	7.5	12070
10.56	5446.0		97293.0	1.0	92142	418041	9.6	15483
11.41	5446.8	100-YR + 1/2 EURV	104732.5	0.8	85532	503574	11.56	18651
11.56	5447.0		106077.0	0.2	16133	519707	11.9	19248
12.56	5448.0		113393.7	1.0	109715	629422	14.4	23312
13.56	5449.0		121367.7	1.0	117358	746780	17.1	27659

Easterly Creek Detention Pond
Outlet Discharge Curve and Drain Times

ECP Outlet Rating Curve from UD-Detention

Depth (ft)	Outflow (cfs)
0.00	0.00
0.50	0.07
1.00	0.09
1.50	0.14
2.00	0.20
2.50	0.24
3.00	0.32
3.50	0.38
4.00	0.43
4.50	0.48
5.00	0.83
5.50	2.00
6.00	2.68
6.50	3.19
7.00	3.63
7.50	4.02
8.00	4.37
8.50	4.69
9.00	4.99
9.50	5.28
10.00	5.55
10.50	6.29
11.00	23.64
11.50	49.89
12.00	68.99
12.50	78.58
13.00	87.08
13.50	94.79
13.56	95.67

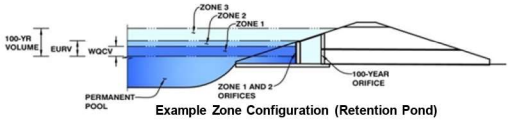
Resulting Drain Times from SWMM

Zone	Volume	Drain Time (hrs)
Zone 1	WQCV	38.8
Zone 2	EURV minues WQCV	12.4
Zone 3	100-yr minus EURV	79.3

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

Project: Easterly Creek Detention Pond Improvements

Basin ID: Easterly Creek Detention Pond



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	55.20	acres
Watershed Length =	2,333	ft
Watershed Slope =	0.013	ft/ft
Watershed Imperviousness =	45.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Groups C/D =	100.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	UDFCD Default	
Water Quality Capture Volume (WQCV) =	0.888	acre-feet
Excess Urban Runoff Volume (EURV) =	2.330	acre-feet
2-yr Runoff Volume (P1 = 0.95 in.) =	1.839	acre-feet
5-yr Runoff Volume (P1 = 1.34 in.) =	3.366	acre-feet
10-yr Runoff Volume (P1 = 1.64 in.) =	4.658	acre-feet
25-yr Runoff Volume (P1 = 2.02 in.) =	6.646	acre-feet
50-yr Runoff Volume (P1 = 2.32 in.) =	8.042	acre-feet
100-yr Runoff Volume (P1 = 2.61 in.) =	9.667	acre-feet
500-yr Runoff Volume (P1 = 3.29 in.) =	13.067	acre-feet
Approximate 2-yr Detention Volume =	1.737	acre-feet
Approximate 5-yr Detention Volume =	2.637	acre-feet
Approximate 10-yr Detention Volume =	2.989	acre-feet
Approximate 25-yr Detention Volume =	3.553	acre-feet
Approximate 50-yr Detention Volume =	4.270	acre-feet
Approximate 100-yr Detention Volume =	5.188	acre-feet

Optional User Input 1-hr Precipitation

	inches
	inches
	inches
	inches
	inches
	inches

Stage-Storage Calculation

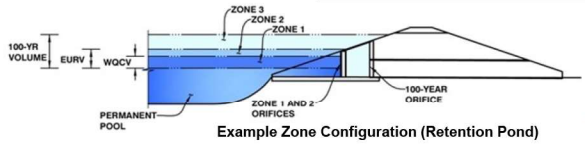
Zone 1 Volume (WQCV) =	0.888	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.443	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	2.858	acre-feet
Total Detention Basin Volume =	5.188	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Micropool	--	0.00	--	--	--	257	0.006		
	--	0.56	--	--	--	1,066	0.024	360	0.008
	--	1.56	--	--	--	3,048	0.070	2,397	0.055
	--	2.56	--	--	--	6,387	0.147	7,145	0.164
	--	3.56	--	--	--	10,626	0.244	15,651	0.359
	--	4.56	--	--	--	29,808	0.684	35,868	0.823
	--	5.56	--	--	--	42,999	0.987	72,272	1.659
	--	6.56	--	--	--	51,674	1.186	119,608	2.746
	--	7.56	--	--	--	61,865	1.420	176,377	4.049
	--	8.56	--	--	--	76,476	1.756	245,548	5.637
	--	9.56	--	--	--	87,086	1.999	327,329	7.514
	--	10.56	--	--	--	97,293	2.234	419,518	9.631
	--	11.56	--	--	--	106,077	2.435	521,203	11.965
	--	12.56	--	--	--	113,394	2.603	630,939	14.484
	--	13.56	--	--	--	121,368	2.786	748,319	17.179
	--		--	--	--				
	--		--	--	--				
	--		--	--	--			

Detention Basin Outlet Structure Design

Project: Easterly Creek Detention Pond Improvements
Basin ID: Easterly Creek Detention Pond



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	4.66	0.888	Orifice Plate
Zone 2 (EURV)	6.20	1.443	Circular Orifice
Zone 3 (100-year)	8.30	2.858	
		5.188	Total

di

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	1.910E-02	ft^2
Depth at top of Zone using Orifice Plate =	4.66	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	18.64	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	2.75	sq. inches (diameter = 1-7/8 inches)	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.40	2.80					
Orifice Area (sq. inches)	2.75	2.75	2.75					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	4.66		ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	6.20		ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	9.00		inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	0.44		ft^2
Vertical Orifice Centroid =	0.38		feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Not Selected	Not Selected	
Overflow Weir Front Edge Height, Ho =	10.45		ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	5.00		feet
Overflow Weir Slope =	0.00		H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	5.00		feet
Overflow Grate Open Area % =	70%		%, grate open area/total area
Debris Clogging % =	50%		%

Calculated Parameters for Overflow Weir

	Not Selected	Not Selected	
Height of Grate Upper Edge, H_t =	10.45		feet
Over Flow Weir Slope Length =	5.00		feet
Grate Open Area / 100-yr Orifice Area =			should be ≥ 4
Overflow Grate Open Area w/o Debris =	17.50		ft^2
Overflow Grate Open Area w/ Debris =	8.75		ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =			ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Not Selected	Not Selected	
Outlet Orifice Area =			ft^2
Outlet Orifice Centroid =			feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=		ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =		feet
Spillway End Slopes =		H:V
Freeboard above Max Water Surface =		feet

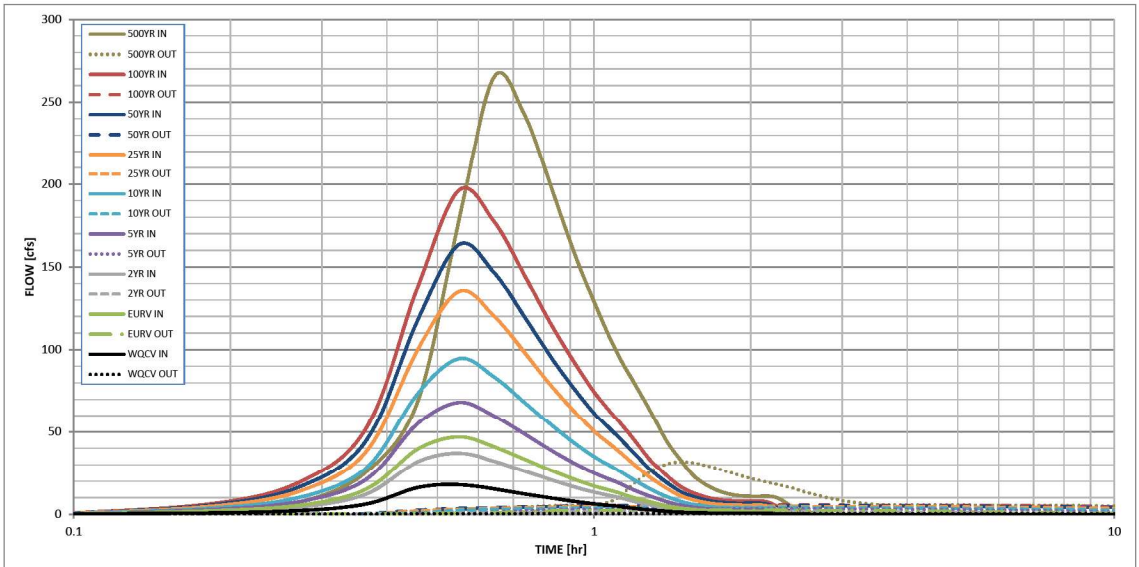
Calculated Parameters for Spillway

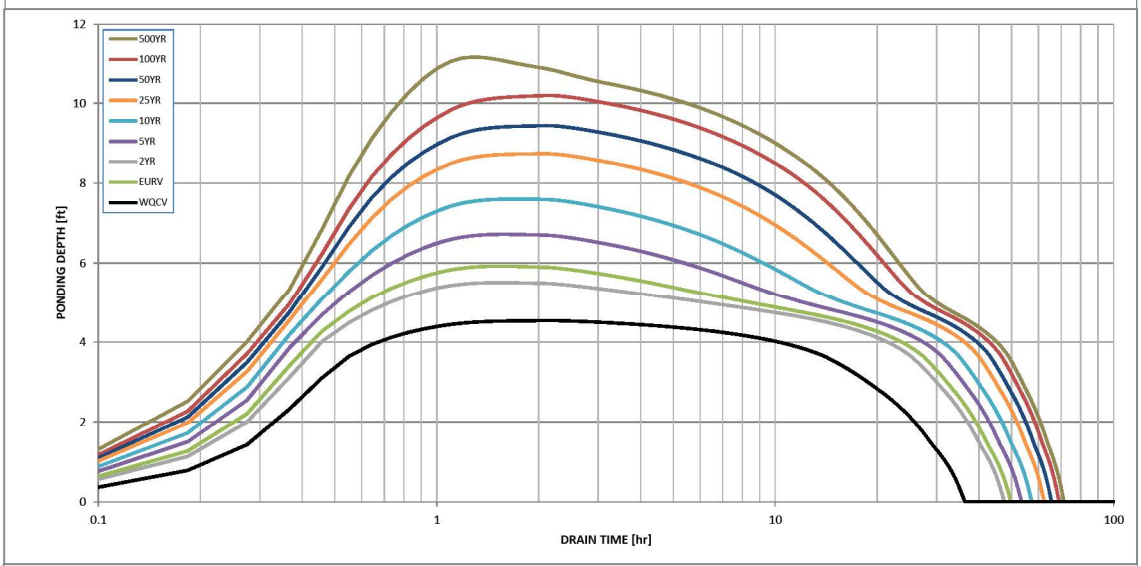
Spillway Design Flow Depth=		feet
Stage at Top of Freeboard =		feet
Basin Area at Top of Freeboard =		acres

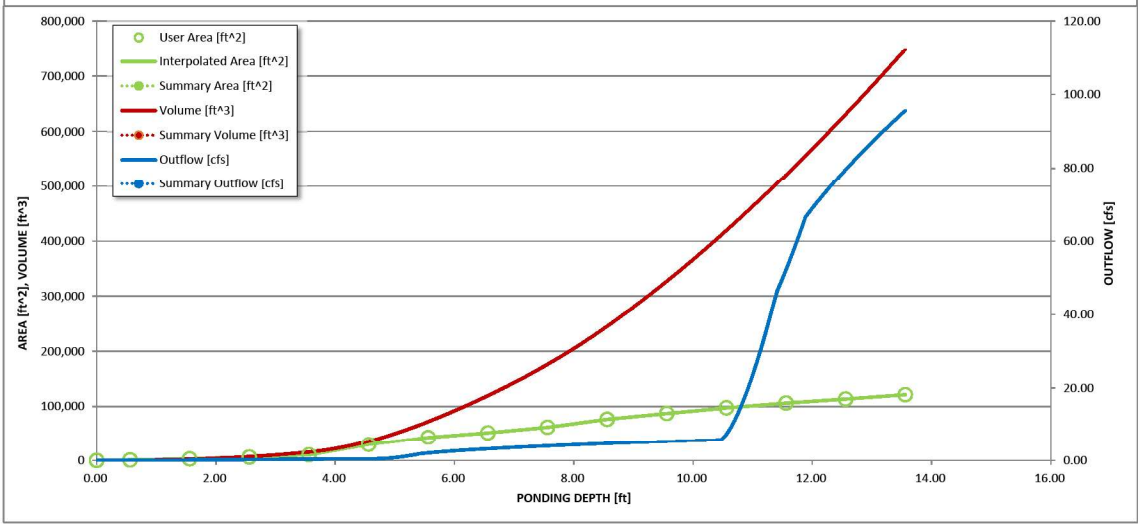
Routed Hydrograph Results

Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.95	1.34	1.64	2.02	2.32	2.61	3.29
Calculated Runoff Volume (acre-ft) =	0.888	2.330	1.839	3.366	4.658	6.646	8.042	9.667	13.067
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.887	2.330	1.839	3.366	4.659	6.642	8.039	9.661	13.066
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.28	0.48	0.90	1.14	1.43	2.00
Predevelopment Peak Q (cfs) =	0.0	0.0	0.8	15.5	26.2	49.8	63.1	79.2	110.3
Peak Inflow Q (cfs) =	17.9	47.0	37.0	68.2	94.6	135.1	163.5	196.3	265.0
Peak Outflow Q (cfs) =	0.5	2.6	2.0	3.4	4.1	4.8	5.2	5.7	31.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.2	0.2	0.1	0.1	0.1	0.3
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Grate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.3
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	32	41	40	43	44	47	48	50	49
Time to Drain 99% of Inflow Volume (hours) =	34	46	44	48	50	54	56	58	59
Maximum Ponding Depth (ft) =	4.54	5.92	5.52	6.72	7.60	8.74	9.45	10.20	11.16
Area at Maximum Ponding Depth (acres) =	0.68	1.06	0.97	1.22	1.43	1.80	1.97	2.15	2.35
Maximum Volume Stored (acre-ft) =	0.810	2.027	1.610	2.939	4.106	5.957	7.276	8.820	10.984

Detention Basin Outlet Structure Design







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

Outflow Hydrograph Workbook Filename: _____

Storm Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

Time Interval	SOURCE	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK
	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.50 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:30	0.03	0.07	0.06	0.09	0.12	0.16	0.18	0.20	0.25
Hydrograph Constant	0:11:00	0.94	2.18	1.79	2.94	3.77	4.89	5.60	6.36	7.79
	0:16:30	2.33	5.72	4.60	8.00	10.71	14.65	17.30	20.28	26.27
0.909	0:22:00	6.41	15.61	12.59	21.64	28.72	38.93	45.76	53.40	68.74
	0:27:30	16.18	39.59	31.88	55.13	73.46	100.06	117.92	137.95	178.30
	0:33:00	17.93	46.95	37.02	68.15	94.60	135.09	163.50	196.35	264.96
	0:38:30	15.34	41.05	32.20	59.91	83.69	120.51	146.86	177.75	243.12
	0:44:00	12.40	33.49	26.23	48.92	68.43	98.73	120.37	145.70	199.41
	0:49:30	9.94	26.78	20.99	39.08	54.62	78.73	95.88	115.91	158.32
	0:55:00	7.82	21.17	16.58	30.95	43.33	62.59	76.31	92.34	126.34
	1:00:30	6.20	16.76	13.13	24.45	34.23	49.45	60.30	72.98	99.88
	1:06:00	5.10	13.60	10.69	19.75	27.62	39.91	48.66	58.88	80.56
	1:11:30	3.67	10.03	7.83	14.76	20.87	30.49	37.39	45.50	62.80
	1:17:00	2.75	7.45	5.84	10.88	15.26	22.10	27.01	32.78	45.07
	1:22:30	1.92	5.27	4.11	7.76	10.96	16.02	19.64	23.90	32.98
	1:28:00	1.39	3.77	2.95	5.51	7.74	11.23	13.73	16.66	22.91
	1:33:30	1.08	2.92	2.28	4.26	5.97	8.65	10.55	12.78	17.52
	1:39:00	0.89	2.37	1.86	3.44	4.81	6.95	8.47	10.24	14.00
	1:44:30	0.79	2.08	1.64	3.01	4.19	6.02	7.33	8.85	12.06
	1:50:00	0.75	1.98	1.56	2.86	3.97	5.68	6.89	8.29	11.24
	1:55:30	0.74	1.93	1.53	2.79	3.87	5.52	6.69	8.05	10.90
	2:01:00	0.74	1.93	1.53	2.79	3.86	5.51	6.67	8.01	10.84
	2:06:30	0.74	1.93	1.53	2.79	3.86	5.51	6.67	8.01	10.84
	2:12:00	0.48	1.34	1.04	1.99	2.84	4.19	5.16	6.31	8.77
	2:17:30	0.28	0.78	0.61	1.16	1.64	2.41	2.98	3.64	5.08
	2:23:00	0.16	0.45	0.35	0.67	0.95	1.41	1.74	2.12	2.96
	2:28:30	0.09	0.24	0.19	0.36	0.51	0.76	0.94	1.15	1.60
	2:34:00	0.04	0.12	0.09	0.18	0.26	0.39	0.49	0.60	0.85
	2:39:30	0.01	0.04	0.03	0.06	0.09	0.14	0.18	0.23	0.34
	2:45:00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.05
	2:50:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:56:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:01:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:07:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:12:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:18:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:23:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:29:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:34:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:51:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:56:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:02:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:07:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:13:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:18:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:24:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:29:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:46:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:51:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:57:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:02:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:08:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:13:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:19:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:24:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:41:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:46:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:52:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:57:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:03:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:08:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:14:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:19:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:30:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:36:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Credit: Matrix Design Group
Figure used by permission of MHFD

E 35TH AVE
N QUEBEC ST
N SYRACUSE ST
E MARTIN LUTHER KING BLVD
N HAVANA WAY
City and County of Denver
City of Aurora
E 26TH AVE
25TH AVE
PEORIA ST
E 24TH AVE
E 23RD AVE
E MONTVIEW BLVD
MONTVIEW BLVD
17TH AVE
E 17TH AVE
HAVANA ST
E 14TH AVE
E 13TH AVE
YOSEMITE ST
DAYTON ST
MOLINE ST
11TH AVE
E 8TH AVE
E 6TH AVENUE PKWY
E 1ST AVE
1ST AVE
ALAMEDA AVE
Sand Creek
Pond #223
Bluff Lake
Unnamed Ditch
Baraimmor Ditch
Westerly Creek
Westerly Creek Dam Pond
Kelly Pond
Cooley Gulch
Revised Area - See figure B.2 for revised SWMM schematic.
Interactive Map functionality disabled. See the Westerly Creek FHAD for functioning interactive hydrology map.

Legend

- City Boundary
- Watershed Boundary (8.6 Sq. Mi.)
- Subbasin
- Lakes or Ponds Detention
- Surface Flow
- Storm Drain

SWMM Routing Elements

- Design Point
- Detention
- Outfall
- Split Flow
- Conveyence

Basin ID
Area, %Imp

Layer Control Instructions

The Map Controls above set the visibility of the layers automatically for the selected map. Additional layer control is available through the "Layers" Navigation Panel which can be accessed from the View Menu under Navigation Panels. In the Panel, the visibility of layers and layer groups can be changed by clicking the square left of the layer/group. An eye in the square indicates that the layer is on. An empty square indicates that the layer is off. Layer groups can be expanded and reduced by clicking the +/- symbol left of the layer/group.

Interactive Figures (Select from Below)

Study Area Map

Baseline Hydrology SWMM Routing Map

0 200 400 800
Feet

Figure B.1 - Annotated SWMM Schematic

FILE - 6/25/2018, fsw3wmk, Mp

Legend

- Detention
- Split Flow
- Design Point
- Basin ID, Area, %Imp
- Conveyance
- Existing Storm

N
W E
S

0 125 250 Feet

1 " = 125 feet

MILE HIGH FLOOD DISTRICT
DENVER THE MILE HIGH CITY
AURORA
Bohannan Huston
www.bhinc.com 800.877.5332

Westerly Creek OSP

Figure B.2 - Revised SWMM Routing Map

P:\20210239\WR\Calculations\Programs\ArcGIS\Maps\FigureB.2_SWMM Routing Map.mxd
Author: cbangs

April 2021

Figure B.23 – Comparison of 2- year FHAD hydrograph with revised hydrograph at SWMM Design Point D_03b (Havana St/E 6th Ave)

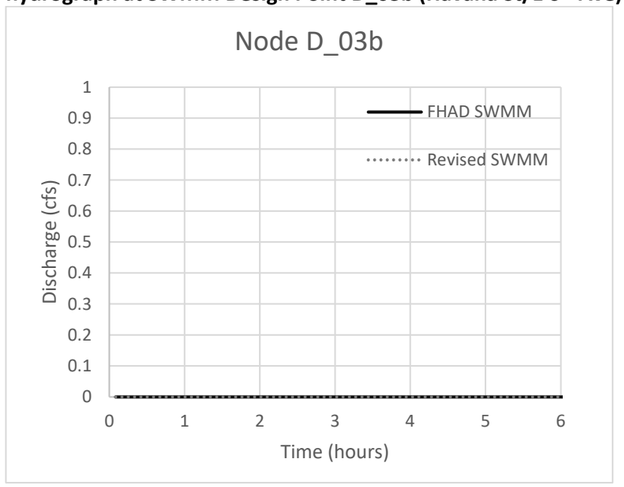


Figure B.24 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_05c (Kenton St/Oakland Ct/ E 6th Ave)

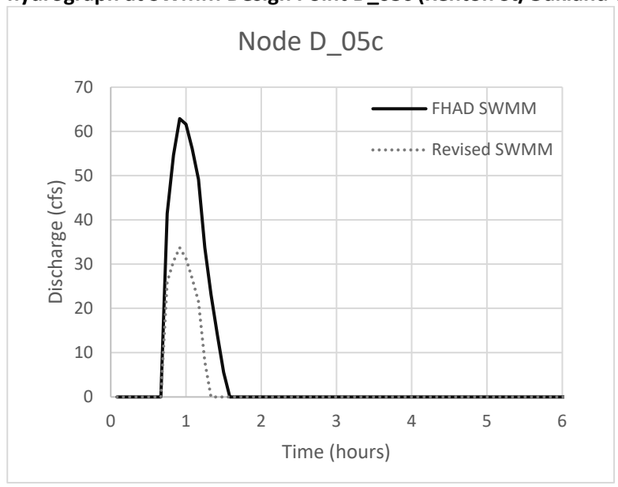


Figure B.25 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_06b (Moline St/Oakland Ct/E 6th Ave)

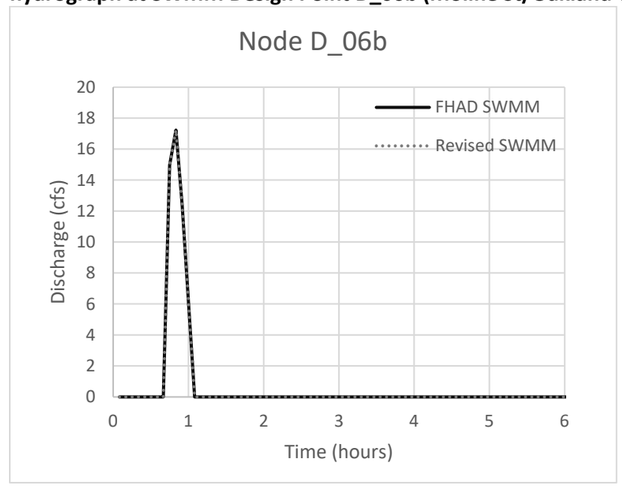


Figure B.26 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_10d (Colfax Ave/Florence St)

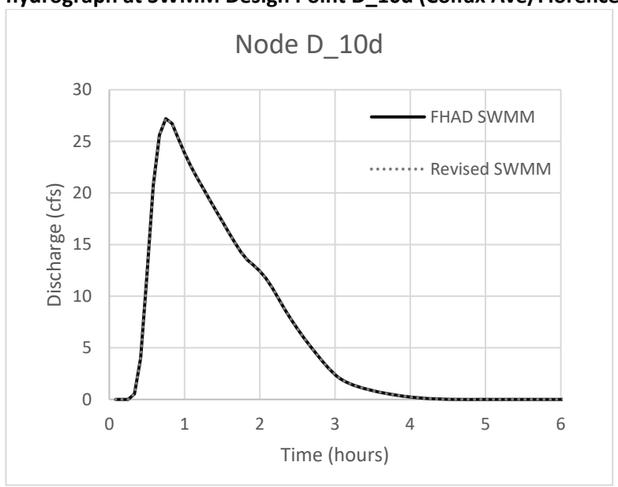


Figure B.27 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_10_13 (E 17th Ave/Del Mar Pkwy)

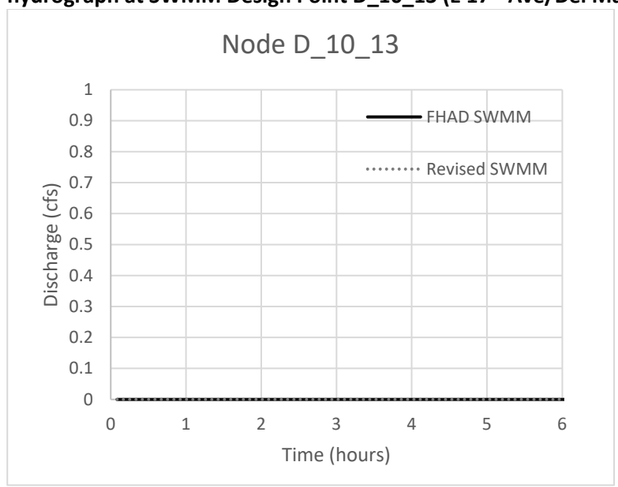


Figure B.28 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_12a (Hanover St/E Colfax Ave)

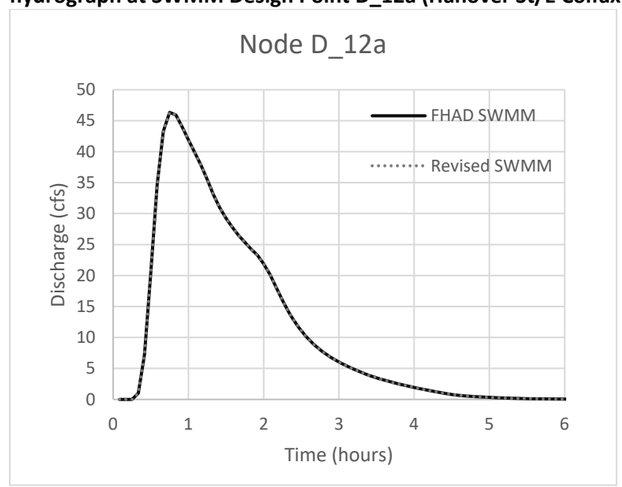


Figure B.29 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_14a (E 19th Ave/Fulton St)

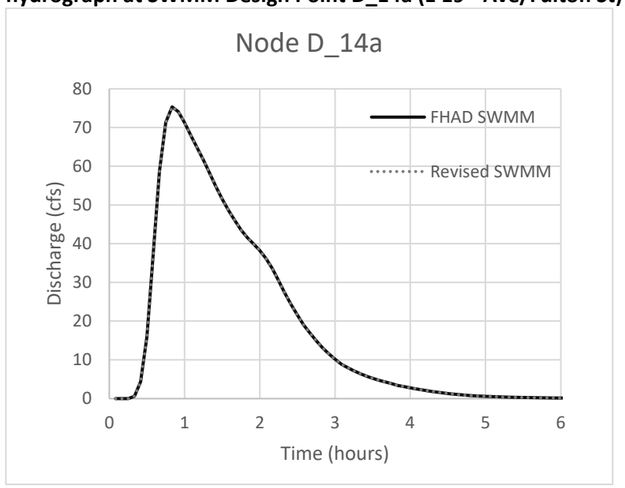


Figure B.30 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point J_15 (Montview Blvd/Del Mar Pkwy)

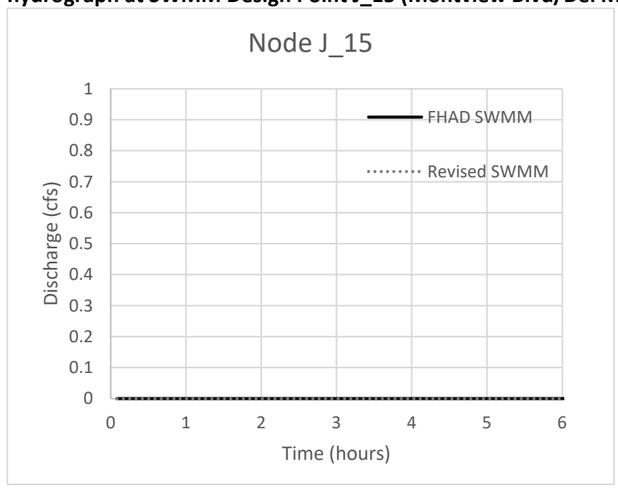


Figure B.31 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point DIV72 (E 11th Ave/Beeler St)

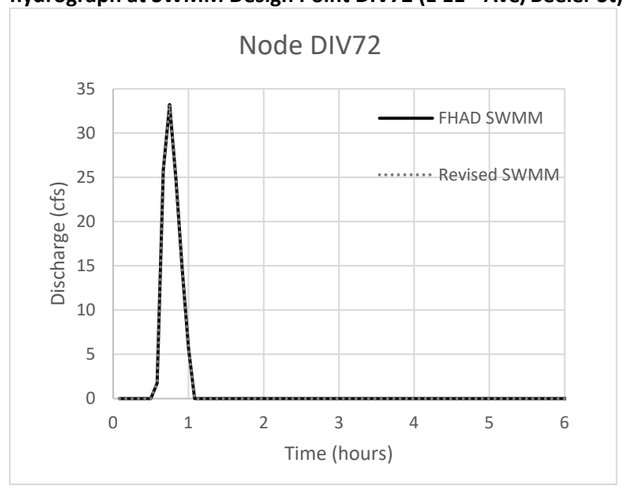


Figure B.32 – Comparison of 2-year FHAD hydrograph with revised hydrograph at SWMM Design Point DIV399 (Emporia St/E 6th Ave)

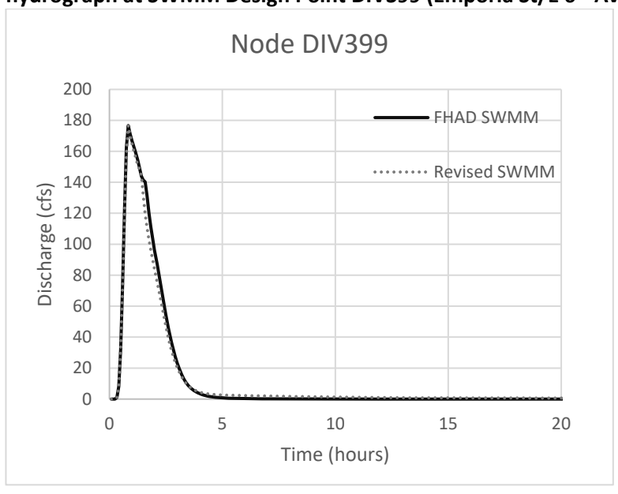


Figure B.23 – Comparison of 5- year FHAD hydrograph with revised hydrograph at SWMM Design Point D_03b (Havana St/E 6th Ave)

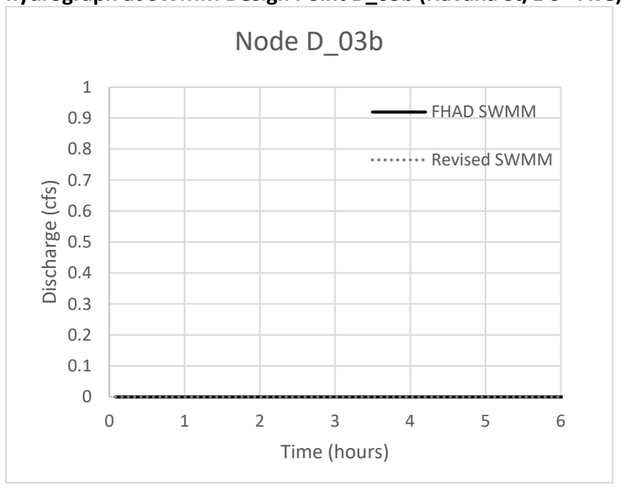


Figure B.24 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_05c (Kenton St/Oakland Ct/ E 6th Ave)

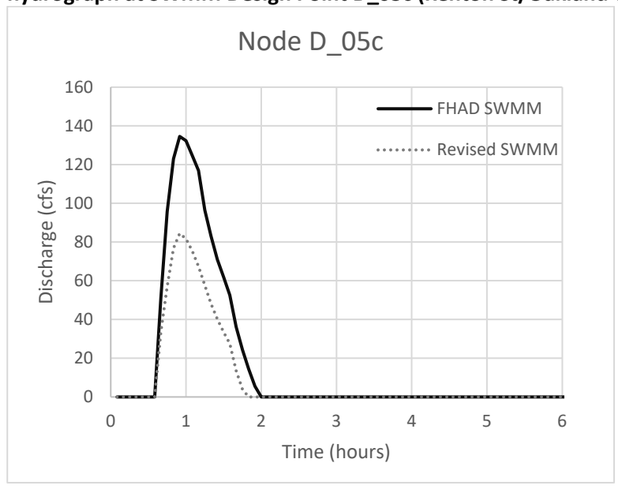


Figure B.25 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_06b (Moline St/Oakland Ct/E 6th Ave)

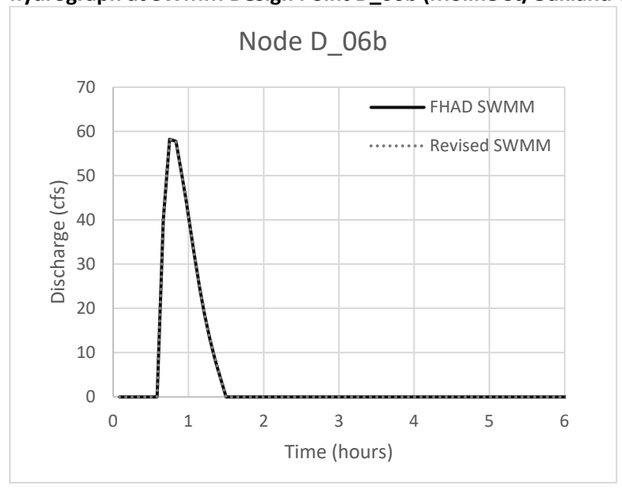


Figure B.26 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_10d (Colfax Ave/Florence St)

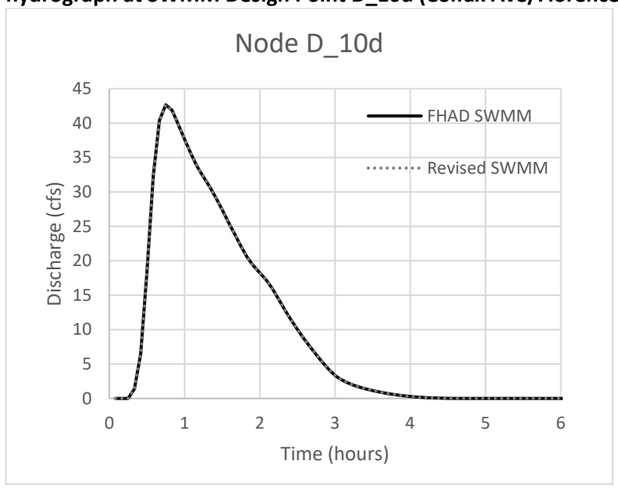


Figure B.27 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_10_13 (E 17th Ave/Del Mar Pkwy)

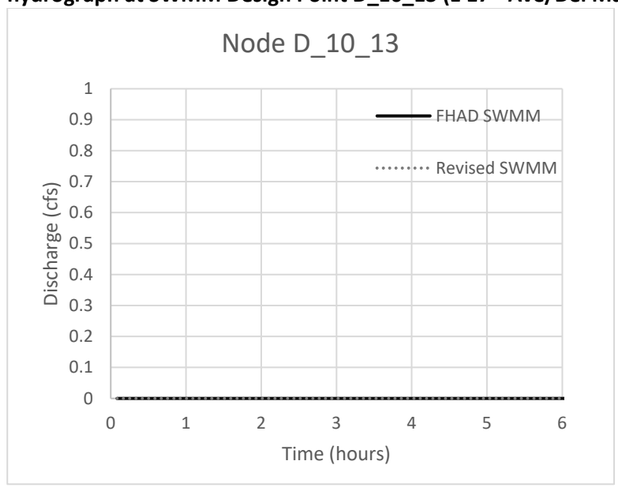


Figure B.28 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_12a (Hanover St/E Colfax Ave)

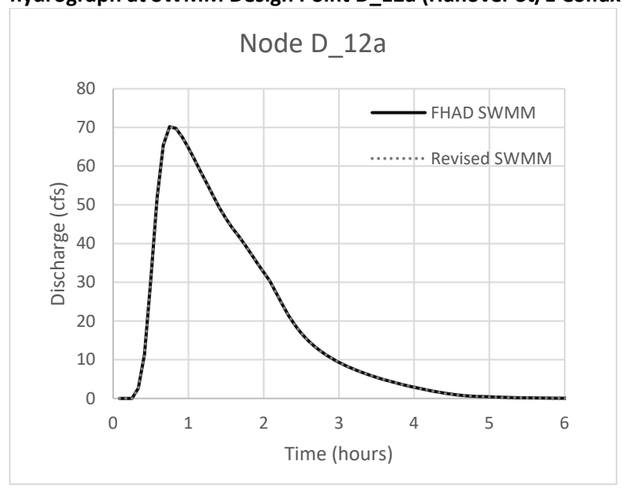


Figure B.29 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_14a (E 19th Ave/Fulton St)

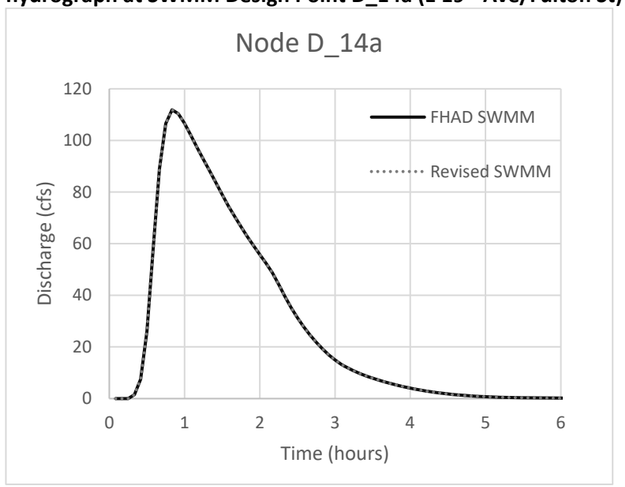


Figure B.30 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point J_15 (Montview Blvd/Del Mar Pkwy)

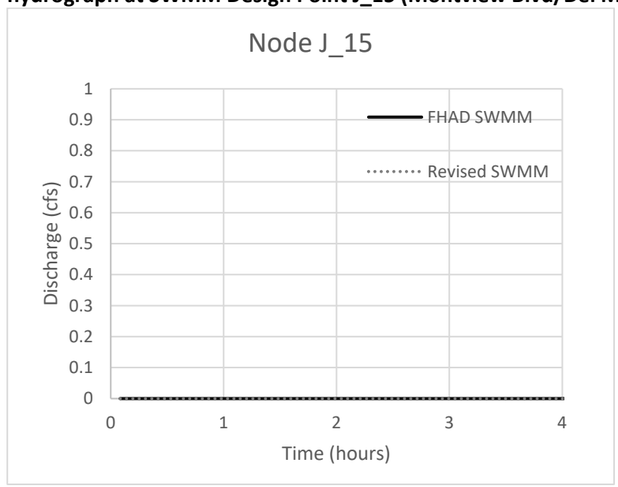


Figure B.31 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point DIV72 (E 11th Ave/Beeler St)

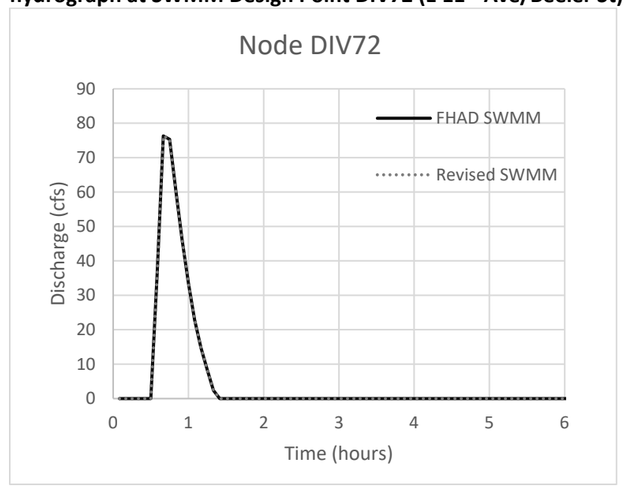


Figure B.32 – Comparison of 5-year FHAD hydrograph with revised hydrograph at SWMM Design Point DIV399 (Emporia St/E 6th Ave)

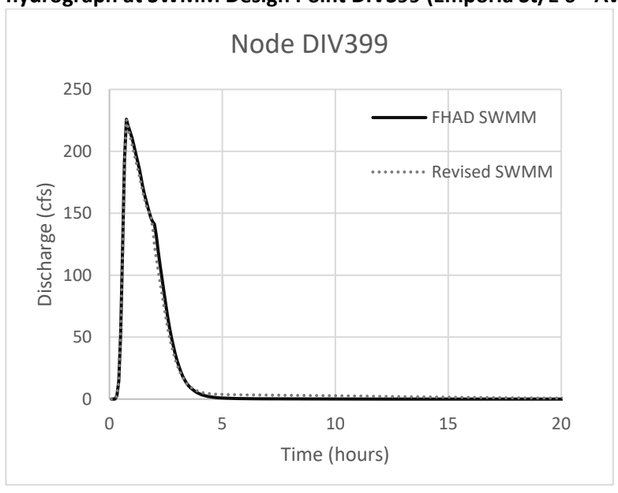


Figure B.23 – Comparison of 100- year FHAD hydrograph with revised hydrograph at SWMM Design Point D_03b (Havana St/E 6th Ave)

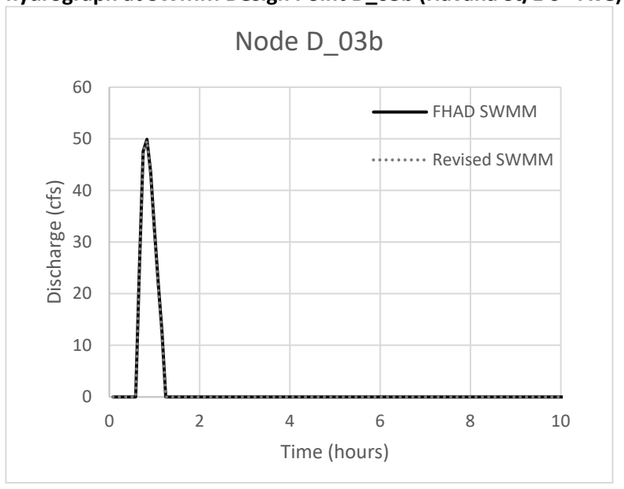


Figure B.24 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_05c (Kenton St/Oakland Ct/ E 6th Ave)

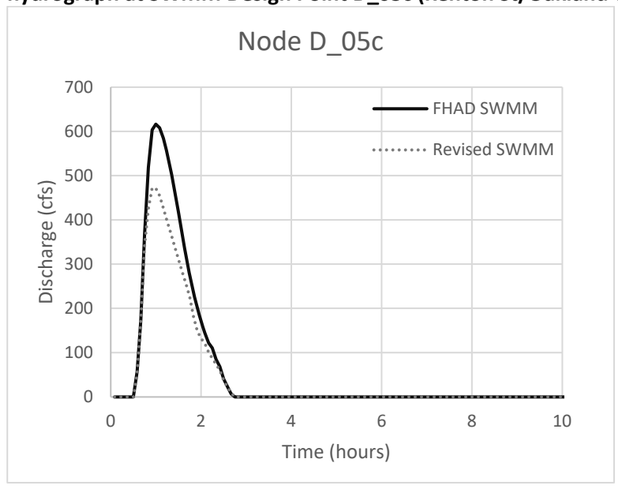


Figure B.25 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_06b (Moline St/Oakland Ct/E 6th Ave)

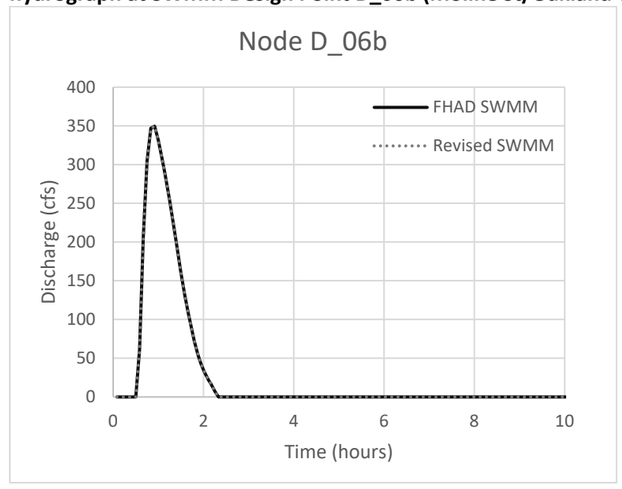


Figure B.26 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_10d (Colfax Ave/Florence St)

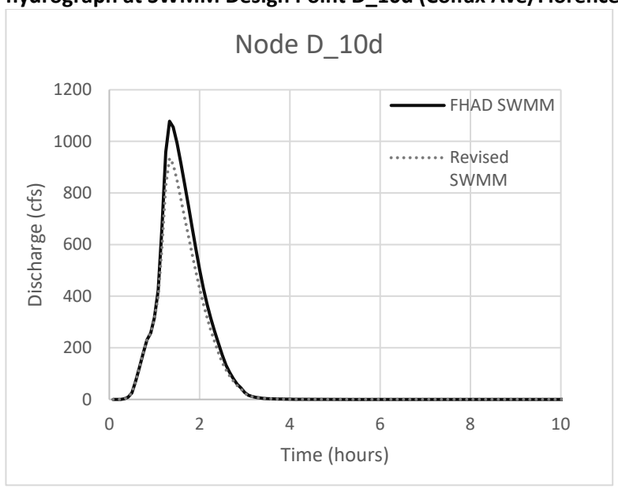


Figure B.27 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_10_13 (E 17th Ave/Del Mar Pkwy)

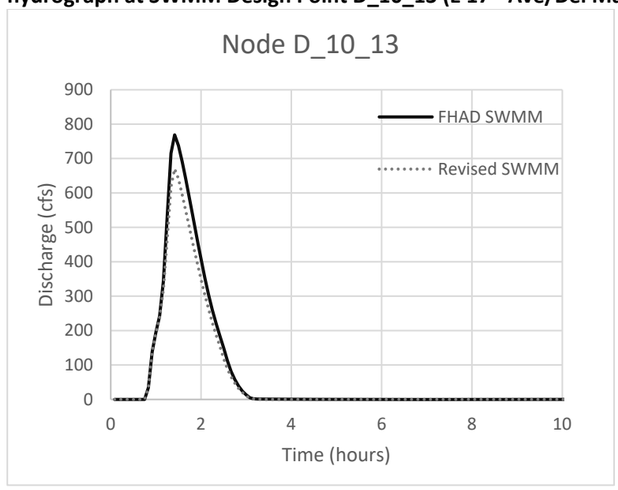


Figure B.28 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_12a (Hanover St/E Colfax Ave)

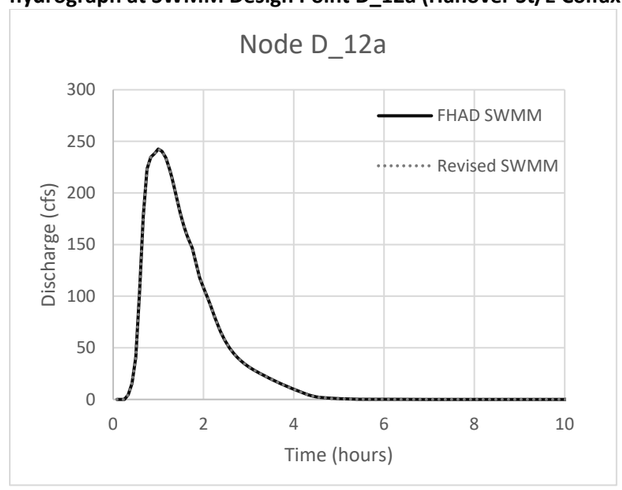


Figure B.29 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point D_14a (E 19th Ave/Fulton St)

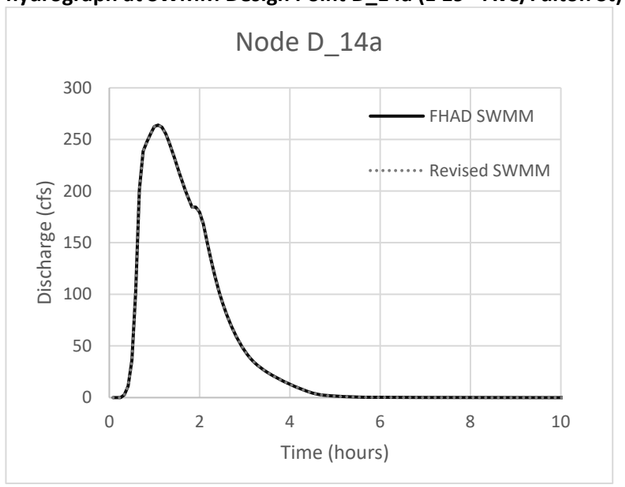


Figure B.30 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point J_15 (Montview Blvd/Del Mar Pkwy)

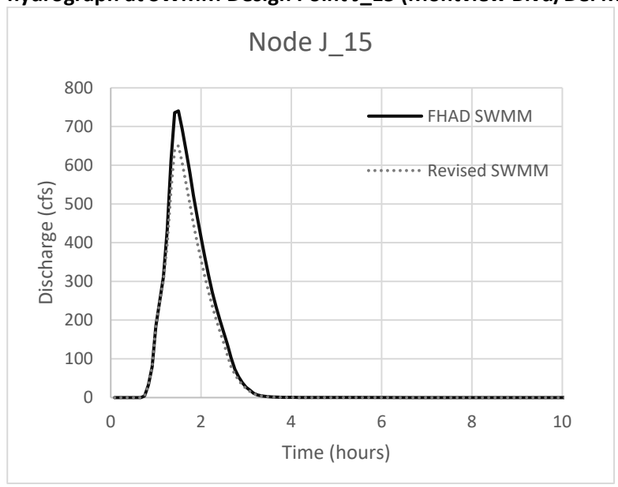


Figure B.31 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point DIV72 (E 11th Ave/Beeler St)

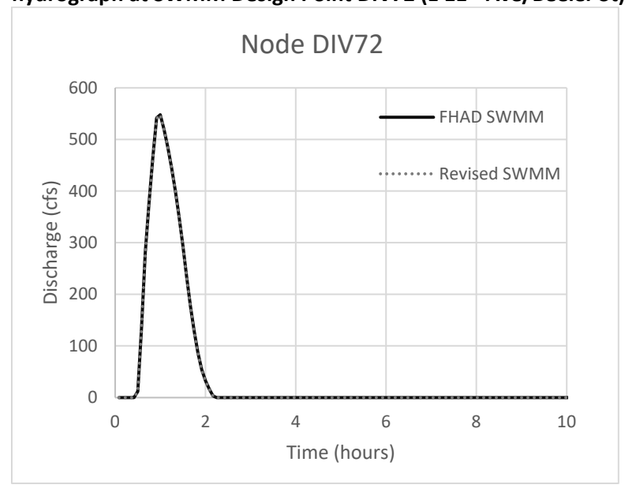


Figure B.32 – Comparison of 100-year FHAD hydrograph with revised hydrograph at SWMM Design Point DIV399 (Emporia St/E 6th Ave)

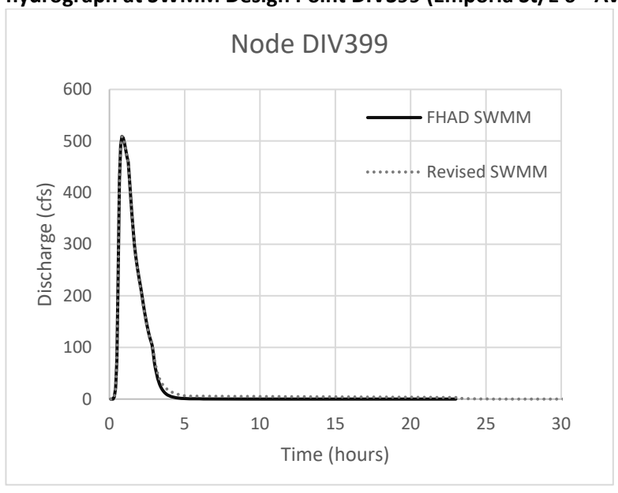


Figure B.33 –100-year (Future) Peak Discharges Along Drainageway Centerline

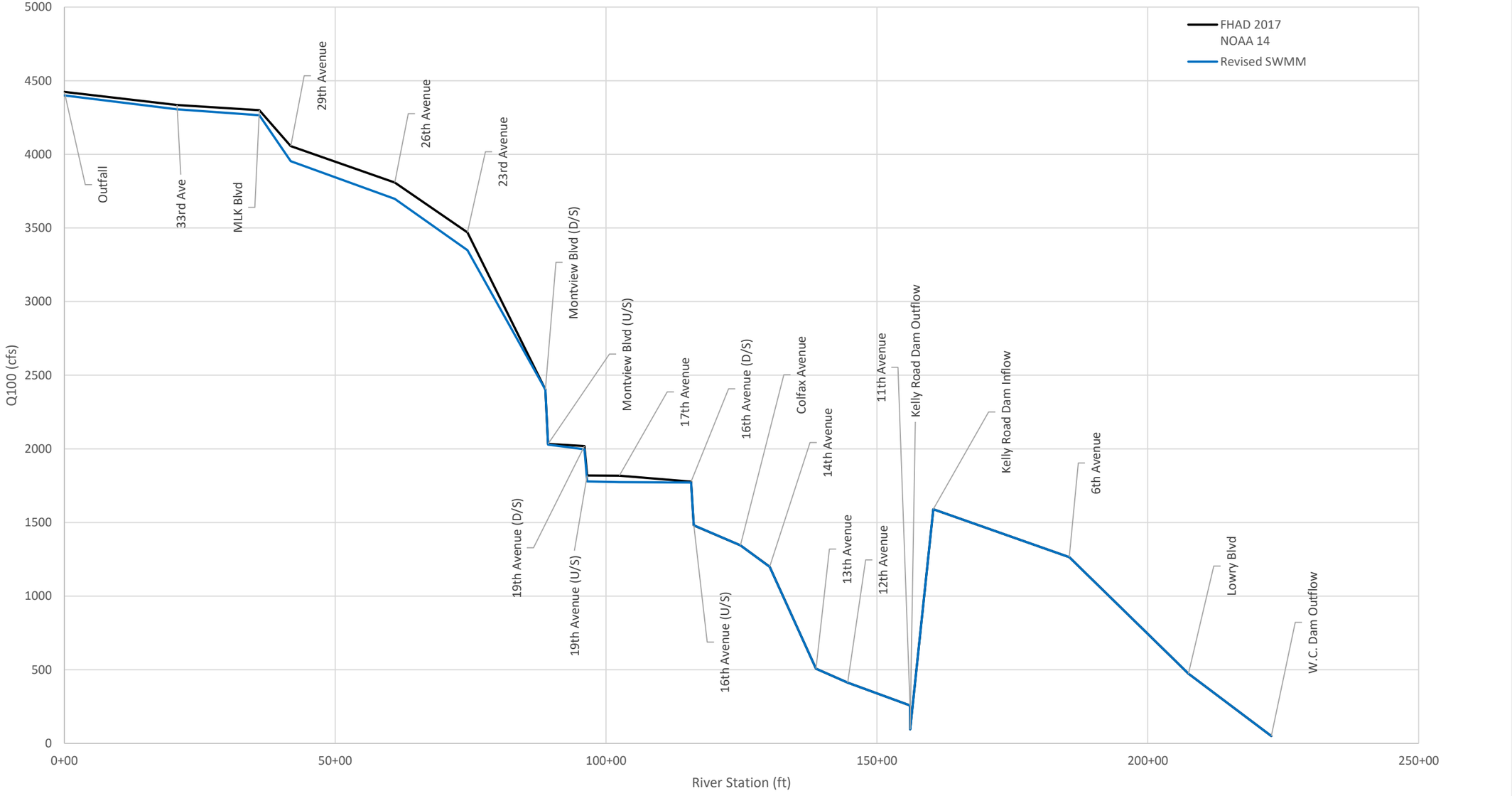


Table B.3 – SWMM Input and Reports for 100-year (Future) Event

```
[TITLE]
;;Project Title/Notes
Lower Westerly Creek
Baseline Hydrology - with 1st and Havana Pond (100-year)
Bohannan Huston
February, 2021
Scenario ID = LowerWesterlyCreek_RevisedFHAD_BaselineHydrology_1stHavanaPond_100-yr

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/25/2005
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         0:05:00
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  SLOPE
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[FILES]
;;Interfacing Files
USE INFLOWS "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\CUHP\6_Fut_100yr_0mi^2_WC_FHAD_2017_NOAA14.txt"
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
EC_Out_23rd      5295       1          0          0          0
;CAR4 (Westerly Creek)
EC_Out_19thAv    5310       0          0          0          0
E-J-01           5467       1          0          0          0
E-J-02           5463       1          0          10         0
E-J-03           5415       1          0          10         0
E-J-04           5449.2     1          0          10         0
E-J-05           5415       1          0          10         0
E-J-06           5421.2     1          0          10         0
E-J-07           5387       1          0          0          0
E-J-08           5389       1          0          0          0
E-J-09           5409       1          0          0          0
E-J-10           5344       1          0          0          0
E-J-11           5371       1          0          0          0
E-J-12           5357       1          0          0          0
E-J-13           5315       1          0          0          0
E-J-14           5336       1          0          0          0
E-J-15           5303       1          0          0          0
;CAD8 (Westerly Creek)
E-J-16           5302       1          0          0          0
J_01a            5458       6          0          2          0
J_02a            5460       1          0          0          0
J_03a            5411       1          0          0          0
J_04a            5437       1          0          0          0
J_05_07          5396       0          0          0          0
J_05a            5415       1          0          0          0
J_06a            5421.2     1          0          0          0
;29 (Westerly Creek)
J_07a            5401       1          0          0          0
;break up flows in street upstream S_07d steeper than D/S
J_07b            5393       1          0          0          0
J_07c            5387       1          0          0          0
J_08a            5389       1          0          0          0
;Flows from 27"RCP & 48" RCP enter Heron Pond in a 4- x 4-ft RCB - since RCB will accomodate U/S flows easily, no need for another RCB element
J_08b            5388.9     1          0          0          0
J_09a            5409       1          0          0          0
;JAR5-DIV (Westerly Creek)
J_10a            5381       1          0          0          0
J_10b            5382.5     1          0          0          0
J_10c            5376       5          0          0          0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
J_14a            5336       1          0          0          0
J_15             5323       0          0          0          0
J_15a            5303       1          0          0          0
J_17thAv_Out     5322       0          0          0          0
J_7b             5384       0          0          0          0
J_AD1            964.6      0          0          0          0
J_AD3            969.2      0          0          0          0
J_AD4            966.6      0          0          0          0
J_AD7            976        0          0          0          0
J_AR1            984.3      0          0          0          0
J_AR2            976        0          0          0          0
J_EC_Colfax_Out  5343       1          0          0          0
J_DE1            964.6      0          0          0          0
J_DE2            976        0          0          0          0
J_DE3            980.9      0          0          0          0
J_DE4            984.3      0          0          0          0
J_DE5            988        0          0          0          0
J_DE6            992        0          0          0          0
J_L1             1007       0          0          0          0
J_L2             5374       0          0          0          0
J_ST1            928        0          0          0          0
J_ST2            915        0          0          0          0
J_ST3            931        0          0          0          0
J_ST4            931        0          0          0          0
J_ST5            933        0          0          0          0
J_ST6            946        0          0          0          0
J_ST7            972        0          0          0          0
J_ST8            946        0          0          0          0
J_ST9            951        0          0          0          0
;BRW drainage basin 100 into intersection of 6th and Dayton.
;Revised to 7a, 7b, and 5c in '08 Revised model.
;J100 purposely left "disconnected" from model.
J100             1010.51    0          0          0          0
J101             1005.01    0          0          0          0
J102             1000.01    0          0          0          0
J104             1000       0          0          0          0
J106             1007.51    0          0          0          0
J107             1002.51    0          0          0          0
J-10a1           5388.5     1          0          0          0
J111             1001.16    0          0          0          0
J113             1008.615   0          0          0          0
J11th            1000       0          0          0          0
J121             1013.865   0          0          0          0
J122             1005.865   0          0          0          0
J124             1005.865   0          0          0          0
J126             1004.585   0          0          0          0
J128             1003.66    0          0          0          0
J12th            992        0          0          0          0
J131             1015.92    0          0          0          0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

J132	1016.26	0	0	0	0
J133	1013.76	0	0	0	0
J134	1009.26	0	0	0	0
J14	1000.01	0	0	0	0
J140	1005.21	0	0	0	0
J141	1005.21	0	0	0	0
J150	1013.01	0	0	0	0
J151	1008.01	0	0	0	0
J154	1003.66	0	0	0	0
J155	1001.16	0	0	0	0
J157	1001.15	0	0	0	0
J159	1000	0	0	0	0
J160	1000.01	0	0	0	0
J161	1013.76	0	0	0	0
J163	1009.26	0	0	0	0
J165	1008.01	0	0	0	0
J166	1003.66	0	0	0	0
J167	1007.085	0	0	0	0
J168	1003.66	0	0	0	0
J169	1007.51	0	0	0	0
J16th-us	976	0	0	0	0
J170	1002.51	0	0	0	0
J171	1005.01	0	0	0	0
J17th	969.2	0	0	0	0
J19th-ds	966.6	0	0	0	0
J19th-us	966.6	0	0	0	0
J200	1031.145	0	0	0	0
J202	1031.135	0	0	0	0
J203	1025.735	0	0	0	0
J204	1025.735	0	0	0	0
J230	1023.198	0	0	0	0
J231	1023.198	0	0	0	0
J232	1024.206	0	0	0	0
J233	1025.582	0	0	0	0
J234	1022.412	0	0	0	0
J235	1019.614	0	0	0	0
J23rd	951	0	0	0	0
J24	1022.331	0	0	0	0
J242	1022.331	0	0	0	0
J245	1016.197	0	0	0	0
J247	1015.28	0	0	0	0
J248	1015.28	0	0	0	0
J25	1016.931	0	0	0	0
J251	1011.21	0	0	0	0
J252	1016.931	0	0	0	0
J253	1011.04	0	0	0	0
J254	1011.04	0	0	0	0
J26th	946	0	0	0	0
J29th	933	0	0	0	0

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

J31	1039.105	0	0	0	0
J311	1036.705	0	0	0	0
J314	1039.105	0	0	0	0
J315	1036.695	0	0	0	0
J32	1037.252	0	0	0	0
J33	1036.785	0	0	0	0
J33rd	928	0	0	0	0
J34	1018.235	0	0	0	0
J341	1034.985	0	0	0	0
J343	1024.235	0	0	0	0
J345	1018.235	0	0	0	0
J346	1018.235	0	0	0	0
J347	1016.135	0	0	0	0
J348	1016.135	0	0	0	0
J35	1036.705	0	0	0	0
J350	1032.335	0	0	0	0
J351	1036.695	0	0	0	0
J352	1030.455	0	0	0	0
J353	1022.735	0	0	0	0
J354	1013.11	0	0	0	0
J355	1036.705	0	0	0	0
J36	1023.8	0	0	0	0
J361	1030.455	0	0	0	0
J362	1027.235	0	0	0	0
J37	1016.81	0	0	0	0
J371	1019.614	0	0	0	0
J372	1016.81	0	0	0	0
J374	1014.81	0	0	0	0
J38	1024.235	0	0	0	0
J390	1016.21	0	0	0	0
J391	1016.21	0	0	0	0
J392	1013.01	0	0	0	0
J393	1008.01	0	0	0	0
J394	1016.21	0	0	0	0
J41	1008.01	0	0	0	0
J42	1018.235	0	0	0	0
J43	1022.735	0	0	0	0
J44	1013.11	0	0	0	0
J51	1013.61	0	0	0	0
J52	1005.01	0	0	0	0
J53	1005.01	0	0	0	0
J54	1011.61	0	0	0	0
J56	1013.61	0	0	0	0
J61	1013.85	0	0	0	0
J62	1009.85	0	0	0	0
J63	1007	0	0	0	0
J64	1000	0	0	0	0
J65	1000	0	0	0	0
J67	1009.85	0	0	0	0

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
J68              1003.4     0          0          0          0
J6th_Pipe        5372.45    0          0          0          0
J74              1006.6     0          0          0          0
J7b              5385       0          0          0          0
JL2              5374       0          0          0          0
JMLK             931        0          0          0          0
JMontview-ds     964.6      0          0          0          0
JMontview-us     964.6      0          0          0          0
J_16thAve_E      5334.64    0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;The names are derived from the swmm element IDs with ROOT_JUNCT_ appended to the front.
JSandCreek       915        NORMAL                      NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
DIV344           1024.235   C344-OVER        OVERFLOW   0          0          0          0
DIV342           1034.985   C342-OVER        OVERFLOW   0          0          0          0
DIV135           1015.92    C135-OVER        OVERFLOW   0          0          0          0
DIV389           1001.15    C389-DIV         TABULAR    DIVCURVE 389     0          0          0          0
DIV397           1009.26    C397-DIV         TABULAR    DIVCURVE_397     0          0          0          0
DIV105           1010.51    C105-OVER        OVERFLOW   0          0          0          0
DIV376           1013.01    C376-OVER        OVERFLOW   0          0          0          0
DIV70            1009.85    C70-OVER         OVERFLOW   0          0          0          0
DIV395           1003.66    C395-DIV         TABULAR    DIVCURVE_395     0          0          0          0
DIV1             1008.01    C1-DIV           TABULAR    DIVCURVE_1       0          0          0          0
DIV164           1009.26    C164-OVER        OVERFLOW   0          0          0          0
DIV125           1005.865   C125-OVER        OVERFLOW   0          0          0          0
DIV316           1032.335   C316-OVER        OVERFLOW   0          0          0          0
DIV396           1005.21    C396-DIV         TABULAR    DIVCURVE_396     0          0          0          0
DIV71            1013.85    C71-OVER         OVERFLOW   0          0          0          0
DIV399           5384       C399-DIV         OVERFLOW   0          0          0          0
DIV162           1013.76    C162-OVER        OVERFLOW   0          0          0          0
DIV136           1016.26    C136-OVER        OVERFLOW   0          0          0          0
DIV123           1008.615   C123-OVER        OVERFLOW   0          0          0          0
J13th-DIV        988        C14th-OVER       OVERFLOW   0          0          0          0
J14th-DIV        984.3      CColf-OVER       OVERFLOW   0          0          0          0
JColfax-DIV      980.9      C16th-OVER       OVERFLOW   0          0          0          0
J16th-DIV        976        C17th-OVER       OVERFLOW   0          0          0          0
D_02a            5460.2     S_02a            TABULAR    Chspk_Pond_DS    1          0          0          0
;split flow HECRAS
D_03b            5409       S_07a            TABULAR    6thAv&Havana     1          0          0          0
D_05-07          5404       S_05_07b         TABULAR    Jamaica/Lowry    0          0          0          0
D_05a            5449       S_05a            OVERFLOW   1          0          0          0
;increase RCP from 42 to 54
D_05b            5415       S_05b            OVERFLOW   1          0          0          0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
;split flow FLO-2D
D_05c            5414       S_05c            TABULAR    6thAv_Kenton     1          0          0          0
;combine flows 6th ave&Kenton SS, divert remainder onto 6th Ave street
D_05d            5414       d_05c            OVERFLOW   1          0          0          0
;discharge to 48" street flows to split flow diversion
D_06a            5421.2     d_06c            OVERFLOW   1          0          0          0
;Flow split HECRAS
D_06b            5421.2     S_09a            TABULAR    6thAv_Moline     1          0          0          0
;divert street flow in Havana to 27" RCP
D_07a            5394       S_07d            OVERFLOW   1          0          0          0
D_08a            5409       S_08a            OVERFLOW   1          0          0          0
;Cresdelmar (Westerly Creek)
D_08b            5389       S_08b            OVERFLOW   1          0          0          0
;Add up to 46 cfs to 42"RCP- below capacity of RCP
D_10a            5371       S_10d            OVERFLOW   1          0          0          0
D_10a1           5388.5     d_10a1           OVERFLOW   1          0          0          0
;D/S RCP 48", flow full
D_10b            5365       S_10e            OVERFLOW   1          0          0          0
D_10c            5352       S_10g            TABULAR    Cofax_Galena     1          0          0          0
D_10d            5344       S_10i            TABULAR    Colfax_Florence  1          0          0          0
D_11a            5371       S_11a            OVERFLOW   1          0          0          0
D_12a            5357       S_10f            OVERFLOW   1          0          0          0
D_13a            5341       S_13b1           OVERFLOW   1          0          0          0
D_14a            5336       S_15a            OVERFLOW   1          0          0          0
D_15a            5314       S_15b            OVERFLOW   1          0          0          0
D_03a            5409       d_03c            OVERFLOW   1          0          0          0
D_12_14          5349       S_12_14          TABULAR    Galena/16thAv    0          0          0          0
D_10_13          5331       S_10_13          TABULAR    17thAv/DelMar    0          0          0          0
J72              1006.5     d_72             OVERFLOW   0          0          0          0
J120             1013.865   C120_Overflow    OVERFLOW   0          0          0          0
J127             1004.585   C127_Overflow    OVERFLOW   0          0          0          0
J129             1003.66    C129_Overflow    OVERFLOW   0          0          0          0
J158             1000.42    C158_Overflow    OVERFLOW   0          0          0          0
J73              1003.4     C73_Overlfow     OVERFLOW   0          0          0          0
J236             1022.412   C236_Overflow    OVERFLOW   0          0          0          0
J244             1016.931   C244_Overflow    OVERFLOW   0          0          0          0
J241             1024.206   C241_Overflow    OVERFLOW   0          0          0          0
J243             1022.331   C243_Overflow    OVERFLOW   0          0          0          0
J246             1016.197   C246_Overflow    OVERFLOW   0          0          0          0
J375             1014.81    C375_Overflow    OVERFLOW   0          0          0          0
J330             1036.785   C330_Overflow    OVERFLOW   0          0          0          0
J320             1019.614   C320_Overflow    OVERFLOW   0          0          0          0
J319             1023.198   C319_Overflow    OVERFLOW   0          0          0          0
J321             1037.252   C321_Overflow    OVERFLOW   0          0          0          0
J373             1016.81    C373_Overflow    OVERFLOW   0          0          0          0
J57              1011.61    C57_Overflow     OVERFLOW   0          0          0          0
J250             1011.21    C250_Overflow    OVERFLOW   0          0          0          0
J317             1030.455   C317_Overflow    OVERFLOW   0          0          0          0
J318             1023.8     C318_Overflow    OVERFLOW   0          0          0          0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
J322             1025.582   C322_Overflow    OVERFLOW   0          0          0          0
J363             1027.235   C363_Overflow    OVERFLOW   0          0          0          0
D_AR2            5338       S_AR2            OVERFLOW   0          0          0          0
DIV72            1006.45    S_Beeler         TABULAR    11thAv_Beeler    0          0          0          0
D_04a            5457.03    S_04b            OVERFLOW   4          0          0          0
D_04b            5440.1     C_04c            TABULAR    1st/HavanaPnd    5          0          0          0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------          -------- --------
;Because SWMM uses Stage-Area and Stage-Discharge, a sythetic
;rectangular basin has been generated to substitute for the
;volume of the system. The artificial pond is a rectangular
;prism with a cross-section of 1 acre. This creates a pond such
;that every 1 foot of stage equals 1 acre foot of volume. This
;is particularlly handy in the sense that it allows us to equate
;volume directly to stage. Also, the rectangular shape allows for
;the proper use of linier interpolation on the pond stage (and
;consequently volume), and as such, the results should reasonably
;mimic those of UDSWMM. Please note that CUHP objects will not
;appear on the map, as it is impossible to determine their placement.
RES30            1036.705 1297       0          FUNCTIONAL 0         0         43560    0        0
RES201           1031.145 950000     0          FUNCTIONAL 0         0         43560    0        0
RES130           1000.01  70000      0          FUNCTIONAL 0         0         43560    0        0
RES156           1001.16  709        0          FUNCTIONAL 0         0         43560    0        0
HavanaPnd        5376     11         0          TABULAR    HavanaPark                    0        0
1st/HavanaPnd    5436.06  20         0          TABULAR    1st/HavanaREV                 0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
C_03a            D_03a            J7b              2438.93    0.019      0          0          0          235
;Increase Manning's n by 25% of engineered conveyance elements.
C_05a            D_05a            D_05b            2449.8     0.019      0          0          0          71
C_05b            D_05b            D_05d            193.7      0.019      0          0          0          140
C_05c            D_05d            D_03a            1131       0.019      0          0          0          140
;6th Ave
C_06a            D_06a            D_05d            1582.84    0.019      0          0          0          95
C_07a            D_07a            D_08b            815.55     0.019      0          0          0          24
C_08a            D_08a            J_08a            2002.62    0.019      0          0          0          101
C_08b            D_08b            J_08b            17.92      0.019      0          0          0          156
C_10a            J_10c            D_10a            989.94     0.019      0          0          0          0
C_10b            D_10a            D_10b            886.51     0.019      0          0          0          46
C_10c            D_10b            D_13a            2675.35    0.019      0          0          0          101
C_11a            D_11a            D_12a            1687.56    0.019      0          0          0          101
C_13a            D_13a            EC_Out_19thAv    3330.28    0.019      0          0          0          139
;Galena/ Fulton
C_14a            D_12a            J_14a            2956.51    0.019      0          0          0          139
;Montview
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C_15a	D_14a	D_15a	3128.33	0.019	0	0	0	237
C_15b	D_15a	J_15a	1316.95	0.019	0	0	0	325
C_16a	E-J-16	EC_Out_23rd	95.8	0.02	0	0	0	0
C_16thAv	D_AR2	J_16thAve_E	1680	0.013	0	0	0	0
C_JL2	JL2	J61	400	0.01	0	0	0	0
C1	DIV1	J151	1	.01	0	0	0	0
C101	J101	J171	1	.01	0	0	0	0
C102	J102	J160	1	.01	0	0	0	0
C104	J104	J159	1	.01	0	0	0	0
C105	DIV105	J151	250	0.04	0	0	0	0
C105-OVER	DIV105	J151	250	0.04	0	0	0	0
C106	J106	J169	1	.01	0	0	0	0
C107	J107	J170	1	.01	0	0	0	0
C111	J111	RES156	1	.01	0	0	0	0
C113	J113	DIV123	1	.01	0	0	0	0
C120	J120	J113	1050	0.019	0	0	0	0
C120_Overflow	J120	J113	1050	0.020	0	0	0	0
C121	J121	J120	1	.01	0	0	0	0
C122	J122	J124	1	.01	0	0	0	0
C123	DIV123	J124	550	0.019	0	0	0	0
C123-OVER	DIV123	J124	550	0.020	0	0	0	0
C124	J124	DIV125	1	.01	0	0	0	0
C125	DIV125	J126	320	0.019	0	0	0	0
C125-OVER	DIV125	J126	320	0.020	0	0	0	0
C126	J126	J127	1	.01	0	0	0	0
C127	J127	J128	185	0.019	0	0	0	0
C127_Overflow	J127	J128	185	0.020	0	0	0	0
C128	J128	DIV395	1	.01	0	0	0	0
C129	J129	J107	230	0.019	0	0	0	0
C129_Overflow	J129	J107	400	0.01	0	0	0	0
C12th	J11th	J12th	1029	.044	0	0	0	0
C131	J131	DIV135	1	.01	0	0	0	0
C132	J132	DIV136	1	.01	0	0	0	0
C133	J133	J161	1	.01	0	0	0	0
C134	J134	J163	1	.01	0	0	0	0
C135	DIV135	J161	540	0.019	0	0	0	0
C135-OVER	DIV135	J161	540	0.02	0	0	0	0
C136	DIV136	J161	500	0.019	0	0	0	0
C136-OVER	DIV136	J161	500	0.02	0	0	0	0
C13th	J12th	J13th-DIV	647	.044	0	0	0	0
C14	J14	RES130	1	.01	0	0	0	0
C140	J140	DIV396	1	.01	0	0	0	0
C141	J141	J107	540	0.019	0	0	0	0
C14th	J13th-DIV	J14th-DIV	737	.019	0	0	0	0
C14th-OVER	J13th-DIV	J14th-DIV	737	0.040	0	0	0	0
C150	J150	DIV376	1	.01	0	0	0	0
C151	J151	J165	1	.01	0	0	0	0
C154	J154	J128	1	.01	0	0	0	0
C155	J155	RES156	1	.01	0	0	0	0

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C157	J157	J104	230	0.019	0	0	0	0
C158	J158	J159	60	0.019	0	0	0	0
C158_Overflow	J158	J159	60	0.01	0	0	0	0
C159	J159	J11th	1	.01	0	0	0	0
C160	J160	RES130	1	.01	0	0	0	0
C161	J161	DIV162	1	.01	0	0	0	0
C162	DIV162	J163	900	0.019	0	0	0	0
C162-OVER	DIV162	J163	900	0.02	0	0	0	0
C163	J163	DIV397	1	.01	0	0	0	0
C164	DIV164	J106	350	0.019	0	0	0	0
C164-OVER	DIV164	J106	350	.02	0	0	0	0
C165	J165	J101	300	0.044	0	0	0	0
C166	J166	RES156	250	0.044	0	0	0	0
C167	J167	J126	250	0.04	0	0	0	0
C168	J168	RES156	250	0.044	0	0	0	0
C169	J169	J101	250	0.044	0	0	0	0
C16th	JColfax-DIV	J16th-us	450	.044	0	0	0	0
C16th2	J16th-us	J16th-DIV	1	0.01	0	0	0	0
C16th-OVER	JColfax-DIV	J16th-us	450	0.04	0	0	0	0
C170	J170	J102	250	0.044	0	0	0	0
C171	J171	J102	500	0.044	0	0	0	0
C17th	J16th-DIV	J17th	1358	0.019	0	0	0	0
C17th-OVER	J16th-DIV	J17th	1358	0.044	0	0	0	0
C19th	J17th	J19th-us	661	0.044	0	0	0	0
C19th2	J19th-us	J19th-ds	1	0.01	0	0	0	0
C1-DIV	DIV1	J57	1	.01	4.599976	0	0	0
C20	J6th_Pipe	DIV105	400	0.01	0	0	0	0
C200	J200	RES201	1	.01	0	0	0	0
C202	J202	J203	900	0.015	0	0	0	0
C203	J203	J204	1	.01	0	0	0	0
;Overflow elements are now comprised by 2 conduits and 1 divider.								
;The additional conduit will have -OVERFLOW appended.								
;Diversion elements areo now comprised by 2 conduits and 1 divider.								
;The additional conduit will have -DIV appended.								
C204	J204	J345	1250	0.035	0	0	0	0
C230	J230	J319	1	.01	0	0	0	0
C231	J231	J230	1	.01	0	0	0	0
C232	J232	J241	1	.01	0	0	0	0
C233	J233	J322	1	.01	0	0	0	0
C234	J234	J236	1	.01	0	0	0	0
C235	J235	J320	1	.01	0	0	0	0
C236	J236	J390	886	0.019	0	0	0	0
C236_Overflow	J236	J390	886	0.02	0	0	0	0
C23rd	JMontview-ds	J23rd	1683	0.044	0	0	0	0
C24	J24	J242	1	.01	0	0	0	0
C241	J241	J242	750	0.019	0	0	0	0
C241_Overflow	J241	J242	750	0.02	0	0	0	0
C242	J242	J243	1	.01	0	0	0	0
C243	J243	J25	1200	0.019	0	0	0	0

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C243_Overflow	J243	J25	1200	0.02	0	0	0	0
C244	J244	J245	144	0.019	0	0	0	0
C244_Overflow	J244	J245	144	0.02	0	0	0	0
C245	J245	J246	1	.01	0	0	0	0
C246	J246	J247	382	0.019	0	0	0	0
C246_Overflow	J246	J247	382	.02	0	0	0	0
C247	J247	J248	1	.01	0	0	0	0
C248	J248	J253	212	0.019	0	0	0	0
C25	J25	J244	1	.01	0	0	0	0
C250	J250	J151	800	0.019	0	0	0	0
C250_Overflow	J250	J151	800	0.02	0	0	0	0
C251	J251	J250	1	.01	0	0	0	0
C252	J252	J25	1	.01	0	0	0	0
C253	J253	J254	1	.01	0	0	0	0
C254	J254	J151	505	0.044	0	0	0	0
C26th	J23rd	J26th	1020	0.044	0	0	0	0
C29th	J26th	J29th	2077	0.044	0	0	0	0
C31	J31	J314	1	.01	0	0	0	0
C311	J311	J355	1	.01	0	0	0	0
C314	J314	J355	800	0.035	0	0	0	0
C315	J315	J350	1090	0.019	0	0	0	0
C316	DIV316	J352	470	0.019	0	0	0	0
C316-OVER	DIV316	J352	470	0.044	0	0	0	0
C317	J317	J36	765	0.019	0	0	0	0
C318	J318	J230	188	0.019	0	0	0	0
C319	J319	J235	1120	0.019	0	0	0	0
C319_Overflow	J319	J235	1120	0.02	0	0	0	0
C32	J32	J321	1	.01	0	0	0	0
C320	J320	J372	701	0.019	0	0	0	0
C320_Overflow	J320	J372	701	0.02	0	0	0	0
C321	J321	J341	687	0.019	0	0	0	0
C321_Overflow	J321	J341	687	0.02	0	0	0	0
C322	J322	J36	594	0.019	0	0	0	0
C33	J33	J330	1	.01	0	0	0	0
C330	J330	J341	600	0.019	0	0	0	0
C330_Overflow	J330	J341	600	0.02	0	0	0	0
C34	J34	J345	1	.01	0	0	0	0
C341	J341	DIV342	1	.01	0	0	0	0
C342	DIV342	J343	2150	0.019	0	0	0	0
C342-OVER	DIV342	J343	2150	0.03	0	0	0	0
C343	J343	DIV344	1	.01	0	0	0	0
C344	DIV344	J345	1200	0.019	0	0	0	0
C344-OVER	DIV344	J345	1200	0.03	0	0	0	0
C345	J345	J346	1	.01	0	0	0	0
C346	J346	J347	700	0.035	0	0	0	0
C347	J347	J348	1	.01	0	0	0	0
C348	J348	J150	1250	0.035	0	0	0	0
C35	J35	J355	1	.01	0	0	0	0
C350	J350	DIV316	1	.01	0	0	0	0

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
C351            J351            J315            1         .01       0         0         0         0
C352            J352            J317            1         .01       0         0         0         0
C353            J353            J345            1500      0.035     0         0         0         0
C354            J354            J151            1700      0.019     0         0         0         0
C355            J355            RES30           1         .01       0         0         0         0
C36             J36             J318            1         .01       0         0         0         0
C361            J361            J352            1         .01       0         0         0         0
C362            J362            J363            1         .01       0         0         0         0
C363            J363            J343            1000      0.019     0         0         0         0
C37             J37             J372            1         .01       0         0         0         0
C371            J371            J235            1         .01       0         0         0         0
C372            J372            J373            1         .01       0         0         0         0
C373            J373            J374            500       0.019     0         0         0         0
C373_Overflow   J373            J374            500       0.02      0         0         0         0
C374            J374            J375            1         .01       0         0         0         0
C375            J375            J150            450       0.019     0         0         0         0
C375_Overflow   J375            J150            450       0.02      0         0         0         0
C376            DIV376          J151            1250      0.019     0         0         0         0
C376-OVER       DIV376          J151            1250      0.044     0         0         0         0
C38             J38             J343            1         .01       0         0         0         0
C389            DIV389          J157            1         .01       0         0         0         0
C389-DIV        DIV389          J158            1         .01       0         0         0         0
C390            J390            J394            1         .01       0         0         0         0
C391            J391            J390            1         .01       0         0         0         0
C392            J392            J150            1         .01       0         0         0         0
C393            J393            J151            1         .01       0         0         0         0
C394            J394            J374            350       0.019     0         0         0         0
C395            DIV395          J129            1         .01       0         0         0         0
C395-DIV        DIV395          J168            1         .01       0         0         0         0
C396            DIV396          J141            1         .01       0         0         0         0
C396-DIV        DIV396          J167            1         .01       2.875     0         0         0
C397            DIV397          DIV164          1         .01       0         0         0         0
C397-DIV        DIV397          J166            1         .01       0         0         0         0
;Manning's n was not increased by 25% to maximize 72-inch pipe capacity for determining split flow into H.E.A.T.
C399            DIV399          J6th_Pipe       3850      .013      0         0         0         0
C399-DIV        DIV399          JL2             1550      .040      0         0         0         0
C41             J41             J151            1         .01       0         0         0         0
C42             J42             J345            1         .01       0         0         0         0
C43             J43             J353            1         .01       0         0         0         0
C44             J44             J354            1         .01       0         0         0         0
C51             J51             J56             1         .01       0         0         0         0
C52             J52             J101            1         .01       0         0         0         0
C53             J53             J101            1         .01       0         0         0         0
C54             J54             J57             1         .01       0         0         0         0
C56             J56             DIV1            1400      0.019     0         0         0         0
C57             J57             J151            900       0.019     0         0         0         0
C57_Overflow    J57             J151            900       0.02      0         0         0         0
C61             J61             DIV71           1         .01       0         0         0         0
C62             J62             J67             1         .01       0         0         0         0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
C63             J63             J72             1          .01        0          0          0          0
C64             J64             J65             1          .01        0          0          0          0
C65             J65             J104            1          .01        0          0          0          0
C67             J67             DIV70           1          .01        0          0          0          0
C68             J68             J73             1          .01        0          0          0          0
C70             DIV70           J74             860        0.019      0          0          0          0
C70-OVER        DIV70           J74             860        0.020      0          0          0          0
C71             DIV71           J67             800        0.019      0          0          0          0
C71-OVER        DIV71           J67             800        0.020      0          0          0          0
;Existing 42" pipe with zero slope per GIS data, however, the slope from MDP 2010 is used.
;Manning's n was not increased by 25% for flow diversion analysis.
C72             J72             J68             775        0.013      0          0          0          0
;48" CMP
C73             J73             J65             1066       0.03       0          0          0          0
C73_Overlfow    J73             J65             850        0.01       0          0          0          0
C74             J74             J72             1          .01        0          0          0          0
CAD1            J_AD1           JMontview-us    1          0.01       0          0          0          0
CAD3            J_AD3           J17th           1          0.01       0          0          0          0
CAD4            J_AD4           J19th-us        1          0.01       0          0          0          0
CAD7            J_AD7           J16th-us        1          0.01       0          0          0          0
CAR1            J_AR1           J14th-DIV       1          0.01       0          0          0          0
CAR2            J_AR2           D_AR2           1          0.01       0          0          0          0
CColfax         J14th-DIV       JColfax-DIV     686        .019       0          0          0          0
CColf-OVER      J14th-DIV       JColfax-DIV     686        0.040      0          0          0          0
CCPark          JMLK            J33rd           1164       0.044      0          0          0          0
CDE1            J_DE1           JMontview-ds    1          0.01       0          0          0          0
CDE2            J_DE2           J16th-us        1          0.01       0          0          0          0
CDE3            J_DE3           JColfax-DIV     1          0.01       0          0          0          0
CDE4            J_DE4           J14th-DIV       1          0.01       0          0          0          0
CDE5            J_DE5           J13th-DIV       1          0.01       0          0          0          0
CDE6            J_DE6           J12th           1          0.01       0          0          0          0
CDIV7b          J7b             DIV399          400        0.01       0          0          0          0
CJ_L1           J_L1            J72             400        0.01       0          0          0          0
CJ7b            J_7b            J7b             400        0.01       0          0          0          0
CJL2            J_L2            JL2             400        0.01       0          0          0          0
CMLK            J29th           JMLK            581        0.044      0          0          0          0
CMontview       J19th-ds        JMontview-us    651        0.044      0          0          0          0
CMontview2      JMontview-us    JMontview-ds    1          0.01       0          0          0          0
CSandCreek      J33rd           JSandCreek      2222       0.044      0          0          0          0
CST1            J_ST1           J33rd           1          0.01       0          0          0          0
CST2            J_ST2           JSandCreek      1          0.01       0          0          0          0
CST3            J_ST3           JMLK            1          0.01       0          0          0          0
CST4            J_ST4           JMLK            1          0.01       0          0          0          0
CST5            J_ST5           J29th           1          0.01       0          0          0          0
CST6            J_ST6           J26th           1          0.01       0          0          0          0
CST7            J_ST7           J26th           2336       0.044      0          0          0          0
CST8            J_ST8           J26th           1          0.01       0          0          0          0
CST9            J_ST9           J23rd           1          0.01       0          0          0          0
d_01a           E-J-01          J_01a           210.16     0.01       0          5          0          0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
d_02a            E-J-02          D_02a           180.32    0.01      0         0         0         0
d_02b            D_02a           J_02a           1449.89   0.01      0         0         0         0
d_03a            E-J-03          J_03a           122.45    0.01      0         0         0         0
d_03b            J_03a           D_03a           156.31    0.01      0         0         0         0
d_03c            D_03a           D_03b           24.36     0.01      0         0         0         0
d_04b            E-J-04          D_04b           34.17     0.01      0         0         0         0
d_04d            J_04a           D_05a           9.97      0.01      0         0         0         0
d_05a            E-J-05          J_05a           82.72     0.01      0         0         0         0
d_05b            J_05a           D_05b           2.47      0.01      0         0         0         0
d_05c            D_05d           D_05c           5.17      0.01      0         0         0         0
d_06a            E-J-06          J_06a           10.71     0.01      0         0         0         0
d_06b            J_06a           D_06a           2.64      0.01      0         0         0         0
d_06c            D_06a           D_06b           4.4       0.01      0         0         0         0
d_07b            E-J-07          J_07c           50.84     0.01      0         0         0         0
d_08a            E-J-08          J_08a           157.2     0.01      0         0         0         0
d_08b            J_08a           D_08b           31.61     0.01      0         0         0         0
d_08c            J_08b           HavanaPnd       238.76    0.01      0         0         0         0
d_09a            E-J-09          J_09a           56.19     0.01      0         0         0         0
d_09b            J_09a           D_08a           11.44     0.01      0         0         0         0
d_10a            E-J-10          D_10d           48.16     0.01      0         0         0         0
d_10a1           D_10a1          HavanaPnd       255.05    0.01      0         0         0         0
d_10a2           D_10a1          J-10a1          47.06     0.01      0         0         0         75
d_11a            E-J-11          D_11a           89.25     0.01      0         0         0         0
d_12a            E-J-12          D_12a           103.6     0.01      0         0         0         0
d_13a            E-J-13          EC_Out_19thAv   235.9     0.01      0         0         0         0
d_14a            E-J-14          J_14a           584.55    0.01      0         0         0         0
d_14b            J_14a           D_14a           22.68     0.01      0         0         0         0
d_15a            E-J-15          J_15a           72.41     0.01      0         0         0         0
d_17thAv         J_17thAv_Out    J17th           400       0.01      0         0         0         0
d_EC_Out_23rd    EC_Out_23rd     J23rd           71.05     0.01      0         0         0         0
d_EC_Out_19thAv  EC_Out_19thAv   J19th-ds        400       0.01      0         0         0         0
;overflow path west of Highline for E02 between Hihline and raised elevation at homes
;Raise Manning's n to 0.15 considering vegetation, fences and structures
S_02a            D_02a           J_01a           1034.82   0.1       0         0         0         0
;6th Ave
S_03a            D_03b           J7b             2422.91   0.01      0         0         0         0
S_05_07a         D_05-07         J_05_07         758       0.01      0         0         0         0
S_05_07b         D_05-07         J_08a           1280      0.01      0         0         0         0
;Kenton
S_05a            D_05a           J_05a           2456      0.01      0         0         0         0
S_05b            D_05b           D_05d           199.6     0.01      0         0         0         0
S_05c            D_05c           D_05-07         1300      0.01      0         0         0         0
;6th Ave
S_05d            D_05c           D_03a           1120.05   0.01      0         0         0         0
;Park East Rd
S_06a            J_02a           J_06a           3268.93   0.01      0         0         0         0
S_06b            D_06b           D_05d           1349.1    0.01      0         0         0         0
S_07a            D_03b           J_07a           241.03    0.01      0         0         0         0
;Havana
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
S_07b            J_07a            J_05_07          756        0.01       0          0          0          0
S_07b2           J_05_07          D_07a            1015.59    0.01       0          0          0          0
S_07d            D_07a            J_07b            98.37      0.01       0          0          0          0
;10th Ave
S_07e            J_07b            J_07c            762.46     0.01       0          0          0          0
;Del Mar
S_08a            D_08a            J_08a            2002.69    0.01       0          0          0          0
S_08b            D_08b            D_10a1           29.48      0.01       0          0          0          0
;Moline St
S_09a            D_06b            J_09a            1335.64    0.01       0          0          0          0
S_10_13          D_10_13          J_17thAv_Out     1689       0.01       0          0          0          0
S_10a            J_10b            J_10a            194.52     0.01       0          0          0          0
S_10a1           J-10a1           J_10a            701.05     0.01       0          0          0          180
S_10b            J_10a            D_10a            800.87     0.01       0          0          0          0
;Flows from Havana reenter DelMar at Hanover
;Assume 42" RCP flowing full D/S (probably actually full at Geneva next block D/S)
S_10c            J_07c            D_10a            1481.34    0.01       0          0          0          0
;Del Mar
S_10d            D_10a            D_10b            814.55     0.01       0          0          0          0
;Del Mar
S_10e            D_10b            D_10d            2003.13    0.01       0          0          0          0
;Colfax
S_10f            D_12a            D_10c            671.65     0.01       0          0          0          0
;Colfax
S_10g            D_10c            D_10d            653.48     0.01       0          0          0          0
S_10i            D_10d            J_EC_Colfax_Out  1914.74    0.01       0          0          0          0
;Hanover
S_11a            D_11a            D_12a            1673.04    0.01       0          0          0          0
S_12_14          D_12_14          D_13a            400        0.01       0          0          0          0
;Florence
S_13a            D_10d            D_13a            671.79     0.01       0          0          0          0
S_13b1           D_13a            D_10_13          972        0.01       0          0          0          0
;Del Mar/ 19th
S_13b2           D_10_13          J_15             1310       0.01       0          0          0          0
S_14a1           D_10c            D_12_14          665        0.01       0          0          0          0
S_14a2           D_12_14          J_14a            1660.01    0.01       0          0          0          0
S_15             J_15             EC_Out_23rd      2785       0.01       0          0          0          0
S_15a            D_14a            J_15             1640       0.01       0          0          0          0
S_15b            D_15a            J_15a            1286.74    0.02       0          0          0          0
S_15c            J_15a            EC_Out_23rd      105.3      0.02       0          0          0          0
S_Beeler         DIV72            J14th-DIV        3235       0.01       0          0          0          0
C317_Overflow    J317             J36              765        0.02       0          0          0          0
C318_Overflow    J318             J230             188        0.02       0          0          0          0
C322_Overflow    J322             J36              594        0.02       0          0          0          0
C363_Overflow    J363             J343             1000       0.035      0          0          0          0
C_EC_Colfax_Out  J_EC_Colfax_Out  D_AR2            1632       0.01       0          0          0          0
S_AR2            D_AR2            D_10_13          720        0.01       0          0          0          0
d_16thAve_E      J_16thAve_E      J16th-DIV        400        0.01       0          0          0          0
d_72             J72              DIV72            400        0.01       0          0          0          0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
C72_Overflow     DIV72           J68             775        0.01       0          0          0          0
C_04b            D_04a           D_04b           2000       0.013      0          0          0          131.5
S_04a            J_01a           D_04a           632.95     0.01       0          0          0          0
d_04c            D_04b           1st/HavanaPnd   400        0.01       0          0          0          0
S_04b            D_04a           J_04a           400        0.01       0          0          0          0
C_04c            D_04b           J_04a           360        0.013      0          0          0          0

[ORIFICES]
;;Name           From Node       To Node         Type         Offset     Qcoeff     Gated    CloseTime
;;-------------- --------------- --------------- ------------ ---------- ---------- -------- ----------
O_10a            HavanaPnd       J_10c           SIDE         0          0.65       NO       0

[WEIRS]
;;Name           From Node       To Node         Type         CrestHt    Qcoeff     Gated    EndCon   EndCoeff   Surcharge  RoadWidth  RoadSurf   Coeff. Curve
;;-------------- --------------- --------------- ------------ ---------- ---------- -------- -------- ---------- ---------- ---------- ---------- ----------------
W_10a            HavanaPnd       J_10b           TRAPEZOIDAL  6.5        3.33       NO       0        0          YES

[OUTLETS]
;;Name           From Node       To Node         Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- --------------- --------------- ---------- --------------- ---------------- ---------- --------
;These define our stage/discharge curves for the system.
;Note that 1 ft of stage exactly equals 1 acre-ft of
;volume. Thus this curve is the exact curve from the original
;UDSWMM input file.
OUT30            RES30           J351            0          TABULAR/DEPTH   RATINGCURVE_30              NO
OUT201           RES201          J202            0          TABULAR/DEPTH   RATINGCURVE_201             NO
OUT130           RES130          J104            0          TABULAR/DEPTH   RATINGCURVE_130             NO
OUT156           RES156          DIV389          0          TABULAR/DEPTH   RATINGCURVE_156             NO
OUT04            1st/HavanaPnd   J_04a           0          TABULAR/DEPTH   1st/HavanaOut               NO

[XSECTIONS]
;;Link           Shape        Geom1           Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ --------------- ---------- ---------- ---------- ---------- ----------
C_03a            CIRCULAR     5.5             0          0          0          1
C_05a            CIRCULAR     3.5             0          0          0          1
C_05b            CIRCULAR     4.5             0          0          0          1
C_05c            CIRCULAR     4.5             0          0          0          1
C_06a            CIRCULAR     4               0          0          0          1
C_07a            CIRCULAR     2.25            0          0          0          1
C_08a            CIRCULAR     4               0          0          0          1
C_08b            RECT_CLOSED  4               4          0          0          1
C_10a            CIRCULAR     3.5             0          0          0          1
C_10b            CIRCULAR     3.5             0          0          0          1
C_10c            CIRCULAR     4               0          0          0          1
C_11a            CIRCULAR     4               0          0          0          1
C_13a            CIRCULAR     4.5             0          0          0          1
C_14a            CIRCULAR     4.5             0          0          0          1
C_15a            CIRCULAR     5.5             0          0          0          1
C_15b            RECT_CLOSED  6.5             10         0          0          1
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C_16a	TRAPEZOIDAL	10	8	3	3	1
C_16thAv	CIRCULAR	9	0	0	0	1
C_JL2	DUMMY	0	0	0	0	1
C1	DUMMY	0	0	0	0	1
C101	DUMMY	0	0	0	0	1
C102	DUMMY	0	0	0	0	1
C104	DUMMY	0	0	0	0	1
C105	TRAPEZOIDAL	6	15	3.33	3.33	1
C105-OVER	TRAPEZOIDAL	10	109.96	10	10	1
C106	DUMMY	0	0	0	0	1
C107	DUMMY	0	0	0	0	1
C111	DUMMY	0	0	0	0	1
C113	DUMMY	0	0	0	0	1
C120	CIRCULAR	3	0	0	0	1
C120_Overflow	TRAPEZOIDAL	4	13.5	20	20	1
C121	DUMMY	0	0	0	0	1
C122	DUMMY	0	0	0	0	1
C123	CIRCULAR	3.5	0	0	0	1
C123-OVER	TRAPEZOIDAL	4	13.5	20	20	1
C124	DUMMY	0	0	0	0	1
C125	CIRCULAR	3.5	0	0	0	1
C125-OVER	TRAPEZOIDAL	6	23.5	20	20	1
C126	DUMMY	0	0	0	0	1
C127	CIRCULAR	4.5	0	0	0	1
C127_Overflow	TRAPEZOIDAL	6	23.5	20	20	1
C128	DUMMY	0	0	0	0	1
C129	CIRCULAR	4	0	0	0	1
C129_Overflow	TRAPEZOIDAL	5	10	4	4	1
C12th	TRAPEZOIDAL	10	25	3	3.5	1
C131	DUMMY	0	0	0	0	1
C132	DUMMY	0	0	0	0	1
C133	DUMMY	0	0	0	0	1
C134	DUMMY	0	0	0	0	1
C135	CIRCULAR	2	0	0	0	1
C135-OVER	TRAPEZOIDAL	3.5	3	50	50	1
C136	CIRCULAR	4	0	0	0	1
C136-OVER	TRAPEZOIDAL	5	5	50	50	1
C13th	TRAPEZOIDAL	10	20	3	3	1
C14	DUMMY	0	0	0	0	1
C140	DUMMY	0	0	0	0	1
C141	CIRCULAR	3	0	0	0	1
C14th	RECT_CLOSED	6	9	0	0	2
C14th-OVER	TRAPEZOIDAL	10	20	20	20	1
C150	DUMMY	0	0	0	0	1
C151	DUMMY	0	0	0	0	1
C154	DUMMY	0	0	0	0	1
C155	DUMMY	0	0	0	0	1
C157	CIRCULAR	4	0	0	0	1
C158	CIRCULAR	4	0	0	0	1

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C158_Overflow	TRAPEZOIDAL	5	1	20	20	1
C159	DUMMY	0	0	0	0	1
C160	DUMMY	0	0	0	0	1
C161	DUMMY	0	0	0	0	1
C162	CIRCULAR	4	0	0	0	1
C162-OVER	TRAPEZOIDAL	5	5	50	50	1
C163	DUMMY	0	0	0	0	1
C164	CIRCULAR	4.5	0	0	0	1
C164-OVER	TRAPEZOIDAL	5.5	5.5	50	50	1
C165	TRAPEZOIDAL	10	10	4	4	1
C166	TRAPEZOIDAL	10	55	10	10	1
C167	TRAPEZOIDAL	10	55	10	10	1
C168	TRAPEZOIDAL	10	55	10	10	1
C169	TRAPEZOIDAL	10	55	10	10	1
C16th	TRAPEZOIDAL	6	8	4	4	1
C16th2	DUMMY	0	0	0	0	1
C16th-OVER	TRAPEZOIDAL	10	55	100	4	1
C170	TRAPEZOIDAL	10	55	10	10	1
C171	TRAPEZOIDAL	10	10	4	4	1
C17th	RECT_CLOSED	6	9	0	0	2
C17th-OVER	TRAPEZOIDAL	10	20	20	20	1
C19th	TRAPEZOIDAL	12	13	4	4	1
C19th2	DUMMY	0	0	0	0	1
C1-DIV	DUMMY	0	0	0	0	1
C20	DUMMY	0	0	0	0	1
C200	DUMMY	0	0	0	0	1
C202	CIRCULAR	4	0	0	0	1
C203	DUMMY	0	0	0	0	1
C204	TRAPEZOIDAL	10	20	5	5	1
C230	DUMMY	0	0	0	0	1
C231	DUMMY	0	0	0	0	1
C232	DUMMY	0	0	0	0	1
C233	DUMMY	0	0	0	0	1
C234	DUMMY	0	0	0	0	1
C235	DUMMY	0	0	0	0	1
C236	CIRCULAR	3	0	0	0	1
C236_Overflow	TRAPEZOIDAL	10	1	20	20	1
C23rd	TRAPEZOIDAL	10	14	19	5	1
C24	DUMMY	0	0	0	0	1
C241	CIRCULAR	5.5	0	0	0	1
C241_Overflow	TRAPEZOIDAL	10	1	20	20	1
C242	DUMMY	0	0	0	0	1
C243	CIRCULAR	6.7	0	0	0	1
C243_Overflow	TRAPEZOIDAL	10	1	20	20	1
C244	CIRCULAR	6.7	0	0	0	1
C244_Overflow	TRAPEZOIDAL	10	1	20	20	1
C245	DUMMY	0	0	0	0	1
C246	CIRCULAR	8	0	0	0	1
C246_Overflow	TRAPEZOIDAL	10	1	20	20	1

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C247	DUMMY	0	0	0	0	1
C248	CIRCULAR	8	0	0	0	1
C25	DUMMY	0	0	0	0	1
C250	CIRCULAR	4	0	0	0	1
C250_Overflow	TRAPEZOIDAL	10	1	20	20	1
C251	DUMMY	0	0	0	0	1
C252	DUMMY	0	0	0	0	1
C253	DUMMY	0	0	0	0	1
C254	TRAPEZOIDAL	5	8	3	3	1
C26th	TRAPEZOIDAL	10	13	30	7	1
C29th	TRAPEZOIDAL	10	20	18	20	1
C31	DUMMY	0	0	0	0	1
C311	DUMMY	0	0	0	0	1
C314	TRAPEZOIDAL	4	5	4	4	1
C315	CIRCULAR	4	0	0	0	1
C316	CIRCULAR	5	0	0	0	1
C316-OVER	TRAPEZOIDAL	6	6	50	50	1
C317	CIRCULAR	5	0	0	0	1
C318	CIRCULAR	6.7	0	0	0	1
C319	CIRCULAR	7.1	0	0	0	1
C319_Overflow	TRAPEZOIDAL	10	1	20	20	1
C32	DUMMY	0	0	0	0	1
C320	CIRCULAR	7.1	0	0	0	1
C320_Overflow	TRAPEZOIDAL	10	1	20	20	1
C321	CIRCULAR	7.1	0	0	0	1
C321_Overflow	TRAPEZOIDAL	10	1	20	20	1
C322	CIRCULAR	4.5	0	0	0	1
C33	DUMMY	0	0	0	0	1
C330	CIRCULAR	5.5	0	0	0	1
C330_Overflow	TRAPEZOIDAL	10	1	20	20	1
C34	DUMMY	0	0	0	0	1
C341	DUMMY	0	0	0	0	1
C342	CIRCULAR	5	0	0	0	1
C342-OVER	TRAPEZOIDAL	8.5	9	10	20	1
C343	DUMMY	0	0	0	0	1
C344	CIRCULAR	6	0	0	0	1
C344-OVER	TRAPEZOIDAL	9.5	10	10	20	1
C345	DUMMY	0	0	0	0	1
C346	TRAPEZOIDAL	8	10	4	4	1
C347	DUMMY	0	0	0	0	1
C348	TRAPEZOIDAL	8	20	4	4	1
C35	DUMMY	0	0	0	0	1
C350	DUMMY	0	0	0	0	1
C351	DUMMY	0	0	0	0	1
C352	DUMMY	0	0	0	0	1
C353	TRAPEZOIDAL	5	8	4	4	1
C354	CIRCULAR	4	0	0	0	1
C355	DUMMY	0	0	0	0	1
C36	DUMMY	0	0	0	0	1

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C361	DUMMY	0	0	0	0	1
C362	DUMMY	0	0	0	0	1
C363	CIRCULAR	4.5	0	0	0	1
C37	DUMMY	0	0	0	0	1
C371	DUMMY	0	0	0	0	1
C372	DUMMY	0	0	0	0	1
C373	CIRCULAR	8.3	0	0	0	1
C373_Overflow	TRAPEZOIDAL	10	1	20	20	1
C374	DUMMY	0	0	0	0	1
C375	CIRCULAR	8.3	0	0	0	1
C375_Overflow	TRAPEZOIDAL	10	1	20	20	1
C376	CIRCULAR	4	0	0	0	1
C376-OVER	TRAPEZOIDAL	10	24	4	4	1
C38	DUMMY	0	0	0	0	1
C389	DUMMY	0	0	0	0	1
C389-DIV	DUMMY	0	0	0	0	1
C390	DUMMY	0	0	0	0	1
C391	DUMMY	0	0	0	0	1
C392	DUMMY	0	0	0	0	1
C393	DUMMY	0	0	0	0	1
C394	CIRCULAR	8.3	0	0	0	1
C395	DUMMY	0	0	0	0	1
C395-DIV	DUMMY	0	0	0	0	1
C396	DUMMY	0	0	0	0	1
C396-DIV	DUMMY	0	0	0	0	1
C397	DUMMY	0	0	0	0	1
C397-DIV	DUMMY	0	0	0	0	1
C399	CIRCULAR	6	0	0	0	1
C399-DIV	IRREGULAR	36ftStreet	0	0	0	1
C41	DUMMY	0	0	0	0	1
C42	DUMMY	0	0	0	0	1
C43	DUMMY	0	0	0	0	1
C44	DUMMY	0	0	0	0	1
C51	DUMMY	0	0	0	0	1
C52	DUMMY	0	0	0	0	1
C53	DUMMY	0	0	0	0	1
C54	DUMMY	0	0	0	0	1
C56	CIRCULAR	5	0	0	0	1
C57	CIRCULAR	5	0	0	0	1
C57_Overflow	TRAPEZOIDAL	10	1	20	20	1
C61	DUMMY	0	0	0	0	1
C62	DUMMY	0	0	0	0	1
C63	DUMMY	0	0	0	0	1
C64	DUMMY	0	0	0	0	1
C65	DUMMY	0	0	0	0	1
C67	DUMMY	0	0	0	0	1
C68	DUMMY	0	0	0	0	1
C70	CIRCULAR	3	0	0	0	1
C70-OVER	IRREGULAR	36ftStreet	0	0	0	1

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C71	CIRCULAR	2.5	0	0	0	1
C71-OVER	IRREGULAR	36ftStreet	0	0	0	1
C72	CIRCULAR	3.5	0	0	0	1
C73	CIRCULAR	4	0	0	0	1
C73_Overlfow	IRREGULAR	50ftStreet	0	0	0	1
C74	DUMMY	0	0	0	0	1
CAD1	DUMMY	0	0	0	0	1
CAD3	DUMMY	0	0	0	0	1
CAD4	DUMMY	0	0	0	0	1
CAD7	DUMMY	0	0	0	0	1
CAR1	DUMMY	0	0	0	0	1
CAR2	DUMMY	0	0	0	0	1
CColfax	RECT_CLOSED	6	9	0	0	2
CColf-OVER	TRAPEZOIDAL	10	20	20	20	1
CCPark	TRAPEZOIDAL	14	14	7	8	1
CDE1	DUMMY	0	0	0	0	1
CDE2	DUMMY	0	0	0	0	1
CDE3	DUMMY	0	0	0	0	1
CDE4	DUMMY	0	0	0	0	1
CDE5	DUMMY	0	0	0	0	1
CDE6	DUMMY	0	0	0	0	1
CDIV7b	DUMMY	0	0	0	0	1
CJ_L1	DUMMY	0	0	0	0	1
CJ7b	DUMMY	0	0	0	0	1
CJL2	DUMMY	0	0	0	0	1
CMLK	TRAPEZOIDAL	14	15	9	5	1
CMontview	TRAPEZOIDAL	20	13	4	4	1
CMontview2	DUMMY	0	0	0	0	1
CSandCreek	TRAPEZOIDAL	14	19	5	4	1
CST1	DUMMY	0	0	0	0	1
CST2	DUMMY	0	0	0	0	1
CST3	DUMMY	0	0	0	0	1
CST4	DUMMY	0	0	0	0	1
CST5	DUMMY	0	0	0	0	1
CST6	DUMMY	0	0	0	0	1
CST7	TRAPEZOIDAL	10	13	9	70	1
CST8	DUMMY	0	0	0	0	1
CST9	DUMMY	0	0	0	0	1
d_01a	DUMMY	0	0	0	0	1
d_02a	DUMMY	0	0	0	0	1
d_02b	DUMMY	0	0	0	0	1
d_03a	DUMMY	0	0	0	0	1
d_03b	DUMMY	0	0	0	0	1
d_03c	DUMMY	0	0	0	0	1
d_04b	DUMMY	0.1	0	0	0	1
d_04d	DUMMY	0	0	0	0	1
d_05a	DUMMY	0	0	0	0	1
d_05b	DUMMY	0	0	0	0	1
d_05c	DUMMY	0	0	0	0	1

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

d_06a	DUMMY	0.1	0	0	0	1
d_06b	DUMMY	0	0	0	0	1
d_06c	DUMMY	0	0	0	0	1
d_07b	DUMMY	0	0	0	0	1
d_08a	DUMMY	0	0	0	0	1
d_08b	DUMMY	0	0	0	0	1
d_08c	DUMMY	0	0	0	0	1
d_09a	DUMMY	0	0	0	0	1
d_09b	DUMMY	0	0	0	0	1
d_10a	DUMMY	0	0	0	0	1
d_10a1	DUMMY	0	0	0	0	1
d_10a2	DUMMY	0	0	0	0	1
d_11a	DUMMY	0	0	0	0	1
d_12a	DUMMY	0	0	0	0	1
d_13a	DUMMY	0	0	0	0	1
d_14a	DUMMY	0	0	0	0	1
d_14b	DUMMY	0	0	0	0	1
d_15a	DUMMY	0	0	0	0	1
d_17thAv	DUMMY	0	0	0	0	1
d_EC_Out_23rd	DUMMY	0	0	0	0	1
d_EC_Out_19thAv	DUMMY	0	0	0	0	1
S_02a	TRAPEZOIDAL	3	15	4	4	1
S_03a	IRREGULAR	6thAve	0	0	0	1
S_05_07a	IRREGULAR	36ftStreet	0	0	0	1
S_05_07b	IRREGULAR	36ftStreet	0	0	0	1
S_05a	IRREGULAR	36ftStreet	0	0	0	1
S_05b	IRREGULAR	50ftStreet	0	0	0	1
S_05c	IRREGULAR	36ftStreet	0	0	0	1
S_05d	IRREGULAR	6thAve	0	0	0	1
S_06a	IRREGULAR	36ftStreet	0	0	0	1
S_06b	IRREGULAR	6thAve	0	0	0	1
S_07a	IRREGULAR	50ftStreet	0	0	0	1
S_07b	IRREGULAR	50ftStreet	0	0	0	1
S_07b2	IRREGULAR	50ftStreet	0	0	0	1
S_07d	IRREGULAR	36ftStreet	0	0	0	1
S_07e	IRREGULAR	36ftStreet	0	0	0	1
S_08a	IRREGULAR	DelMarPkwy	0	0	0	1
S_08b	IRREGULAR	DelMarPkwy	0	0	0	1
S_09a	IRREGULAR	50ftStreet	0	0	0	1
S_10_13	IRREGULAR	50ftStreet	0	0	0	1
S_10a	IRREGULAR	36ftStreet	0	0	0	1
S_10a1	IRREGULAR	DelMarPkwy	0	0	0	1
S_10b	IRREGULAR	DelMarPkwy	0	0	0	1
S_10c	IRREGULAR	36ftStreet	0	0	0	1
S_10d	IRREGULAR	DelMarPkwy	0	0	0	1
S_10e	IRREGULAR	DelMarPkwy	0	0	0	1
S_10f	IRREGULAR	Colfax	0	0	0	1
S_10g	IRREGULAR	Colfax	0	0	0	1
S_10i	DUMMY	0	0	0	0	1

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
S_11a            IRREGULAR    36ftStreet       0          0          0          1
S_12_14          IRREGULAR    50ftStreet       0          0          0          1
S_13a            IRREGULAR    50ftStreet       0          0          0          1
S_13b1           IRREGULAR    DelMarPkwy       0          0          0          1
S_13b2           IRREGULAR    DelMarPkwy       0          0          0          1
S_14a1           IRREGULAR    36ftStreet       0          0          0          1
S_14a2           IRREGULAR    36ftStreet       0          0          0          1
S_15             IRREGULAR    50ftStreet       0          0          0          1
S_15a            IRREGULAR    36ftStreet       0          0          0          1
S_15b            TRAPEZOIDAL  10               50         20         20         1
S_15c            TRAPEZOIDAL  10               50         20         20         1
S_Beeler         IRREGULAR    36ftStreet       0          0          0          1
C317_Overflow    TRAPEZOIDAL  10               1          20         20         1
C318_Overflow    TRAPEZOIDAL  10               1          20         20         1
C322_Overflow    TRAPEZOIDAL  10               1          20         20         1
C363_Overflow    TRAPEZOIDAL  10               1          20         20         1
C_EC_Colfax_Out  IRREGULAR    50ftStreet       0          0          0          1
S_AR2            IRREGULAR    36ftStreet       0          0          0          1
d_16thAve_E      DUMMY        0                0          0          0          1
d_72             DUMMY        0                0          0          0          1
C72_Overflow     IRREGULAR    50ftStreet       0          0          0          1
C_04b            CIRCULAR     4                0          0          0          1
S_04a            IRREGULAR    36ftStreet       0          0          0          1
d_04c            DUMMY        0                0          0          0          1
S_04b            IRREGULAR    36ftStreet       0          0          0          1
C_04c            CIRCULAR     3                0          0          0          1
O_10a            CIRCULAR     1.5              0          0          0
W_10a            TRAPEZOIDAL  6.5              55         50         50

[TRANSECTS]
;;Transect Data in HEC-2 format
;
;Full street, width = 50ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.27ft.
NC 0.05     0.05     0.02
X1 50ftStreet        9        30       80       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.27     0        0.67     30       0        30       0.5      55
GR 0        80       0.67     80       1.27     110      10       110
;
;Full street, width = 36ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.67ft.
NC 0.05     0.05     0.02
X1 36ftStreet        9        50       86       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.67     0        0.67     50       0        50       0.36     68
GR 0        86       0.67     86       1.67     136      10       136
;
;Full street, width = 82ft, curb = .67ft , cross-slope = 0.02ft/ft, bank-slope = 0.01ft/ft, bank-height = .87ft.
;Increase Manning's n by 25% for roadway per UDFCD USDCM.
;Increase Manning's n to 0.10 for overbank area considering the lawn area, fences and vegetation.
NC 0.1      0.1      0.02
X1 6thAve            9        20       102      0.0      0.0      0.0      0.0      0.0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
GR 6        0        0.87     0        0.67     20       0        20       0.82     61
GR 0        102      0.67     102      0.87     122      6        122
;
;Full street, width = 32ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 0.75ft.
NC 0.1      0.1      0.02
X1 DelMarPkwy        15       4        88       0.0      0.0      0.0      0.0      0.0
GR 8        -16      1.07     -16      0.67     4        0        4        0.32     20
GR 0        36       0.67     36       0.87     46       0.67     56       0        56
GR 0.32     72       0        88       0.67     88       1.07     108      8        108
;
;Full street, width = 80ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = .77ft.
NC 0.02     0.02     0.02
X1 Colfax            12       5        87       0.0      0.0      0.0      0.0      0.0
GR 10       0        0.77     0        0.67     5        0        5        0.8      45
GR 3.3      45       3.3      47       0.8      47       0        87       0.67     87
GR 0.77     92       10       92

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
J200             FLOW             INFLOW_200       FLOW     1.0      1.0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
DIVCURVE_389     DIVERSION  0          0
DIVCURVE_389                16         0
DIVCURVE_389                17         1
DIVCURVE_389                50         34
DIVCURVE_389                200        184
;
DIVCURVE_397     DIVERSION  0          0
DIVCURVE_397                100        0
DIVCURVE_397                101        1
DIVCURVE_397                200        100
DIVCURVE_397                600        500
;
DIVCURVE_395     DIVERSION  0          0
DIVCURVE_395                78         0
DIVCURVE_395                79         1
DIVCURVE_395                178        100
DIVCURVE_395                578        500
;
DIVCURVE_1       DIVERSION  0          0
DIVCURVE_1                  36         0
DIVCURVE_1                  37         1
DIVCURVE_1                  100        64
;
DIVCURVE_396     DIVERSION  0          0
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
DIVCURVE_396                16          0
DIVCURVE_396                17          1
DIVCURVE_396                50          34
DIVCURVE_396                200         184
;
DIVCURVE_399     Diversion  0           0
DIVCURVE_399                275         0
DIVCURVE_399                455         72
DIVCURVE_399                626         165
DIVCURVE_399                845         317
DIVCURVE_399                1155        502
DIVCURVE_399                1543        739
DIVCURVE_399                1977        1004
;
DIVCURVE_7a      Diversion  0           0
DIVCURVE_7a                 105         0
DIVCURVE_7a                 592         0
DIVCURVE_7a                 930         25
DIVCURVE_7a                 1363        101
;
DIV7a2           Diversion  0           0
DIV7a2                      127         0
DIV7a2                      137         10
DIV7a2                      192         59
DIV7a2                      300         133
DIV7a2                      447         243
DIV7a2                      645         383
DIV7a2                      1399        890
DIV7a2                      2302        1501
;
6thAv_Moline     Diversion  0           0
6thAv_Moline                100         11
6thAv_Moline                200         39
6thAv_Moline                300         81
6thAv_Moline                400         136
6thAv_Moline                500         201
6thAv_Moline                600         276
6thAv_Moline                700         358
6thAv_Moline                800         446
6thAv_Moline                900         540
6thAv_Moline                1000        638
;
Cofax_Galena     Diversion  0           0
Cofax_Galena                50          40
Cofax_Galena                100         70
Cofax_Galena                150         92
Cofax_Galena                200         104
Cofax_Galena                250         108
Cofax_Galena                300         110
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
Cofax_Galena                350         110
Cofax_Galena                400         110
Cofax_Galena                450         110
;
Colfax_Florence  Diversion  0           0
Colfax_Florence             200         34
Colfax_Florence             400         84
Colfax_Florence             600         141
Colfax_Florence             800         202
Colfax_Florence             1000        265
Colfax_Florence             1200        332
Colfax_Florence             1400        400
Colfax_Florence             1600        470
Colfax_Florence             1800        541
Colfax_Florence             2000        614
Colfax_Florence             2200        688
Colfax_Florence             2400        763
Colfax_Florence             2600        839
Colfax_Florence             2800        916
;
;street flows leaving Easterly Creek to Westerly Creek
6thAv&Havana     Diversion  0           0
6thAv&Havana                50          39
6thAv&Havana                100         75
6thAv&Havana                150         108
6thAv&Havana                200         141
6thAv&Havana                250         173
6thAv&Havana                300         205
6thAv&Havana                350         235
6thAv&Havana                400         266
6thAv&Havana                450         296
6thAv&Havana                500         326
;
;divides flow from Chsp Pond 10% to E04 90% to E06 - relative weir length to high point and direct basin contribution
Chspk_Pond_DS    Diversion  00          0
Chspk_Pond_DS               100         10
Chspk_Pond_DS               1000        100
;
Jamaica/Lowry    Diversion  0           0
Jamaica/Lowry               100         56
Jamaica/Lowry               200         101
Jamaica/Lowry               300         142
Jamaica/Lowry               400         180
Jamaica/Lowry               500         217
Jamaica/Lowry               600         253
Jamaica/Lowry               700         287
Jamaica/Lowry               800         319
Jamaica/Lowry               900         351
Jamaica/Lowry               1000        383
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
Jamaica/Lowry              1100       413
Jamaica/Lowry              1200       443
;
6thAv_Kenton     Diversion 0          0
6thAv_Kenton               200        177
6thAv_Kenton               400        375
6thAv_Kenton               600        574
6thAv_Kenton               800        773
6thAv_Kenton               1000       973
6thAv_Kenton               1200       1172
6thAv_Kenton               1400       1372
6thAv_Kenton               1600       1571
6thAv_Kenton               1800       1771
6thAv_Kenton               2000       1971
;
Galena/16thAv    Diversion 0          0
Galena/16thAv              50         20
Galena/16thAv              100        40
Galena/16thAv              150        58
Galena/16thAv              200        75
Galena/16thAv              250        91
Galena/16thAv              300        107
Galena/16thAv              350        121
Galena/16thAv              400        134
Galena/16thAv              450        146
;
17thAv/DelMar    Diversion 0          0
17thAv/DelMar              200        16
17thAv/DelMar              400        32
17thAv/DelMar              600        48
17thAv/DelMar              800        64
17thAv/DelMar              1000       80
17thAv/DelMar              1200       96
17thAv/DelMar              1400       112
17thAv/DelMar              1600       128
17thAv/DelMar              1800       144
17thAv/DelMar              2000       160
17thAv/DelMar              2200       176
17thAv/DelMar              2400       192
17thAv/DelMar              2600       208
17thAv/DelMar              2800       224
;
11thAv_Beeler    Diversion 0          0
11thAv_Beeler              100        97
11thAv_Beeler              200        188
11thAv_Beeler              300        275
11thAv_Beeler              400        361
11thAv_Beeler              500        446
11thAv_Beeler              600        530
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
11thAv_Beeler               700        612
11thAv_Beeler               800        694
11thAv_Beeler               900        776
11thAv_Beeler               1000       857
11thAv_Beeler               1100       937
11thAv_Beeler               1200       1017
11thAv_Beeler               1300       1096
11thAv_Beeler               1400       1175
;
1st/HavanaPnd    Diversion  0          0
1st/HavanaPnd               64.066     27.066
1st/HavanaPnd               90.536     22.336
1st/HavanaPnd               91         60
1st/HavanaPnd               225.868    60
;
;Curves are named using RATINGCURVE_ for rating (outflow) curves
;and DIVCURVE_ for diversion curves.
RATINGCURVE_30   RATING     0          0
RATINGCURVE_30              0.04       0.5
RATINGCURVE_30              1.12       5
RATINGCURVE_30              3.56       16
RATINGCURVE_30              7.55       19.5
RATINGCURVE_30              12.97      20
;
RATINGCURVE_201  RATING     0          0
RATINGCURVE_201             1          1
RATINGCURVE_201             50         10
RATINGCURVE_201             150        25
RATINGCURVE_201             175        34
RATINGCURVE_201             400        44
RATINGCURVE_201             500        48
RATINGCURVE_201             1150       58
RATINGCURVE_201             2150       67
RATINGCURVE_201             3100       76
RATINGCURVE_201             4500       83
RATINGCURVE_201             5850       90
RATINGCURVE_201             7500       96
RATINGCURVE_201             9500       102
;
RATINGCURVE_130  RATING     0          0
RATINGCURVE_130             1          5
RATINGCURVE_130             5          30
RATINGCURVE_130             15         55
RATINGCURVE_130             85         80
RATINGCURVE_130             250        105
RATINGCURVE_130             300        250
RATINGCURVE_130             345        565
RATINGCURVE_130             700        670
;
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
RATINGCURVE_156  RATING     0          0
RATINGCURVE_156             1.11       12
RATINGCURVE_156             3.49       25
RATINGCURVE_156             7.09       109
;
;OUTdelmar2
OUTdelmar2       Rating     0          0
OUTdelmar2                  1.06       4.7
OUTdelmar2                  2.06       9.7
OUTdelmar2                  3.06       12.9
OUTdelmar2                  4.06       15.5
OUTdelmar2                  5.06       17.7
OUTdelmar2                  6.06       19.6
OUTdelmar2                  7.06       21.4
OUTdelmar2                  7.31       52
OUTdelmar2                  7.56       139
OUTdelmar2                  7.81       266
OUTdelmar2                  8.06       443
OUTdelmar2                  8.31       673
OUTdelmar2                  8.56       988
OUTdelmar2                  8.81       1413
OUTdelmar2                  9.06       1976
;
1st/HavanaOut    Rating     0          0
1st/HavanaOut               1          0.09
1st/HavanaOut               2          0.2
1st/HavanaOut               3          0.32
1st/HavanaOut               4          0.43
1st/HavanaOut               5          0.83
1st/HavanaOut               6          2.68
1st/HavanaOut               7          3.63
1st/HavanaOut               8          4.37
1st/HavanaOut               9          4.99
1st/HavanaOut               10         5.55
1st/HavanaOut               11         23.64
1st/HavanaOut               12         87.08
;
Out              Rating     0          163
Out                         5          163
;
;RESdelmar2
RESdelmar2       Storage    1.06       2550
RESdelmar2                  2.06       12300
RESdelmar2                  3.06       29600
RESdelmar2                  4.06       53925
RESdelmar2                  5.06       84425
RESdelmar2                  6.06       103200
RESdelmar2                  7.06       165000
RESdelmar2                  7.31       180000
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
RESdelmar2                  7.56        195000
RESdelmar2                  7.81        208000
RESdelmar2                  8.06        220000
RESdelmar2                  8.31        235000
RESdelmar2                  8.56        250000
RESdelmar2                  8.81        265000
RESdelmar2                  9.06        280000
;
HavanaPark        Storage   0           0
HavanaPark                  2           24145
HavanaPark                  4           77005
HavanaPark                  6           91130
HavanaPark                  8           105770
HavanaPark                  10          121890
;
1st/Havana        Storage   0           244.1673255
1st/Havana                  1           3026.130127
1st/Havana                  2           6949.90645
1st/Havana                  3           13086.27921
1st/Havana                  4           25268.49063
1st/Havana                  4.1         33726.61398
1st/Havana                  5           40414.9381
1st/Havana                  5.64        51343.50432
1st/Havana                  6           61564.8495
1st/Havana                  7           74632.48013
1st/Havana                  8           76112.53524
1st/Havana                  9           78893.93142
1st/Havana                  10          83164.86615
1st/Havana                  10.34       88613.1849
1st/Havana                  10.85       109542.2679
1st/Havana                  11          127115.93
1st/Havana                  12          135520.17
;
1st/HavanaREV     Storage   0           243.25
1st/HavanaREV               1           2899.85
1st/HavanaREV               2           8448.85
1st/HavanaREV               3           14051.31
1st/HavanaREV               4           21356.73
1st/HavanaREV               4.1         30011.16
1st/HavanaREV               5           41058.61
1st/HavanaREV               5.64        55019.53
1st/HavanaREV               6           62505.00
1st/HavanaREV               7           74533.80
1st/HavanaREV               8           76137.61
1st/HavanaREV               9           78504.32
1st/HavanaREV               10          82353.65
1st/HavanaREV               10.34       86880.06
1st/HavanaREV               10.85       111275.23
1st/HavanaREV               11          119000
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
1st/HavanaREV               12         127116
1st/HavanaREV               13         135520

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Timeseries INFLOW_200
INFLOW_200                  0          0
INFLOW_200                  0.5        80
INFLOW_200                  0.83       1350
INFLOW_200                  1          3280
INFLOW_200                  1.33       2860
INFLOW_200                  1.48       2610
INFLOW_200                  1.55       1800
INFLOW_200                  1.67       1600
INFLOW_200                  1.83       1400
INFLOW_200                  2.06       1200
INFLOW_200                  2.33       1100
INFLOW_200                  2.9        1080
INFLOW_200                  3.18       1000
INFLOW_200                  3.5        830
INFLOW_200                  3.98       720
INFLOW_200                  4.16       700
INFLOW_200                  5          625
INFLOW_200                  11.93      0

[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node        D_05a           Major_System
Node        D_06b           Major_System
Link        C_05a           Storm_Sewer
Link        C_05b           Storm_Sewer
Link        C_05c           Storm_Sewer
Link        C_06a           Storm_Sewer
Link        C_07a           Storm_Sewer
Link        C_08a           Storm_Sewer
Link        C_08b           Storm_Sewer
Link        C_10a           storm_sewer
Link        C_10b           Storm_Sewer
Link        C_10c           Storm_Sewer
Link        C_11a           Storm_Sewer
Link        C_13a           Storm_Sewer
Link        C_14a           Storm_Sewer
Link        C_15a           Storm_Sewer
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
Link       C_15b            Storm_Sewer
Link       C_16a            Major_System
Link       d_01a            Dummy
Link       d_02a            Dummy
Link       d_02b            Dummy
Link       d_03a            Dummy
Link       d_03b            Dummy
Link       d_03c            Dummy
Link       d_04b            Dummy
Link       d_04d            Dummy
Link       d_05a            Dummy
Link       d_05b            Dummy
Link       d_05c            Dummy
Link       d_06a            Dummy
Link       d_06b            Dummy
Link       d_06c            Dummy
Link       d_07b            Dummy
Link       d_08a            Dummy
Link       d_08b            Dummy
Link       d_08c            Dummy
Link       d_09a            Dummy
Link       d_09b            Dummy
Link       d_10a            Dummy
Link       d_10a1           dummy
Link       d_10a2           dummy
Link       d_11a            Dummy
Link       d_12a            Dummy
Link       d_13a            Dummy
Link       d_14a            Dummy
Link       d_14b            Dummy
Link       d_15a            dummy
Link       d_EC_Out_23rd    dummy
Link       S_02a            Major_System
Link       S_03a            Major_System
Link       S_05a            Major_System
Link       S_05b            Major_System
Link       S_05d            Major_System
Link       S_06a            Major_System
Link       S_06b            Major_System
Link       S_07a            Major_System
Link       S_07b            Major_System
Link       S_07d            Major_System
Link       S_07e            Major_System
Link       S_08a            Major_System
Link       S_08b            Major_System
Link       S_09a            Major_System
Link       S_10a            Major_System
Link       S_10a1           Major_System
Link       S_10b            Major_System
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
Link       S_10c            Major_System
Link       S_10d            Major_System
Link       S_10e            Major_System
Link       S_10f            Major_System
Link       S_10g            Major_System
Link       S_10i            Dummy
Link       S_11a            Major_System
Link       S_13a            Major_System
Link       S_13b2           Major_System
Link       S_14a2           Major_System
Link       S_15a            Major_System
Link       S_15b            Major_System
Link       S_15c            Major_System
Link       S_04a            Major_System
Link       O_10a            orifice

[MAP]
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
EC_Out_23rd      3174521.509        1699077.830
EC_Out_19thAv    3174457.567        1697083.194
E-J-01           3181383.716        1685758.763
E-J-02           3181690.538        1686708.934
E-J-03           3178574.934        1688917.803
E-J-04           3179702.026        1686913.000
E-J-05           3179839.389        1689382.701
E-J-06           3180865.876        1689410.897
E-J-07           3177535.385        1691600.056
E-J-08           3179241.043        1691903.960
E-J-09           3181239.307        1690987.377
E-J-10           3176536.499        1694830.918
E-J-11           3178364.362        1693571.563
E-J-12           3178084.501        1695058.327
E-J-13           3174523.362        1696775.802
E-J-14           3176620.329        1696763.482
E-J-15           3174702.172        1698637.894
E-J-16           3174617.300        1699076.888
J_01a            3181271.416        1685936.409
J_02a            3182594.638        1687816.368
J_03a            3178501.780        1689593.752
J_04a            3179228.492        1687184.457
J_05_07          3178378.880        1690796.429
J_05a            3179629.094        1689505.601
J_06a            3180864.918        1689604.416
J_07a            3178378.880        1690032.680
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

J_07b	3178256.491	1691783.663
J_07c	3177686.786	1691958.317
J_08a	3179152.260	1691856.403
J_08b	3179109.611	1691998.393
J_09a	3180834.384	1690977.968
J_10a	3178587.731	1692428.820
J_10b	3178770.814	1692348.675
J_10c	3178793.264	1692391.228
J_14a	3177008.599	1696919.585
J_15	3175998.600	1697755.205
J_15a	3174525.821	1698972.614
J_17thAv_Out	3174362.115	1696418.297
J_7b	3176715.915	1688684.249
J_AD1	3173538.576	1697378.478
J_AD3	3173644.612	1696024.963
J_AD4	3173531.287	1696813.017
J_AD7	3173909.314	1695285.787
J_AR1	3174257.099	1694121.463
J_AR2	3176061.147	1693891.756
J_EC_Colfax_Out	3176281.246	1695091.821
J_DE1	3170656.900	1697690.347
J_DE2	3171948.041	1695656.957
J_DE3	3171399.213	1694801.912
J_DE4	3170773.226	1694249.812
J_DE5	3170779.463	1693626.073
J_DE6	3170742.039	1692921.247
J_L1	3174784.459	1692597.053
J_L2	3175669.580	1691420.211
J_ST1	3173309.381	1702734.958
J_ST2	3176374.052	1703239.480
J_ST3	3171743.217	1702135.822
J_ST4	3176651.035	1701357.935
J_ST5	3171732.706	1701063.683
J_ST6	3177553.497	1699806.993
J_ST7	3171701.635	1700154.778
J_ST8	3173214.231	1699673.838
J_ST9	3173123.018	1698521.700
J100	3175856.701	1689634.141
J101	3171638.866	1690958.108
J102	3171682.052	1691599.727
J104	3172129.334	1692459.258
J106	3171248.062	1690918.870
J107	3171171.769	1691632.757
J-10a1	3178871.305	1691930.921
J111	3170010.141	1692290.701
J113	3170016.311	1691559.626
J11th	3172376.236	1692784.025
J121	3168726.904	1691920.536
J122	3170282.612	1691251.791

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

J124	3170461.343	1691463.978
J126	3170742.204	1691600.447
J128	3170936.782	1691611.012
J12th	3172525.933	1693389.052
J131	3169390.116	1691130.852
J132	3168908.902	1690137.577
J133	3170059.497	1690208.525
J134	3170827.588	1690223.948
J14	3171351.988	1691978.044
J140	3170673.353	1691198.715
J141	3170898.537	1691405.391
J150	3171881.826	1688711.969
J151	3171444.529	1690091.306
J154	3170952.630	1691496.554
J155	3170793.657	1692089.093
J157	3171324.226	1692462.342
J159	3172203.367	1692576.476
J160	3171703.645	1691775.555
J161	3170185.970	1690739.094
J163	3170876.944	1690745.264
J165	3171577.172	1690334.998
J166	3170941.722	1691123.580
J167	3170746.606	1691501.837
J168	3170963.315	1691783.707
J169	3171373.581	1690918.007
J16th-us	3173397.302	1695711.821
J170	3171246.021	1691453.849
J171	3171657.374	1691143.191
J17th	3174101.141	1696418.297
J19th-ds	3174272.220	1697085.197
J19th-us	3174241.978	1696737.412
J200	3174812.838	1684923.600
J202	3174005.358	1687159.698
J203	3173936.316	1687606.796
J204	3173749.139	1687866.242
J230	3169578.765	1687307.093
J231	3169569.447	1687158.011
J232	3170010.141	1688518.106
J233	3168240.099	1687118.285
J234	3170187.798	1688400.880
J235	3170328.523	1687867.120
J23rd	3174255.876	1699237.221
J24	3169562.859	1689273.859
J242	3169732.518	1689230.673
J245	3171092.873	1689449.687
J247	3171348.904	1689684.125
J248	3171429.106	1689751.988
J25	3170926.299	1689289.283
J251	3170947.892	1689751.988

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

J252	3170602.405	1688986.982
J253	3171426.021	1689866.123
J254	3171429.106	1689958.664
J26th	3174249.639	1700197.780
J29th	3174904.565	1701632.380
J31	3167150.264	1685083.819
J311	3167787.145	1685828.149
J314	3167146.763	1685668.834
J315	3167715.298	1686655.960
J32	3170356.172	1685746.608
J33	3171078.245	1685568.031
J33rd	3175149.244	1703027.785
J34	3173228.936	1687874.006
J341	3170657.370	1686107.712
J343	3172398.164	1687478.031
J345	3173228.936	1688145.754
J346	3173096.944	1688316.567
J347	3172871.781	1688619.372
J348	3172739.790	1688829.006
J35	3166924.972	1686296.721
J350	3168514.994	1686652.836
J351	3167709.319	1686248.518
J352	3168830.500	1686652.836
J353	3174021.329	1688641.125
J354	3172935.984	1688889.590
J355	3167315.449	1685884.378
J36	3169302.627	1687124.371
J361	3168761.776	1686362.321
J362	3170930.725	1687423.681
J37	3171060.030	1687748.485
J371	3170644.359	1687552.980
J372	3171045.016	1688372.927
J374	3171482.942	1688596.550
J38	3172343.814	1687198.519
J390	3171147.509	1688792.219
J391	3170644.359	1688512.691
J392	3171697.631	1688145.214
J393	3171558.663	1689202.911
J394	3171250.003	1688754.949
J41	3171892.088	1689585.521
J42	3173997.594	1688091.405
J43	3174871.463	1688584.449
J44	3173444.752	1688937.040
J51	3172975.241	1690559.216
J52	3171943.693	1690479.118
J53	3172419.296	1690757.602
J54	3173006.063	1690004.426
J56	3172840.397	1690555.363
J61	3174871.637	1691083.479

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

J62	3175007.364	1691709.674
J63	3173696.364	1691558.524
J64	3172585.534	1691673.130
J65	3172157.054	1692352.276
J67	3174402.762	1691688.081
J68	3173065.185	1692165.261
J6th_Pipe	3172308.592	1689796.409
J74	3173927.691	1692295.707
J7b	3176080.853	1689820.134
JL2	3175090.696	1690751.809
JMLK	3175060.500	1702237.407
JMontview-ds	3174262.114	1697958.555
JMontview-us	3174393.748	1697665.173
J_16thAve_E	3174326.556	1695736.397
JSandCreek	3175194.607	1705114.495
DIV344	3172545.684	1687571.202
DIV342	3170762.820	1686245.117
DIV135	3169784.958	1691047.565
DIV389	3171113.818	1692471.002
DIV397	3170978.739	1690769.941
DIV105	3172095.068	1689796.409
DIV376	3171849.910	1688860.593
DIV70	3174304.051	1691811.470
DIV395	3170984.908	1691623.302
DIV1	3172408.893	1690204.766
DIV164	3171049.687	1690806.958
DIV125	3170535.300	1691534.413
DIV316	3168593.090	1686655.960
DIV396	3170751.009	1691399.705
DIV71	3174788.350	1691194.528
DIV399	3175674.894	1689817.498
DIV162	3170466.678	1690680.485
DIV136	3169710.925	1690621.875
DIV123	3170099.598	1691485.593
J13th-DIV	3172719.293	1693975.367
J14th-DIV	3173058.297	1694509.277
JColfax-DIV	3173101.958	1695064.405
J16th-DIV	3174006.888	1695767.840
D_02a	3181545.309	1686815.819
D_03b	3178378.880	1689848.330
D_05-07	3179108.136	1690800.495
D_05a	3179220.387	1687205.087
D_05b	3179514.388	1689597.093
D_05c	3179511.150	1689852.184
D_05d	3179515.514	1689750.342
D_06a	3180863.552	1689700.875
D_06b	3180859.456	1689811.484
D_07a	3178375.954	1691732.808
D_08a	3180828.541	1690987.804

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
D_08b            3179086.534        1691897.386
D_10a            3178190.607        1693124.289
D_10a1           3179013.427        1691925.179
D_10b            3177506.187        1693480.664
D_10c            3177341.037        1695074.458
D_10d            3176685.570        1695087.272
D_11a            3178362.251        1693755.318
D_12a            3177993.794        1695108.374
D_13a            3176709.038        1695756.424
D_14a            3177004.000        1697100.082
D_15a            3174530.826        1697704.714
D_03a            3178387.658        1689757.618
D_12_14          3177323.333        1695759.004
D_10_13          3176022.859        1696423.569
J72              3173768.342        1692354.378
J120             3169095.103        1691833.239
J127             3170790.629        1691601.327
J129             3171058.751        1691620.951
J158             3171203.922        1692582.646
J73              3172904.425        1692314.718
J236             3170318.244        1688531.326
J244             3171012.671        1689369.485
J241             3170062.581        1688678.511
J243             3169855.906        1689236.843
J246             3171157.652        1689508.297
J375             3171626.786        1688641.125
J330             3170884.140        1685909.657
J320             3170607.225        1688082.717
J319             3169824.412        1687497.074
J321             3170356.998        1685915.985
J373             3171184.779        1688428.833
J57              3172528.327        1690039.100
J250             3171037.348        1689742.734
J317             3168874.233        1686780.913
J318             3169395.803        1687189.594
J322             3168883.335        1687459.804
J363             3171326.700        1687501.323
D_AR2            3175710.036        1695767.840
DIV72            3173768.342        1692488.300
D_04a            3181048.480        1686498.275
D_04b            3179638.775        1687031.540
RES30            3167421.659        1686068.683
RES201           3173966.537        1686243.519
RES130           3171786.932        1692058.246
RES156           3170880.028        1692235.176
HavanaPnd        3178969.825        1692186.983
1st/HavanaPnd    3179472.003        1686941.310

[VERTICES]
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
C_05a            3179202.673        1687395.185
C_05a            3179474.407        1688139.203
C_06a            3180789.812        1689774.615
C_07a            3179013.848        1691738.869
C_08a            3180499.807        1691251.254
C_08a            3180410.327        1691339.549
C_08a            3180052.999        1691511.991
C_08a            3179533.304        1691650.656
C_10a            3178638.063        1692446.141
C_10a            3178219.026        1693123.966
C_10b            3178204.984        1693171.581
C_10b            3178070.600        1693354.343
C_10b            3177963.093        1693418.847
C_10b            3177533.064        1693515.604
C_10c            3177485.697        1693534.317
C_10c            3177385.019        1693649.377
C_10c            3177367.041        1694278.615
C_10c            3177298.724        1694433.228
C_10c            3177172.876        1694544.692
C_10c            3176788.142        1694681.327
C_10c            3176744.995        1694738.857
C_11a            3178014.263        1693769.232
C_13a            3176145.272        1696219.002
C_13a            3176070.309        1696434.113
C_13a            3176062.401        1697069.414
C_14a            3177360.707        1695139.372
C_14a            3177356.773        1696412.077
C_14a            3177028.270        1696408.142
C_15a            3176340.001        1697072.030
C_15a            3176310.691        1697687.533
C105             3171846.398        1689804.085
C105-OVER        3171855.182        1689896.581
C120_Overflow    3169643.887        1691810.991
C123-OVER        3170290.850        1691519.525
C125-OVER        3170597.811        1691638.306
C127_Overflow    3170863.820        1691684.919
C129_Overflow    3171112.839        1691670.308
C135-OVER        3170087.259        1690967.362
C136             3169982.379        1690618.791
C136-OVER        3169966.955        1690655.807
C14th-OVER       3172721.477        1694315.918
C158_Overflow    3171866.470        1692663.957
C162-OVER        3170642.506        1690773.026
C164-OVER        3171084.576        1690951.567
C16th-OVER       3172958.498        1695370.037
C17th-OVER       3174255.876        1696031.201
C236_Overflow    3170752.103        1688794.835
```

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

C241_Overflow	3169955.112	1689061.177
C243_Overflow	3170418.668	1689355.982
C244_Overflow	3171004.212	1689480.004
C246_Overflow	3171246.156	1689677.218
C250_Overflow	3171196.249	1690045.332
C316-OVER	3168699.299	1686693.446
C319_Overflow	3169922.244	1687751.971
C320_Overflow	3170796.530	1688355.431
C321_Overflow	3170433.793	1686137.964
C330_Overflow	3170884.156	1686106.582
C342-OVER	3171171.416	1686864.657
C344-OVER	3172607.798	1687835.185
C373_Overflow	3171273.737	1688574.678
C375_Overflow	3171740.187	1688755.736
C376-OVER	3171834.094	1689242.828
C57_Overflow	3172177.409	1690105.872
C70-OVER	3174211.510	1692119.940
C71-OVER	3174717.402	1691465.983
C72	3173335.213	1692354.908
C73_Overlfow	3172565.113	1692506.003
CAR2	3175746.719	1694552.054
CColf-OVER	3172839.988	1694852.333
S_02a	3181468.641	1686779.095
S_02a	3181528.949	1686446.584
S_02a	3181541.989	1686348.787
S_02a	3181533.839	1686281.959
S_02a	3181512.650	1686234.690
S_02a	3181436.042	1686068.435
S_03a	3177069.391	1689978.300
S_05_07b	3179132.743	1691195.476
S_05_07b	3179326.084	1691652.464
S_05a	3179234.171	1687384.206
S_05a	3179303.252	1687583.772
S_05a	3179514.331	1688132.579
S_05a	3179563.548	1689187.428
S_05b	3179610.082	1689676.143
S_05c	3179115.166	1690193.617
S_05d	3178742.971	1689856.549
S_05d	3178558.754	1689802.156
S_06a	3182530.569	1687868.314
S_06a	3181468.453	1688716.080
S_06a	3181734.774	1689095.066
S_06a	3181745.698	1689613.975
S_06b	3180209.453	1689905.707
S_07e	3177671.816	1691781.168
S_08a	3180416.373	1691342.352
S_08a	3180060.941	1691530.777
S_08a	3179538.644	1691669.844
S_09a	3180891.830	1690539.534

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

S_09a	3181082.469	1690752.104
S_10a1	3178772.450	1691994.867
S_10a1	3178659.181	1692211.683
S_10c	3177680.886	1692440.532
S_10c	3177791.081	1692445.908
S_10c	3177796.456	1692838.309
S_10c	3177858.273	1692932.377
S_10d	3178049.098	1693322.091
S_10d	3177952.342	1693383.907
S_10e	3177360.510	1693638.048
S_10e	3177332.412	1694260.218
S_10e	3177240.090	1694412.750
S_10e	3177143.754	1694509.086
S_10e	3176774.467	1694649.576
S_10e	3176718.271	1694733.870
S_10f	3177899.689	1695066.590
S_11a	3178038.405	1693764.584
S_11a	3178018.645	1695050.566
S_13a	3176683.266	1695627.055
S_13a	3176683.665	1695634.637
S_13a	3176690.773	1695671.104
S_13b1	3176102.757	1696187.510
S_13b2	3176005.195	1697052.949
S_14a2	3177325.300	1696382.570
S_14a2	3176975.159	1696374.702
S_15	3175686.129	1697752.534
S_15	3175683.459	1698393.499
S_15	3175341.610	1698412.194
S_15	3175333.598	1699061.171
S_15a	3176351.603	1697097.283
S_15a	3176340.448	1697725.827
S_15b	3174604.636	1698350.559
S_Beeler	3174018.463	1692856.587
S_Beeler	3174022.231	1694003.333
C317_Overflow	3169000.267	1687073.398
C318_Overflow	3169453.276	1687333.709
C322_Overflow	3169172.681	1687404.703
C363_Overflow	3171868.299	1687641.707
C_EC_Colfax_Out	3176019.223	1695138.985
C_EC_Colfax_Out	3176034.944	1695767.840
C72_Overflow	3173307.491	1692407.553
C_04b	3180977.006	1686912.924
C_04b	3180859.404	1686989.973
C_04b	3179908.449	1686981.863
S_04a	3181064.194	1686264.084
S_04b	3181039.102	1686912.924
S_04b	3180905.279	1687036.609
S_04b	3180069.898	1687018.360
S_04b	3179875.246	1687016.333

Table B.3 – SWMM Input and Reports for 100-year (Future) Event (Continued)

```
S_04b            3179674.511        1687135.963
S_04b            3179441.335        1687135.963


[BACKDROP]
FILE       "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\Background\Westerly_Creek_SWMM_Background.jpg"
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
```

Table B.4 – SWMM Output Reports for 2-year (Future) Event

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

Lower Westerly Creek OSP
Baseline Hydrology - with 1st and Havana Pond (2-year)
Bohannan Huston

WARNING 08: elevation drop exceeds length for Conduit C_JL2
WARNING 04: minimum elevation drop used for Conduit C1
WARNING 04: minimum elevation drop used for Conduit C101
WARNING 04: minimum elevation drop used for Conduit C102
WARNING 04: minimum elevation drop used for Conduit C104
WARNING 04: minimum elevation drop used for Conduit C106
WARNING 04: minimum elevation drop used for Conduit C107
WARNING 04: minimum elevation drop used for Conduit C111
WARNING 04: minimum elevation drop used for Conduit C113
WARNING 04: minimum elevation drop used for Conduit C121
WARNING 04: minimum elevation drop used for Conduit C122
WARNING 04: minimum elevation drop used for Conduit C124
WARNING 04: minimum elevation drop used for Conduit C126
WARNING 04: minimum elevation drop used for Conduit C128
WARNING 04: minimum elevation drop used for Conduit C131
WARNING 04: minimum elevation drop used for Conduit C132
WARNING 04: minimum elevation drop used for Conduit C133
WARNING 04: minimum elevation drop used for Conduit C134
WARNING 04: minimum elevation drop used for Conduit C14
WARNING 04: minimum elevation drop used for Conduit C140
WARNING 04: minimum elevation drop used for Conduit C150
WARNING 04: minimum elevation drop used for Conduit C151
WARNING 04: minimum elevation drop used for Conduit C154
WARNING 04: minimum elevation drop used for Conduit C155
WARNING 04: minimum elevation drop used for Conduit C159
WARNING 04: minimum elevation drop used for Conduit C160
WARNING 04: minimum elevation drop used for Conduit C161
WARNING 04: minimum elevation drop used for Conduit C163
WARNING 04: minimum elevation drop used for Conduit C16th2
WARNING 04: minimum elevation drop used for Conduit C19th2
WARNING 08: elevation drop exceeds length for Conduit C20
WARNING 04: minimum elevation drop used for Conduit C200
WARNING 04: minimum elevation drop used for Conduit C203
WARNING 04: minimum elevation drop used for Conduit C230
WARNING 04: minimum elevation drop used for Conduit C231
WARNING 04: minimum elevation drop used for Conduit C232
WARNING 04: minimum elevation drop used for Conduit C233
WARNING 04: minimum elevation drop used for Conduit C234
WARNING 04: minimum elevation drop used for Conduit C235
WARNING 04: minimum elevation drop used for Conduit C24
WARNING 04: minimum elevation drop used for Conduit C242
WARNING 04: minimum elevation drop used for Conduit C245
```

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

```
WARNING 04: minimum elevation drop used for Conduit C247
WARNING 04: minimum elevation drop used for Conduit C25
WARNING 04: minimum elevation drop used for Conduit C251
WARNING 04: minimum elevation drop used for Conduit C252
WARNING 04: minimum elevation drop used for Conduit C253
WARNING 04: minimum elevation drop used for Conduit C31
WARNING 04: minimum elevation drop used for Conduit C311
WARNING 04: minimum elevation drop used for Conduit C32
WARNING 04: minimum elevation drop used for Conduit C33
WARNING 04: minimum elevation drop used for Conduit C34
WARNING 04: minimum elevation drop used for Conduit C341
WARNING 04: minimum elevation drop used for Conduit C343
WARNING 04: minimum elevation drop used for Conduit C345
WARNING 04: minimum elevation drop used for Conduit C347
WARNING 04: minimum elevation drop used for Conduit C35
WARNING 04: minimum elevation drop used for Conduit C350
WARNING 04: minimum elevation drop used for Conduit C351
WARNING 04: minimum elevation drop used for Conduit C352
WARNING 04: minimum elevation drop used for Conduit C355
WARNING 04: minimum elevation drop used for Conduit C36
WARNING 04: minimum elevation drop used for Conduit C361
WARNING 04: minimum elevation drop used for Conduit C362
WARNING 04: minimum elevation drop used for Conduit C37
WARNING 04: minimum elevation drop used for Conduit C371
WARNING 04: minimum elevation drop used for Conduit C372
WARNING 04: minimum elevation drop used for Conduit C374
WARNING 04: minimum elevation drop used for Conduit C38
WARNING 04: minimum elevation drop used for Conduit C389
WARNING 04: minimum elevation drop used for Conduit C390
WARNING 04: minimum elevation drop used for Conduit C391
WARNING 04: minimum elevation drop used for Conduit C392
WARNING 04: minimum elevation drop used for Conduit C393
WARNING 04: minimum elevation drop used for Conduit C395
WARNING 04: minimum elevation drop used for Conduit C395-DIV
WARNING 04: minimum elevation drop used for Conduit C396
WARNING 08: elevation drop exceeds length for Conduit C396-DIV
WARNING 04: minimum elevation drop used for Conduit C397
WARNING 08: elevation drop exceeds length for Conduit C397-DIV
WARNING 04: minimum elevation drop used for Conduit C41
WARNING 04: minimum elevation drop used for Conduit C42
WARNING 04: minimum elevation drop used for Conduit C43
WARNING 04: minimum elevation drop used for Conduit C44
WARNING 04: minimum elevation drop used for Conduit C51
WARNING 04: minimum elevation drop used for Conduit C52
WARNING 04: minimum elevation drop used for Conduit C53
WARNING 04: minimum elevation drop used for Conduit C54
WARNING 04: minimum elevation drop used for Conduit C61
WARNING 04: minimum elevation drop used for Conduit C62
WARNING 04: minimum elevation drop used for Conduit C64
```

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

```
WARNING 04: minimum elevation drop used for Conduit C65
WARNING 04: minimum elevation drop used for Conduit C67
WARNING 04: minimum elevation drop used for Conduit C68
WARNING 04: minimum elevation drop used for Conduit CAD1
WARNING 04: minimum elevation drop used for Conduit CAD3
WARNING 04: minimum elevation drop used for Conduit CAD4
WARNING 04: minimum elevation drop used for Conduit CAD7
WARNING 04: minimum elevation drop used for Conduit CAR1
WARNING 08: elevation drop exceeds length for Conduit CAR2
WARNING 04: minimum elevation drop used for Conduit CDE1
WARNING 04: minimum elevation drop used for Conduit CDE2
WARNING 04: minimum elevation drop used for Conduit CDE3
WARNING 04: minimum elevation drop used for Conduit CDE4
WARNING 04: minimum elevation drop used for Conduit CDE5
WARNING 04: minimum elevation drop used for Conduit CDE6
WARNING 04: minimum elevation drop used for Conduit CJL2
WARNING 04: minimum elevation drop used for Conduit CMontview2
WARNING 04: minimum elevation drop used for Conduit CST1
WARNING 04: minimum elevation drop used for Conduit CST2
WARNING 04: minimum elevation drop used for Conduit CST3
WARNING 04: minimum elevation drop used for Conduit CST4
WARNING 04: minimum elevation drop used for Conduit CST5
WARNING 04: minimum elevation drop used for Conduit CST6
WARNING 04: minimum elevation drop used for Conduit CST8
WARNING 04: minimum elevation drop used for Conduit CST9
WARNING 04: minimum elevation drop used for Conduit d_03c
WARNING 08: elevation drop exceeds length for Conduit d_04d
WARNING 04: minimum elevation drop used for Conduit d_05a
WARNING 04: minimum elevation drop used for Conduit d_05b
WARNING 04: minimum elevation drop used for Conduit d_05c
WARNING 04: minimum elevation drop used for Conduit d_06a
WARNING 04: minimum elevation drop used for Conduit d_06b
WARNING 04: minimum elevation drop used for Conduit d_06c
WARNING 04: minimum elevation drop used for Conduit d_07b
WARNING 04: minimum elevation drop used for Conduit d_08a
WARNING 04: minimum elevation drop used for Conduit d_08b
WARNING 04: minimum elevation drop used for Conduit d_09a
WARNING 04: minimum elevation drop used for Conduit d_09b
WARNING 04: minimum elevation drop used for Conduit d_10a
WARNING 04: minimum elevation drop used for Conduit d_10a2
WARNING 04: minimum elevation drop used for Conduit d_11a
WARNING 04: minimum elevation drop used for Conduit d_12a
WARNING 04: minimum elevation drop used for Conduit d_14a
WARNING 04: minimum elevation drop used for Conduit d_14b
WARNING 04: minimum elevation drop used for Conduit d_15a
WARNING 08: elevation drop exceeds length for Conduit d_17thAv
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_23rd
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_19thAv
WARNING 08: elevation drop exceeds length for Conduit d_16thAve_E
```

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

```
WARNING 10: crest elevation is below downstream invert for regulator Link OUT04
WARNING 02: maximum depth increased for Node EC_Out_23rd
WARNING 02: maximum depth increased for Node E-J-16
WARNING 02: maximum depth increased for Node J_01a
WARNING 02: maximum depth increased for Node J_02a
WARNING 02: maximum depth increased for Node J_04a
WARNING 02: maximum depth increased for Node J_05a
WARNING 02: maximum depth increased for Node J_06a
WARNING 02: maximum depth increased for Node J_07a
WARNING 02: maximum depth increased for Node J_07b
WARNING 02: maximum depth increased for Node J_07c
WARNING 02: maximum depth increased for Node J_08a
WARNING 02: maximum depth increased for Node J_08b
WARNING 02: maximum depth increased for Node J_09a
WARNING 02: maximum depth increased for Node J_10a
WARNING 02: maximum depth increased for Node J_10b
WARNING 02: maximum depth increased for Node J_14a
WARNING 02: maximum depth increased for Node J_15a
WARNING 02: maximum depth increased for Node J_EC_Colfax_Out
WARNING 02: maximum depth increased for Node J-10a1
WARNING 02: maximum depth increased for Node D_02a
WARNING 02: maximum depth increased for Node D_03b
WARNING 02: maximum depth increased for Node D_05a
WARNING 02: maximum depth increased for Node D_05b
WARNING 02: maximum depth increased for Node D_05c
WARNING 02: maximum depth increased for Node D_05d
WARNING 02: maximum depth increased for Node D_06a
WARNING 02: maximum depth increased for Node D_06b
WARNING 02: maximum depth increased for Node D_07a
WARNING 02: maximum depth increased for Node D_08a
WARNING 02: maximum depth increased for Node D_08b
WARNING 02: maximum depth increased for Node D_10a
WARNING 02: maximum depth increased for Node D_10a1
WARNING 02: maximum depth increased for Node D_10b
WARNING 02: maximum depth increased for Node D_10c
WARNING 02: maximum depth increased for Node D_10d
WARNING 02: maximum depth increased for Node D_11a
WARNING 02: maximum depth increased for Node D_12a
WARNING 02: maximum depth increased for Node D_13a
WARNING 02: maximum depth increased for Node D_14a
WARNING 02: maximum depth increased for Node D_15a
WARNING 02: maximum depth increased for Node D_03a
WARNING 02: maximum depth increased for Node D_04a

****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****************************************************
```

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

```
****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/25/2005 12:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 300.00 sec


*************************        Volume         Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........       820.358        267.326
External Outflow .........       821.810        267.799
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....        -0.177


******************************
Highest Flow Instability Indexes
******************************
All links are stable.


************************
Routing Time Step Summary
************************
Minimum Time Step           :   300.00 sec
Average Time Step           :   300.00 sec
```

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

```
Maximum Time Step           :   300.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00
Percent Not Converging      :     0.00


******************
Node Depth Summary
******************
```

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Feet
EC_Out_23rd	JUNCTION	0.00	0.40	5295.40	0	00:40	0.40
EC_Out_19thAv	JUNCTION	0.01	1.70	5311.70	0	01:15	1.70
E-J-01	JUNCTION	0.00	0.00	5467.00	0	00:00	0.00
E-J-02	JUNCTION	0.00	0.00	5463.00	0	00:00	0.00
E-J-03	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-04	JUNCTION	0.00	0.00	5449.20	0	00:00	0.00
E-J-05	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-06	JUNCTION	0.00	0.00	5421.20	0	00:00	0.00
E-J-07	JUNCTION	0.00	0.00	5387.00	0	00:00	0.00
E-J-08	JUNCTION	0.00	0.00	5389.00	0	00:00	0.00
E-J-09	JUNCTION	0.00	0.00	5409.00	0	00:00	0.00
E-J-10	JUNCTION	0.00	0.00	5344.00	0	00:00	0.00
E-J-11	JUNCTION	0.00	0.00	5371.00	0	00:00	0.00
E-J-12	JUNCTION	0.00	0.00	5357.00	0	00:00	0.00
E-J-13	JUNCTION	0.00	0.00	5315.00	0	00:00	0.00
E-J-14	JUNCTION	0.00	0.00	5336.00	0	00:00	0.00
E-J-15	JUNCTION	0.00	0.00	5303.00	0	00:00	0.00
E-J-16	JUNCTION	0.00	0.40	5302.40	0	00:40	0.40
J_01a	JUNCTION	5.00	5.00	5463.00	0	00:05	5.00
J_02a	JUNCTION	0.00	0.60	5460.60	0	00:40	0.60
J_03a	JUNCTION	0.00	0.00	5411.00	0	00:00	0.00
J_04a	JUNCTION	0.00	1.39	5438.39	0	00:45	1.39
J_05_07	JUNCTION	0.00	0.44	5396.44	0	01:05	0.44
J_05a	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
J_06a	JUNCTION	0.00	0.58	5421.78	0	00:50	0.58
J_07a	JUNCTION	0.00	0.00	5401.00	0	00:00	0.00
J_07b	JUNCTION	0.00	0.00	5393.00	0	00:00	0.00
J_07c	JUNCTION	0.00	0.28	5387.28	0	00:50	0.28
J_08a	JUNCTION	0.00	1.20	5390.20	0	00:50	1.20
J_08b	JUNCTION	0.01	2.06	5390.96	0	01:15	2.06
J_09a	JUNCTION	0.00	0.13	5409.13	0	01:05	0.13
J_10a	JUNCTION	0.00	0.00	5381.00	0	00:00	0.00
J_10b	JUNCTION	0.00	0.00	5382.50	0	00:00	0.00
J_10c	JUNCTION	0.01	1.38	5377.38	0	02:05	1.38

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J_14a	JUNCTION	0.01	1.98	5337.98	0	00:55	1.98
J_15	JUNCTION	0.00	0.00	5323.00	0	00:00	0.00
J_15a	JUNCTION	0.00	1.11	5304.11	0	01:00	1.11
J_17thAv_Out	JUNCTION	0.00	0.00	5322.00	0	00:00	0.00
J_7b	JUNCTION	0.00	0.00	5384.00	0	00:00	0.00
J_AD1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_AD3	JUNCTION	0.00	0.00	969.20	0	00:00	0.00
J_AD4	JUNCTION	0.00	0.00	966.60	0	00:00	0.00
J_AD7	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_AR1	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_AR2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_EC_Colfax_Out	JUNCTION	0.00	0.28	5343.28	0	00:45	0.28
J_DE1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_DE2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_DE3	JUNCTION	0.00	0.00	980.90	0	00:00	0.00
J_DE4	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_DE5	JUNCTION	0.00	0.00	988.00	0	00:00	0.00
J_DE6	JUNCTION	0.00	0.00	992.00	0	00:00	0.00
J_L1	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J_L2	JUNCTION	0.00	0.00	5374.00	0	00:00	0.00
J_ST1	JUNCTION	0.00	0.00	928.00	0	00:00	0.00
J_ST2	JUNCTION	0.00	0.00	915.00	0	00:00	0.00
J_ST3	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST4	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST5	JUNCTION	0.00	0.00	933.00	0	00:00	0.00
J_ST6	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST7	JUNCTION	0.00	0.76	972.76	0	00:45	0.76
J_ST8	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST9	JUNCTION	0.00	0.00	951.00	0	00:00	0.00
J100	JUNCTION	0.00	0.00	1010.51	0	00:00	0.00
J101	JUNCTION	0.40	3.03	1008.04	0	01:05	3.03
J102	JUNCTION	0.40	3.13	1003.14	0	01:05	3.13
J104	JUNCTION	0.00	0.55	1000.55	0	01:50	0.55
J106	JUNCTION	0.00	1.45	1008.96	0	00:45	1.45
J107	JUNCTION	0.00	1.17	1003.68	0	00:45	1.17
J-10a1	JUNCTION	0.00	0.00	5388.50	0	00:00	0.00
J111	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J113	JUNCTION	0.00	0.75	1009.37	0	00:40	0.75
J11th	JUNCTION	0.28	1.35	1001.35	0	01:10	1.35
J121	JUNCTION	0.00	0.00	1013.87	0	00:00	0.00
J122	JUNCTION	0.00	0.00	1005.87	0	00:00	0.00
J124	JUNCTION	0.00	0.72	1006.58	0	00:45	0.72
J126	JUNCTION	0.00	1.23	1005.82	0	00:45	1.23
J128	JUNCTION	0.00	1.06	1004.72	0	00:45	1.06
J12th	JUNCTION	0.34	1.78	993.78	0	01:15	1.78
J131	JUNCTION	0.00	0.00	1015.92	0	00:00	0.00
J132	JUNCTION	0.00	0.00	1016.26	0	00:00	0.00
J133	JUNCTION	0.00	0.00	1013.76	0	00:00	0.00
J134	JUNCTION	0.00	0.00	1009.26	0	00:00	0.00

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J14	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J140	JUNCTION	0.00	0.00	1005.21	0	00:00	0.00
J141	JUNCTION	0.00	0.58	1005.79	0	00:40	0.58
J150	JUNCTION	0.36	2.25	1015.26	0	00:45	2.25
J151	JUNCTION	0.95	4.00	1012.01	0	00:45	4.00
J154	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J155	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J157	JUNCTION	0.00	0.55	1001.70	0	01:45	0.55
J159	JUNCTION	0.00	0.00	1000.00	0	00:00	0.00
J160	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J161	JUNCTION	0.00	0.95	1014.71	0	00:40	0.95
J163	JUNCTION	0.00	1.41	1010.67	0	00:45	1.41
J165	JUNCTION	0.40	3.03	1011.04	0	01:05	3.03
J166	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J167	JUNCTION	0.00	0.00	1007.09	0	00:00	0.00
J168	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J169	JUNCTION	0.00	0.27	1007.78	0	00:45	0.27
J16th-us	JUNCTION	0.45	2.58	978.58	0	01:00	2.58
J170	JUNCTION	0.00	0.22	1002.73	0	00:45	0.22
J171	JUNCTION	0.40	3.13	1008.14	0	01:05	3.13
J17th	JUNCTION	0.48	3.30	972.50	0	01:05	3.30
J19th-ds	JUNCTION	0.51	3.82	970.42	0	01:05	3.82
J19th-us	JUNCTION	0.48	3.30	969.90	0	01:05	3.30
J200	JUNCTION	0.00	0.00	1031.14	0	00:00	0.00
J202	JUNCTION	0.73	2.03	1033.17	0	11:30	2.03
J203	JUNCTION	0.73	2.03	1027.77	0	11:30	2.03
J204	JUNCTION	0.28	0.81	1026.54	0	11:30	0.81
J230	JUNCTION	0.01	1.60	1024.80	0	00:40	1.60
J231	JUNCTION	0.00	0.00	1023.20	0	00:00	0.00
J232	JUNCTION	0.00	0.00	1024.21	0	00:00	0.00
J233	JUNCTION	0.00	0.00	1025.58	0	00:00	0.00
J234	JUNCTION	0.00	0.00	1022.41	0	00:00	0.00
J235	JUNCTION	0.01	1.92	1021.53	0	00:45	1.92
J23rd	JUNCTION	0.37	2.78	953.78	0	01:10	2.78
J24	JUNCTION	0.00	0.00	1022.33	0	00:00	0.00
J242	JUNCTION	0.01	1.70	1024.03	0	00:45	1.70
J245	JUNCTION	0.01	2.06	1018.26	0	00:45	2.06
J247	JUNCTION	0.01	2.35	1017.63	0	00:45	2.35
J248	JUNCTION	0.00	1.38	1016.66	0	00:45	1.38
J25	JUNCTION	0.01	1.98	1018.91	0	00:45	1.98
J251	JUNCTION	0.00	0.00	1011.21	0	00:00	0.00
J252	JUNCTION	0.00	0.00	1016.93	0	00:00	0.00
J253	JUNCTION	0.00	1.38	1012.42	0	00:45	1.38
J254	JUNCTION	0.00	1.59	1012.63	0	00:45	1.59
J26th	JUNCTION	0.37	2.77	948.77	0	01:15	2.77
J29th	JUNCTION	0.45	4.19	937.19	0	01:25	4.19
J31	JUNCTION	0.00	0.00	1039.11	0	00:00	0.00
J311	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J314	JUNCTION	0.00	1.21	1040.31	0	00:40	1.21

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J315	JUNCTION	0.01	1.04	1037.74	0	02:05	1.04
J32	JUNCTION	0.00	0.00	1037.25	0	00:00	0.00
J33	JUNCTION	0.00	0.00	1036.79	0	00:00	0.00
J33rd	JUNCTION	0.50	4.62	932.62	0	01:30	4.62
J34	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J341	JUNCTION	0.01	1.51	1036.50	0	00:50	1.51
J343	JUNCTION	0.01	1.97	1026.20	0	00:55	1.97
J345	JUNCTION	0.28	2.06	1020.30	0	00:55	2.06
J346	JUNCTION	0.49	1.71	1019.94	0	01:45	1.71
J347	JUNCTION	0.49	1.70	1017.84	0	01:50	1.70
J348	JUNCTION	0.36	1.32	1017.46	0	01:50	1.32
J35	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J350	JUNCTION	0.01	1.04	1033.38	0	02:10	1.04
J351	JUNCTION	0.00	0.00	1036.69	0	00:00	0.00
J352	JUNCTION	0.01	0.97	1031.42	0	02:10	0.97
J353	JUNCTION	0.00	0.62	1023.35	0	00:45	0.62
J354	JUNCTION	0.00	0.44	1013.55	0	00:55	0.44
J355	JUNCTION	0.00	1.19	1037.90	0	00:45	1.19
J36	JUNCTION	0.01	1.13	1024.93	0	00:45	1.13
J361	JUNCTION	0.00	0.00	1030.45	0	00:00	0.00
J362	JUNCTION	0.00	0.00	1027.23	0	00:00	0.00
J37	JUNCTION	0.00	0.00	1016.81	0	00:00	0.00
J371	JUNCTION	0.00	0.00	1019.61	0	00:00	0.00
J372	JUNCTION	0.01	2.06	1018.87	0	00:45	2.06
J374	JUNCTION	0.01	2.05	1016.86	0	00:45	2.05
J38	JUNCTION	0.00	0.00	1024.23	0	00:00	0.00
J390	JUNCTION	0.00	1.06	1017.27	0	00:40	1.06
J391	JUNCTION	0.00	0.00	1016.21	0	00:00	0.00
J392	JUNCTION	0.00	0.00	1013.01	0	00:00	0.00
J393	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J394	JUNCTION	0.00	0.96	1017.17	0	00:40	0.96
J41	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J42	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J43	JUNCTION	0.00	0.00	1022.74	0	00:00	0.00
J44	JUNCTION	0.00	0.00	1013.11	0	00:00	0.00
J51	JUNCTION	0.00	0.00	1013.61	0	00:00	0.00
J52	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J53	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J54	JUNCTION	0.00	0.00	1011.61	0	00:00	0.00
J56	JUNCTION	0.00	0.90	1014.51	0	00:40	0.90
J61	JUNCTION	0.00	0.00	1013.85	0	00:00	0.00
J62	JUNCTION	0.00	0.00	1009.85	0	00:00	0.00
J63	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J64	JUNCTION	0.00	0.00	1000.00	0	00:00	0.00
J65	JUNCTION	0.01	4.00	1004.00	0	00:35	4.00
J67	JUNCTION	0.01	2.50	1012.35	0	00:30	2.50
J68	JUNCTION	0.01	3.50	1006.90	0	00:40	3.50
J6th_Pipe	JUNCTION	0.04	3.81	5376.26	0	00:55	3.81
J74	JUNCTION	0.01	3.00	1009.60	0	00:35	3.00

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J7b	JUNCTION	0.03	2.95	5387.95	0	00:50	2.95
JL2	JUNCTION	0.00	0.00	5374.00	0	00:00	0.00
JMLK	JUNCTION	0.50	4.63	935.63	0	01:25	4.63
JMontview-ds	JUNCTION	0.34	2.49	967.09	0	01:10	2.49
JMontview-us	JUNCTION	0.51	3.81	968.41	0	01:10	3.81
J_16thAve_E	JUNCTION	0.01	1.83	5336.47	0	01:05	1.83
JSandCreek	OUTFALL	0.36	4.02	919.02	0	01:35	4.02
DIV344	DIVIDER	0.01	2.06	1026.30	0	00:55	2.06
DIV342	DIVIDER	0.01	1.98	1036.97	0	00:50	1.98
DIV135	DIVIDER	0.00	0.42	1016.34	0	00:50	0.42
DIV389	DIVIDER	0.00	0.00	1001.15	0	00:00	0.00
DIV397	DIVIDER	0.00	0.00	1009.26	0	00:00	0.00
DIV105	DIVIDER	0.01	1.78	1012.29	0	00:55	1.78
DIV376	DIVIDER	0.95	4.00	1017.01	0	00:40	4.00
DIV70	DIVIDER	0.01	3.00	1012.85	0	00:30	3.00
DIV395	DIVIDER	0.00	0.00	1003.66	0	00:00	0.00
DIV1	DIVIDER	4.60	4.60	1012.61	0	00:05	4.60
DIV164	DIVIDER	0.00	1.45	1010.71	0	00:45	1.45
DIV125	DIVIDER	0.00	1.23	1007.10	0	00:45	1.23
DIV316	DIVIDER	0.01	0.97	1033.30	0	02:10	0.97
DIV396	DIVIDER	2.88	2.88	1008.09	0	00:05	2.88
DIV71	DIVIDER	0.01	2.50	1016.35	0	00:30	2.50
DIV399	DIVIDER	0.04	3.92	5387.92	0	00:50	3.92
DIV162	DIVIDER	0.00	1.42	1015.18	0	00:40	1.42
DIV136	DIVIDER	0.00	0.95	1017.21	0	00:40	0.95
DIV123	DIVIDER	0.00	0.71	1009.33	0	00:40	0.71
J13th-DIV	DIVIDER	0.34	1.77	989.77	0	01:15	1.77
J14th-DIV	DIVIDER	0.25	1.86	986.16	0	01:00	1.86
JColfax-DIV	DIVIDER	0.45	2.59	983.49	0	01:00	2.59
J16th-DIV	DIVIDER	0.25	2.30	978.30	0	01:00	2.30
D_02a	DIVIDER	0.00	0.79	5460.99	0	00:40	0.79
D_03b	DIVIDER	0.00	0.00	5409.00	0	00:00	0.00
D_05-07	DIVIDER	0.00	0.47	5404.47	0	01:00	0.47
D_05a	DIVIDER	0.03	1.41	5450.41	0	00:45	1.41
D_05b	DIVIDER	0.03	2.26	5417.26	0	00:50	2.26
D_05c	DIVIDER	0.00	0.47	5414.47	0	00:55	0.47
D_05d	DIVIDER	0.04	4.50	5418.50	0	00:45	4.50
D_06a	DIVIDER	0.01	4.00	5425.20	0	00:45	4.00
D_06b	DIVIDER	0.00	0.40	5421.60	0	00:50	0.40
D_07a	DIVIDER	0.00	1.29	5395.29	0	01:20	1.29
D_08a	DIVIDER	0.00	1.21	5410.21	0	00:45	1.21
D_08b	DIVIDER	0.01	2.06	5391.06	0	01:15	2.06
D_10a	DIVIDER	0.01	1.55	5372.55	0	01:30	1.55
D_10a1	DIVIDER	0.00	0.00	5388.50	0	00:00	0.00
D_10b	DIVIDER	0.01	1.55	5366.55	0	01:35	1.55
D_10c	DIVIDER	0.00	0.00	5352.00	0	00:00	0.00
D_10d	DIVIDER	0.00	0.47	5344.47	0	00:45	0.47
D_11a	DIVIDER	0.01	1.17	5372.17	0	00:55	1.17
D_12a	DIVIDER	0.01	2.00	5359.00	0	00:45	2.00

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

D_13a	DIVIDER	0.01	1.70	5342.70	0	01:10	1.70
D_14a	DIVIDER	0.01	2.39	5338.39	0	00:50	2.39
D_15a	DIVIDER	0.01	2.36	5316.36	0	00:55	2.36
D_03a	DIVIDER	0.04	4.50	5413.50	0	00:45	4.50
D_12_14	DIVIDER	0.00	0.00	5349.00	0	00:00	0.00
D_10_13	DIVIDER	0.00	0.00	5331.00	0	00:00	0.00
J72	DIVIDER	0.01	3.50	1010.00	0	00:35	3.50
J120	DIVIDER	0.00	0.76	1014.63	0	00:35	0.76
J127	DIVIDER	0.00	1.06	1005.65	0	00:45	1.06
J129	DIVIDER	0.00	1.17	1004.83	0	00:45	1.17
J158	DIVIDER	0.00	0.00	1000.42	0	00:00	0.00
J73	DIVIDER	0.01	4.00	1007.40	0	00:30	4.00
J236	DIVIDER	0.00	1.06	1023.48	0	00:35	1.06
J244	DIVIDER	0.01	2.06	1018.99	0	00:40	2.06
J241	DIVIDER	0.01	1.70	1025.90	0	00:40	1.70
J243	DIVIDER	0.01	2.00	1024.34	0	00:40	2.00
J246	DIVIDER	0.01	2.34	1018.54	0	00:45	2.34
J375	DIVIDER	0.01	2.25	1017.06	0	00:45	2.25
J330	DIVIDER	0.01	1.32	1038.10	0	00:50	1.32
J320	DIVIDER	0.01	2.05	1021.66	0	00:45	2.05
J319	DIVIDER	0.01	1.93	1025.13	0	00:40	1.93
J321	DIVIDER	0.01	1.52	1038.77	0	00:45	1.52
J373	DIVIDER	0.01	2.05	1018.86	0	00:45	2.05
J57	DIVIDER	0.00	1.49	1013.10	0	00:35	1.49
J250	DIVIDER	0.00	0.87	1012.08	0	00:45	0.87
J317	DIVIDER	0.01	1.10	1031.55	0	00:35	1.10
J318	DIVIDER	0.01	1.61	1025.41	0	00:40	1.61
J322	DIVIDER	0.00	1.13	1026.72	0	00:40	1.13
J363	DIVIDER	0.00	1.04	1028.28	0	00:40	1.04
D_AR2	DIVIDER	0.01	1.83	5339.83	0	01:00	1.83
DIV72	DIVIDER	0.00	0.50	1006.95	0	00:45	0.50
D_04a	DIVIDER	0.00	1.66	5458.69	0	00:40	1.66
D_04b	DIVIDER	0.00	1.63	5441.73	0	00:45	1.63
RES30	STORAGE	0.01	2.07	1038.77	0	02:05	2.07
RES201	STORAGE	103.61	597.62	1628.77	0	11:30	597.62
RES130	STORAGE	4.10	43.92	1043.93	0	03:50	43.92
RES156	STORAGE	0.00	0.26	1001.42	0	01:45	0.26
HavanaPnd	STORAGE	0.02	3.76	5379.76	0	02:05	3.76
1st/HavanaPnd	STORAGE	0.39	6.03	5442.09	0	03:00	6.03

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Node Inflow Summary
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	Maximum Lateral Inflow	Maximum Total Inflow	Time of Max Occurrence	Lateral Inflow Volume	Total Inflow Volume	Flow Balance Error

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

Node	Type	CFS	CFS	days	hr:min	10^6 gal	10^6 gal	Percent	
EC_Out_23rd	JUNCTION	0.00	135.56	0	00:55	0	5.52	0.000	
EC_Out_19thAv	JUNCTION	0.00	55.83	0	01:10	0	3.79	0.000	
E-J-01	JUNCTION	48.60	48.60	0	00:35	0.945	0.945	0.000	
E-J-02	JUNCTION	74.45	74.45	0	00:40	1.85	1.85	0.000	
E-J-03	JUNCTION	41.18	41.18	0	00:40	1.13	1.13	0.000	
E-J-04	JUNCTION	17.77	17.77	0	00:45	0.72	0.72	0.000	
E-J-05	JUNCTION	21.96	21.96	0	00:45	0.84	0.84	0.000	
E-J-06	JUNCTION	23.50	23.50	0	00:45	0.864	0.864	0.000	
E-J-07	JUNCTION	8.94	8.94	0	00:50	0.468	0.468	0.000	
E-J-08	JUNCTION	14.06	14.06	0	00:45	0.554	0.554	0.000	
E-J-09	JUNCTION	19.61	19.61	0	00:45	0.666	0.666	0.000	
E-J-10	JUNCTION	27.20	27.20	0	00:45	1.04	1.04	0.000	
E-J-11	JUNCTION	16.63	16.63	0	00:55	0.865	0.865	0.000	
E-J-12	JUNCTION	33.09	33.09	0	00:40	1.01	1.01	0.000	
E-J-13	JUNCTION	20.15	20.15	0	00:50	0.86	0.86	0.000	
E-J-14	JUNCTION	30.52	30.52	0	00:45	1.2	1.2	0.000	
E-J-15	JUNCTION	36.80	36.80	0	00:45	1.27	1.27	0.000	
E-J-16	JUNCTION	35.98	35.98	0	00:40	1.16	1.16	0.000	
J_01a	JUNCTION	0.00	48.72	0	00:35	0	1.15	0.000	
J_02a	JUNCTION	0.00	67.00	0	00:40	0	1.66	0.000	
J_03a	JUNCTION	0.00	41.18	0	00:40	0	1.13	0.000	
J_04a	JUNCTION	0.00	27.60	0	00:45	0	1.87	0.000	
J_05_07	JUNCTION	0.00	12.31	0	01:05	0	0.157	0.000	
J_05a	JUNCTION	0.00	21.96	0	00:45	0	0.84	0.000	
J_06a	JUNCTION	0.00	83.52	0	00:50	0	2.56	0.000	
J_07a	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_07b	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_07c	JUNCTION	0.00	8.94	0	00:50	0	0.468	0.000	
J_08a	JUNCTION	0.00	43.70	0	01:05	0	1.44	0.000	
J_08b	JUNCTION	0.00	48.69	0	01:15	0	1.61	0.000	
J_09a	JUNCTION	0.00	19.61	0	00:45	0	0.682	0.000	
J_10a	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_10b	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_10c	JUNCTION	0.00	16.01	0	02:05	0	1.61	0.000	
J_14a	JUNCTION	0.00	75.35	0	00:50	0	3.07	0.000	
J_15	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_15a	JUNCTION	0.00	105.13	0	00:55	0	4.35	0.000	
J_17thAv_Out	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_7b	JUNCTION	50.43	50.43	0	00:45	1.71	1.71	0.000	
J_AD1	JUNCTION	6.88	6.88	0	00:45	0.257	0.257	0.000	
J_AD3	JUNCTION	4.95	4.95	0	00:40	0.16	0.16	0.000	
J_AD4	JUNCTION	5.90	5.90	0	00:40	0.165	0.165	0.000	
J_AD7	JUNCTION	10.07	10.07	0	00:40	0.269	0.269	0.000	
J_AR1	JUNCTION	49.97	49.97	0	00:40	1.22	1.22	0.000	
J_AR2	JUNCTION	47.28	47.28	0	01:00	2.54	2.54	0.000	
J_EC_Colfax_Out	JUNCTION	0.00	4.62	0	00:45	0	0.176	0.000	
J_DE1	JUNCTION	73.30	73.30	0	00:50	2.99	2.99	0.000	

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J_DE2	JUNCTION	19.16	19.16	0	00:45	0.645	0.645	0.000
J_DE3	JUNCTION	9.12	9.12	0	00:50	0.45	0.45	0.000
J_DE4	JUNCTION	9.58	9.58	0	00:55	0.506	0.506	0.000
J_DE5	JUNCTION	17.29	17.29	0	00:50	0.827	0.827	0.000
J_DE6	JUNCTION	30.93	30.93	0	00:45	1.17	1.17	0.000
J_L1	JUNCTION	9.25	9.25	0	00:35	0.21	0.21	0.000
J_L2	JUNCTION	3.54	3.54	0	00:45	0.153	0.153	0.000
J_ST1	JUNCTION	2.69	2.69	0	01:15	0.242	0.242	0.000
J_ST2	JUNCTION	16.76	16.76	0	00:50	0.753	0.753	0.000
J_ST3	JUNCTION	25.16	25.16	0	00:55	1.33	1.33	0.000
J_ST4	JUNCTION	83.57	83.57	0	00:45	2.62	2.62	0.000
J_ST5	JUNCTION	61.22	61.22	0	00:55	3.08	3.08	0.000
J_ST6	JUNCTION	15.26	15.26	0	00:55	0.801	0.801	0.000
J_ST7	JUNCTION	67.28	67.28	0	00:45	2.27	2.27	0.000
J_ST8	JUNCTION	8.14	8.14	0	00:45	0.325	0.325	0.000
J_ST9	JUNCTION	22.92	22.92	0	00:45	0.766	0.766	0.000
J100	JUNCTION	107.03	107.03	0	00:55	4.82	4.82	0.000
J101	JUNCTION	0.00	373.10	0	01:05	0	226	0.000
J102	JUNCTION	0.00	385.55	0	01:05	0	226	0.000
J104	JUNCTION	0.00	130.57	0	01:10	0	230	0.000
J106	JUNCTION	0.00	21.45	0	00:45	0	0.652	0.000
J107	JUNCTION	0.00	15.50	0	00:45	0	0.519	0.000
J-10a1	JUNCTION	0.00	0.00	0	00:00	0	0	0.000 gal
J111	JUNCTION	4.19	4.19	0	00:45	0.152	0.152	0.000
J113	JUNCTION	0.00	4.45	0	00:40	0	0.117	0.000
J11th	JUNCTION	0.00	130.57	0	01:10	0	230	0.000
J121	JUNCTION	4.55	4.55	0	00:35	0.118	0.118	0.000
J122	JUNCTION	7.06	7.06	0	00:45	0.259	0.259	0.000
J124	JUNCTION	0.00	11.57	0	00:45	0	0.377	0.000
J126	JUNCTION	0.00	11.59	0	00:45	0	0.376	0.000
J128	JUNCTION	0.00	12.96	0	00:45	0	0.434	0.000
J12th	JUNCTION	0.00	152.40	0	01:15	0	231	0.000
J131	JUNCTION	0.94	0.94	0	00:50	0.0516	0.0516	0.000
J132	JUNCTION	8.68	8.68	0	00:40	0.27	0.27	0.000
J133	JUNCTION	9.46	9.46	0	00:35	0.242	0.242	0.000
J134	JUNCTION	2.85	2.85	0	00:40	0.0888	0.0888	0.000
J14	JUNCTION	17.26	17.26	0	00:40	0.534	0.534	0.000
J140	JUNCTION	2.63	2.63	0	00:40	0.0853	0.0853	0.000
J141	JUNCTION	0.00	2.63	0	00:40	0	0.0853	0.000
J150	JUNCTION	0.00	124.54	0	01:05	0	214	0.000
J151	JUNCTION	0.00	349.27	0	01:05	0	225	0.000
J154	JUNCTION	1.39	1.39	0	00:45	0.0588	0.0588	0.000
J155	JUNCTION	1.60	1.60	0	00:40	0.0533	0.0533	0.000
J157	JUNCTION	0.00	2.81	0	01:45	0	0.204	0.000
J159	JUNCTION	0.00	130.57	0	01:10	0	230	0.000
J160	JUNCTION	0.00	385.55	0	01:05	0	226	0.000
J161	JUNCTION	0.00	18.75	0	00:40	0	0.564	0.000
J163	JUNCTION	0.00	21.29	0	00:45	0	0.652	0.000
J165	JUNCTION	0.00	349.27	0	01:05	0	225	0.000

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J166	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J167	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J168	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J169	JUNCTION	0.00	21.45	0	00:45	0	0.652	0.000	
J16th-us	JUNCTION	0.00	252.71	0	01:00	0	235	0.000	
J170	JUNCTION	0.00	15.50	0	00:45	0	0.519	0.000	
J171	JUNCTION	0.00	373.10	0	01:05	0	226	0.000	
J17th	JUNCTION	0.00	305.95	0	01:05	0	238	0.000	
J19th-ds	JUNCTION	0.00	364.66	0	01:05	0	242	0.000	
J19th-us	JUNCTION	0.00	309.67	0	01:05	0	238	0.000	
J200	JUNCTION	3280.00	3280.00	0	01:05	208	208	0.000	
J202	JUNCTION	0.00	49.50	0	11:30	0	208	0.000	
J203	JUNCTION	0.00	49.50	0	11:30	0	208	0.000	
J204	JUNCTION	0.00	49.50	0	11:30	0	208	0.000	
J230	JUNCTION	0.00	41.40	0	00:40	0	2.17	0.000	
J231	JUNCTION	13.72	13.72	0	00:35	0.37	0.37	0.000	
J232	JUNCTION	23.73	23.73	0	00:40	0.805	0.805	0.000	
J233	JUNCTION	10.24	10.24	0	00:40	0.344	0.344	0.000	
J234	JUNCTION	10.31	10.31	0	00:35	0.263	0.263	0.000	
J235	JUNCTION	0.00	52.09	0	00:45	0	2.5	0.000	
J23rd	JUNCTION	0.00	564.66	0	01:10	0	251	0.000	
J24	JUNCTION	29.90	29.90	0	00:35	0.64	0.64	0.000	
J242	JUNCTION	0.00	50.83	0	00:40	0	1.44	0.000	
J245	JUNCTION	0.00	57.09	0	00:45	0	1.64	0.000	
J247	JUNCTION	0.00	57.55	0	00:45	0	1.64	0.000	
J248	JUNCTION	0.00	57.55	0	00:45	0	1.64	0.000	
J25	JUNCTION	0.00	57.11	0	00:40	0	1.65	0.000	
J251	JUNCTION	6.42	6.42	0	00:45	0.249	0.249	0.000	
J252	JUNCTION	7.52	7.52	0	00:40	0.204	0.204	0.000	
J253	JUNCTION	0.00	57.67	0	00:45	0	1.64	0.000	
J254	JUNCTION	0.00	57.67	0	00:45	0	1.64	0.000	
J26th	JUNCTION	0.00	636.62	0	01:15	0	255	0.000	
J29th	JUNCTION	0.00	677.75	0	01:25	0	258	0.000	
J31	JUNCTION	23.63	23.63	0	00:40	0.603	0.603	0.000	
J311	JUNCTION	3.85	3.85	0	00:45	0.149	0.149	0.000	
J314	JUNCTION	0.00	23.63	0	00:40	0	0.603	0.000	
J315	JUNCTION	0.00	9.27	0	02:05	0	1.07	0.000	
J32	JUNCTION	26.21	26.21	0	00:45	0.982	0.982	0.000	
J33	JUNCTION	15.80	15.80	0	00:50	0.689	0.689	0.000	
J33rd	JUNCTION	0.00	744.27	0	01:30	0	262	0.000	
J34	JUNCTION	2.39	2.39	0	01:00	0.154	0.154	0.000	
J341	JUNCTION	0.00	41.76	0	00:50	0	1.67	0.000	
J343	JUNCTION	0.00	52.04	0	00:55	0	2.13	0.000	
J345	JUNCTION	0.00	75.06	0	01:45	0	210	0.000	
J346	JUNCTION	0.00	75.06	0	01:45	0	210	0.000	
J347	JUNCTION	0.00	74.63	0	01:50	0	210	0.000	
J348	JUNCTION	0.00	74.63	0	01:50	0	210	0.000	
J35	JUNCTION	15.45	15.45	0	00:35	0.317	0.317	0.000	
J350	JUNCTION	0.00	9.27	0	02:10	0	1.07	0.000	

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J351	JUNCTION	0.00	9.27	0	02:05	0	1.07	0.000
J352	JUNCTION	0.00	17.51	0	00:35	0	1.46	0.000
J353	JUNCTION	0.00	9.41	0	00:45	0	0.353	0.000
J354	JUNCTION	0.00	1.39	0	00:55	0	0.0857	0.000
J355	JUNCTION	0.00	39.82	0	00:40	0	1.07	0.000
J36	JUNCTION	0.00	27.76	0	00:40	0	1.8	0.000
J361	JUNCTION	17.37	17.37	0	00:35	0.395	0.395	0.000
J362	JUNCTION	8.65	8.65	0	00:40	0.264	0.264	0.000
J37	JUNCTION	6.40	6.40	0	00:35	0.158	0.158	0.000
J371	JUNCTION	11.64	11.64	0	00:40	0.343	0.343	0.000
J372	JUNCTION	0.00	58.26	0	00:45	0	2.66	0.000
J374	JUNCTION	0.00	70.15	0	00:45	0	2.99	0.000
J38	JUNCTION	3.26	3.26	0	00:55	0.197	0.197	0.000
J390	JUNCTION	0.00	12.34	0	00:40	0	0.338	0.000
J391	JUNCTION	2.07	2.07	0	00:45	0.0748	0.0748	0.000
J392	JUNCTION	13.27	13.27	0	00:35	0.346	0.346	0.000
J393	JUNCTION	7.29	7.29	0	00:35	0.167	0.167	0.000
J394	JUNCTION	0.00	12.34	0	00:40	0	0.338	0.000
J41	JUNCTION	3.33	3.33	0	00:50	0.166	0.166	0.000
J42	JUNCTION	1.89	1.89	0	01:10	0.169	0.169	0.000
J43	JUNCTION	9.41	9.41	0	00:45	0.353	0.353	0.000
J44	JUNCTION	1.39	1.39	0	00:55	0.0857	0.0857	0.000
J51	JUNCTION	7.90	7.90	0	00:40	0.228	0.228	0.000
J52	JUNCTION	7.04	7.04	0	00:35	0.161	0.161	0.000
J53	JUNCTION	9.79	9.79	0	00:35	0.195	0.195	0.000
J54	JUNCTION	21.75	21.75	0	00:35	0.385	0.385	0.000
J56	JUNCTION	0.00	7.90	0	00:40	0	0.228	0.000
J61	JUNCTION	47.39	50.33	0	00:35	0.951	1.1	0.000
J62	JUNCTION	21.77	21.77	0	00:35	0.442	0.442	0.000
J63	JUNCTION	22.10	22.10	0	00:40	0.696	0.696	0.000
J64	JUNCTION	22.25	22.25	0	00:35	0.464	0.464	0.000
J65	JUNCTION	0.00	79.90	0	00:45	0	2.74	0.000
J67	JUNCTION	0.00	69.11	0	00:40	0	1.55	0.000
J68	JUNCTION	0.00	65.40	0	01:05	0	2.25	0.000
J6th_Pipe	JUNCTION	0.00	169.45	0	00:55	0	7.82	0.000
J74	JUNCTION	0.00	67.05	0	00:45	0	1.57	0.000
J7b	JUNCTION	0.00	176.56	0	00:50	0	7.82	0.000
JL2	JUNCTION	0.00	3.54	0	00:45	0	0.153	0.000
JMLK	JUNCTION	0.00	745.42	0	01:25	0	262	0.000
JMontview-ds	JUNCTION	0.00	431.13	0	01:10	0	245	0.000
JMontview-us	JUNCTION	0.00	369.51	0	01:10	0	242	0.000
J_16thAve_E	JUNCTION	0.00	50.37	0	01:05	0	2.71	0.000
JSandCreek	OUTFALL	0.00	751.54	0	01:35	0	263	0.000
DIV344	DIVIDER	0.00	52.04	0	00:55	0	2.13	0.000
DIV342	DIVIDER	0.00	41.76	0	00:50	0	1.67	0.000
DIV135	DIVIDER	0.00	0.94	0	00:50	0	0.0516	0.000
DIV389	DIVIDER	0.00	2.81	0	01:45	0	0.204	0.000
DIV397	DIVIDER	0.00	21.29	0	00:45	0	0.652	0.000
DIV105	DIVIDER	0.00	169.45	0	00:55	0	7.82	0.000

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

DIV376	DIVIDER	0.00	124.54	0	01:05	0	214	0.000	
DIV70	DIVIDER	0.00	69.11	0	00:40	0	1.55	0.000	
DIV395	DIVIDER	0.00	12.96	0	00:45	0	0.434	0.000	
DIV1	DIVIDER	0.00	7.70	0	00:45	0	0.227	0.000	
DIV164	DIVIDER	0.00	21.29	0	00:45	0	0.652	0.000	
DIV125	DIVIDER	0.00	11.57	0	00:45	0	0.377	0.000	
DIV316	DIVIDER	0.00	9.27	0	02:10	0	1.07	0.000	
DIV396	DIVIDER	0.00	2.63	0	00:40	0	0.0853	0.000	
DIV71	DIVIDER	0.00	50.33	0	00:35	0	1.1	0.000	
DIV399	DIVIDER	0.00	176.56	0	00:50	0	7.82	0.000	
DIV162	DIVIDER	0.00	18.75	0	00:40	0	0.564	0.000	
DIV136	DIVIDER	0.00	8.68	0	00:40	0	0.27	0.000	
DIV123	DIVIDER	0.00	4.45	0	00:40	0	0.117	0.000	
J13th-DIV	DIVIDER	0.00	167.10	0	01:15	0	232	0.000	
J14th-DIV	DIVIDER	0.00	222.24	0	01:00	0	234	0.000	
JColfax-DIV	DIVIDER	0.00	230.68	0	01:00	0	234	0.000	
J16th-DIV	DIVIDER	0.00	302.79	0	01:00	0	238	0.000	
D_02a	DIVIDER	0.00	74.45	0	00:40	0	1.85	0.000	
D_03b	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_05-07	DIVIDER	0.00	28.67	0	01:00	0	0.358	0.000	
D_05a	DIVIDER	0.00	27.60	0	00:45	0	1.87	0.000	
D_05b	DIVIDER	0.00	48.54	0	00:50	0	2.71	0.000	
D_05c	DIVIDER	0.00	33.74	0	00:55	0	0.399	0.000	
D_05d	DIVIDER	0.00	123.21	0	00:55	0	5.3	0.000	
D_06a	DIVIDER	0.00	83.52	0	00:50	0	2.56	0.000	
D_06b	DIVIDER	0.00	17.23	0	00:50	0	0.114	0.000	
D_07a	DIVIDER	0.00	10.37	0	01:20	0	0.167	0.000	
D_08a	DIVIDER	0.00	19.61	0	00:45	0	0.682	0.000	
D_08b	DIVIDER	0.00	48.68	0	01:15	0	1.61	0.000	
D_10a	DIVIDER	0.00	23.00	0	01:30	0	2.08	0.000	
D_10a1	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_10b	DIVIDER	0.00	22.94	0	01:35	0	2.07	0.000	
D_10c	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_10d	DIVIDER	0.00	27.20	0	00:45	0	1.04	0.000	
D_11a	DIVIDER	0.00	16.63	0	00:55	0	0.865	0.000	
D_12a	DIVIDER	0.00	46.34	0	00:45	0	1.87	0.000	
D_13a	DIVIDER	0.00	39.39	0	01:10	0	2.93	0.000	
D_14a	DIVIDER	0.00	75.35	0	00:50	0	3.07	0.000	
D_15a	DIVIDER	0.00	73.98	0	00:55	0	3.07	0.000	
D_03a	DIVIDER	0.00	128.67	0	00:45	0	6.11	0.000	
D_12_14	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_10_13	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
J72	DIVIDER	0.00	96.85	0	00:45	0	2.48	0.000	
J120	DIVIDER	0.00	4.55	0	00:35	0	0.118	0.000	
J127	DIVIDER	0.00	11.59	0	00:45	0	0.376	0.000	
J129	DIVIDER	0.00	12.96	0	00:45	0	0.434	0.000	
J158	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
J73	DIVIDER	0.00	65.40	0	01:05	0	2.25	0.000	
J236	DIVIDER	0.00	10.31	0	00:35	0	0.263	-0.000	

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

J244	DIVIDER	0.00	57.11	0	00:40	0	1.65	0.000
J241	DIVIDER	0.00	23.73	0	00:40	0	0.805	0.000
J243	DIVIDER	0.00	50.83	0	00:40	0	1.44	0.000
J246	DIVIDER	0.00	57.09	0	00:45	0	1.64	0.000
J375	DIVIDER	0.00	70.15	0	00:45	0	2.99	0.000
J330	DIVIDER	0.00	15.80	0	00:50	0	0.689	0.000
J320	DIVIDER	0.00	52.09	0	00:45	0	2.5	0.000
J319	DIVIDER	0.00	41.40	0	00:40	0	2.17	0.000
J321	DIVIDER	0.00	26.21	0	00:45	0	0.982	0.000
J373	DIVIDER	0.00	58.26	0	00:45	0	2.66	0.000
J57	DIVIDER	0.00	21.75	0	00:35	0	0.385	0.000
J250	DIVIDER	0.00	6.42	0	00:45	0	0.249	0.000
J317	DIVIDER	0.00	17.51	0	00:35	0	1.46	0.000
J318	DIVIDER	0.00	27.76	0	00:40	0	1.8	0.000
J322	DIVIDER	0.00	10.24	0	00:40	0	0.344	0.000
J363	DIVIDER	0.00	8.65	0	00:40	0	0.264	0.000
D_AR2	DIVIDER	0.00	50.82	0	01:00	0	2.72	0.000
DIV72	DIVIDER	0.00	33.22	0	00:45	0	0.238	0.000
D_04a	DIVIDER	0.00	47.50	0	00:40	0	1.15	0.000
D_04b	DIVIDER	0.00	64.07	0	00:45	0	1.87	0.000
RES30	STORAGE	0.00	39.82	0	00:40	0	1.07	0.177
RES201	STORAGE	0.00	3280.00	0	01:05	0	208	0.001
RES130	STORAGE	0.00	398.04	0	01:05	0	227	0.019
RES156	STORAGE	0.00	5.76	0	00:45	0	0.205	0.547
HavanaPnd	STORAGE	0.00	48.69	0	01:15	0	1.61	0.026
1st/HavanaPnd	STORAGE	0.00	37.00	0	00:45	0	1.08	0.103

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
RES30	0.629	0	0	0	90.164	0	0 02:00	9.27
RES201	4513.350	0	0	0	26032.459	0	0 11:30	49.50
RES130	178.736	0	0	0	1913.524	0	0 03:50	65.33
RES156	0.055	0	0	0	11.377	0	0 01:40	2.81
HavanaPnd	0.477	0	0	0	108.102	13	0 02:00	16.01

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

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1st/HavanaPnd             4.165       0     0     0       124.651       6       0  02:55       2.71


**********************
Outfall Loading Summary
**********************

-----------------------------------------------------------
                       Flow       Avg       Max       Total
                       Freq      Flow      Flow      Volume
Outfall Node            Pcnt       CFS       CFS    10^6 gal
-----------------------------------------------------------
JSandCreek             75.61     21.97    751.54     262.961
-----------------------------------------------------------
System                 75.61     21.97    751.54     262.961


*******************
Link Flow Summary
*******************

-------------------------------------------------------------------------------
                             Maximum  Time of Max   Maximum    Max/    Max/
                             |Flow|   Occurrence   |Veloc|    Full    Full
Link                 Type       CFS  days hr:min    ft/sec    Flow   Depth
-------------------------------------------------------------------------------
C_03a                CONDUIT  128.12     0  00:50      9.93    0.56    0.53
C_05a                CONDUIT   26.93     0  00:50      7.70    0.33    0.39
C_05b                CONDUIT   48.68     0  00:50      6.09    0.50    0.50
C_05c                CONDUIT   94.75     0  01:20      6.61    1.06    1.00
C_06a                CONDUIT   69.07     0  01:10      6.36    1.04    1.00
C_07a                CONDUIT   10.39     0  01:20      4.43    0.63    0.57
C_08a                CONDUIT   19.29     0  00:50      6.11    0.20    0.30
C_08b                CONDUIT   48.69     0  01:15      5.90    0.52    0.52
C_10a                CONDUIT   16.01     0  02:05      4.55    0.33    0.39
C_10b                CONDUIT   22.94     0  01:35      5.58    0.41    0.44
C_10c                CONDUIT   22.92     0  01:40      6.14    0.25    0.34
C_11a                CONDUIT   16.54     0  01:00      5.46    0.18    0.29
C_13a                CONDUIT   39.23     0  01:15      7.17    0.30    0.38
C_14a                CONDUIT   45.38     0  00:55      6.81    0.40    0.44
C_15a                CONDUIT   73.98     0  00:55      7.65    0.38    0.43
C_15b                CONDUIT   74.08     0  01:00      6.71    0.10    0.17
C_16a                CONDUIT   36.07     0  00:40      9.93    0.00    0.04
C_16thAv             CONDUIT   50.37     0  01:05      5.47    0.09    0.20
C_JL2                DUMMY      3.54     0  00:45
C1                   DUMMY      7.70     0  00:45
C101                 DUMMY    373.10     0  01:05
C102                 DUMMY    385.55     0  01:05
C104                 DUMMY    130.57     0  01:10
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Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

C105	CONDUIT	170.18	0	01:00	4.57	0.09	0.30
C105-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C106	DUMMY	21.45	0	00:45			
C107	DUMMY	15.50	0	00:45			
C111	DUMMY	4.19	0	00:45			
C113	DUMMY	4.45	0	00:40			
C120	CONDUIT	4.45	0	00:40	3.26	0.14	0.25
C120_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C121	DUMMY	4.55	0	00:35			
C122	DUMMY	7.06	0	00:45			
C123	CONDUIT	4.52	0	00:45	3.19	0.09	0.20
C123-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C124	DUMMY	11.57	0	00:45			
C125	CONDUIT	11.59	0	00:45	3.83	0.27	0.35
C125-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C126	DUMMY	11.59	0	00:45			
C127	CONDUIT	11.58	0	00:45	4.05	0.12	0.24
C127_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C128	DUMMY	12.96	0	00:45			
C129	CONDUIT	12.89	0	00:45	4.21	0.19	0.29
C129_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C12th	CONDUIT	129.19	0	01:15	3.30	0.02	0.13
C131	DUMMY	0.94	0	00:50			
C132	DUMMY	8.68	0	00:40			
C133	DUMMY	9.46	0	00:35			
C134	DUMMY	2.85	0	00:40			
C135	CONDUIT	0.94	0	00:55	1.97	0.10	0.21
C135-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C136	CONDUIT	8.62	0	00:40	3.77	0.12	0.24
C136-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C13th	CONDUIT	152.17	0	01:15	3.39	0.03	0.18
C14	DUMMY	17.26	0	00:40			
C140	DUMMY	2.63	0	00:40			
C141	CONDUIT	2.62	0	00:45	2.76	0.08	0.19
C14th	CONDUIT	166.70	0	01:15	6.05	0.19	0.26
C14th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C150	DUMMY	124.54	0	01:05			
C151	DUMMY	349.27	0	01:05			
C154	DUMMY	1.39	0	00:45			
C155	DUMMY	1.60	0	00:40			
C157	CONDUIT	2.81	0	01:50	2.71	0.04	0.14
C158	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C158_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C159	DUMMY	130.57	0	01:10			
C160	DUMMY	385.55	0	01:05			
C161	DUMMY	18.75	0	00:40			
C162	CONDUIT	18.53	0	00:45	4.71	0.27	0.35
C162-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C163	DUMMY	21.29	0	00:45			

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

C164	CONDUIT	21.45	0	00:45	4.84	0.23	0.32
C164-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C165	CONDUIT	349.06	0	01:05	5.21	0.07	0.30
C166	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C167	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C168	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C169	CONDUIT	21.52	0	00:45	1.37	0.00	0.03
C16th	CONDUIT	230.08	0	01:00	4.86	0.15	0.43
C16th2	DUMMY	252.71	0	01:00			
C16th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C170	CONDUIT	15.41	0	00:50	1.22	0.00	0.02
C171	CONDUIT	372.88	0	01:05	5.30	0.07	0.31
C17th	CONDUIT	302.28	0	01:05	7.33	0.34	0.38
C17th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C19th	CONDUIT	305.78	0	01:05	3.54	0.06	0.28
C19th2	DUMMY	309.67	0	01:05			
C1-DIV	DUMMY	0.00	0	00:00			
C20	DUMMY	169.45	0	00:55			
C200	DUMMY	3280.00	0	01:05			
C202	CONDUIT	49.50	0	11:30	7.72	0.51	0.51
C203	DUMMY	49.50	0	11:30			
C204	CONDUIT	49.50	0	11:35	2.56	0.01	0.08
C230	DUMMY	41.40	0	00:40			
C231	DUMMY	13.72	0	00:35			
C232	DUMMY	23.73	0	00:40			
C233	DUMMY	10.24	0	00:40			
C234	DUMMY	10.31	0	00:35			
C235	DUMMY	52.09	0	00:45			
C236	CONDUIT	10.29	0	00:40	4.63	0.27	0.35
C236_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C23rd	CONDUIT	428.72	0	01:15	3.96	0.03	0.25
C24	DUMMY	29.90	0	00:35			
C241	CONDUIT	23.84	0	00:45	3.82	0.21	0.31
C241_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C242	DUMMY	50.83	0	00:40			
C243	CONDUIT	49.81	0	00:45	5.74	0.19	0.30
C243_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C244	CONDUIT	57.09	0	00:45	6.20	0.21	0.31
C244_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C245	DUMMY	57.09	0	00:45			
C246	CONDUIT	57.55	0	00:45	4.68	0.19	0.29
C246_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C247	DUMMY	57.55	0	00:45			
C248	CONDUIT	57.67	0	00:45	9.93	0.07	0.17
C25	DUMMY	57.11	0	00:40			
C250	CONDUIT	6.34	0	00:50	3.21	0.10	0.22
C250_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C251	DUMMY	6.42	0	00:45			
C252	DUMMY	7.52	0	00:40			

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

C253	DUMMY	57.67	0	00:45			
C254	CONDUIT	57.55	0	00:45	2.84	0.09	0.32
C26th	CONDUIT	562.33	0	01:15	3.17	0.04	0.28
C29th	CONDUIT	626.29	0	01:25	3.56	0.04	0.26
C31	DUMMY	23.63	0	00:40			
C311	DUMMY	3.85	0	00:45			
C314	CONDUIT	23.07	0	00:45	2.02	0.07	0.30
C315	CONDUIT	9.27	0	02:10	3.56	0.15	0.26
C316	CONDUIT	9.27	0	02:10	3.47	0.08	0.19
C316-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C317	CONDUIT	17.74	0	00:40	5.55	0.11	0.22
C318	CONDUIT	27.70	0	00:40	4.27	0.13	0.24
C319	CONDUIT	40.98	0	00:45	4.79	0.16	0.27
C319_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C32	DUMMY	26.21	0	00:45			
C320	CONDUIT	52.59	0	00:45	5.54	0.18	0.29
C320_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C321	CONDUIT	25.96	0	00:50	4.23	0.10	0.21
C321_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322	CONDUIT	10.20	0	00:45	3.27	0.14	0.25
C33	DUMMY	15.80	0	00:50			
C330	CONDUIT	15.81	0	00:50	3.62	0.13	0.24
C330_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C34	DUMMY	2.39	0	01:00			
C341	DUMMY	41.76	0	00:50			
C342	CONDUIT	41.19	0	00:55	5.79	0.33	0.39
C342-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C343	DUMMY	52.04	0	00:55			
C344	CONDUIT	52.19	0	00:55	6.06	0.25	0.34
C344-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C345	DUMMY	75.06	0	01:45			
C346	CONDUIT	74.63	0	01:50	2.62	0.04	0.21
C347	DUMMY	74.63	0	01:50			
C348	CONDUIT	74.18	0	01:55	2.24	0.03	0.16
C35	DUMMY	15.45	0	00:35			
C350	DUMMY	9.27	0	02:10			
C351	DUMMY	9.27	0	02:05			
C352	DUMMY	17.51	0	00:35			
C353	CONDUIT	8.48	0	01:00	1.44	0.01	0.12
C354	CONDUIT	1.34	0	01:15	1.83	0.02	0.11
C355	DUMMY	39.82	0	00:40			
C36	DUMMY	27.76	0	00:40			
C361	DUMMY	17.37	0	00:35			
C362	DUMMY	8.65	0	00:40			
C363	CONDUIT	8.54	0	00:45	3.12	0.12	0.23
C37	DUMMY	6.40	0	00:35			
C371	DUMMY	11.64	0	00:40			
C372	DUMMY	58.26	0	00:45			
C373	CONDUIT	58.26	0	00:45	5.60	0.13	0.25

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

C373_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C374	DUMMY	70.15	0	00:45			
C375	CONDUIT	69.84	0	00:45	5.89	0.16	0.27
C375_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C376	CONDUIT	66.70	0	03:00	5.75	1.07	1.00
C376-OVER	CONDUIT	59.83	0	01:15	2.04	0.01	0.11
C38	DUMMY	3.26	0	00:55			
C389	DUMMY	2.81	0	01:45			
C389-DIV	DUMMY	0.00	0	00:00			
C390	DUMMY	12.34	0	00:40			
C391	DUMMY	2.07	0	00:45			
C392	DUMMY	13.27	0	00:35			
C393	DUMMY	7.29	0	00:35			
C394	CONDUIT	12.38	0	00:40	3.56	0.03	0.12
C395	DUMMY	12.96	0	00:45			
C395-DIV	DUMMY	0.00	0	00:00			
C396	DUMMY	2.63	0	00:40			
C396-DIV	DUMMY	0.00	0	00:00			
C397	DUMMY	21.29	0	00:45			
C397-DIV	DUMMY	0.00	0	00:00			
C399	CONDUIT	169.45	0	00:55	9.05	0.73	0.64
C399-DIV	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
C41	DUMMY	3.33	0	00:50			
C42	DUMMY	1.89	0	01:10			
C43	DUMMY	9.41	0	00:45			
C44	DUMMY	1.39	0	00:55			
C51	DUMMY	7.90	0	00:40			
C52	DUMMY	7.04	0	00:35			
C53	DUMMY	9.79	0	00:35			
C54	DUMMY	21.75	0	00:35			
C56	CONDUIT	7.70	0	00:45	3.33	0.07	0.18
C57	CONDUIT	20.68	0	00:35	4.50	0.18	0.29
C57_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C61	DUMMY	50.33	0	00:35			
C62	DUMMY	21.77	0	00:35			
C63	DUMMY	22.10	0	00:40			
C64	DUMMY	22.25	0	00:35			
C65	DUMMY	79.90	0	00:45			
C67	DUMMY	69.11	0	00:40			
C68	DUMMY	65.40	0	01:05			
C70	CONDUIT	28.08	0	01:20	4.85	1.00	1.00
C70-OVER	CHANNEL	39.00	0	00:45	5.68	0.00	0.06
C71	CONDUIT	19.96	0	01:15	4.85	1.01	1.00
C71-OVER	CHANNEL	29.09	0	00:40	6.52	0.00	0.05
C72	CONDUIT	64.79	0	01:05	7.71	1.02	1.00
C73	CONDUIT	35.39	0	01:30	3.41	1.01	1.00
C73_Overlfow	CHANNEL	29.35	0	01:05	8.55	0.00	0.05
C74	DUMMY	67.05	0	00:45			
CAD1	DUMMY	6.88	0	00:45			

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

CAD3	DUMMY	4.95	0	00:40			
CAD4	DUMMY	5.90	0	00:40			
CAD7	DUMMY	10.07	0	00:40			
CAR1	DUMMY	49.97	0	00:40			
CAR2	DUMMY	47.28	0	01:00			
CColfax	CONDUIT	221.97	0	01:00	6.62	0.25	0.31
CColf-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CCPark	CONDUIT	741.67	0	01:30	3.32	0.07	0.33
CDE1	DUMMY	73.30	0	00:50			
CDE2	DUMMY	19.16	0	00:45			
CDE3	DUMMY	9.12	0	00:50			
CDE4	DUMMY	9.58	0	00:55			
CDE5	DUMMY	17.29	0	00:50			
CDE6	DUMMY	30.93	0	00:45			
CDIV7b	DUMMY	176.56	0	00:50			
CJ_L1	DUMMY	9.25	0	00:35			
CJ7b	DUMMY	50.43	0	00:45			
CJL2	DUMMY	3.54	0	00:45			
CMLK	CONDUIT	678.86	0	01:25	3.65	0.06	0.30
CMontview	CONDUIT	364.19	0	01:10	3.38	0.02	0.19
CMontview2	DUMMY	369.51	0	01:10			
CSandCreek	CONDUIT	739.93	0	01:35	4.99	0.06	0.29
CST1	DUMMY	2.69	0	01:15			
CST2	DUMMY	16.76	0	00:50			
CST3	DUMMY	25.16	0	00:55			
CST4	DUMMY	83.57	0	00:45			
CST5	DUMMY	61.22	0	00:55			
CST6	DUMMY	15.26	0	00:55			
CST7	CONDUIT	58.31	0	01:05	2.08	0.00	0.07
CST8	DUMMY	8.14	0	00:45			
CST9	DUMMY	22.92	0	00:45			
d_01a	DUMMY	48.60	0	00:35			
d_02a	DUMMY	74.45	0	00:40			
d_02b	DUMMY	67.00	0	00:40			
d_03a	DUMMY	41.18	0	00:40			
d_03b	DUMMY	41.18	0	00:40			
d_03c	DUMMY	0.00	0	00:00			
d_04b	DUMMY	17.77	0	00:45			
d_04d	DUMMY	27.60	0	00:45			
d_05a	DUMMY	21.96	0	00:45			
d_05b	DUMMY	21.96	0	00:45			
d_05c	DUMMY	33.74	0	00:55			
d_06a	DUMMY	23.50	0	00:45			
d_06b	DUMMY	83.52	0	00:50			
d_06c	DUMMY	17.23	0	00:50			
d_07b	DUMMY	8.94	0	00:50			
d_08a	DUMMY	14.06	0	00:45			
d_08b	DUMMY	43.70	0	01:05			
d_08c	DUMMY	48.69	0	01:15			

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

d_09a	DUMMY	19.61	0	00:45			
d_09b	DUMMY	19.61	0	00:45			
d_10a	DUMMY	27.20	0	00:45			
d_10a1	DUMMY	0.00	0	00:00			
d_10a2	DUMMY	0.00	0	00:00			
d_11a	DUMMY	16.63	0	00:55			
d_12a	DUMMY	33.09	0	00:40			
d_13a	DUMMY	20.15	0	00:50			
d_14a	DUMMY	30.52	0	00:45			
d_14b	DUMMY	75.35	0	00:50			
d_15a	DUMMY	36.80	0	00:45			
d_17thAv	DUMMY	0.00	0	00:00			
d_EC_Out_23rd	DUMMY	135.56	0	00:55			
d_EC_Out_19thAv	DUMMY	55.83	0	01:10			
S_02a	CONDUIT	5.24	0	01:05	0.51	0.06	0.21
S_03a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_05_07a	CHANNEL	12.31	0	01:05	3.28	0.00	0.03
S_05_07b	CHANNEL	14.81	0	01:10	9.98	0.00	0.03
S_05a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_05b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_05c	CHANNEL	28.67	0	01:00	8.54	0.00	0.05
S_05d	CHANNEL	3.35	0	01:05	5.42	0.00	0.04
S_06a	CHANNEL	60.60	0	00:50	10.06	0.00	0.06
S_06b	CHANNEL	11.77	0	01:00	6.74	0.00	0.06
S_07a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_07b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_07b2	CHANNEL	10.37	0	01:20	5.99	0.00	0.04
S_07d	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_07e	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_08a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_08b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_09a	CHANNEL	1.52	0	01:05	12.65	0.00	0.01
S_10_13	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10a1	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10c	CHANNEL	8.73	0	01:05	9.58	0.00	0.03
S_10d	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10e	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10f	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10g	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10i	DUMMY	4.62	0	00:45			
S_11a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_12_14	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_13a	CHANNEL	22.39	0	00:50	8.81	0.00	0.05
S_13b1	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_13b2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_14a1	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_14a2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00

Table B.4– SWMM Output Reports for 2-year (Future) Event (Continued)

S_15	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_15a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_15b	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
S_15c	CONDUIT	105.25	0	01:00	7.68	0.00	0.02
S_Beeler	CHANNEL	21.79	0	01:00	8.89	0.00	0.04
C317_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C318_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C363_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C_EC_Colfax_Out	CHANNEL	3.87	0	01:10	7.40	0.00	0.03
S_AR2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
d_16thAve_E	DUMMY	50.37	0	01:05			
d_72	DUMMY	33.22	0	00:45			
C72_Overflow	CHANNEL	0.66	0	00:55	8.19	0.00	0.01
C_04b	CONDUIT	46.29	0	00:45	9.75	0.35	0.41
S_04a	CHANNEL	47.50	0	00:40	2.04	0.01	0.08
d_04c	DUMMY	37.00	0	00:45			
C_04c	CONDUIT	27.24	0	00:45	8.50	0.44	0.46
S_04b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
O_10a	ORIFICE	16.01	0	02:05			0.00
W_10a	WEIR	0.00	0	00:00			0.00
OUT30	DUMMY	9.27	0	02:05			
OUT201	DUMMY	49.50	0	11:30			
OUT130	DUMMY	65.33	0	03:50			
OUT156	DUMMY	2.81	0	01:45			
OUT04	DUMMY	2.71	0	03:00			

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Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C_05c	0.58	0.58	0.58	0.67	0.58
C_06a	0.33	0.33	0.33	0.17	0.33
C376	2.50	2.50	2.50	2.50	2.50
C70	0.83	0.83	0.83	0.08	0.83
C71	0.75	0.75	0.75	0.83	0.75
C72	0.50	0.50	0.50	0.50	0.50
C73	1.08	1.08	1.08	1.08	1.08

Analysis begun on: Mon May 3 14:26:54 2021
Analysis ended on: Mon May 3 14:26:55 2021
Total elapsed time: 00:00:01

Table B.4 – SWMM Output Reports for 5-year (Future) Event

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

Lower Westerly Creek
Baseline Hydrology - with 1st and Havana Pond (5-year)
Bohannan Huston

WARNING 08: elevation drop exceeds length for Conduit C_JL2
WARNING 04: minimum elevation drop used for Conduit C1
WARNING 04: minimum elevation drop used for Conduit C101
WARNING 04: minimum elevation drop used for Conduit C102
WARNING 04: minimum elevation drop used for Conduit C104
WARNING 04: minimum elevation drop used for Conduit C106
WARNING 04: minimum elevation drop used for Conduit C107
WARNING 04: minimum elevation drop used for Conduit C111
WARNING 04: minimum elevation drop used for Conduit C113
WARNING 04: minimum elevation drop used for Conduit C121
WARNING 04: minimum elevation drop used for Conduit C122
WARNING 04: minimum elevation drop used for Conduit C124
WARNING 04: minimum elevation drop used for Conduit C126
WARNING 04: minimum elevation drop used for Conduit C128
WARNING 04: minimum elevation drop used for Conduit C131
WARNING 04: minimum elevation drop used for Conduit C132
WARNING 04: minimum elevation drop used for Conduit C133
WARNING 04: minimum elevation drop used for Conduit C134
WARNING 04: minimum elevation drop used for Conduit C14
WARNING 04: minimum elevation drop used for Conduit C140
WARNING 04: minimum elevation drop used for Conduit C150
WARNING 04: minimum elevation drop used for Conduit C151
WARNING 04: minimum elevation drop used for Conduit C154
WARNING 04: minimum elevation drop used for Conduit C155
WARNING 04: minimum elevation drop used for Conduit C159
WARNING 04: minimum elevation drop used for Conduit C160
WARNING 04: minimum elevation drop used for Conduit C161
WARNING 04: minimum elevation drop used for Conduit C163
WARNING 04: minimum elevation drop used for Conduit C16th2
WARNING 04: minimum elevation drop used for Conduit C19th2
WARNING 08: elevation drop exceeds length for Conduit C20
WARNING 04: minimum elevation drop used for Conduit C200
WARNING 04: minimum elevation drop used for Conduit C203
WARNING 04: minimum elevation drop used for Conduit C230
WARNING 04: minimum elevation drop used for Conduit C231
WARNING 04: minimum elevation drop used for Conduit C232
WARNING 04: minimum elevation drop used for Conduit C233
WARNING 04: minimum elevation drop used for Conduit C234
WARNING 04: minimum elevation drop used for Conduit C235
WARNING 04: minimum elevation drop used for Conduit C24
WARNING 04: minimum elevation drop used for Conduit C242
WARNING 04: minimum elevation drop used for Conduit C245
```

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

```
WARNING 04: minimum elevation drop used for Conduit C247
WARNING 04: minimum elevation drop used for Conduit C25
WARNING 04: minimum elevation drop used for Conduit C251
WARNING 04: minimum elevation drop used for Conduit C252
WARNING 04: minimum elevation drop used for Conduit C253
WARNING 04: minimum elevation drop used for Conduit C31
WARNING 04: minimum elevation drop used for Conduit C311
WARNING 04: minimum elevation drop used for Conduit C32
WARNING 04: minimum elevation drop used for Conduit C33
WARNING 04: minimum elevation drop used for Conduit C34
WARNING 04: minimum elevation drop used for Conduit C341
WARNING 04: minimum elevation drop used for Conduit C343
WARNING 04: minimum elevation drop used for Conduit C345
WARNING 04: minimum elevation drop used for Conduit C347
WARNING 04: minimum elevation drop used for Conduit C35
WARNING 04: minimum elevation drop used for Conduit C350
WARNING 04: minimum elevation drop used for Conduit C351
WARNING 04: minimum elevation drop used for Conduit C352
WARNING 04: minimum elevation drop used for Conduit C355
WARNING 04: minimum elevation drop used for Conduit C36
WARNING 04: minimum elevation drop used for Conduit C361
WARNING 04: minimum elevation drop used for Conduit C362
WARNING 04: minimum elevation drop used for Conduit C37
WARNING 04: minimum elevation drop used for Conduit C371
WARNING 04: minimum elevation drop used for Conduit C372
WARNING 04: minimum elevation drop used for Conduit C374
WARNING 04: minimum elevation drop used for Conduit C38
WARNING 04: minimum elevation drop used for Conduit C389
WARNING 04: minimum elevation drop used for Conduit C390
WARNING 04: minimum elevation drop used for Conduit C391
WARNING 04: minimum elevation drop used for Conduit C392
WARNING 04: minimum elevation drop used for Conduit C393
WARNING 04: minimum elevation drop used for Conduit C395
WARNING 04: minimum elevation drop used for Conduit C395-DIV
WARNING 04: minimum elevation drop used for Conduit C396
WARNING 08: elevation drop exceeds length for Conduit C396-DIV
WARNING 04: minimum elevation drop used for Conduit C397
WARNING 08: elevation drop exceeds length for Conduit C397-DIV
WARNING 04: minimum elevation drop used for Conduit C41
WARNING 04: minimum elevation drop used for Conduit C42
WARNING 04: minimum elevation drop used for Conduit C43
WARNING 04: minimum elevation drop used for Conduit C44
WARNING 04: minimum elevation drop used for Conduit C51
WARNING 04: minimum elevation drop used for Conduit C52
WARNING 04: minimum elevation drop used for Conduit C53
WARNING 04: minimum elevation drop used for Conduit C54
WARNING 04: minimum elevation drop used for Conduit C61
WARNING 04: minimum elevation drop used for Conduit C62
WARNING 04: minimum elevation drop used for Conduit C64
```

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

```
WARNING 04: minimum elevation drop used for Conduit C65
WARNING 04: minimum elevation drop used for Conduit C67
WARNING 04: minimum elevation drop used for Conduit C68
WARNING 04: minimum elevation drop used for Conduit CAD1
WARNING 04: minimum elevation drop used for Conduit CAD3
WARNING 04: minimum elevation drop used for Conduit CAD4
WARNING 04: minimum elevation drop used for Conduit CAD7
WARNING 04: minimum elevation drop used for Conduit CAR1
WARNING 08: elevation drop exceeds length for Conduit CAR2
WARNING 04: minimum elevation drop used for Conduit CDE1
WARNING 04: minimum elevation drop used for Conduit CDE2
WARNING 04: minimum elevation drop used for Conduit CDE3
WARNING 04: minimum elevation drop used for Conduit CDE4
WARNING 04: minimum elevation drop used for Conduit CDE5
WARNING 04: minimum elevation drop used for Conduit CDE6
WARNING 04: minimum elevation drop used for Conduit CJL2
WARNING 04: minimum elevation drop used for Conduit CMontview2
WARNING 04: minimum elevation drop used for Conduit CST1
WARNING 04: minimum elevation drop used for Conduit CST2
WARNING 04: minimum elevation drop used for Conduit CST3
WARNING 04: minimum elevation drop used for Conduit CST4
WARNING 04: minimum elevation drop used for Conduit CST5
WARNING 04: minimum elevation drop used for Conduit CST6
WARNING 04: minimum elevation drop used for Conduit CST8
WARNING 04: minimum elevation drop used for Conduit CST9
WARNING 04: minimum elevation drop used for Conduit d_03c
WARNING 08: elevation drop exceeds length for Conduit d_04d
WARNING 04: minimum elevation drop used for Conduit d_05a
WARNING 04: minimum elevation drop used for Conduit d_05b
WARNING 04: minimum elevation drop used for Conduit d_05c
WARNING 04: minimum elevation drop used for Conduit d_06a
WARNING 04: minimum elevation drop used for Conduit d_06b
WARNING 04: minimum elevation drop used for Conduit d_06c
WARNING 04: minimum elevation drop used for Conduit d_07b
WARNING 04: minimum elevation drop used for Conduit d_08a
WARNING 04: minimum elevation drop used for Conduit d_08b
WARNING 04: minimum elevation drop used for Conduit d_09a
WARNING 04: minimum elevation drop used for Conduit d_09b
WARNING 04: minimum elevation drop used for Conduit d_10a
WARNING 04: minimum elevation drop used for Conduit d_10a2
WARNING 04: minimum elevation drop used for Conduit d_11a
WARNING 04: minimum elevation drop used for Conduit d_12a
WARNING 04: minimum elevation drop used for Conduit d_14a
WARNING 04: minimum elevation drop used for Conduit d_14b
WARNING 04: minimum elevation drop used for Conduit d_15a
WARNING 08: elevation drop exceeds length for Conduit d_17thAv
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_23rd
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_19thAv
WARNING 08: elevation drop exceeds length for Conduit d_16thAve_E
```

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

```
WARNING 10: crest elevation is below downstream invert for regulator Link OUT04
WARNING 02: maximum depth increased for Node EC_Out_23rd
WARNING 02: maximum depth increased for Node E-J-16
WARNING 02: maximum depth increased for Node J_01a
WARNING 02: maximum depth increased for Node J_02a
WARNING 02: maximum depth increased for Node J_04a
WARNING 02: maximum depth increased for Node J_05a
WARNING 02: maximum depth increased for Node J_06a
WARNING 02: maximum depth increased for Node J_07a
WARNING 02: maximum depth increased for Node J_07b
WARNING 02: maximum depth increased for Node J_07c
WARNING 02: maximum depth increased for Node J_08a
WARNING 02: maximum depth increased for Node J_08b
WARNING 02: maximum depth increased for Node J_09a
WARNING 02: maximum depth increased for Node J_10a
WARNING 02: maximum depth increased for Node J_10b
WARNING 02: maximum depth increased for Node J_14a
WARNING 02: maximum depth increased for Node J_15a
WARNING 02: maximum depth increased for Node J_EC_Colfax_Out
WARNING 02: maximum depth increased for Node J-10a1
WARNING 02: maximum depth increased for Node D_02a
WARNING 02: maximum depth increased for Node D_03b
WARNING 02: maximum depth increased for Node D_05a
WARNING 02: maximum depth increased for Node D_05b
WARNING 02: maximum depth increased for Node D_05c
WARNING 02: maximum depth increased for Node D_05d
WARNING 02: maximum depth increased for Node D_06a
WARNING 02: maximum depth increased for Node D_06b
WARNING 02: maximum depth increased for Node D_07a
WARNING 02: maximum depth increased for Node D_08a
WARNING 02: maximum depth increased for Node D_08b
WARNING 02: maximum depth increased for Node D_10a
WARNING 02: maximum depth increased for Node D_10a1
WARNING 02: maximum depth increased for Node D_10b
WARNING 02: maximum depth increased for Node D_10c
WARNING 02: maximum depth increased for Node D_10d
WARNING 02: maximum depth increased for Node D_11a
WARNING 02: maximum depth increased for Node D_12a
WARNING 02: maximum depth increased for Node D_13a
WARNING 02: maximum depth increased for Node D_14a
WARNING 02: maximum depth increased for Node D_15a
WARNING 02: maximum depth increased for Node D_03a
WARNING 02: maximum depth increased for Node D_04a

****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****************************************************
```

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

```
****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/25/2005 12:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 300.00 sec


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........       914.424       297.979
External Outflow .........       916.344       298.604
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.210


******************************
Highest Flow Instability Indexes
******************************
All links are stable.


************************
Routing Time Step Summary
************************
Minimum Time Step           :   300.00 sec
Average Time Step           :   300.00 sec
```

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

```
Maximum Time Step           :   300.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00
Percent Not Converging      :     0.00


******************
Node Depth Summary
******************
```

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Feet
EC_Out_23rd	JUNCTION	0.00	0.48	5295.48	0	00:40	0.48
EC_Out_19thAv	JUNCTION	0.02	2.46	5312.46	0	01:35	2.46
E-J-01	JUNCTION	0.00	0.00	5467.00	0	00:00	0.00
E-J-02	JUNCTION	0.00	0.00	5463.00	0	00:00	0.00
E-J-03	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-04	JUNCTION	0.00	0.00	5449.20	0	00:00	0.00
E-J-05	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-06	JUNCTION	0.00	0.00	5421.20	0	00:00	0.00
E-J-07	JUNCTION	0.00	0.00	5387.00	0	00:00	0.00
E-J-08	JUNCTION	0.00	0.00	5389.00	0	00:00	0.00
E-J-09	JUNCTION	0.00	0.00	5409.00	0	00:00	0.00
E-J-10	JUNCTION	0.00	0.00	5344.00	0	00:00	0.00
E-J-11	JUNCTION	0.00	0.00	5371.00	0	00:00	0.00
E-J-12	JUNCTION	0.00	0.00	5357.00	0	00:00	0.00
E-J-13	JUNCTION	0.00	0.00	5315.00	0	00:00	0.00
E-J-14	JUNCTION	0.00	0.00	5336.00	0	00:00	0.00
E-J-15	JUNCTION	0.00	0.00	5303.00	0	00:00	0.00
E-J-16	JUNCTION	0.00	0.48	5302.48	0	00:40	0.48
J_01a	JUNCTION	5.00	5.00	5463.00	0	00:05	5.00
J_02a	JUNCTION	0.00	0.69	5460.69	0	00:40	0.69
J_03a	JUNCTION	0.00	0.00	5411.00	0	00:00	0.00
J_04a	JUNCTION	0.01	1.38	5438.38	0	01:05	1.38
J_05_07	JUNCTION	0.00	0.63	5396.63	0	01:00	0.63
J_05a	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
J_06a	JUNCTION	0.00	0.66	5421.86	0	00:50	0.66
J_07a	JUNCTION	0.00	0.00	5401.00	0	00:00	0.00
J_07b	JUNCTION	0.00	0.36	5393.36	0	01:10	0.36
J_07c	JUNCTION	0.00	0.43	5387.43	0	01:15	0.43
J_08a	JUNCTION	0.01	1.66	5390.66	0	00:55	1.66
J_08b	JUNCTION	0.01	3.98	5392.88	0	01:15	3.98
J_09a	JUNCTION	0.00	0.24	5409.24	0	01:00	0.24
J_10a	JUNCTION	0.00	0.27	5381.27	0	01:10	0.27
J_10b	JUNCTION	0.00	0.00	5382.50	0	00:00	0.00
J_10c	JUNCTION	0.02	1.62	5377.62	0	02:20	1.62

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J_14a	JUNCTION	0.01	2.54	5338.54	0	00:55	2.54
J_15	JUNCTION	0.00	0.00	5323.00	0	00:00	0.00
J_15a	JUNCTION	0.01	1.44	5304.44	0	01:00	1.44
J_17thAv_Out	JUNCTION	0.00	0.00	5322.00	0	00:00	0.00
J_7b	JUNCTION	0.00	0.00	5384.00	0	00:00	0.00
J_AD1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_AD3	JUNCTION	0.00	0.00	969.20	0	00:00	0.00
J_AD4	JUNCTION	0.00	0.00	966.60	0	00:00	0.00
J_AD7	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_AR1	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_AR2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_EC_Colfax_Out	JUNCTION	0.00	0.33	5343.33	0	00:45	0.33
J_DE1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_DE2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_DE3	JUNCTION	0.00	0.00	980.90	0	00:00	0.00
J_DE4	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_DE5	JUNCTION	0.00	0.00	988.00	0	00:00	0.00
J_DE6	JUNCTION	0.00	0.00	992.00	0	00:00	0.00
J_L1	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J_L2	JUNCTION	0.00	0.00	5374.00	0	00:00	0.00
J_ST1	JUNCTION	0.00	0.00	928.00	0	00:00	0.00
J_ST2	JUNCTION	0.00	0.00	915.00	0	00:00	0.00
J_ST3	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST4	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST5	JUNCTION	0.00	0.00	933.00	0	00:00	0.00
J_ST6	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST7	JUNCTION	0.00	0.90	972.90	0	00:45	0.90
J_ST8	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST9	JUNCTION	0.00	0.00	951.00	0	00:00	0.00
J100	JUNCTION	0.00	0.00	1010.51	0	00:00	0.00
J101	JUNCTION	0.41	3.59	1008.60	0	01:05	3.59
J102	JUNCTION	0.41	3.71	1003.72	0	01:05	3.71
J104	JUNCTION	0.00	0.69	1000.69	0	01:45	0.69
J106	JUNCTION	0.01	1.84	1009.35	0	00:45	1.84
J107	JUNCTION	0.00	1.51	1004.02	0	00:45	1.51
J-10a1	JUNCTION	0.00	0.29	5388.79	0	01:05	0.29
J111	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J113	JUNCTION	0.00	0.97	1009.59	0	00:40	0.97
J11th	JUNCTION	0.28	1.41	1001.41	0	01:25	1.41
J121	JUNCTION	0.00	0.00	1013.87	0	00:00	0.00
J122	JUNCTION	0.00	0.00	1005.87	0	00:00	0.00
J124	JUNCTION	0.00	0.92	1006.78	0	00:45	0.92
J126	JUNCTION	0.00	1.61	1006.19	0	00:45	1.61
J128	JUNCTION	0.00	1.36	1005.02	0	00:45	1.36
J12th	JUNCTION	0.34	1.95	993.95	0	01:05	1.95
J131	JUNCTION	0.00	0.00	1015.92	0	00:00	0.00
J132	JUNCTION	0.00	0.00	1016.26	0	00:00	0.00
J133	JUNCTION	0.00	0.00	1013.76	0	00:00	0.00
J134	JUNCTION	0.00	0.00	1009.26	0	00:00	0.00

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J14	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J140	JUNCTION	0.00	0.00	1005.21	0	00:00	0.00
J141	JUNCTION	0.00	0.74	1005.95	0	00:40	0.74
J150	JUNCTION	0.36	2.67	1015.68	0	00:45	2.67
J151	JUNCTION	0.95	4.00	1012.01	0	00:40	4.00
J154	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J155	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J157	JUNCTION	0.00	0.69	1001.84	0	01:45	0.69
J159	JUNCTION	0.00	0.00	1000.00	0	00:00	0.00
J160	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J161	JUNCTION	0.00	1.22	1014.98	0	00:40	1.22
J163	JUNCTION	0.01	1.80	1011.06	0	00:45	1.80
J165	JUNCTION	0.41	3.59	1011.60	0	01:00	3.59
J166	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J167	JUNCTION	0.00	0.00	1007.09	0	00:00	0.00
J168	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J169	JUNCTION	0.00	0.35	1007.86	0	00:45	0.35
J16th-us	JUNCTION	0.46	3.10	979.10	0	00:55	3.10
J170	JUNCTION	0.00	0.30	1002.81	0	00:45	0.30
J171	JUNCTION	0.41	3.71	1008.72	0	01:00	3.71
J17th	JUNCTION	0.49	4.01	973.21	0	01:00	4.01
J19th-ds	JUNCTION	0.52	4.62	971.22	0	01:00	4.62
J19th-us	JUNCTION	0.49	4.01	970.61	0	01:00	4.01
J200	JUNCTION	0.00	0.00	1031.14	0	00:00	0.00
J202	JUNCTION	0.73	2.03	1033.17	0	11:30	2.03
J203	JUNCTION	0.73	2.03	1027.77	0	11:30	2.03
J204	JUNCTION	0.28	0.81	1026.54	0	11:30	0.81
J230	JUNCTION	0.02	1.94	1025.13	0	00:40	1.94
J231	JUNCTION	0.00	0.00	1023.20	0	00:00	0.00
J232	JUNCTION	0.00	0.00	1024.21	0	00:00	0.00
J233	JUNCTION	0.00	0.00	1025.58	0	00:00	0.00
J234	JUNCTION	0.00	0.00	1022.41	0	00:00	0.00
J235	JUNCTION	0.02	2.28	1021.89	0	00:45	2.28
J23rd	JUNCTION	0.38	3.30	954.30	0	01:05	3.30
J24	JUNCTION	0.00	0.00	1022.33	0	00:00	0.00
J242	JUNCTION	0.01	1.98	1024.32	0	00:45	1.98
J245	JUNCTION	0.01	2.47	1018.67	0	00:40	2.47
J247	JUNCTION	0.01	2.79	1018.07	0	00:45	2.79
J248	JUNCTION	0.00	1.63	1016.91	0	00:45	1.63
J25	JUNCTION	0.01	2.36	1019.29	0	00:40	2.36
J251	JUNCTION	0.00	0.00	1011.21	0	00:00	0.00
J252	JUNCTION	0.00	0.00	1016.93	0	00:00	0.00
J253	JUNCTION	0.00	1.63	1012.67	0	00:45	1.63
J254	JUNCTION	0.01	1.89	1012.93	0	00:45	1.89
J26th	JUNCTION	0.38	3.30	949.30	0	01:10	3.30
J29th	JUNCTION	0.46	5.07	938.07	0	01:20	5.07
J31	JUNCTION	0.00	0.00	1039.11	0	00:00	0.00
J311	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J314	JUNCTION	0.00	1.43	1040.53	0	00:35	1.43

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J315	JUNCTION	0.01	1.25	1037.94	0	02:00	1.25
J32	JUNCTION	0.00	0.00	1037.25	0	00:00	0.00
J33	JUNCTION	0.00	0.00	1036.79	0	00:00	0.00
J33rd	JUNCTION	0.51	5.56	933.56	0	01:25	5.56
J34	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J341	JUNCTION	0.01	1.87	1036.85	0	00:45	1.87
J343	JUNCTION	0.01	2.51	1026.74	0	00:55	2.51
J345	JUNCTION	0.28	2.65	1020.88	0	00:55	2.65
J346	JUNCTION	0.49	2.06	1020.30	0	00:55	2.06
J347	JUNCTION	0.49	2.06	1018.20	0	01:00	2.06
J348	JUNCTION	0.36	1.63	1017.77	0	01:00	1.63
J35	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J350	JUNCTION	0.01	1.25	1033.58	0	02:00	1.25
J351	JUNCTION	0.00	0.00	1036.69	0	00:00	0.00
J352	JUNCTION	0.01	1.15	1031.61	0	02:05	1.15
J353	JUNCTION	0.00	0.84	1023.58	0	00:45	0.84
J354	JUNCTION	0.00	0.56	1013.67	0	00:55	0.56
J355	JUNCTION	0.00	1.41	1038.11	0	00:45	1.41
J36	JUNCTION	0.01	1.34	1025.14	0	00:40	1.34
J361	JUNCTION	0.00	0.00	1030.45	0	00:00	0.00
J362	JUNCTION	0.00	0.00	1027.23	0	00:00	0.00
J37	JUNCTION	0.00	0.00	1016.81	0	00:00	0.00
J371	JUNCTION	0.00	0.00	1019.61	0	00:00	0.00
J372	JUNCTION	0.02	2.44	1019.25	0	00:45	2.44
J374	JUNCTION	0.02	2.42	1017.23	0	00:45	2.42
J38	JUNCTION	0.00	0.00	1024.23	0	00:00	0.00
J390	JUNCTION	0.00	1.24	1017.45	0	00:40	1.24
J391	JUNCTION	0.00	0.00	1016.21	0	00:00	0.00
J392	JUNCTION	0.00	0.00	1013.01	0	00:00	0.00
J393	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J394	JUNCTION	0.00	1.13	1017.34	0	00:40	1.13
J41	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J42	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J43	JUNCTION	0.00	0.00	1022.74	0	00:00	0.00
J44	JUNCTION	0.00	0.00	1013.11	0	00:00	0.00
J51	JUNCTION	0.00	0.00	1013.61	0	00:00	0.00
J52	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J53	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J54	JUNCTION	0.00	0.00	1011.61	0	00:00	0.00
J56	JUNCTION	0.00	1.06	1014.67	0	00:40	1.06
J61	JUNCTION	0.00	0.00	1013.85	0	00:00	0.00
J62	JUNCTION	0.00	0.00	1009.85	0	00:00	0.00
J63	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J64	JUNCTION	0.00	0.00	1000.00	0	00:00	0.00
J65	JUNCTION	0.01	4.00	1004.00	0	00:35	4.00
J67	JUNCTION	0.01	2.50	1012.35	0	00:30	2.50
J68	JUNCTION	0.01	3.50	1006.90	0	00:35	3.50
J6th_Pipe	JUNCTION	0.04	4.60	5377.05	0	00:55	4.60
J74	JUNCTION	0.01	3.00	1009.60	0	00:30	3.00

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J7b	JUNCTION	0.04	3.23	5388.23	0	00:45	3.23
JL2	JUNCTION	0.00	0.00	5374.00	0	00:00	0.00
JMLK	JUNCTION	0.51	5.57	936.57	0	01:20	5.57
JMontview-ds	JUNCTION	0.35	2.99	967.59	0	01:05	2.99
JMontview-us	JUNCTION	0.52	4.62	969.22	0	01:05	4.62
J_16thAve_E	JUNCTION	0.01	2.28	5336.92	0	01:05	2.28
JSandCreek	OUTFALL	0.37	4.96	919.96	0	01:30	4.96
DIV344	DIVIDER	0.01	2.65	1026.88	0	00:50	2.65
DIV342	DIVIDER	0.01	2.52	1037.51	0	00:50	2.52
DIV135	DIVIDER	0.00	0.61	1016.53	0	00:50	0.61
DIV389	DIVIDER	0.00	0.00	1001.15	0	00:00	0.00
DIV397	DIVIDER	0.00	0.00	1009.26	0	00:00	0.00
DIV105	DIVIDER	0.02	2.03	1012.54	0	00:55	2.03
DIV376	DIVIDER	0.95	4.00	1017.01	0	00:35	4.00
DIV70	DIVIDER	0.01	3.00	1012.85	0	00:30	3.00
DIV395	DIVIDER	0.00	0.00	1003.66	0	00:00	0.00
DIV1	DIVIDER	4.60	4.60	1012.61	0	00:05	4.60
DIV164	DIVIDER	0.01	1.83	1011.09	0	00:45	1.83
DIV125	DIVIDER	0.00	1.60	1007.47	0	00:45	1.60
DIV316	DIVIDER	0.01	1.15	1033.49	0	02:00	1.15
DIV396	DIVIDER	2.88	2.88	1008.09	0	00:05	2.88
DIV71	DIVIDER	0.01	2.50	1016.35	0	00:25	2.50
DIV399	DIVIDER	0.04	4.78	5388.78	0	00:45	4.78
DIV162	DIVIDER	0.01	1.82	1015.58	0	00:40	1.82
DIV136	DIVIDER	0.00	1.22	1017.48	0	00:40	1.22
DIV123	DIVIDER	0.00	0.92	1009.53	0	00:40	0.92
J13th-DIV	DIVIDER	0.34	1.94	989.94	0	01:05	1.94
J14th-DIV	DIVIDER	0.25	2.43	986.73	0	00:55	2.43
JColfax-DIV	DIVIDER	0.46	3.10	984.00	0	00:55	3.10
J16th-DIV	DIVIDER	0.26	3.05	979.05	0	00:55	3.05
D_02a	DIVIDER	0.00	0.95	5461.15	0	00:40	0.95
D_03b	DIVIDER	0.00	0.00	5409.00	0	00:00	0.00
D_05-07	DIVIDER	0.00	0.69	5404.69	0	01:00	0.69
D_05a	DIVIDER	0.03	1.44	5450.44	0	01:05	1.44
D_05b	DIVIDER	0.04	2.61	5417.61	0	00:45	2.61
D_05c	DIVIDER	0.00	0.69	5414.69	0	00:55	0.69
D_05d	DIVIDER	0.05	4.50	5418.50	0	00:40	4.50
D_06a	DIVIDER	0.01	4.00	5425.20	0	00:40	4.00
D_06b	DIVIDER	0.00	0.64	5421.84	0	00:45	0.64
D_07a	DIVIDER	0.00	2.25	5396.25	0	01:05	2.25
D_08a	DIVIDER	0.01	1.67	5410.67	0	00:50	1.67
D_08b	DIVIDER	0.01	4.00	5393.00	0	01:00	4.00
D_10a	DIVIDER	0.02	2.40	5373.40	0	01:15	2.40
D_10a1	DIVIDER	0.00	0.27	5388.77	0	01:05	0.27
D_10b	DIVIDER	0.02	2.42	5367.42	0	01:20	2.42
D_10c	DIVIDER	0.00	0.00	5352.00	0	00:00	0.00
D_10d	DIVIDER	0.00	0.56	5344.56	0	00:45	0.56
D_11a	DIVIDER	0.01	1.55	5372.55	0	00:55	1.55
D_12a	DIVIDER	0.01	2.56	5359.56	0	00:45	2.56

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

D_13a	DIVIDER	0.02	2.48	5343.48	0	01:30	2.48
D_14a	DIVIDER	0.01	3.01	5339.01	0	00:50	3.01
D_15a	DIVIDER	0.01	2.99	5316.99	0	00:55	2.99
D_03a	DIVIDER	0.05	4.50	5413.50	0	00:40	4.50
D_12_14	DIVIDER	0.00	0.00	5349.00	0	00:00	0.00
D_10_13	DIVIDER	0.00	0.00	5331.00	0	00:00	0.00
J72	DIVIDER	0.01	3.50	1010.00	0	00:35	3.50
J120	DIVIDER	0.00	0.98	1014.84	0	00:35	0.98
J127	DIVIDER	0.00	1.36	1005.94	0	00:45	1.36
J129	DIVIDER	0.00	1.51	1005.17	0	00:45	1.51
J158	DIVIDER	0.00	0.00	1000.42	0	00:00	0.00
J73	DIVIDER	0.01	4.00	1007.40	0	00:30	4.00
J236	DIVIDER	0.00	1.25	1023.66	0	00:35	1.25
J244	DIVIDER	0.01	2.48	1019.41	0	00:40	2.48
J241	DIVIDER	0.01	1.99	1026.19	0	00:40	1.99
J243	DIVIDER	0.01	2.37	1024.70	0	00:40	2.37
J246	DIVIDER	0.01	2.80	1019.00	0	00:40	2.80
J375	DIVIDER	0.02	2.67	1017.48	0	00:45	2.67
J330	DIVIDER	0.01	1.66	1038.44	0	00:50	1.66
J320	DIVIDER	0.02	2.43	1022.04	0	00:40	2.43
J319	DIVIDER	0.02	2.30	1025.50	0	00:40	2.30
J321	DIVIDER	0.01	1.87	1039.12	0	00:45	1.87
J373	DIVIDER	0.02	2.42	1019.23	0	00:45	2.42
J57	DIVIDER	0.00	1.81	1013.42	0	00:35	1.81
J250	DIVIDER	0.00	1.06	1012.27	0	00:45	1.06
J317	DIVIDER	0.01	1.34	1031.79	0	00:35	1.34
J318	DIVIDER	0.02	1.93	1025.73	0	00:40	1.93
J322	DIVIDER	0.00	1.32	1026.90	0	00:40	1.32
J363	DIVIDER	0.00	1.27	1028.50	0	00:40	1.27
D_AR2	DIVIDER	0.01	2.28	5340.28	0	01:00	2.28
DIV72	DIVIDER	0.00	0.71	1007.16	0	00:40	0.71
D_04a	DIVIDER	0.01	1.98	5459.01	0	00:40	1.98
D_04b	DIVIDER	0.01	1.96	5442.06	0	00:45	1.96
RES30	STORAGE	0.02	2.92	1039.63	0	02:00	2.92
RES201	STORAGE	103.61	597.62	1628.77	0	11:30	597.62
RES130	STORAGE	5.25	66.08	1066.09	0	04:00	66.08
RES156	STORAGE	0.00	0.42	1001.58	0	01:45	0.42
HavanaPnd	STORAGE	0.05	6.12	5382.12	0	02:20	6.12
1st/HavanaPnd	STORAGE	0.46	7.03	5443.09	0	03:00	7.03

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Node Inflow Summary
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	Maximum Lateral Inflow	Maximum Total Inflow	Time of Max Occurrence	Lateral Inflow Volume	Total Inflow Volume	Flow Balance Error

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

Node	Type	CFS	CFS	days	hr:min	10^6 gal	10^6 gal	Percent	
EC_Out_23rd	JUNCTION	0.00	198.61	0	00:55	0	8.06	0.000	
EC_Out_19thAv	JUNCTION	0.00	95.49	0	01:35	0	7.01	0.000	
E-J-01	JUNCTION	67.19	67.19	0	00:35	1.32	1.32	0.000	
E-J-02	JUNCTION	103.34	103.34	0	00:40	2.6	2.6	0.000	
E-J-03	JUNCTION	59.06	59.06	0	00:40	1.62	1.62	0.000	
E-J-04	JUNCTION	26.91	26.91	0	00:45	1.08	1.08	0.000	
E-J-05	JUNCTION	37.82	37.82	0	00:45	1.4	1.4	0.000	
E-J-06	JUNCTION	40.46	40.46	0	00:45	1.44	1.44	0.000	
E-J-07	JUNCTION	16.16	16.16	0	00:55	0.819	0.819	0.000	
E-J-08	JUNCTION	25.39	25.39	0	00:45	0.968	0.968	0.000	
E-J-09	JUNCTION	33.43	33.43	0	00:45	1.1	1.1	0.000	
E-J-10	JUNCTION	42.66	42.66	0	00:45	1.6	1.6	0.000	
E-J-11	JUNCTION	28.36	28.36	0	00:55	1.43	1.43	0.000	
E-J-12	JUNCTION	47.33	47.33	0	00:40	1.44	1.44	0.000	
E-J-13	JUNCTION	28.71	28.71	0	00:50	1.23	1.23	0.000	
E-J-14	JUNCTION	43.59	43.59	0	00:45	1.72	1.72	0.000	
E-J-15	JUNCTION	51.31	51.31	0	00:45	1.8	1.8	0.000	
E-J-16	JUNCTION	51.05	51.05	0	00:40	1.65	1.65	0.000	
J_01a	JUNCTION	0.00	67.48	0	00:35	0	1.61	0.000	
J_02a	JUNCTION	0.00	93.01	0	00:40	0	2.34	0.000	
J_03a	JUNCTION	0.00	59.06	0	00:40	0	1.62	0.000	
J_04a	JUNCTION	0.00	28.86	0	01:05	0	2.69	0.000	
J_05_07	JUNCTION	0.00	31.95	0	01:00	0	0.614	-0.000	
J_05a	JUNCTION	0.00	37.82	0	00:45	0	1.4	0.000	
J_06a	JUNCTION	0.00	124.53	0	00:45	0	3.82	0.000	
J_07a	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_07b	JUNCTION	0.00	14.10	0	01:10	0	0.144	0.000	
J_07c	JUNCTION	0.00	27.01	0	01:15	0	0.963	0.000	
J_08a	JUNCTION	0.00	95.72	0	01:00	0	2.94	0.000	
J_08b	JUNCTION	0.00	104.20	0	01:00	0	3.39	0.000	
J_09a	JUNCTION	0.00	35.64	0	00:50	0	1.19	0.000	
J_10a	JUNCTION	0.00	15.45	0	01:10	0	0.106	0.000	
J_10b	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_10c	JUNCTION	0.00	21.35	0	02:20	0	3.39	-0.000	
J_14a	JUNCTION	0.00	111.89	0	00:50	0	4.6	0.000	
J_15	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_15a	JUNCTION	0.00	155.02	0	00:55	0	6.4	0.000	
J_17thAv_Out	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_7b	JUNCTION	77.25	77.25	0	00:45	2.59	2.59	0.000	
J_AD1	JUNCTION	10.51	10.51	0	00:45	0.389	0.389	0.000	
J_AD3	JUNCTION	7.64	7.64	0	00:40	0.243	0.243	0.000	
J_AD4	JUNCTION	9.10	9.10	0	00:40	0.25	0.25	0.000	
J_AD7	JUNCTION	15.54	15.54	0	00:40	0.408	0.408	0.000	
J_AR1	JUNCTION	77.07	77.07	0	00:40	1.85	1.85	0.000	
J_AR2	JUNCTION	72.70	72.70	0	01:00	3.85	3.85	0.000	
J_EC_Colfax_Out	JUNCTION	0.00	7.25	0	00:45	0	0.271	0.000	
J_DE1	JUNCTION	112.12	112.12	0	00:50	4.53	4.53	0.000	

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J_DE2	JUNCTION	29.33	29.33	0	00:40	0.977	0.977	0.000
J_DE3	JUNCTION	13.94	13.94	0	00:50	0.681	0.681	0.000
J_DE4	JUNCTION	14.72	14.72	0	00:55	0.766	0.766	0.000
J_DE5	JUNCTION	26.45	26.45	0	00:50	1.25	1.25	0.000
J_DE6	JUNCTION	47.36	47.36	0	00:45	1.77	1.77	0.000
J_L1	JUNCTION	14.30	14.30	0	00:35	0.318	0.318	0.000
J_L2	JUNCTION	5.41	5.41	0	00:45	0.232	0.232	0.000
J_ST1	JUNCTION	6.33	6.33	0	01:15	0.548	0.548	0.000
J_ST2	JUNCTION	29.11	29.11	0	00:50	1.27	1.27	0.000
J_ST3	JUNCTION	35.58	35.58	0	00:55	1.89	1.89	0.000
J_ST4	JUNCTION	120.89	120.89	0	00:45	3.8	3.8	0.000
J_ST5	JUNCTION	93.55	93.55	0	01:00	4.65	4.65	0.000
J_ST6	JUNCTION	24.65	24.65	0	00:55	1.26	1.26	0.000
J_ST7	JUNCTION	101.47	101.47	0	00:45	3.4	3.4	0.000
J_ST8	JUNCTION	14.68	14.68	0	00:45	0.569	0.569	0.000
J_ST9	JUNCTION	35.69	35.69	0	00:45	1.18	1.18	0.000
J100	JUNCTION	169.12	169.12	0	00:55	7.47	7.47	0.000
J101	JUNCTION	0.00	538.46	0	01:00	0	234	0.000
J102	JUNCTION	0.00	558.31	0	01:05	0	235	0.000
J104	JUNCTION	0.00	140.17	0	01:25	0	239	0.000
J106	JUNCTION	0.00	33.38	0	00:45	0	1.02	0.000
J107	JUNCTION	0.00	25.29	0	00:45	0	0.821	0.000
J-10a1	JUNCTION	0.00	18.04	0	01:05	0	0.106	0.000
J111	JUNCTION	6.73	6.73	0	00:40	0.24	0.24	0.000
J113	JUNCTION	0.00	7.34	0	00:40	0	0.185	0.000
J11th	JUNCTION	0.00	140.17	0	01:25	0	239	0.000
J121	JUNCTION	7.39	7.39	0	00:35	0.185	0.185	0.000
J122	JUNCTION	11.36	11.36	0	00:45	0.408	0.408	0.000
J124	JUNCTION	0.00	18.71	0	00:45	0	0.593	0.000
J126	JUNCTION	0.00	18.81	0	00:45	0	0.593	0.000
J128	JUNCTION	0.00	21.06	0	00:45	0	0.686	0.000
J12th	JUNCTION	0.00	179.35	0	01:05	0	241	0.000
J131	JUNCTION	1.96	1.96	0	00:50	0.103	0.103	0.000
J132	JUNCTION	14.12	14.12	0	00:40	0.426	0.426	0.000
J133	JUNCTION	13.93	13.93	0	00:35	0.353	0.353	0.000
J134	JUNCTION	4.40	4.40	0	00:40	0.134	0.134	0.000
J14	JUNCTION	26.63	26.63	0	00:40	0.808	0.808	0.000
J140	JUNCTION	4.36	4.36	0	00:40	0.136	0.136	0.000
J141	JUNCTION	0.00	4.36	0	00:40	0	0.136	0.000
J150	JUNCTION	0.00	195.62	0	01:00	0	217	0.000
J151	JUNCTION	0.00	499.73	0	01:00	0	232	0.000
J154	JUNCTION	2.26	2.26	0	00:45	0.0937	0.0937	0.000
J155	JUNCTION	2.64	2.64	0	00:40	0.0849	0.0849	0.000
J157	JUNCTION	0.00	4.54	0	01:45	0	0.323	0.000
J159	JUNCTION	0.00	140.17	0	01:25	0	239	0.000
J160	JUNCTION	0.00	558.31	0	01:05	0	235	0.000
J161	JUNCTION	0.00	29.41	0	00:40	0	0.882	0.000
J163	JUNCTION	0.00	33.10	0	00:45	0	1.02	0.000
J165	JUNCTION	0.00	499.73	0	01:00	0	232	0.000

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J166	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J167	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J168	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J169	JUNCTION	0.00	33.38	0	00:45	0	1.02	0.000	
J16th-us	JUNCTION	0.00	378.58	0	00:55	0	248	0.000	
J170	JUNCTION	0.00	25.29	0	00:45	0	0.821	0.000	
J171	JUNCTION	0.00	538.46	0	01:00	0	234	0.000	
J17th	JUNCTION	0.00	458.16	0	01:00	0	252	0.000	
J19th-ds	JUNCTION	0.00	547.57	0	01:00	0	259	0.000	
J19th-us	JUNCTION	0.00	464.73	0	01:00	0	252	0.000	
J200	JUNCTION	3280.00	3280.00	0	01:05	208	208	0.000	
J202	JUNCTION	0.00	49.50	0	11:30	0	208	0.000	
J203	JUNCTION	0.00	49.50	0	11:30	0	208	0.000	
J204	JUNCTION	0.00	49.50	0	11:30	0	208	0.000	
J230	JUNCTION	0.00	58.25	0	00:40	0	3.05	0.000	
J231	JUNCTION	18.50	18.50	0	00:35	0.507	0.507	0.000	
J232	JUNCTION	32.05	32.05	0	00:40	1.11	1.11	0.000	
J233	JUNCTION	13.81	13.81	0	00:40	0.474	0.474	0.000	
J234	JUNCTION	13.89	13.89	0	00:35	0.36	0.36	0.000	
J235	JUNCTION	0.00	72.25	0	00:40	0	3.51	0.000	
J23rd	JUNCTION	0.00	858.46	0	01:05	0	274	0.000	
J24	JUNCTION	41.89	41.89	0	00:35	0.904	0.904	0.000	
J242	JUNCTION	0.00	70.07	0	00:40	0	2.01	0.000	
J245	JUNCTION	0.00	80.67	0	00:40	0	2.31	0.000	
J247	JUNCTION	0.00	79.96	0	00:45	0	2.31	0.000	
J248	JUNCTION	0.00	79.96	0	00:45	0	2.31	0.000	
J25	JUNCTION	0.00	80.85	0	00:40	0	2.31	0.000	
J251	JUNCTION	9.64	9.64	0	00:45	0.372	0.372	0.000	
J252	JUNCTION	11.40	11.40	0	00:40	0.306	0.306	0.000	
J253	JUNCTION	0.00	80.45	0	00:45	0	2.31	0.000	
J254	JUNCTION	0.00	80.45	0	00:45	0	2.31	-0.000	
J26th	JUNCTION	0.00	976.41	0	01:10	0	279	0.000	
J29th	JUNCTION	0.00	1041.20	0	01:20	0	284	0.000	
J31	JUNCTION	33.43	33.43	0	00:35	0.858	0.858	0.000	
J311	JUNCTION	5.40	5.40	0	00:45	0.212	0.212	0.000	
J314	JUNCTION	0.00	33.43	0	00:35	0	0.858	0.000	
J315	JUNCTION	0.00	13.13	0	02:00	0	1.5	0.000	
J32	JUNCTION	39.69	39.69	0	00:45	1.47	1.47	0.000	
J33	JUNCTION	24.89	24.89	0	00:50	1.07	1.07	0.000	
J33rd	JUNCTION	0.00	1148.58	0	01:25	0	290	0.000	
J34	JUNCTION	5.68	5.68	0	00:55	0.347	0.347	0.000	
J341	JUNCTION	0.00	63.97	0	00:50	0	2.54	0.000	
J343	JUNCTION	0.00	82.50	0	00:50	0	3.36	0.000	
J345	JUNCTION	0.00	109.46	0	00:55	0	212	0.000	
J346	JUNCTION	0.00	109.46	0	00:55	0	212	0.000	
J347	JUNCTION	0.00	109.16	0	01:00	0	212	0.000	
J348	JUNCTION	0.00	109.16	0	01:00	0	212	0.000	
J35	JUNCTION	20.46	20.46	0	00:35	0.431	0.431	0.000	
J350	JUNCTION	0.00	13.12	0	02:00	0	1.5	0.000	

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J351	JUNCTION	0.00	13.13	0	02:00	0	1.5	0.000
J352	JUNCTION	0.00	25.99	0	00:35	0	2.07	0.000
J353	JUNCTION	0.00	16.54	0	00:45	0	0.603	0.000
J354	JUNCTION	0.00	2.28	0	00:55	0	0.137	0.000
J355	JUNCTION	0.00	55.69	0	00:40	0	1.5	0.000
J36	JUNCTION	0.00	39.89	0	00:40	0	2.54	0.000
J361	JUNCTION	25.68	25.68	0	00:35	0.577	0.577	0.000
J362	JUNCTION	12.76	12.76	0	00:40	0.386	0.386	0.000
J37	JUNCTION	8.73	8.73	0	00:35	0.219	0.219	0.000
J371	JUNCTION	15.76	15.76	0	00:40	0.474	0.474	0.000
J372	JUNCTION	0.00	80.52	0	00:45	0	3.73	0.000
J374	JUNCTION	0.00	97.38	0	00:45	0	4.21	0.000
J38	JUNCTION	7.54	7.54	0	00:55	0.433	0.433	0.000
J390	JUNCTION	0.00	17.27	0	00:40	0	0.484	0.000
J391	JUNCTION	3.53	3.53	0	00:40	0.124	0.124	0.000
J392	JUNCTION	18.86	18.86	0	00:35	0.493	0.493	0.000
J393	JUNCTION	10.73	10.73	0	00:35	0.243	0.243	0.000
J394	JUNCTION	0.00	17.27	0	00:40	0	0.484	0.000
J41	JUNCTION	6.81	6.81	0	00:50	0.326	0.326	0.000
J42	JUNCTION	5.48	5.48	0	01:10	0.463	0.463	0.000
J43	JUNCTION	16.54	16.54	0	00:45	0.603	0.603	0.000
J44	JUNCTION	2.28	2.28	0	00:55	0.137	0.137	0.000
J51	JUNCTION	11.16	11.16	0	00:40	0.325	0.325	0.000
J52	JUNCTION	10.20	10.20	0	00:35	0.232	0.232	0.000
J53	JUNCTION	14.16	14.16	0	00:35	0.282	0.282	0.000
J54	JUNCTION	31.47	31.47	0	00:35	0.556	0.556	0.000
J56	JUNCTION	0.00	11.16	0	00:40	0	0.325	0.000
J61	JUNCTION	67.16	71.69	0	00:35	1.35	1.59	0.000
J62	JUNCTION	32.44	32.44	0	00:35	0.651	0.651	0.000
J63	JUNCTION	31.19	31.19	0	00:40	0.989	0.989	0.000
J64	JUNCTION	31.54	31.54	0	00:35	0.66	0.66	0.000
J65	JUNCTION	0.00	88.51	0	00:45	0	3.45	0.000
J67	JUNCTION	0.00	100.33	0	00:40	0	2.25	0.000
J68	JUNCTION	0.00	66.84	0	01:20	0	2.75	0.000
J6th_Pipe	JUNCTION	0.00	216.67	0	00:55	0	10.7	0.000
J74	JUNCTION	0.00	96.45	0	00:45	0	2.25	0.000
J7b	JUNCTION	0.00	225.50	0	00:45	0	10.7	0.000
JL2	JUNCTION	0.00	5.41	0	00:45	0	0.232	0.000
JMLK	JUNCTION	0.00	1149.47	0	01:20	0	289	0.000
JMontview-ds	JUNCTION	0.00	654.91	0	01:05	0	264	0.000
JMontview-us	JUNCTION	0.00	555.51	0	01:05	0	260	0.000
J_16thAve_E	JUNCTION	0.00	78.37	0	01:05	0	4.12	0.000
JSandCreek	OUTFALL	0.00	1162.98	0	01:30	0	291	0.000
DIV344	DIVIDER	0.00	82.50	0	00:50	0	3.36	0.000
DIV342	DIVIDER	0.00	63.97	0	00:50	0	2.54	0.000
DIV135	DIVIDER	0.00	1.96	0	00:50	0	0.103	0.000
DIV389	DIVIDER	0.00	4.54	0	01:45	0	0.323	0.000
DIV397	DIVIDER	0.00	33.10	0	00:45	0	1.02	0.000
DIV105	DIVIDER	0.00	216.67	0	00:55	0	10.7	0.000

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

DIV376	DIVIDER	0.00	195.62	0	01:00	0	217	0.000	
DIV70	DIVIDER	0.00	100.33	0	00:40	0	2.25	0.000	
DIV395	DIVIDER	0.00	21.06	0	00:45	0	0.686	0.000	
DIV1	DIVIDER	0.00	10.93	0	00:45	0	0.324	0.000	
DIV164	DIVIDER	0.00	33.10	0	00:45	0	1.02	0.000	
DIV125	DIVIDER	0.00	18.71	0	00:45	0	0.593	0.000	
DIV316	DIVIDER	0.00	13.12	0	02:00	0	1.5	0.000	
DIV396	DIVIDER	0.00	4.36	0	00:40	0	0.136	0.000	
DIV71	DIVIDER	0.00	71.69	0	00:35	0	1.59	0.000	
DIV399	DIVIDER	0.00	225.50	0	00:45	0	10.7	0.000	
DIV162	DIVIDER	0.00	29.41	0	00:40	0	0.882	0.000	
DIV136	DIVIDER	0.00	14.12	0	00:40	0	0.426	0.000	
DIV123	DIVIDER	0.00	7.34	0	00:40	0	0.185	0.000	
J13th-DIV	DIVIDER	0.00	203.69	0	01:05	0	242	0.000	
J14th-DIV	DIVIDER	0.00	327.10	0	00:55	0	246	0.000	
JColfax-DIV	DIVIDER	0.00	341.16	0	00:55	0	246	0.000	
J16th-DIV	DIVIDER	0.00	452.76	0	00:55	0	252	0.000	
D_02a	DIVIDER	0.00	103.34	0	00:40	0	2.6	0.000	
D_03b	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_05-07	DIVIDER	0.00	73.80	0	01:00	0	1.39	-0.000	
D_05a	DIVIDER	0.00	28.86	0	01:05	0	2.69	0.000	
D_05b	DIVIDER	0.00	61.75	0	00:45	0	4.09	0.000	
D_05c	DIVIDER	0.00	84.43	0	00:55	0	1.57	0.000	
D_05d	DIVIDER	0.00	173.89	0	00:55	0	7.87	0.000	
D_06a	DIVIDER	0.00	124.53	0	00:45	0	3.82	0.000	
D_06b	DIVIDER	0.00	58.24	0	00:45	0	0.745	0.000	
D_07a	DIVIDER	0.00	30.12	0	01:10	0	0.627	0.000	
D_08a	DIVIDER	0.00	35.64	0	00:50	0	1.19	0.000	
D_08b	DIVIDER	0.00	111.33	0	01:05	0	3.43	0.000	
D_10a	DIVIDER	0.00	55.66	0	01:20	0	4.46	0.000	
D_10a1	DIVIDER	0.00	18.04	0	01:05	0	0.106	0.000	
D_10b	DIVIDER	0.00	53.17	0	01:30	0	4.46	0.000	
D_10c	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_10d	DIVIDER	0.00	42.66	0	00:45	0	1.6	0.000	
D_11a	DIVIDER	0.00	28.36	0	00:55	0	1.43	0.000	
D_12a	DIVIDER	0.00	70.20	0	00:45	0	2.87	0.000	
D_13a	DIVIDER	0.00	76.10	0	01:30	0	5.78	0.000	
D_14a	DIVIDER	0.00	111.89	0	00:50	0	4.6	0.000	
D_15a	DIVIDER	0.00	110.50	0	00:55	0	4.6	0.000	
D_03a	DIVIDER	0.00	148.52	0	00:40	0	8.15	0.000	
D_12_14	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_10_13	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
J72	DIVIDER	0.00	139.95	0	00:40	0	3.56	0.000	
J120	DIVIDER	0.00	7.39	0	00:35	0	0.185	0.000	
J127	DIVIDER	0.00	18.81	0	00:45	0	0.593	0.000	
J129	DIVIDER	0.00	21.06	0	00:45	0	0.686	0.000	
J158	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
J73	DIVIDER	0.00	66.84	0	01:20	0	2.75	0.000	
J236	DIVIDER	0.00	13.89	0	00:35	0	0.36	0.000	

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

J244	DIVIDER	0.00	80.85	0	00:40	0	2.31	0.000
J241	DIVIDER	0.00	32.05	0	00:40	0	1.11	0.000
J243	DIVIDER	0.00	70.07	0	00:40	0	2.01	0.000
J246	DIVIDER	0.00	80.67	0	00:40	0	2.31	0.000
J375	DIVIDER	0.00	97.38	0	00:45	0	4.21	0.000
J330	DIVIDER	0.00	24.89	0	00:50	0	1.07	0.000
J320	DIVIDER	0.00	72.25	0	00:40	0	3.51	0.000
J319	DIVIDER	0.00	58.25	0	00:40	0	3.05	0.000
J321	DIVIDER	0.00	39.69	0	00:45	0	1.47	0.000
J373	DIVIDER	0.00	80.52	0	00:45	0	3.73	0.000
J57	DIVIDER	0.00	31.47	0	00:35	0	0.556	0.000
J250	DIVIDER	0.00	9.64	0	00:45	0	0.372	0.000
J317	DIVIDER	0.00	25.99	0	00:35	0	2.07	0.000
J318	DIVIDER	0.00	39.89	0	00:40	0	2.54	0.000
J322	DIVIDER	0.00	13.81	0	00:40	0	0.474	0.000
J363	DIVIDER	0.00	12.76	0	00:40	0	0.386	0.000
D_AR2	DIVIDER	0.00	78.60	0	01:00	0	4.13	0.000
DIV72	DIVIDER	0.00	76.32	0	00:40	0	0.843	0.000
D_04a	DIVIDER	0.00	65.18	0	00:40	0	1.61	0.000
D_04b	DIVIDER	0.00	90.54	0	00:45	0	2.69	0.000
RES30	STORAGE	0.00	55.69	0	00:40	0	1.5	0.140
RES201	STORAGE	0.00	3280.00	0	01:05	0	208	0.001
RES130	STORAGE	0.00	578.84	0	01:00	0	235	0.018
RES156	STORAGE	0.00	9.37	0	00:40	0	0.325	0.504
HavanaPnd	STORAGE	0.00	104.20	0	01:00	0	3.39	0.022
1st/HavanaPnd	STORAGE	0.00	68.20	0	00:45	0	1.68	0.088

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
RES30	0.894	0	0	0	127.362	0	0 02:00	13.13
RES201	4513.350	0	0	0	26032.459	0	0 11:30	49.50
RES130	228.772	0	0	0	2878.439	0	0 04:00	73.24
RES156	0.085	0	0	0	18.337	0	0 01:40	4.54
HavanaPnd	1.994	0	0	0	304.267	36	0 02:15	21.35

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

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1st/HavanaPnd            6.047       0     0     0       193.832      10        0  02:55       3.66


**********************
Outfall Loading Summary
**********************

-----------------------------------------------------------
                       Flow       Avg       Max       Total
                       Freq      Flow      Flow      Volume
Outfall Node            Pcnt       CFS       CFS    10^6 gal
-----------------------------------------------------------
JSandCreek             75.61     24.32   1162.98     291.116
-----------------------------------------------------------
System                 75.61     24.32   1162.98     291.116


*******************
Link Flow Summary
*******************

-------------------------------------------------------------------------------
                             Maximum  Time of Max    Maximum    Max/    Max/
                             |Flow|   Occurrence   |Veloc|    Full    Full
Link                 Type       CFS  days hr:min    ft/sec    Flow   Depth
-------------------------------------------------------------------------------
C_03a                CONDUIT  148.25     0  00:45     10.27    0.65    0.58
C_05a                CONDUIT   28.44     0  01:10      7.78    0.35    0.41
C_05b                CONDUIT   62.13     0  00:45      6.47    0.64    0.58
C_05c                CONDUIT   94.20     0  01:45      6.66    1.05    1.00
C_06a                CONDUIT   68.80     0  01:35      6.35    1.04    1.00
C_07a                CONDUIT   17.51     0  01:40      4.97    1.06    1.00
C_08a                CONDUIT   35.31     0  00:55      7.21    0.36    0.41
C_08b                CONDUIT  104.20     0  01:00      6.75    1.11    1.00
C_10a                CONDUIT   21.35     0  02:20      4.91    0.44    0.46
C_10b                CONDUIT   46.52     0  01:20      6.60    0.82    0.69
C_10c                CONDUIT   52.24     0  01:30      7.79    0.56    0.54
C_11a                CONDUIT   28.22     0  01:00      6.33    0.32    0.39
C_13a                CONDUIT   75.45     0  01:35      8.63    0.58    0.55
C_14a                CONDUIT   69.24     0  00:55      7.55    0.61    0.56
C_15a                CONDUIT  110.50     0  00:55      8.46    0.57    0.54
C_15b                CONDUIT  110.38     0  01:00      7.70    0.15    0.22
C_16a                CONDUIT   51.03     0  00:40     11.16    0.00    0.05
C_16thAv             CONDUIT   78.37     0  01:05      6.20    0.14    0.25
C_JL2                DUMMY      5.41     0  00:45
C1                   DUMMY     10.93     0  00:45
C101                 DUMMY    538.46     0  01:00
C102                 DUMMY    558.31     0  01:05
C104                 DUMMY    140.17     0  01:25
```

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

C105	CONDUIT	217.56	0	00:55	4.92	0.12	0.34
C105-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C106	DUMMY	33.38	0	00:45			
C107	DUMMY	25.29	0	00:45			
C111	DUMMY	6.73	0	00:40			
C113	DUMMY	7.34	0	00:40			
C120	CONDUIT	7.34	0	00:40	3.75	0.23	0.32
C120_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C121	DUMMY	7.39	0	00:35			
C122	DUMMY	11.36	0	00:45			
C123	CONDUIT	7.35	0	00:45	3.68	0.15	0.26
C123-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C124	DUMMY	18.71	0	00:45			
C125	CONDUIT	18.81	0	00:45	4.37	0.43	0.46
C125-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C126	DUMMY	18.81	0	00:45			
C127	CONDUIT	18.80	0	00:45	4.65	0.20	0.30
C127_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C128	DUMMY	21.06	0	00:45			
C129	CONDUIT	21.03	0	00:45	4.84	0.30	0.38
C129_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C12th	CONDUIT	139.78	0	01:05	3.38	0.02	0.14
C131	DUMMY	1.96	0	00:50			
C132	DUMMY	14.12	0	00:40			
C133	DUMMY	13.93	0	00:35			
C134	DUMMY	4.40	0	00:40			
C135	CONDUIT	1.96	0	00:55	2.43	0.20	0.30
C135-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C136	CONDUIT	14.06	0	00:40	4.32	0.20	0.31
C136-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C13th	CONDUIT	179.12	0	01:05	3.57	0.04	0.19
C14	DUMMY	26.63	0	00:40			
C140	DUMMY	4.36	0	00:40			
C141	CONDUIT	4.33	0	00:40	3.18	0.13	0.25
C14th	CONDUIT	203.31	0	01:05	6.46	0.23	0.29
C14th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C150	DUMMY	195.62	0	01:00			
C151	DUMMY	499.73	0	01:00			
C154	DUMMY	2.26	0	00:45			
C155	DUMMY	2.64	0	00:40			
C157	CONDUIT	4.54	0	01:45	3.12	0.07	0.17
C158	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C158_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C159	DUMMY	140.17	0	01:25			
C160	DUMMY	558.31	0	01:05			
C161	DUMMY	29.41	0	00:40			
C162	CONDUIT	28.90	0	00:45	5.33	0.42	0.45
C162-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C163	DUMMY	33.10	0	00:45			

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

C164	CONDUIT	33.38	0	00:45	5.47	0.35	0.41
C164-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C165	CONDUIT	500.04	0	01:05	5.73	0.10	0.36
C166	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C167	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C168	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C169	CONDUIT	33.54	0	00:45	1.62	0.00	0.04
C16th	CONDUIT	340.86	0	00:55	5.38	0.23	0.52
C16th2	DUMMY	378.58	0	00:55			
C16th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C170	CONDUIT	24.90	0	00:45	1.46	0.00	0.03
C171	CONDUIT	537.94	0	01:05	5.84	0.10	0.37
C17th	CONDUIT	452.14	0	01:00	8.26	0.51	0.51
C17th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C19th	CONDUIT	458.22	0	01:00	3.94	0.08	0.33
C19th2	DUMMY	464.73	0	01:00			
C1-DIV	DUMMY	0.00	0	00:00			
C20	DUMMY	216.67	0	00:55			
C200	DUMMY	3280.00	0	01:05			
C202	CONDUIT	49.50	0	11:30	7.72	0.51	0.51
C203	DUMMY	49.50	0	11:30			
C204	CONDUIT	49.50	0	11:35	2.56	0.01	0.08
C230	DUMMY	58.25	0	00:40			
C231	DUMMY	18.50	0	00:35			
C232	DUMMY	32.05	0	00:40			
C233	DUMMY	13.81	0	00:40			
C234	DUMMY	13.89	0	00:35			
C235	DUMMY	72.25	0	00:40			
C236	CONDUIT	13.74	0	00:40	5.01	0.36	0.41
C236_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C23rd	CONDUIT	650.11	0	01:10	4.40	0.05	0.30
C24	DUMMY	41.89	0	00:35			
C241	CONDUIT	31.98	0	00:45	4.16	0.28	0.36
C241_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C242	DUMMY	70.07	0	00:40			
C243	CONDUIT	69.44	0	00:40	6.30	0.27	0.35
C243_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C244	CONDUIT	80.67	0	00:40	6.82	0.29	0.37
C244_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C245	DUMMY	80.67	0	00:40			
C246	CONDUIT	79.96	0	00:45	5.14	0.26	0.35
C246_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C247	DUMMY	79.96	0	00:45			
C248	CONDUIT	80.45	0	00:45	10.96	0.09	0.20
C25	DUMMY	80.85	0	00:40			
C250	CONDUIT	9.55	0	00:45	3.60	0.15	0.27
C250_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C251	DUMMY	9.64	0	00:45			
C252	DUMMY	11.40	0	00:40			

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

C253	DUMMY	80.45	0	00:45			
C254	CONDUIT	80.98	0	00:45	3.12	0.13	0.38
C26th	CONDUIT	856.17	0	01:10	3.52	0.06	0.33
C29th	CONDUIT	958.83	0	01:20	3.96	0.06	0.31
C31	DUMMY	33.43	0	00:35			
C311	DUMMY	5.40	0	00:45			
C314	CONDUIT	32.53	0	00:45	2.22	0.10	0.35
C315	CONDUIT	13.12	0	02:00	3.92	0.21	0.31
C316	CONDUIT	13.13	0	02:05	3.84	0.12	0.23
C316-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C317	CONDUIT	26.27	0	00:40	6.21	0.16	0.27
C318	CONDUIT	40.03	0	00:40	4.75	0.18	0.29
C319	CONDUIT	57.17	0	00:45	5.28	0.22	0.32
C319_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C32	DUMMY	39.69	0	00:45			
C320	CONDUIT	72.99	0	00:45	6.09	0.25	0.34
C320_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C321	CONDUIT	39.46	0	00:45	4.76	0.15	0.26
C321_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322	CONDUIT	13.65	0	00:45	3.56	0.19	0.29
C33	DUMMY	24.89	0	00:50			
C330	CONDUIT	24.78	0	00:50	4.12	0.20	0.30
C330_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C34	DUMMY	5.68	0	00:55			
C341	DUMMY	63.97	0	00:50			
C342	CONDUIT	63.26	0	00:55	6.47	0.50	0.50
C342-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C343	DUMMY	82.50	0	00:50			
C344	CONDUIT	82.49	0	00:55	6.87	0.40	0.44
C344-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C345	DUMMY	109.46	0	00:55			
C346	CONDUIT	109.16	0	01:00	2.91	0.05	0.26
C347	DUMMY	109.16	0	01:00			
C348	CONDUIT	107.35	0	01:05	2.52	0.04	0.20
C35	DUMMY	20.46	0	00:35			
C350	DUMMY	13.12	0	02:00			
C351	DUMMY	13.13	0	02:00			
C352	DUMMY	25.99	0	00:35			
C353	CONDUIT	15.26	0	01:00	1.73	0.02	0.16
C354	CONDUIT	2.22	0	01:10	2.13	0.04	0.14
C355	DUMMY	55.69	0	00:40			
C36	DUMMY	39.89	0	00:40			
C361	DUMMY	25.68	0	00:35			
C362	DUMMY	12.76	0	00:40			
C363	CONDUIT	12.56	0	00:45	3.50	0.17	0.28
C37	DUMMY	8.73	0	00:35			
C371	DUMMY	15.76	0	00:40			
C372	DUMMY	80.52	0	00:45			
C373	CONDUIT	80.92	0	00:45	6.16	0.19	0.29

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

C373_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C374	DUMMY	97.38	0	00:45			
C375	CONDUIT	97.60	0	00:45	6.49	0.22	0.32
C375_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C376	CONDUIT	65.99	0	03:30	5.75	1.06	1.00
C376-OVER	CONDUIT	130.61	0	01:10	2.62	0.03	0.16
C38	DUMMY	7.54	0	00:55			
C389	DUMMY	4.54	0	01:45			
C389-DIV	DUMMY	0.00	0	00:00			
C390	DUMMY	17.27	0	00:40			
C391	DUMMY	3.53	0	00:40			
C392	DUMMY	18.86	0	00:35			
C393	DUMMY	10.73	0	00:35			
C394	CONDUIT	17.40	0	00:40	3.94	0.04	0.14
C395	DUMMY	21.06	0	00:45			
C395-DIV	DUMMY	0.00	0	00:00			
C396	DUMMY	4.36	0	00:40			
C396-DIV	DUMMY	0.00	0	00:00			
C397	DUMMY	33.10	0	00:45			
C397-DIV	DUMMY	0.00	0	00:00			
C399	CONDUIT	216.67	0	00:55	9.43	0.93	0.76
C399-DIV	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
C41	DUMMY	6.81	0	00:50			
C42	DUMMY	5.48	0	01:10			
C43	DUMMY	16.54	0	00:45			
C44	DUMMY	2.28	0	00:55			
C51	DUMMY	11.16	0	00:40			
C52	DUMMY	10.20	0	00:35			
C53	DUMMY	14.16	0	00:35			
C54	DUMMY	31.47	0	00:35			
C56	CONDUIT	10.93	0	00:45	3.70	0.10	0.21
C57	CONDUIT	30.44	0	00:35	4.98	0.27	0.36
C57_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C61	DUMMY	71.69	0	00:35			
C62	DUMMY	32.44	0	00:35			
C63	DUMMY	31.19	0	00:40			
C64	DUMMY	31.54	0	00:35			
C65	DUMMY	88.51	0	00:45			
C67	DUMMY	100.33	0	00:40			
C68	DUMMY	66.84	0	01:20			
C70	CONDUIT	29.23	0	01:35	4.86	1.04	1.00
C70-OVER	CHANNEL	68.40	0	00:45	5.68	0.01	0.08
C71	CONDUIT	20.52	0	01:30	4.86	1.03	1.00
C71-OVER	CHANNEL	50.53	0	00:40	6.53	0.00	0.06
C72	CONDUIT	66.25	0	01:20	7.75	1.04	1.00
C73	CONDUIT	37.36	0	01:55	3.37	1.06	1.00
C73_Overlfow	CHANNEL	30.95	0	01:25	8.57	0.00	0.05
C74	DUMMY	96.45	0	00:45			
CAD1	DUMMY	10.51	0	00:45			

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

CAD3	DUMMY	7.64	0	00:40			
CAD4	DUMMY	9.10	0	00:40			
CAD7	DUMMY	15.54	0	00:40			
CAR1	DUMMY	77.07	0	00:40			
CAR2	DUMMY	72.70	0	01:00			
CColfax	CONDUIT	327.33	0	00:55	7.47	0.37	0.41
CColf-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CCPark	CONDUIT	1142.32	0	01:25	3.71	0.11	0.40
CDE1	DUMMY	112.12	0	00:50			
CDE2	DUMMY	29.33	0	00:40			
CDE3	DUMMY	13.94	0	00:50			
CDE4	DUMMY	14.72	0	00:55			
CDE5	DUMMY	26.45	0	00:50			
CDE6	DUMMY	47.36	0	00:45			
CDIV7b	DUMMY	225.50	0	00:45			
CJ_L1	DUMMY	14.30	0	00:35			
CJ7b	DUMMY	77.25	0	00:45			
CJL2	DUMMY	5.41	0	00:45			
CMLK	CONDUIT	1043.84	0	01:20	4.08	0.09	0.36
CMontview	CONDUIT	546.93	0	01:05	3.77	0.03	0.23
CMontview2	DUMMY	555.51	0	01:05			
CSandCreek	CONDUIT	1141.84	0	01:30	5.61	0.10	0.35
CST1	DUMMY	6.33	0	01:15			
CST2	DUMMY	29.11	0	00:50			
CST3	DUMMY	35.58	0	00:55			
CST4	DUMMY	120.89	0	00:45			
CST5	DUMMY	93.55	0	01:00			
CST6	DUMMY	24.65	0	00:55			
CST7	CONDUIT	89.87	0	01:00	2.32	0.00	0.09
CST8	DUMMY	14.68	0	00:45			
CST9	DUMMY	35.69	0	00:45			
d_01a	DUMMY	67.19	0	00:35			
d_02a	DUMMY	103.34	0	00:40			
d_02b	DUMMY	93.01	0	00:40			
d_03a	DUMMY	59.06	0	00:40			
d_03b	DUMMY	59.06	0	00:40			
d_03c	DUMMY	0.00	0	00:00			
d_04b	DUMMY	26.91	0	00:45			
d_04d	DUMMY	28.86	0	01:05			
d_05a	DUMMY	37.82	0	00:45			
d_05b	DUMMY	37.82	0	00:45			
d_05c	DUMMY	84.43	0	00:55			
d_06a	DUMMY	40.46	0	00:45			
d_06b	DUMMY	124.53	0	00:45			
d_06c	DUMMY	58.24	0	00:45			
d_07b	DUMMY	16.16	0	00:55			
d_08a	DUMMY	25.39	0	00:45			
d_08b	DUMMY	95.72	0	01:00			
d_08c	DUMMY	104.20	0	01:00			

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

d_09a	DUMMY	33.43	0	00:45			
d_09b	DUMMY	35.64	0	00:50			
d_10a	DUMMY	42.66	0	00:45			
d_10a1	DUMMY	0.00	0	00:00			
d_10a2	DUMMY	18.04	0	01:05			
d_11a	DUMMY	28.36	0	00:55			
d_12a	DUMMY	47.33	0	00:40			
d_13a	DUMMY	28.71	0	00:50			
d_14a	DUMMY	43.59	0	00:45			
d_14b	DUMMY	111.89	0	00:50			
d_15a	DUMMY	51.31	0	00:45			
d_17thAv	DUMMY	0.00	0	00:00			
d_EC_Out_23rd	DUMMY	198.61	0	00:55			
d_EC_Out_19thAv	DUMMY	95.49	0	01:35			
S_02a	CONDUIT	7.52	0	01:05	0.57	0.08	0.26
S_03a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_05_07a	CHANNEL	31.95	0	01:00	3.28	0.00	0.05
S_05_07b	CHANNEL	40.73	0	01:05	9.98	0.00	0.05
S_05a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_05b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_05c	CHANNEL	73.80	0	01:00	8.10	0.00	0.07
S_05d	CHANNEL	8.94	0	01:05	5.29	0.00	0.06
S_06a	CHANNEL	84.63	0	00:50	10.07	0.00	0.07
S_06b	CHANNEL	47.68	0	00:55	6.73	0.01	0.10
S_07a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_07b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_07b2	CHANNEL	30.12	0	01:10	6.00	0.00	0.06
S_07d	CHANNEL	14.10	0	01:10	7.80	0.00	0.03
S_07e	CHANNEL	12.65	0	01:20	8.15	0.00	0.03
S_08a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_08b	CHANNEL	18.04	0	01:05	12.08	0.00	0.03
S_09a	CHANNEL	5.53	0	01:00	12.58	0.00	0.02
S_10_13	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10a1	CHANNEL	15.45	0	01:10	10.81	0.00	0.03
S_10b	CHANNEL	12.79	0	01:15	4.57	0.00	0.03
S_10c	CHANNEL	26.18	0	01:25	9.60	0.00	0.04
S_10d	CHANNEL	7.14	0	01:30	9.20	0.00	0.03
S_10e	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10f	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10g	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_10i	DUMMY	7.25	0	00:45			
S_11a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_12_14	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_13a	CHANNEL	35.19	0	00:50	8.83	0.00	0.06
S_13b1	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_13b2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_14a1	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_14a2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

S_15	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_15a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_15b	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
S_15c	CONDUIT	154.67	0	00:55	8.79	0.00	0.03
S_Beeler	CHANNEL	58.94	0	00:55	8.65	0.00	0.06
C317_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C318_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C363_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C_EC_Colfax_Out	CHANNEL	6.23	0	01:10	7.48	0.00	0.03
S_AR2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
d_16thAve_E	DUMMY	78.37	0	01:05			
d_72	DUMMY	76.32	0	00:40			
C72_Overflow	CHANNEL	1.94	0	00:50	8.31	0.00	0.02
C_04b	CONDUIT	63.62	0	00:45	10.58	0.48	0.49
S_04a	CHANNEL	65.18	0	00:40	2.16	0.01	0.09
d_04c	DUMMY	68.20	0	00:45			
C_04c	CONDUIT	26.69	0	01:05	8.44	0.43	0.46
S_04b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
O_10a	ORIFICE	21.35	0	02:20			0.00
W_10a	WEIR	0.00	0	00:00			0.00
OUT30	DUMMY	13.13	0	02:00			
OUT201	DUMMY	49.50	0	11:30			
OUT130	DUMMY	73.24	0	04:00			
OUT156	DUMMY	4.54	0	01:45			
OUT04	DUMMY	3.66	0	03:00			

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C_05c	1.17	1.17	1.17	1.25	1.17
C_06a	0.83	0.83	0.83	0.08	0.83
C_07a	0.58	0.58	0.58	0.67	0.58
C_08b	0.33	0.33	0.33	0.33	0.33
C376	3.17	3.17	3.17	3.17	3.17
C70	1.08	1.08	1.08	0.08	1.08
C71	1.08	1.08	1.08	1.08	1.08
C72	0.83	0.83	0.83	0.92	0.83
C73	1.42	1.42	1.42	1.42	1.42

Analysis begun on: Mon May 3 14:23:44 2021

Table B.4– SWMM Output Reports for 5-year (Future) Event (Continued)

```
  Analysis ended on:  Mon May  3 14:23:44 2021
  Total elapsed time: < 1 sec
```

Table B.4 – SWMM Output Reports for 100-year (Future) Event

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
--------------------------------------------------------------

Lower Westerly Creek
Baseline Hydrology - with 1st and Havana Pond (100-year)
Bohannan Huston

WARNING 08: elevation drop exceeds length for Conduit C_JL2
WARNING 04: minimum elevation drop used for Conduit C1
WARNING 04: minimum elevation drop used for Conduit C101
WARNING 04: minimum elevation drop used for Conduit C102
WARNING 04: minimum elevation drop used for Conduit C104
WARNING 04: minimum elevation drop used for Conduit C106
WARNING 04: minimum elevation drop used for Conduit C107
WARNING 04: minimum elevation drop used for Conduit C111
WARNING 04: minimum elevation drop used for Conduit C113
WARNING 04: minimum elevation drop used for Conduit C121
WARNING 04: minimum elevation drop used for Conduit C122
WARNING 04: minimum elevation drop used for Conduit C124
WARNING 04: minimum elevation drop used for Conduit C126
WARNING 04: minimum elevation drop used for Conduit C128
WARNING 04: minimum elevation drop used for Conduit C131
WARNING 04: minimum elevation drop used for Conduit C132
WARNING 04: minimum elevation drop used for Conduit C133
WARNING 04: minimum elevation drop used for Conduit C134
WARNING 04: minimum elevation drop used for Conduit C14
WARNING 04: minimum elevation drop used for Conduit C140
WARNING 04: minimum elevation drop used for Conduit C150
WARNING 04: minimum elevation drop used for Conduit C151
WARNING 04: minimum elevation drop used for Conduit C154
WARNING 04: minimum elevation drop used for Conduit C155
WARNING 04: minimum elevation drop used for Conduit C159
WARNING 04: minimum elevation drop used for Conduit C160
WARNING 04: minimum elevation drop used for Conduit C161
WARNING 04: minimum elevation drop used for Conduit C163
WARNING 04: minimum elevation drop used for Conduit C16th2
WARNING 04: minimum elevation drop used for Conduit C19th2
WARNING 08: elevation drop exceeds length for Conduit C20
WARNING 04: minimum elevation drop used for Conduit C200
WARNING 04: minimum elevation drop used for Conduit C203
WARNING 04: minimum elevation drop used for Conduit C230
WARNING 04: minimum elevation drop used for Conduit C231
WARNING 04: minimum elevation drop used for Conduit C232
WARNING 04: minimum elevation drop used for Conduit C233
WARNING 04: minimum elevation drop used for Conduit C234
WARNING 04: minimum elevation drop used for Conduit C235
WARNING 04: minimum elevation drop used for Conduit C24
WARNING 04: minimum elevation drop used for Conduit C242
WARNING 04: minimum elevation drop used for Conduit C245
```

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

```
WARNING 04: minimum elevation drop used for Conduit C247
WARNING 04: minimum elevation drop used for Conduit C25
WARNING 04: minimum elevation drop used for Conduit C251
WARNING 04: minimum elevation drop used for Conduit C252
WARNING 04: minimum elevation drop used for Conduit C253
WARNING 04: minimum elevation drop used for Conduit C31
WARNING 04: minimum elevation drop used for Conduit C311
WARNING 04: minimum elevation drop used for Conduit C32
WARNING 04: minimum elevation drop used for Conduit C33
WARNING 04: minimum elevation drop used for Conduit C34
WARNING 04: minimum elevation drop used for Conduit C341
WARNING 04: minimum elevation drop used for Conduit C343
WARNING 04: minimum elevation drop used for Conduit C345
WARNING 04: minimum elevation drop used for Conduit C347
WARNING 04: minimum elevation drop used for Conduit C35
WARNING 04: minimum elevation drop used for Conduit C350
WARNING 04: minimum elevation drop used for Conduit C351
WARNING 04: minimum elevation drop used for Conduit C352
WARNING 04: minimum elevation drop used for Conduit C355
WARNING 04: minimum elevation drop used for Conduit C36
WARNING 04: minimum elevation drop used for Conduit C361
WARNING 04: minimum elevation drop used for Conduit C362
WARNING 04: minimum elevation drop used for Conduit C37
WARNING 04: minimum elevation drop used for Conduit C371
WARNING 04: minimum elevation drop used for Conduit C372
WARNING 04: minimum elevation drop used for Conduit C374
WARNING 04: minimum elevation drop used for Conduit C38
WARNING 04: minimum elevation drop used for Conduit C389
WARNING 04: minimum elevation drop used for Conduit C390
WARNING 04: minimum elevation drop used for Conduit C391
WARNING 04: minimum elevation drop used for Conduit C392
WARNING 04: minimum elevation drop used for Conduit C393
WARNING 04: minimum elevation drop used for Conduit C395
WARNING 04: minimum elevation drop used for Conduit C395-DIV
WARNING 04: minimum elevation drop used for Conduit C396
WARNING 08: elevation drop exceeds length for Conduit C396-DIV
WARNING 04: minimum elevation drop used for Conduit C397
WARNING 08: elevation drop exceeds length for Conduit C397-DIV
WARNING 04: minimum elevation drop used for Conduit C41
WARNING 04: minimum elevation drop used for Conduit C42
WARNING 04: minimum elevation drop used for Conduit C43
WARNING 04: minimum elevation drop used for Conduit C44
WARNING 04: minimum elevation drop used for Conduit C51
WARNING 04: minimum elevation drop used for Conduit C52
WARNING 04: minimum elevation drop used for Conduit C53
WARNING 04: minimum elevation drop used for Conduit C54
WARNING 04: minimum elevation drop used for Conduit C61
WARNING 04: minimum elevation drop used for Conduit C62
WARNING 04: minimum elevation drop used for Conduit C64
```

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

```
WARNING 04: minimum elevation drop used for Conduit C65
WARNING 04: minimum elevation drop used for Conduit C67
WARNING 04: minimum elevation drop used for Conduit C68
WARNING 04: minimum elevation drop used for Conduit CAD1
WARNING 04: minimum elevation drop used for Conduit CAD3
WARNING 04: minimum elevation drop used for Conduit CAD4
WARNING 04: minimum elevation drop used for Conduit CAD7
WARNING 04: minimum elevation drop used for Conduit CAR1
WARNING 08: elevation drop exceeds length for Conduit CAR2
WARNING 04: minimum elevation drop used for Conduit CDE1
WARNING 04: minimum elevation drop used for Conduit CDE2
WARNING 04: minimum elevation drop used for Conduit CDE3
WARNING 04: minimum elevation drop used for Conduit CDE4
WARNING 04: minimum elevation drop used for Conduit CDE5
WARNING 04: minimum elevation drop used for Conduit CDE6
WARNING 04: minimum elevation drop used for Conduit CJL2
WARNING 04: minimum elevation drop used for Conduit CMontview2
WARNING 04: minimum elevation drop used for Conduit CST1
WARNING 04: minimum elevation drop used for Conduit CST2
WARNING 04: minimum elevation drop used for Conduit CST3
WARNING 04: minimum elevation drop used for Conduit CST4
WARNING 04: minimum elevation drop used for Conduit CST5
WARNING 04: minimum elevation drop used for Conduit CST6
WARNING 04: minimum elevation drop used for Conduit CST8
WARNING 04: minimum elevation drop used for Conduit CST9
WARNING 04: minimum elevation drop used for Conduit d_03c
WARNING 08: elevation drop exceeds length for Conduit d_04d
WARNING 04: minimum elevation drop used for Conduit d_05a
WARNING 04: minimum elevation drop used for Conduit d_05b
WARNING 04: minimum elevation drop used for Conduit d_05c
WARNING 04: minimum elevation drop used for Conduit d_06a
WARNING 04: minimum elevation drop used for Conduit d_06b
WARNING 04: minimum elevation drop used for Conduit d_06c
WARNING 04: minimum elevation drop used for Conduit d_07b
WARNING 04: minimum elevation drop used for Conduit d_08a
WARNING 04: minimum elevation drop used for Conduit d_08b
WARNING 04: minimum elevation drop used for Conduit d_09a
WARNING 04: minimum elevation drop used for Conduit d_09b
WARNING 04: minimum elevation drop used for Conduit d_10a
WARNING 04: minimum elevation drop used for Conduit d_10a2
WARNING 04: minimum elevation drop used for Conduit d_11a
WARNING 04: minimum elevation drop used for Conduit d_12a
WARNING 04: minimum elevation drop used for Conduit d_14a
WARNING 04: minimum elevation drop used for Conduit d_14b
WARNING 04: minimum elevation drop used for Conduit d_15a
WARNING 08: elevation drop exceeds length for Conduit d_17thAv
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_23rd
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_19thAv
WARNING 08: elevation drop exceeds length for Conduit d_16thAve_E
```

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

```
WARNING 10: crest elevation is below downstream invert for regulator Link OUT04
WARNING 02: maximum depth increased for Node EC_Out_23rd
WARNING 02: maximum depth increased for Node E-J-16
WARNING 02: maximum depth increased for Node J_01a
WARNING 02: maximum depth increased for Node J_02a
WARNING 02: maximum depth increased for Node J_04a
WARNING 02: maximum depth increased for Node J_05a
WARNING 02: maximum depth increased for Node J_06a
WARNING 02: maximum depth increased for Node J_07a
WARNING 02: maximum depth increased for Node J_07b
WARNING 02: maximum depth increased for Node J_07c
WARNING 02: maximum depth increased for Node J_08a
WARNING 02: maximum depth increased for Node J_08b
WARNING 02: maximum depth increased for Node J_09a
WARNING 02: maximum depth increased for Node J_10a
WARNING 02: maximum depth increased for Node J_10b
WARNING 02: maximum depth increased for Node J_14a
WARNING 02: maximum depth increased for Node J_15a
WARNING 02: maximum depth increased for Node J_EC_Colfax_Out
WARNING 02: maximum depth increased for Node J-10a1
WARNING 02: maximum depth increased for Node D_02a
WARNING 02: maximum depth increased for Node D_03b
WARNING 02: maximum depth increased for Node D_05a
WARNING 02: maximum depth increased for Node D_05b
WARNING 02: maximum depth increased for Node D_05c
WARNING 02: maximum depth increased for Node D_05d
WARNING 02: maximum depth increased for Node D_06a
WARNING 02: maximum depth increased for Node D_06b
WARNING 02: maximum depth increased for Node D_07a
WARNING 02: maximum depth increased for Node D_08a
WARNING 02: maximum depth increased for Node D_08b
WARNING 02: maximum depth increased for Node D_10a
WARNING 02: maximum depth increased for Node D_10a1
WARNING 02: maximum depth increased for Node D_10b
WARNING 02: maximum depth increased for Node D_10c
WARNING 02: maximum depth increased for Node D_10d
WARNING 02: maximum depth increased for Node D_11a
WARNING 02: maximum depth increased for Node D_12a
WARNING 02: maximum depth increased for Node D_13a
WARNING 02: maximum depth increased for Node D_14a
WARNING 02: maximum depth increased for Node D_15a
WARNING 02: maximum depth increased for Node D_03a
WARNING 02: maximum depth increased for Node D_04a

**************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************
```

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

```
****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/01/2005 00:00:00
Ending Date .............. 01/25/2005 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 300.00 sec


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........      1545.381       503.585
External Outflow .........      1557.849       507.648
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....        -0.807


******************************
Highest Flow Instability Indexes
******************************
All links are stable.


************************
Routing Time Step Summary
************************
Minimum Time Step           :   300.00 sec
Average Time Step           :   300.00 sec
```

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

```
Maximum Time Step           :   300.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00
Percent Not Converging      :     0.00


******************
Node Depth Summary
******************
```

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days	Time of Max Occurrence hr:min	Reported Max Depth Feet
EC_Out_23rd	JUNCTION	0.01	1.55	5296.55	0	01:35	1.55
EC_Out_19thAv	JUNCTION	0.03	3.94	5313.94	0	03:00	3.94
E-J-01	JUNCTION	0.00	0.00	5467.00	0	00:00	0.00
E-J-02	JUNCTION	0.00	0.00	5463.00	0	00:00	0.00
E-J-03	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-04	JUNCTION	0.00	0.00	5449.20	0	00:00	0.00
E-J-05	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-06	JUNCTION	0.00	0.00	5421.20	0	00:00	0.00
E-J-07	JUNCTION	0.00	0.00	5387.00	0	00:00	0.00
E-J-08	JUNCTION	0.00	0.00	5389.00	0	00:00	0.00
E-J-09	JUNCTION	0.00	0.00	5409.00	0	00:00	0.00
E-J-10	JUNCTION	0.00	0.00	5344.00	0	00:00	0.00
E-J-11	JUNCTION	0.00	0.00	5371.00	0	00:00	0.00
E-J-12	JUNCTION	0.00	0.00	5357.00	0	00:00	0.00
E-J-13	JUNCTION	0.00	0.00	5315.00	0	00:00	0.00
E-J-14	JUNCTION	0.00	0.00	5336.00	0	00:00	0.00
E-J-15	JUNCTION	0.00	0.00	5303.00	0	00:00	0.00
E-J-16	JUNCTION	0.00	0.94	5302.94	0	00:50	0.94
J_01a	JUNCTION	5.00	5.00	5463.00	0	00:05	5.00
J_02a	JUNCTION	0.00	1.09	5461.09	0	00:45	1.09
J_03a	JUNCTION	0.00	0.00	5411.00	0	00:00	0.00
J_04a	JUNCTION	0.01	2.99	5439.99	0	00:40	2.99
J_05_07	JUNCTION	0.00	1.53	5397.53	0	01:05	1.53
J_05a	JUNCTION	0.00	0.39	5415.39	0	01:00	0.39
J_06a	JUNCTION	0.00	1.06	5422.26	0	00:55	1.06
J_07a	JUNCTION	0.00	0.54	5401.54	0	00:50	0.54
J_07b	JUNCTION	0.00	1.20	5394.20	0	01:10	1.20
J_07c	JUNCTION	0.00	1.25	5388.25	0	01:10	1.25
J_08a	JUNCTION	0.01	3.34	5392.34	0	01:30	3.34
J_08b	JUNCTION	0.02	4.00	5392.90	0	00:40	4.00
J_09a	JUNCTION	0.00	0.74	5409.74	0	00:55	0.74
J_10a	JUNCTION	0.00	1.50	5382.50	0	01:15	1.50
J_10b	JUNCTION	0.00	1.50	5384.00	0	01:15	1.50
J_10c	JUNCTION	0.02	1.78	5377.78	0	01:15	1.78

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J_14a	JUNCTION	0.02	4.50	5340.50	0	00:50	4.50
J_15	JUNCTION	0.00	1.56	5324.56	0	01:30	1.56
J_15a	JUNCTION	0.01	2.17	5305.17	0	00:50	2.17
J_17thAv_Out	JUNCTION	0.00	0.62	5322.62	0	01:35	0.62
J_7b	JUNCTION	0.00	0.00	5384.00	0	00:00	0.00
J_AD1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_AD3	JUNCTION	0.00	0.00	969.20	0	00:00	0.00
J_AD4	JUNCTION	0.00	0.00	966.60	0	00:00	0.00
J_AD7	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_AR1	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_AR2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_EC_Colfax_Out	JUNCTION	0.00	1.32	5344.32	0	01:20	1.32
J_DE1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_DE2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_DE3	JUNCTION	0.00	0.00	980.90	0	00:00	0.00
J_DE4	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_DE5	JUNCTION	0.00	0.00	988.00	0	00:00	0.00
J_DE6	JUNCTION	0.00	0.00	992.00	0	00:00	0.00
J_L1	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J_L2	JUNCTION	0.00	0.00	5374.00	0	00:00	0.00
J_ST1	JUNCTION	0.00	0.00	928.00	0	00:00	0.00
J_ST2	JUNCTION	0.00	0.00	915.00	0	00:00	0.00
J_ST3	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST4	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST5	JUNCTION	0.00	0.00	933.00	0	00:00	0.00
J_ST6	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST7	JUNCTION	0.00	1.51	973.51	0	00:50	1.51
J_ST8	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST9	JUNCTION	0.00	0.00	951.00	0	00:00	0.00
J100	JUNCTION	0.00	0.00	1010.51	0	00:00	0.00
J101	JUNCTION	0.41	5.46	1010.47	0	01:05	5.46
J102	JUNCTION	0.41	5.73	1005.74	0	01:00	5.73
J104	JUNCTION	0.01	1.31	1001.31	0	01:15	1.31
J106	JUNCTION	0.01	4.44	1011.95	0	00:50	4.44
J107	JUNCTION	0.01	4.00	1006.51	0	00:50	4.00
J-10a1	JUNCTION	0.00	0.49	5388.99	0	00:40	0.49
J111	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J113	JUNCTION	0.00	2.18	1010.79	0	00:45	2.18
J11th	JUNCTION	0.30	1.99	1001.99	0	01:05	1.99
J121	JUNCTION	0.00	0.00	1013.87	0	00:00	0.00
J122	JUNCTION	0.00	0.00	1005.87	0	00:00	0.00
J124	JUNCTION	0.00	1.91	1007.78	0	00:45	1.91
J126	JUNCTION	0.01	3.50	1008.09	0	00:40	3.50
J128	JUNCTION	0.01	2.99	1006.65	0	00:50	2.99
J12th	JUNCTION	0.37	3.07	995.07	0	01:05	3.07
J131	JUNCTION	0.00	0.00	1015.92	0	00:00	0.00
J132	JUNCTION	0.00	0.00	1016.26	0	00:00	0.00
J133	JUNCTION	0.00	0.00	1013.76	0	00:00	0.00
J134	JUNCTION	0.00	0.00	1009.26	0	00:00	0.00

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J14	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J140	JUNCTION	0.00	0.00	1005.21	0	00:00	0.00
J141	JUNCTION	0.00	1.49	1006.70	0	00:40	1.49
J150	JUNCTION	0.37	4.75	1017.76	0	00:50	4.75
J151	JUNCTION	0.94	4.00	1012.01	0	00:35	4.00
J154	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J155	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J157	JUNCTION	0.01	1.31	1002.46	0	01:15	1.31
J159	JUNCTION	0.00	0.38	1000.38	0	01:35	0.38
J160	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J161	JUNCTION	0.01	2.66	1016.42	0	00:50	2.66
J163	JUNCTION	0.01	4.00	1013.26	0	00:40	4.00
J165	JUNCTION	0.41	5.46	1013.47	0	01:05	5.46
J166	JUNCTION	0.00	0.25	1003.91	0	00:55	0.25
J167	JUNCTION	0.00	0.05	1007.13	0	00:45	0.05
J168	JUNCTION	0.00	0.12	1003.78	0	00:50	0.12
J169	JUNCTION	0.00	0.69	1008.20	0	00:55	0.69
J16th-us	JUNCTION	0.49	5.70	981.70	0	01:00	5.70
J170	JUNCTION	0.00	0.65	1003.16	0	01:05	0.65
J171	JUNCTION	0.41	5.73	1010.74	0	01:00	5.73
J17th	JUNCTION	0.52	7.44	976.64	0	01:30	7.44
J19th-ds	JUNCTION	0.56	8.27	974.87	0	01:10	8.27
J19th-us	JUNCTION	0.52	7.42	974.02	0	01:30	7.42
J200	JUNCTION	0.00	0.00	1031.14	0	00:00	0.00
J202	JUNCTION	0.72	2.03	1033.17	0	11:30	2.03
J203	JUNCTION	0.72	2.03	1027.77	0	11:30	2.03
J204	JUNCTION	0.27	0.81	1026.54	0	11:30	0.81
J230	JUNCTION	0.03	3.49	1026.68	0	00:45	3.49
J231	JUNCTION	0.00	0.00	1023.20	0	00:00	0.00
J232	JUNCTION	0.00	0.00	1024.21	0	00:00	0.00
J233	JUNCTION	0.00	0.00	1025.58	0	00:00	0.00
J234	JUNCTION	0.00	0.00	1022.41	0	00:00	0.00
J235	JUNCTION	0.03	4.08	1023.69	0	00:50	4.08
J23rd	JUNCTION	0.40	5.71	956.71	0	01:30	5.71
J24	JUNCTION	0.00	0.00	1022.33	0	00:00	0.00
J242	JUNCTION	0.01	3.42	1025.75	0	00:50	3.42
J245	JUNCTION	0.01	4.55	1020.74	0	00:45	4.55
J247	JUNCTION	0.01	5.05	1020.33	0	00:45	5.05
J248	JUNCTION	0.01	2.73	1018.01	0	00:45	2.73
J25	JUNCTION	0.01	4.17	1021.10	0	00:45	4.17
J251	JUNCTION	0.00	0.00	1011.21	0	00:00	0.00
J252	JUNCTION	0.00	0.00	1016.93	0	00:00	0.00
J253	JUNCTION	0.01	2.73	1013.77	0	00:45	2.73
J254	JUNCTION	0.01	3.12	1014.16	0	00:45	3.12
J26th	JUNCTION	0.40	5.71	951.71	0	01:35	5.71
J29th	JUNCTION	0.49	8.93	941.93	0	01:35	8.93
J31	JUNCTION	0.00	0.00	1039.11	0	00:00	0.00
J311	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J314	JUNCTION	0.01	2.32	1041.42	0	00:45	2.32

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J315	JUNCTION	0.03	1.54	1038.24	0	02:10	1.54
J32	JUNCTION	0.00	0.00	1037.25	0	00:00	0.00
J33	JUNCTION	0.00	0.00	1036.79	0	00:00	0.00
J33rd	JUNCTION	0.55	9.62	937.62	0	01:25	9.62
J34	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J341	JUNCTION	0.01	3.67	1038.66	0	00:55	3.67
J343	JUNCTION	0.02	5.00	1029.23	0	00:45	5.00
J345	JUNCTION	0.29	6.00	1024.24	0	00:50	6.00
J346	JUNCTION	0.49	4.15	1022.39	0	01:10	4.15
J347	JUNCTION	0.49	4.15	1020.29	0	01:15	4.15
J348	JUNCTION	0.36	3.56	1019.69	0	01:15	3.56
J35	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J350	JUNCTION	0.03	1.54	1033.88	0	02:15	1.54
J351	JUNCTION	0.00	0.00	1036.69	0	00:00	0.00
J352	JUNCTION	0.02	1.41	1031.87	0	02:15	1.41
J353	JUNCTION	0.01	1.85	1024.58	0	00:50	1.85
J354	JUNCTION	0.01	1.15	1014.26	0	01:05	1.15
J355	JUNCTION	0.01	2.30	1039.01	0	00:45	2.30
J36	JUNCTION	0.02	2.50	1026.30	0	00:45	2.50
J361	JUNCTION	0.00	0.00	1030.45	0	00:00	0.00
J362	JUNCTION	0.00	0.00	1027.23	0	00:00	0.00
J37	JUNCTION	0.00	0.00	1016.81	0	00:00	0.00
J371	JUNCTION	0.00	0.00	1019.61	0	00:00	0.00
J372	JUNCTION	0.03	4.40	1021.21	0	00:50	4.40
J374	JUNCTION	0.03	4.21	1019.02	0	00:50	4.21
J38	JUNCTION	0.00	0.00	1024.23	0	00:00	0.00
J390	JUNCTION	0.00	2.18	1018.39	0	00:45	2.18
J391	JUNCTION	0.00	0.00	1016.21	0	00:00	0.00
J392	JUNCTION	0.00	0.00	1013.01	0	00:00	0.00
J393	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J394	JUNCTION	0.00	1.87	1018.08	0	00:45	1.87
J41	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J42	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J43	JUNCTION	0.00	0.00	1022.74	0	00:00	0.00
J44	JUNCTION	0.00	0.00	1013.11	0	00:00	0.00
J51	JUNCTION	0.00	0.00	1013.61	0	00:00	0.00
J52	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J53	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J54	JUNCTION	0.00	0.00	1011.61	0	00:00	0.00
J56	JUNCTION	0.00	1.82	1015.43	0	00:45	1.82
J61	JUNCTION	0.00	0.00	1013.85	0	00:00	0.00
J62	JUNCTION	0.00	0.00	1009.85	0	00:00	0.00
J63	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J64	JUNCTION	0.00	0.00	1000.00	0	00:00	0.00
J65	JUNCTION	0.02	4.00	1004.00	0	00:35	4.00
J67	JUNCTION	0.01	2.50	1012.35	0	00:25	2.50
J68	JUNCTION	0.01	3.50	1006.90	0	00:35	3.50
J6th_Pipe	JUNCTION	0.07	6.00	5378.45	0	00:40	6.00
J74	JUNCTION	0.01	3.00	1009.60	0	00:30	3.00

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J7b	JUNCTION	0.06	4.72	5389.72	0	01:15	4.72
JL2	JUNCTION	0.00	1.29	5375.29	0	01:00	1.29
JMLK	JUNCTION	0.55	9.62	940.62	0	01:25	9.62
JMontview-ds	JUNCTION	0.37	5.18	969.78	0	01:10	5.18
JMontview-us	JUNCTION	0.56	8.26	972.86	0	01:10	8.26
J_16thAve_E	JUNCTION	0.02	6.27	5340.91	0	01:30	6.27
JSandCreek	OUTFALL	0.40	9.12	924.12	0	01:30	9.12
DIV344	DIVIDER	0.02	6.00	1030.23	0	00:45	6.00
DIV342	DIVIDER	0.02	5.00	1039.98	0	00:40	5.00
DIV135	DIVIDER	0.01	2.00	1017.92	0	00:45	2.00
DIV389	DIVIDER	0.00	0.00	1001.15	0	00:00	0.00
DIV397	DIVIDER	0.00	0.00	1009.26	0	00:00	0.00
DIV105	DIVIDER	0.02	2.17	1012.68	0	02:05	2.17
DIV376	DIVIDER	0.94	4.00	1017.01	0	00:35	4.00
DIV70	DIVIDER	0.01	3.00	1012.85	0	00:25	3.00
DIV395	DIVIDER	0.00	0.00	1003.66	0	00:00	0.00
DIV1	DIVIDER	4.60	4.60	1012.61	0	00:05	4.60
DIV164	DIVIDER	0.01	4.50	1013.76	0	00:45	4.50
DIV125	DIVIDER	0.01	3.50	1009.37	0	00:40	3.50
DIV316	DIVIDER	0.02	1.41	1033.75	0	02:15	1.41
DIV396	DIVIDER	2.88	2.88	1008.09	0	00:05	2.88
DIV71	DIVIDER	0.01	2.50	1016.35	0	00:25	2.50
DIV399	DIVIDER	0.07	6.00	5390.00	0	00:35	6.00
DIV162	DIVIDER	0.01	4.00	1017.76	0	00:40	4.00
DIV136	DIVIDER	0.01	2.67	1018.93	0	00:45	2.67
DIV123	DIVIDER	0.00	1.91	1010.53	0	00:45	1.91
J13th-DIV	DIVIDER	0.37	3.31	991.31	0	01:05	3.31
J14th-DIV	DIVIDER	0.28	6.00	990.30	0	00:50	6.00
JColfax-DIV	DIVIDER	0.49	6.00	986.90	0	01:05	6.00
J16th-DIV	DIVIDER	0.28	6.00	982.00	0	00:45	6.00
D_02a	DIVIDER	0.00	1.65	5461.85	0	00:45	1.65
D_03b	DIVIDER	0.00	0.41	5409.41	0	00:50	0.41
D_05-07	DIVIDER	0.00	1.55	5405.55	0	01:00	1.55
D_05a	DIVIDER	0.05	2.54	5451.54	0	00:40	2.54
D_05b	DIVIDER	0.07	4.50	5419.50	0	00:40	4.50
D_05c	DIVIDER	0.00	1.55	5415.55	0	00:55	1.55
D_05d	DIVIDER	0.07	4.50	5418.50	0	00:35	4.50
D_06a	DIVIDER	0.02	4.00	5425.20	0	00:35	4.00
D_06b	DIVIDER	0.00	1.10	5422.30	0	00:55	1.10
D_07a	DIVIDER	0.01	2.25	5396.25	0	00:50	2.25
D_08a	DIVIDER	0.01	4.00	5413.00	0	00:40	4.00
D_08b	DIVIDER	0.02	4.00	5393.00	0	00:35	4.00
D_10a	DIVIDER	0.03	2.40	5373.40	0	00:45	2.40
D_10a1	DIVIDER	0.00	1.03	5389.53	0	01:05	1.03
D_10b	DIVIDER	0.03	4.00	5369.00	0	00:50	4.00
D_10c	DIVIDER	0.00	0.84	5352.84	0	01:05	0.84
D_10d	DIVIDER	0.01	1.93	5345.93	0	01:20	1.93
D_11a	DIVIDER	0.02	4.00	5375.00	0	00:45	4.00
D_12a	DIVIDER	0.02	4.50	5361.50	0	00:40	4.50

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

D_13a	DIVIDER	0.03	4.50	5345.50	0	00:45	4.50
D_14a	DIVIDER	0.02	5.50	5341.50	0	00:40	5.50
D_15a	DIVIDER	0.02	5.50	5319.50	0	00:50	5.50
D_03a	DIVIDER	0.07	5.50	5414.50	0	00:40	5.50
D_12_14	DIVIDER	0.00	0.63	5349.63	0	01:05	0.63
D_10_13	DIVIDER	0.00	1.45	5332.45	0	01:25	1.45
J72	DIVIDER	0.01	3.50	1010.00	0	00:30	3.50
J120	DIVIDER	0.00	2.17	1016.04	0	00:45	2.17
J127	DIVIDER	0.01	2.99	1007.57	0	00:50	2.99
J129	DIVIDER	0.01	4.00	1007.66	0	00:45	4.00
J158	DIVIDER	0.00	0.38	1000.80	0	01:40	0.38
J73	DIVIDER	0.02	4.00	1007.40	0	00:30	4.00
J236	DIVIDER	0.00	2.17	1024.58	0	00:40	2.17
J244	DIVIDER	0.01	4.55	1021.48	0	00:45	4.55
J241	DIVIDER	0.01	3.41	1027.62	0	00:50	3.41
J243	DIVIDER	0.01	4.18	1026.52	0	00:45	4.18
J246	DIVIDER	0.01	5.07	1021.27	0	00:45	5.07
J375	DIVIDER	0.03	4.74	1019.55	0	00:50	4.74
J330	DIVIDER	0.01	3.60	1040.39	0	00:55	3.60
J320	DIVIDER	0.03	4.38	1024.00	0	00:45	4.38
J319	DIVIDER	0.03	4.10	1027.30	0	00:45	4.10
J321	DIVIDER	0.01	3.67	1040.92	0	00:50	3.67
J373	DIVIDER	0.03	4.20	1021.01	0	00:50	4.20
J57	DIVIDER	0.01	3.41	1015.02	0	00:40	3.41
J250	DIVIDER	0.01	2.08	1013.29	0	00:50	2.08
J317	DIVIDER	0.02	2.50	1032.96	0	00:45	2.50
J318	DIVIDER	0.03	3.48	1027.28	0	00:45	3.48
J322	DIVIDER	0.01	2.17	1027.76	0	00:45	2.17
J363	DIVIDER	0.01	2.38	1029.61	0	00:45	2.38
D_AR2	DIVIDER	0.02	6.26	5344.26	0	01:25	6.26
DIV72	DIVIDER	0.00	1.65	1008.10	0	01:00	1.65
D_04a	DIVIDER	0.01	3.26	5460.29	0	00:40	3.26
D_04b	DIVIDER	0.01	3.33	5443.43	0	00:45	3.33
RES30	STORAGE	0.08	8.93	1045.63	0	02:10	8.93
RES201	STORAGE	101.71	597.62	1628.77	0	11:30	597.62
RES130	STORAGE	13.91	188.03	1188.04	0	04:50	188.03
RES156	STORAGE	0.01	2.14	1003.30	0	01:40	2.14
HavanaPnd	STORAGE	0.07	8.23	5384.23	0	01:15	8.23
1st/HavanaPnd	STORAGE	0.69	10.92	5446.98	0	02:25	10.92

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Node Inflow Summary
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	Maximum Lateral Inflow	Maximum Total Inflow	Time of Max Occurrence	Lateral Inflow Volume	Total Inflow Volume	Flow Balance Error

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

Node	Type	CFS	CFS	days	hr:min	10^6 gal	10^6 gal	Percent
EC_Out_23rd	JUNCTION	0.00	984.64	0	01:35	0	38.1	0.000
EC_Out_19thAv	JUNCTION	0.00	223.39	0	01:00	0	16.1	0.000
E-J-01	JUNCTION	174.54	174.54	0	00:40	3.35	3.35	0.000
E-J-02	JUNCTION	282.37	282.37	0	00:45	6.72	6.72	0.000
E-J-03	JUNCTION	174.21	174.21	0	00:45	4.51	4.51	0.000
E-J-04	JUNCTION	94.44	94.44	0	00:55	3.45	3.45	0.000
E-J-05	JUNCTION	166.92	166.92	0	00:55	5.74	5.74	0.000
E-J-06	JUNCTION	177.77	177.77	0	00:50	5.91	5.91	0.000
E-J-07	JUNCTION	79.51	79.51	0	01:00	3.62	3.62	0.000
E-J-08	JUNCTION	121.05	121.05	0	00:55	4.29	4.29	0.000
E-J-09	JUNCTION	144.35	144.35	0	00:50	4.43	4.43	0.000
E-J-10	JUNCTION	159.62	159.62	0	00:55	5.49	5.49	0.000
E-J-11	JUNCTION	126.91	126.91	0	01:00	5.75	5.75	0.000
E-J-12	JUNCTION	138.47	138.47	0	00:45	3.96	3.96	0.000
E-J-13	JUNCTION	90.47	90.47	0	00:55	3.49	3.49	0.000
E-J-14	JUNCTION	135.66	135.66	0	00:55	4.88	4.88	0.000
E-J-15	JUNCTION	152.49	152.49	0	00:50	4.89	4.89	0.000
E-J-16	JUNCTION	167.14	167.14	0	00:50	4.91	4.91	0.000
J_01a	JUNCTION	0.00	176.73	0	00:40	0	4.05	0.000
J_02a	JUNCTION	0.00	254.13	0	00:45	0	6.05	0.000
J_03a	JUNCTION	0.00	174.21	0	00:45	0	4.51	0.000
J_04a	JUNCTION	0.00	102.87	0	00:50	0	7.5	0.000
J_05_07	JUNCTION	0.00	272.21	0	01:05	0	6.88	0.000
J_05a	JUNCTION	0.00	188.56	0	00:55	0	5.97	0.000
J_06a	JUNCTION	0.00	415.89	0	00:55	0	12	0.000
J_07a	JUNCTION	0.00	38.67	0	00:50	0	0.403	0.000
J_07b	JUNCTION	0.00	251.86	0	01:10	0	5.89	0.000
J_07c	JUNCTION	0.00	328.92	0	01:10	0	9.51	0.000
J_08a	JUNCTION	0.00	548.41	0	01:05	0	16.6	0.000
J_08b	JUNCTION	0.00	96.53	0	02:30	0	6.01	0.000
J_09a	JUNCTION	0.00	247.41	0	00:55	0	6.32	0.000
J_10a	JUNCTION	0.00	490.76	0	01:15	0	13.3	0.000
J_10b	JUNCTION	0.00	416.91	0	01:15	0	9.87	0.000
J_10c	JUNCTION	0.00	25.21	0	01:15	0	4.32	0.000
J_14a	JUNCTION	0.00	264.01	0	01:05	0	12.4	0.000
J_15	JUNCTION	0.00	650.51	0	01:30	0	17.2	0.000
J_15a	JUNCTION	0.00	357.59	0	00:50	0	16	0.000
J_17thAv_Out	JUNCTION	0.00	50.86	0	01:35	0	1.39	0.000
J_7b	JUNCTION	273.66	273.66	0	00:50	8.45	8.45	0.000
J_AD1	JUNCTION	37.54	37.54	0	00:50	1.27	1.27	0.000
J_AD3	JUNCTION	26.69	26.69	0	00:45	0.793	0.793	0.000
J_AD4	JUNCTION	31.70	31.70	0	00:45	0.818	0.818	0.000
J_AD7	JUNCTION	53.99	53.99	0	00:45	1.33	1.33	0.000
J_AR1	JUNCTION	266.32	266.32	0	00:45	6.05	6.05	0.000
J_AR2	JUNCTION	266.74	266.74	0	01:05	12.6	12.6	0.000
J_EC_Colfax_Out	JUNCTION	0.00	244.23	0	01:20	0	5.77	0.000
J_DE1	JUNCTION	402.94	402.94	0	00:55	14.8	14.8	0.000

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J_DE2	JUNCTION	104.26	104.26	0	00:50	3.19	3.19	0.000
J_DE3	JUNCTION	50.78	50.78	0	01:00	2.22	2.22	0.000
J_DE4	JUNCTION	54.00	54.00	0	01:00	2.5	2.5	0.000
J_DE5	JUNCTION	96.31	96.31	0	01:00	4.09	4.09	0.000
J_DE6	JUNCTION	168.67	168.67	0	00:55	5.8	5.8	0.000
J_L1	JUNCTION	48.73	48.73	0	00:40	1.04	1.04	0.000
J_L2	JUNCTION	19.46	19.46	0	00:55	0.756	0.756	0.000
J_ST1	JUNCTION	46.16	46.16	0	01:15	3.5	3.5	0.000
J_ST2	JUNCTION	133.26	133.26	0	00:55	5.3	5.3	0.000
J_ST3	JUNCTION	106.52	106.52	0	01:05	5.07	5.07	0.000
J_ST4	JUNCTION	376.84	376.84	0	00:50	10.9	10.9	0.000
J_ST5	JUNCTION	339.33	339.33	0	01:05	15	15	0.000
J_ST6	JUNCTION	100.24	100.24	0	01:00	4.59	4.59	0.000
J_ST7	JUNCTION	346.72	346.72	0	00:50	10.7	10.7	0.000
J_ST8	JUNCTION	69.95	69.95	0	00:55	2.52	2.52	0.000
J_ST9	JUNCTION	131.69	131.69	0	00:50	3.99	3.99	0.000
J100	JUNCTION	653.61	653.61	0	01:00	26	26	0.000
J101	JUNCTION	0.00	1413.38	0	01:00	0	276	0.000
J102	JUNCTION	0.00	1506.86	0	01:00	0	279	0.000
J104	JUNCTION	0.00	257.44	0	01:05	0	290	0.000
J106	JUNCTION	0.00	103.63	0	00:55	0	3.49	0.000
J107	JUNCTION	0.00	94.72	0	01:05	0	3.01	0.000
J-10a1	JUNCTION	0.00	75.00	0	00:40	0	3.4	0.000
J111	JUNCTION	26.68	26.68	0	00:50	0.871	0.871	0.000
J113	JUNCTION	0.00	28.25	0	00:45	0	0.672	0.000
J11th	JUNCTION	0.00	257.44	0	01:05	0	290	0.000
J121	JUNCTION	28.20	28.20	0	00:45	0.672	0.672	0.000
J122	JUNCTION	44.97	44.97	0	00:50	1.48	1.48	0.000
J124	JUNCTION	0.00	72.89	0	00:50	0	2.16	0.000
J126	JUNCTION	0.00	74.08	0	00:50	0	2.17	0.000
J128	JUNCTION	0.00	83.53	0	00:50	0	2.52	0.000
J12th	JUNCTION	0.00	412.33	0	01:05	0	295	0.000
J131	JUNCTION	11.83	11.83	0	01:00	0.567	0.567	0.000
J132	JUNCTION	54.51	54.51	0	00:45	1.55	1.55	0.000
J133	JUNCTION	42.82	42.82	0	00:45	1.03	1.03	0.000
J134	JUNCTION	15.37	15.37	0	00:45	0.44	0.44	0.000
J14	JUNCTION	92.70	92.70	0	00:45	2.64	2.64	0.000
J140	JUNCTION	17.33	17.33	0	00:45	0.509	0.509	0.000
J141	JUNCTION	0.00	16.00	0	00:40	0	0.502	0.000
J150	JUNCTION	0.00	707.59	0	01:10	0	241	0.000
J151	JUNCTION	0.00	1264.12	0	01:05	0	271	0.000
J154	JUNCTION	9.24	9.24	0	00:50	0.351	0.351	0.000
J155	JUNCTION	10.51	10.51	0	00:45	0.318	0.318	0.000
J157	JUNCTION	0.00	16.00	0	01:15	0	1.32	0.000
J159	JUNCTION	0.00	257.44	0	01:05	0	290	0.000
J160	JUNCTION	0.00	1506.86	0	01:00	0	279	0.000
J161	JUNCTION	0.00	106.28	0	00:45	0	3.15	0.000
J163	JUNCTION	0.00	118.30	0	00:55	0	3.6	0.000
J165	JUNCTION	0.00	1264.12	0	01:05	0	271	0.000

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J166	JUNCTION	0.00	18.30	0	00:55	0	0.147	0.000
J167	JUNCTION	0.00	1.33	0	00:45	0	0.00698	0.000
J168	JUNCTION	0.00	5.53	0	00:50	0	0.0217	0.000
J169	JUNCTION	0.00	103.63	0	00:55	0	3.49	0.000
J16th-us	JUNCTION	0.00	1481.07	0	01:00	0	327	0.000
J170	JUNCTION	0.00	94.72	0	01:05	0	3.01	0.000
J171	JUNCTION	0.00	1413.38	0	01:00	0	276	0.000
J17th	JUNCTION	0.00	1773.76	0	01:30	0	349	0.000
J19th-ds	JUNCTION	0.00	1997.31	0	01:10	0	366	0.000
J19th-us	JUNCTION	0.00	1778.58	0	01:10	0	349	0.000
J200	JUNCTION	3280.00	3280.00	0	01:05	208	208	0.000
J202	JUNCTION	0.00	49.50	0	11:30	0	208	0.000
J203	JUNCTION	0.00	49.50	0	11:30	0	208	0.000
J204	JUNCTION	0.00	49.50	0	11:30	0	208	0.000
J230	JUNCTION	0.00	162.63	0	00:45	0	7.84	0.000
J231	JUNCTION	45.00	45.00	0	00:45	1.18	1.18	0.000
J232	JUNCTION	81.20	81.20	0	00:50	2.63	2.63	0.000
J233	JUNCTION	34.75	34.75	0	00:45	1.12	1.12	0.000
J234	JUNCTION	33.30	33.30	0	00:40	0.839	0.839	0.000
J235	JUNCTION	0.00	201.36	0	00:45	0	8.98	0.000
J23rd	JUNCTION	0.00	3348.95	0	01:30	0	424	0.000
J24	JUNCTION	112.76	112.76	0	00:40	2.35	2.35	0.000
J242	JUNCTION	0.00	186.10	0	00:45	0	4.98	0.000
J245	JUNCTION	0.00	223.03	0	00:45	0	5.94	0.000
J247	JUNCTION	0.00	221.81	0	00:45	0	5.94	0.000
J248	JUNCTION	0.00	221.81	0	00:45	0	5.94	0.000
J25	JUNCTION	0.00	223.25	0	00:45	0	5.94	0.000
J251	JUNCTION	33.29	33.29	0	00:50	1.17	1.17	0.000
J252	JUNCTION	38.36	38.36	0	00:45	0.964	0.964	0.000
J253	JUNCTION	0.00	221.43	0	00:45	0	5.94	0.000
J254	JUNCTION	0.00	221.43	0	00:45	0	5.94	0.000
J26th	JUNCTION	0.00	3697.62	0	01:30	0	442	0.000
J29th	JUNCTION	0.00	3952.58	0	01:35	0	457	0.000
J31	JUNCTION	95.10	95.10	0	00:45	2.3	2.3	0.000
J311	JUNCTION	15.90	15.90	0	00:50	0.568	0.568	0.000
J314	JUNCTION	0.00	95.10	0	00:45	0	2.3	0.000
J315	JUNCTION	0.00	19.63	0	02:10	0	3.85	0.000
J32	JUNCTION	137.69	137.69	0	00:50	4.71	4.71	0.000
J33	JUNCTION	96.15	96.15	0	00:55	3.72	3.72	0.000
J33rd	JUNCTION	0.00	4306.05	0	01:25	0	476	0.000
J34	JUNCTION	40.61	40.61	0	01:10	2.22	2.22	0.000
J341	JUNCTION	0.00	233.67	0	00:55	0	8.43	0.000
J343	JUNCTION	0.00	310.93	0	01:05	0	12.4	0.000
J345	JUNCTION	0.00	473.13	0	01:10	0	228	0.000
J346	JUNCTION	0.00	473.13	0	01:10	0	228	0.000
J347	JUNCTION	0.00	472.69	0	01:15	0	228	0.000
J348	JUNCTION	0.00	472.69	0	01:15	0	228	0.000
J35	JUNCTION	47.49	47.49	0	00:40	0.981	0.981	0.000
J350	JUNCTION	0.00	19.63	0	02:15	0	3.85	0.000

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J351	JUNCTION	0.00	19.63	0	02:10	0	3.85	0.000
J352	JUNCTION	0.00	83.17	0	00:45	0	5.55	0.000
J353	JUNCTION	0.00	75.49	0	00:50	0	2.56	0.000
J354	JUNCTION	0.00	9.65	0	01:05	0	0.511	0.000
J355	JUNCTION	0.00	153.37	0	00:45	0	3.86	0.000
J36	JUNCTION	0.00	117.37	0	00:45	0	6.67	0.000
J361	JUNCTION	79.36	79.36	0	00:40	1.71	1.71	0.000
J362	JUNCTION	40.40	40.40	0	00:45	1.14	1.14	0.000
J37	JUNCTION	21.75	21.75	0	00:40	0.529	0.529	0.000
J371	JUNCTION	40.41	40.41	0	00:45	1.15	1.15	0.000
J372	JUNCTION	0.00	222.30	0	00:50	0	9.51	0.000
J374	JUNCTION	0.00	270.60	0	00:50	0	10.8	0.000
J38	JUNCTION	51.66	51.66	0	01:05	2.68	2.68	0.000
J390	JUNCTION	0.00	48.42	0	00:45	0	1.34	0.000
J391	JUNCTION	15.28	15.28	0	00:50	0.497	0.497	0.000
J392	JUNCTION	53.38	53.38	0	00:45	1.32	1.32	0.000
J393	JUNCTION	32.74	32.74	0	00:40	0.712	0.712	0.000
J394	JUNCTION	0.00	48.42	0	00:45	0	1.34	0.000
J41	JUNCTION	39.63	39.63	0	00:55	1.74	1.74	0.000
J42	JUNCTION	48.44	48.44	0	01:15	3.59	3.59	0.000
J43	JUNCTION	75.49	75.49	0	00:50	2.56	2.56	0.000
J44	JUNCTION	9.65	9.65	0	01:05	0.511	0.511	0.000
J51	JUNCTION	32.01	32.01	0	00:45	0.871	0.871	0.000
J52	JUNCTION	29.96	29.96	0	00:40	0.655	0.655	0.000
J53	JUNCTION	41.33	41.33	0	00:40	0.794	0.794	0.000
J54	JUNCTION	91.20	91.20	0	00:40	1.57	1.57	0.000
J56	JUNCTION	0.00	32.01	0	00:45	0	0.871	0.000
J61	JUNCTION	186.58	427.57	0	00:55	3.63	10.4	0.000
J62	JUNCTION	101.83	101.83	0	00:40	1.97	1.97	0.000
J63	JUNCTION	88.36	88.36	0	00:45	2.63	2.63	0.000
J64	JUNCTION	87.65	87.65	0	00:40	1.77	1.77	0.000
J65	JUNCTION	0.00	176.99	0	01:00	0	6.62	0.000
J67	JUNCTION	0.00	500.80	0	00:55	0	12.4	0.000
J68	JUNCTION	0.00	124.63	0	01:00	0	4.8	0.000
J6th_Pipe	JUNCTION	0.00	244.93	0	02:05	0	17.9	0.000
J74	JUNCTION	0.00	496.20	0	01:00	0	12.4	0.000
J7b	JUNCTION	0.00	508.78	0	00:50	0	23.8	0.000
JL2	JUNCTION	0.00	290.78	0	01:00	0	6.81	0.000
JMLK	JUNCTION	0.00	4265.66	0	01:25	0	473	0.000
JMontview-ds	JUNCTION	0.00	2402.82	0	01:10	0	382	0.000
JMontview-us	JUNCTION	0.00	2029.11	0	01:10	0	367	0.000
J_16thAve_E	JUNCTION	0.00	463.95	0	01:30	0	18.3	0.000
JSandCreek	OUTFALL	0.00	4399.54	0	01:30	0	482	0.000
DIV344	DIVIDER	0.00	310.93	0	01:05	0	12.4	0.000
DIV342	DIVIDER	0.00	233.67	0	00:55	0	8.43	0.000
DIV135	DIVIDER	0.00	11.83	0	01:00	0	0.567	0.000
DIV389	DIVIDER	0.00	17.61	0	01:40	0	1.36	0.000
DIV397	DIVIDER	0.00	118.30	0	00:55	0	3.6	0.000
DIV105	DIVIDER	0.00	244.93	0	02:05	0	17.9	0.000

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

DIV376	DIVIDER	0.00	707.59	0	01:10	0	241	0.000
DIV70	DIVIDER	0.00	500.80	0	00:55	0	12.4	0.000
DIV395	DIVIDER	0.00	83.53	0	00:50	0	2.52	0.000
DIV1	DIVIDER	0.00	31.66	0	00:50	0	0.871	0.000
DIV164	DIVIDER	0.00	100.00	0	00:45	0	3.45	0.000
DIV125	DIVIDER	0.00	72.89	0	00:50	0	2.16	0.000
DIV316	DIVIDER	0.00	19.63	0	02:15	0	3.85	0.000
DIV396	DIVIDER	0.00	17.33	0	00:45	0	0.509	0.000
DIV71	DIVIDER	0.00	427.57	0	00:55	0	10.4	0.000
DIV399	DIVIDER	0.00	508.78	0	00:50	0	23.8	0.000
DIV162	DIVIDER	0.00	106.28	0	00:45	0	3.15	0.000
DIV136	DIVIDER	0.00	54.51	0	00:45	0	1.55	0.000
DIV123	DIVIDER	0.00	28.25	0	00:45	0	0.672	0.000
J13th-DIV	DIVIDER	0.00	507.10	0	01:05	0	300	0.000
J14th-DIV	DIVIDER	0.00	1199.08	0	01:05	0	319	0.000
JColfax-DIV	DIVIDER	0.00	1344.69	0	01:00	0	323	0.000
J16th-DIV	DIVIDER	0.00	1771.61	0	01:00	0	346	0.000
D_02a	DIVIDER	0.00	282.37	0	00:45	0	6.72	0.000
D_03b	DIVIDER	0.00	49.62	0	00:50	0	0.516	0.000
D_05-07	DIVIDER	0.00	442.97	0	01:00	0	12.4	0.000
D_05a	DIVIDER	0.00	102.87	0	00:50	0	7.5	0.000
D_05b	DIVIDER	0.00	259.56	0	00:55	0	13.3	0.000
D_05c	DIVIDER	0.00	472.41	0	00:55	0	13.4	0.000
D_05d	DIVIDER	0.00	561.87	0	00:55	0	23.4	0.000
D_06a	DIVIDER	0.00	415.89	0	00:55	0	12	0.000
D_06b	DIVIDER	0.00	349.61	0	00:55	0	7.93	0.000
D_07a	DIVIDER	0.00	268.22	0	01:10	0	6.89	0.000
D_08a	DIVIDER	0.00	247.41	0	00:55	0	6.32	0.000
D_08b	DIVIDER	0.00	565.00	0	01:05	0	17.6	0.000
D_10a	DIVIDER	0.00	841.72	0	01:15	0	27.1	0.000
D_10a1	DIVIDER	0.00	472.00	0	01:05	0	11.6	0.000
D_10b	DIVIDER	0.00	834.67	0	01:15	0	27.1	0.000
D_10c	DIVIDER	0.00	128.31	0	01:05	0	2.91	0.000
D_10d	DIVIDER	0.00	934.07	0	01:20	0	25.3	0.000
D_11a	DIVIDER	0.00	126.91	0	01:00	0	5.75	0.000
D_12a	DIVIDER	0.00	242.56	0	01:00	0	9.76	0.000
D_13a	DIVIDER	0.00	794.43	0	01:25	0	29.5	0.000
D_14a	DIVIDER	0.00	264.01	0	01:05	0	12.4	0.000
D_15a	DIVIDER	0.00	200.00	0	01:55	0	11.1	0.000
D_03a	DIVIDER	0.00	277.54	0	00:50	0	15.6	0.000
D_12_14	DIVIDER	0.00	45.62	0	01:05	0	0.9	0.000
D_10_13	DIVIDER	0.00	670.19	0	01:25	0	17.2	0.000
J72	DIVIDER	0.00	611.29	0	01:00	0	16.1	0.000
J120	DIVIDER	0.00	28.20	0	00:45	0	0.672	0.000
J127	DIVIDER	0.00	74.08	0	00:50	0	2.17	0.000
J129	DIVIDER	0.00	78.00	0	00:50	0	2.5	0.000
J158	DIVIDER	0.00	1.61	0	01:40	0	0.0328	0.000
J73	DIVIDER	0.00	124.63	0	01:00	0	4.8	0.000
J236	DIVIDER	0.00	33.30	0	00:40	0	0.839	0.000

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

J244	DIVIDER	0.00	223.25	0	00:45	0	5.94	0.000
J241	DIVIDER	0.00	81.20	0	00:50	0	2.63	0.000
J243	DIVIDER	0.00	186.10	0	00:45	0	4.98	0.000
J246	DIVIDER	0.00	223.03	0	00:45	0	5.94	0.000
J375	DIVIDER	0.00	270.60	0	00:50	0	10.8	0.000
J330	DIVIDER	0.00	96.15	0	00:55	0	3.72	0.000
J320	DIVIDER	0.00	201.36	0	00:45	0	8.98	0.000
J319	DIVIDER	0.00	162.63	0	00:45	0	7.84	0.000
J321	DIVIDER	0.00	137.69	0	00:50	0	4.71	0.000
J373	DIVIDER	0.00	222.30	0	00:50	0	9.51	0.000
J57	DIVIDER	0.00	91.20	0	00:40	0	1.57	0.000
J250	DIVIDER	0.00	33.29	0	00:50	0	1.17	0.000
J317	DIVIDER	0.00	83.17	0	00:45	0	5.55	0.000
J318	DIVIDER	0.00	117.37	0	00:45	0	6.67	0.000
J322	DIVIDER	0.00	34.75	0	00:45	0	1.12	0.000
J363	DIVIDER	0.00	40.40	0	00:45	0	1.14	0.000
D_AR2	DIVIDER	0.00	463.82	0	01:25	0	18.4	0.000
DIV72	DIVIDER	0.00	547.66	0	01:00	0	12.5	0.000
D_04a	DIVIDER	0.00	171.65	0	00:45	0	4.05	0.000
D_04b	DIVIDER	0.00	225.87	0	00:55	0	7.21	0.000
RES30	STORAGE	0.00	153.37	0	00:45	0	3.86	0.064
RES201	STORAGE	0.00	3280.00	0	01:05	0	208	0.001
RES130	STORAGE	0.00	1589.75	0	01:00	0	282	0.013
RES156	STORAGE	0.00	59.89	0	00:55	0	1.36	0.164
HavanaPnd	STORAGE	0.00	490.48	0	01:05	0	14.2	0.121
1st/HavanaPnd	STORAGE	0.00	165.87	0	00:55	0	4.65	0.075

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
RES30	3.270	0	0	0	388.954	1	0 02:10	19.63
RES201	4430.467	0	0	0	26032.459	0	0 11:30	49.50
RES130	605.664	0	0	0	8190.709	0	0 04:50	95.61
RES156	0.395	0	0	0	93.165	0	0 01:40	17.61
HavanaPnd	3.250	0	0	0	515.026	61	0 01:15	442.12

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

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1st/HavanaPnd           15.218       1     0     0       511.021      26       0  02:25      22.10


**********************
Outfall Loading Summary
**********************

-----------------------------------------------------------
                       Flow       Avg       Max       Total
                       Freq      Flow      Flow      Volume
Outfall Node            Pcnt       CFS       CFS    10^6 gal
-----------------------------------------------------------
JSandCreek             74.22     40.23   4399.54     481.602
-----------------------------------------------------------
System                 74.22     40.23   4399.54     481.602


*******************
Link Flow Summary
*******************

-------------------------------------------------------------------------------
                             Maximum  Time of Max   Maximum    Max/    Max/
                             |Flow|   Occurrence   |Veloc|    Full    Full
Link                 Type       CFS  days hr:min    ft/sec    Flow   Depth
-------------------------------------------------------------------------------
C_03a                CONDUIT    236.42     0  01:15     11.18    1.04    0.92
C_05a                CONDUIT     71.00     0  01:00     10.51    0.88    0.73
C_05b                CONDUIT    101.03     0  02:05      6.94    1.04    1.00
C_05c                CONDUIT     92.98     0  02:45      6.70    1.04    1.00
C_06a                CONDUIT     66.73     0  02:25      6.48    1.01    1.00
C_07a                CONDUIT     17.51     0  02:45      5.08    1.06    1.00
C_08a                CONDUIT     99.89     0  01:30      9.48    1.02    0.92
C_08b                CONDUIT     96.53     0  02:30      6.57    1.03    1.00
C_10a                CONDUIT     25.19     0  01:20      5.12    0.51    0.51
C_10b                CONDUIT     46.30     0  00:50      6.58    0.82    0.69
C_10c                CONDUIT     97.84     0  02:50      9.01    1.05    0.94
C_11a                CONDUIT     93.09     0  00:50      8.39    1.04    1.00
C_13a                CONDUIT    136.54     0  03:00     10.12    1.05    0.93
C_14a                CONDUIT    120.52     0  02:00      8.61    1.06    1.00
C_15a                CONDUIT    200.00     0  01:55      9.58    1.04    1.00
C_15b                CONDUIT    205.10     0  00:50      9.63    0.28    0.33
C_16a                CONDUIT    167.21     0  00:50     16.34    0.01    0.09
C_16thAv             CONDUIT    463.95     0  01:30      9.87    0.83    0.69
C_JL2                DUMMY      290.78     0  01:00
C1                   DUMMY       31.66     0  00:50
C101                 DUMMY     1413.38     0  01:00
C102                 DUMMY     1506.86     0  01:00
C104                 DUMMY      257.44     0  01:05
```

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

C105	CONDUIT	247.36	0	00:45	5.22	0.13	0.36
C105-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C106	DUMMY	103.63	0	00:55			
C107	DUMMY	94.72	0	01:05			
C111	DUMMY	26.68	0	00:50			
C113	DUMMY	28.25	0	00:45			
C120	CONDUIT	28.25	0	00:45	5.19	0.88	0.72
C120_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C121	DUMMY	28.20	0	00:45			
C122	DUMMY	44.97	0	00:50			
C123	CONDUIT	28.18	0	00:45	5.25	0.58	0.55
C123-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C124	DUMMY	72.89	0	00:50			
C125	CONDUIT	44.13	0	01:25	5.30	1.01	1.00
C125-OVER	CONDUIT	29.79	0	00:50	2.26	0.00	0.07
C126	DUMMY	74.08	0	00:50			
C127	CONDUIT	74.29	0	00:50	6.62	0.78	0.66
C127_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C128	DUMMY	83.53	0	00:50			
C129	CONDUIT	73.77	0	01:05	6.39	1.06	1.00
C129_Overflow	CONDUIT	8.59	0	00:55	3.04	0.00	0.05
C12th	CONDUIT	256.72	0	01:10	4.12	0.04	0.20
C131	DUMMY	11.83	0	01:00			
C132	DUMMY	54.51	0	00:45			
C133	DUMMY	42.82	0	00:45			
C134	DUMMY	15.37	0	00:45			
C135	CONDUIT	10.22	0	01:30	3.68	1.04	1.00
C135-OVER	CONDUIT	1.94	0	01:10	2.25	0.00	0.05
C136	CONDUIT	54.26	0	00:50	6.14	0.78	0.66
C136-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C13th	CONDUIT	412.68	0	01:05	4.60	0.09	0.31
C14	DUMMY	92.70	0	00:45			
C140	DUMMY	17.33	0	00:45			
C141	CONDUIT	16.22	0	00:45	4.59	0.50	0.50
C14th	CONDUIT	507.62	0	01:05	8.52	0.57	0.55
C14th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C150	DUMMY	707.59	0	01:10			
C151	DUMMY	1264.12	0	01:05			
C154	DUMMY	9.24	0	00:50			
C155	DUMMY	10.51	0	00:45			
C157	CONDUIT	16.01	0	01:15	4.49	0.23	0.33
C158	CONDUIT	1.60	0	01:35	2.61	0.02	0.10
C158_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C159	DUMMY	257.44	0	01:05			
C160	DUMMY	1506.86	0	01:00			
C161	DUMMY	106.28	0	00:45			
C162	CONDUIT	72.18	0	01:20	6.52	1.04	1.00
C162-OVER	CONDUIT	34.36	0	00:55	5.27	0.00	0.10
C163	DUMMY	118.30	0	00:55			

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

C164	CONDUIT	98.76	0	00:55	6.87	1.04	0.99
C164-OVER	CONDUIT	4.86	0	00:55	2.33	0.00	0.04
C165	CONDUIT	1262.96	0	01:05	7.27	0.24	0.55
C166	CONDUIT	19.38	0	00:55	1.34	0.00	0.03
C167	CONDUIT	1.00	0	00:55	0.81	0.00	0.00
C168	CONDUIT	4.37	0	00:55	1.02	0.00	0.01
C169	CONDUIT	103.22	0	00:55	2.44	0.01	0.07
C16th	CONDUIT	1340.79	0	01:00	7.63	0.89	0.95
C16th2	DUMMY	1481.07	0	01:00			
C16th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C170	CONDUIT	94.33	0	01:05	2.37	0.01	0.06
C171	CONDUIT	1412.92	0	01:00	7.48	0.27	0.57
C17th	CONDUIT	1053.24	0	01:50	10.14	1.19	1.00
C17th-OVER	CONDUIT	839.55	0	01:05	5.63	0.05	0.30
C19th	CONDUIT	1763.60	0	01:30	5.59	0.33	0.62
C19th2	DUMMY	1778.58	0	01:10			
C1-DIV	DUMMY	0.00	0	00:00			
C20	DUMMY	244.93	0	02:05			
C200	DUMMY	3280.00	0	01:05			
C202	CONDUIT	49.50	0	11:30	7.72	0.51	0.51
C203	DUMMY	49.50	0	11:30			
C204	CONDUIT	49.50	0	11:35	2.56	0.01	0.08
C230	DUMMY	162.63	0	00:45			
C231	DUMMY	45.00	0	00:45			
C232	DUMMY	81.20	0	00:50			
C233	DUMMY	34.75	0	00:45			
C234	DUMMY	33.30	0	00:40			
C235	DUMMY	201.36	0	00:45			
C236	CONDUIT	33.42	0	00:45	6.12	0.88	0.72
C236_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C23rd	CONDUIT	2389.69	0	01:15	6.10	0.19	0.52
C24	DUMMY	112.76	0	00:40			
C241	CONDUIT	81.30	0	00:50	5.25	0.71	0.62
C241_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C242	DUMMY	186.10	0	00:45			
C243	CONDUIT	184.90	0	00:45	8.06	0.71	0.62
C243_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C244	CONDUIT	223.03	0	00:45	8.75	0.80	0.68
C244_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C245	DUMMY	223.03	0	00:45			
C246	CONDUIT	221.81	0	00:45	6.64	0.73	0.63
C246_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C247	DUMMY	221.81	0	00:45			
C248	CONDUIT	221.43	0	00:45	14.62	0.25	0.34
C25	DUMMY	223.25	0	00:45			
C250	CONDUIT	33.16	0	00:55	5.04	0.53	0.52
C250_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C251	DUMMY	33.29	0	00:50			
C252	DUMMY	38.36	0	00:45			

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

C253	DUMMY	221.43	0	00:45			
C254	CONDUIT	223.59	0	00:50	4.11	0.37	0.63
C26th	CONDUIT	3336.99	0	01:35	4.94	0.24	0.57
C29th	CONDUIT	3690.61	0	01:35	5.55	0.22	0.54
C31	DUMMY	95.10	0	00:45			
C311	DUMMY	15.90	0	00:50			
C314	CONDUIT	93.61	0	00:45	2.90	0.28	0.58
C315	CONDUIT	19.63	0	02:15	4.38	0.32	0.39
C316	CONDUIT	19.63	0	02:15	4.31	0.17	0.28
C316-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C317	CONDUIT	83.20	0	00:45	8.47	0.50	0.50
C318	CONDUIT	117.63	0	00:45	6.35	0.53	0.52
C319	CONDUIT	161.22	0	00:50	6.87	0.63	0.58
C319_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C32	DUMMY	137.69	0	00:50			
C320	CONDUIT	202.25	0	00:50	7.88	0.70	0.62
C320_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C321	CONDUIT	137.95	0	00:55	6.69	0.53	0.52
C321_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322	CONDUIT	34.85	0	00:50	4.58	0.47	0.48
C33	DUMMY	96.15	0	00:55			
C330	CONDUIT	95.72	0	00:55	5.84	0.76	0.65
C330_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C34	DUMMY	40.61	0	01:10			
C341	DUMMY	233.67	0	00:55			
C342	CONDUIT	129.50	0	01:50	7.79	1.03	1.00
C342-OVER	CONDUIT	98.96	0	01:05	5.84	0.01	0.15
C343	DUMMY	310.93	0	01:05			
C344	CONDUIT	213.19	0	01:50	8.61	1.04	1.00
C344-OVER	CONDUIT	103.46	0	01:10	4.10	0.01	0.13
C345	DUMMY	473.13	0	01:10			
C346	CONDUIT	472.69	0	01:15	4.29	0.22	0.52
C347	DUMMY	472.69	0	01:15			
C348	CONDUIT	470.58	0	01:20	3.89	0.19	0.44
C35	DUMMY	47.49	0	00:40			
C350	DUMMY	19.63	0	02:15			
C351	DUMMY	19.63	0	02:10			
C352	DUMMY	83.17	0	00:45			
C353	CONDUIT	73.78	0	01:00	2.67	0.11	0.36
C354	CONDUIT	9.61	0	01:10	3.27	0.18	0.29
C355	DUMMY	153.37	0	00:45			
C36	DUMMY	117.37	0	00:45			
C361	DUMMY	79.36	0	00:40			
C362	DUMMY	40.40	0	00:45			
C363	CONDUIT	40.14	0	00:50	4.76	0.54	0.52
C37	DUMMY	21.75	0	00:40			
C371	DUMMY	40.41	0	00:45			
C372	DUMMY	222.30	0	00:50			
C373	CONDUIT	223.38	0	00:50	8.11	0.51	0.51

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

C373_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C374	DUMMY	270.60	0	00:50			
C375	CONDUIT	271.23	0	00:50	8.49	0.62	0.57
C375_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C376	CONDUIT	66.82	0	06:50	5.74	1.07	1.00
C376-OVER	CONDUIT	642.93	0	01:15	4.20	0.14	0.39
C38	DUMMY	51.66	0	01:05			
C389	DUMMY	16.00	0	01:15			
C389-DIV	DUMMY	1.61	0	01:40			
C390	DUMMY	48.42	0	00:45			
C391	DUMMY	15.28	0	00:50			
C392	DUMMY	53.38	0	00:45			
C393	DUMMY	32.74	0	00:40			
C394	CONDUIT	48.42	0	00:45	5.31	0.11	0.23
C395	DUMMY	78.00	0	00:50			
C395-DIV	DUMMY	5.53	0	00:50			
C396	DUMMY	16.00	0	00:40			
C396-DIV	DUMMY	1.33	0	00:45			
C397	DUMMY	100.00	0	00:45			
C397-DIV	DUMMY	18.30	0	00:55			
C399	CONDUIT	244.93	0	02:05	9.92	1.06	1.00
C399-DIV	CHANNEL	271.84	0	01:00	8.67	0.02	0.13
C41	DUMMY	39.63	0	00:55			
C42	DUMMY	48.44	0	01:15			
C43	DUMMY	75.49	0	00:50			
C44	DUMMY	9.65	0	01:05			
C51	DUMMY	32.01	0	00:45			
C52	DUMMY	29.96	0	00:40			
C53	DUMMY	41.33	0	00:40			
C54	DUMMY	91.20	0	00:40			
C56	CONDUIT	31.66	0	00:50	4.97	0.28	0.36
C57	CONDUIT	91.78	0	00:40	6.45	0.81	0.68
C57_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C61	DUMMY	427.57	0	00:55			
C62	DUMMY	101.83	0	00:40			
C63	DUMMY	88.36	0	00:45			
C64	DUMMY	87.65	0	00:40			
C65	DUMMY	176.99	0	01:00			
C67	DUMMY	500.80	0	00:55			
C68	DUMMY	124.63	0	01:00			
C70	CONDUIT	28.11	0	02:15	5.17	1.00	1.00
C70-OVER	CHANNEL	468.15	0	01:00	5.68	0.03	0.18
C71	CONDUIT	20.09	0	02:15	5.00	1.01	1.00
C71-OVER	CHANNEL	404.26	0	00:55	6.54	0.03	0.16
C72	CONDUIT	66.55	0	02:10	7.84	1.05	1.00
C73	CONDUIT	35.15	0	00:35	3.72	1.00	1.00
C73_Overlfow	CHANNEL	89.05	0	01:05	8.52	0.01	0.08
C74	DUMMY	496.20	0	01:00			
CAD1	DUMMY	37.54	0	00:50			

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

CAD3	DUMMY	26.69	0	00:45			
CAD4	DUMMY	31.70	0	00:45			
CAD7	DUMMY	53.99	0	00:45			
CAR1	DUMMY	266.32	0	00:45			
CAR2	DUMMY	266.74	0	01:05			
CColfax	CONDUIT	1054.43	0	01:00	9.92	1.20	1.00
CColf-OVER	CONDUIT	314.94	0	01:10	4.29	0.02	0.19
CCPark	CONDUIT	4260.89	0	01:25	5.15	0.39	0.69
CDE1	DUMMY	402.94	0	00:55			
CDE2	DUMMY	104.26	0	00:50			
CDE3	DUMMY	50.78	0	01:00			
CDE4	DUMMY	54.00	0	01:00			
CDE5	DUMMY	96.31	0	01:00			
CDE6	DUMMY	168.67	0	00:55			
CDIV7b	DUMMY	508.78	0	00:50			
CJ_L1	DUMMY	48.73	0	00:40			
CJ7b	DUMMY	273.66	0	00:50			
CJL2	DUMMY	19.46	0	00:55			
CMLK	CONDUIT	3951.48	0	01:35	5.71	0.33	0.64
CMontview	CONDUIT	1996.49	0	01:10	5.25	0.12	0.41
CMontview2	DUMMY	2029.11	0	01:10			
CSandCreek	CONDUIT	4301.75	0	01:30	7.87	0.37	0.65
CST1	DUMMY	46.16	0	01:15			
CST2	DUMMY	133.26	0	00:55			
CST3	DUMMY	106.52	0	01:05			
CST4	DUMMY	376.84	0	00:50			
CST5	DUMMY	339.33	0	01:05			
CST6	DUMMY	100.24	0	01:00			
CST7	CONDUIT	326.41	0	01:05	3.18	0.01	0.15
CST8	DUMMY	69.95	0	00:55			
CST9	DUMMY	131.69	0	00:50			
d_01a	DUMMY	174.54	0	00:40			
d_02a	DUMMY	282.37	0	00:45			
d_02b	DUMMY	254.13	0	00:45			
d_03a	DUMMY	174.21	0	00:45			
d_03b	DUMMY	174.21	0	00:45			
d_03c	DUMMY	49.62	0	00:50			
d_04b	DUMMY	94.44	0	00:55			
d_04d	DUMMY	102.87	0	00:50			
d_05a	DUMMY	166.92	0	00:55			
d_05b	DUMMY	188.56	0	00:55			
d_05c	DUMMY	472.41	0	00:55			
d_06a	DUMMY	177.77	0	00:50			
d_06b	DUMMY	415.89	0	00:55			
d_06c	DUMMY	349.61	0	00:55			
d_07b	DUMMY	79.51	0	01:00			
d_08a	DUMMY	121.05	0	00:55			
d_08b	DUMMY	548.41	0	01:05			
d_08c	DUMMY	96.53	0	02:30			

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

d_09a	DUMMY	144.35	0	00:50			
d_09b	DUMMY	247.41	0	00:55			
d_10a	DUMMY	159.62	0	00:55			
d_10a1	DUMMY	397.00	0	01:05			
d_10a2	DUMMY	75.00	0	00:40			
d_11a	DUMMY	126.91	0	01:00			
d_12a	DUMMY	138.47	0	00:45			
d_13a	DUMMY	90.47	0	00:55			
d_14a	DUMMY	135.66	0	00:55			
d_14b	DUMMY	264.01	0	01:05			
d_15a	DUMMY	152.49	0	00:50			
d_17thAv	DUMMY	50.86	0	01:35			
d_EC_Out_23rd	DUMMY	984.64	0	01:35			
d_EC_Out_19thAv	DUMMY	223.39	0	01:00			
S_02a	CONDUIT	23.03	0	01:05	0.81	0.26	0.48
S_03a	CHANNEL	8.43	0	01:05	8.01	0.00	0.05
S_05_07a	CHANNEL	248.21	0	01:05	5.77	0.01	0.11
S_05_07b	CHANNEL	196.08	0	01:05	9.98	0.01	0.10
S_05a	CHANNEL	22.63	0	01:00	11.75	0.00	0.04
S_05b	CHANNEL	163.09	0	00:55	4.61	0.01	0.10
S_05c	CHANNEL	442.97	0	01:00	8.66	0.02	0.15
S_05d	CHANNEL	25.23	0	01:10	5.35	0.00	0.08
S_06a	CHANNEL	239.08	0	00:55	10.07	0.01	0.11
S_06b	CHANNEL	238.98	0	01:00	7.41	0.03	0.18
S_07a	CHANNEL	38.67	0	00:50	13.70	0.00	0.04
S_07b	CHANNEL	37.26	0	00:55	10.58	0.00	0.05
S_07b2	CHANNEL	268.22	0	01:10	5.99	0.03	0.15
S_07d	CHANNEL	251.86	0	01:10	7.43	0.01	0.11
S_07e	CHANNEL	251.59	0	01:10	8.20	0.01	0.12
S_08a	CHANNEL	143.07	0	01:00	10.83	0.01	0.08
S_08b	CHANNEL	472.00	0	01:05	6.95	0.02	0.13
S_09a	CHANNEL	106.97	0	00:55	12.83	0.01	0.07
S_10_13	CHANNEL	50.86	0	01:35	9.89	0.00	0.06
S_10a	CHANNEL	415.76	0	01:15	8.12	0.02	0.15
S_10a1	CHANNEL	81.95	0	00:45	10.99	0.00	0.06
S_10b	CHANNEL	491.02	0	01:15	11.97	0.02	0.14
S_10c	CHANNEL	325.58	0	01:15	9.58	0.01	0.12
S_10d	CHANNEL	788.67	0	01:15	9.03	0.05	0.20
S_10e	CHANNEL	736.15	0	01:20	11.02	0.04	0.17
S_10f	CHANNEL	128.31	0	01:05	11.32	0.01	0.08
S_10g	CHANNEL	82.32	0	01:05	14.75	0.00	0.07
S_10i	DUMMY	244.23	0	01:20			
S_11a	CHANNEL	36.27	0	01:10	8.44	0.00	0.05
S_12_14	CHANNEL	18.11	0	01:10	4.93	0.00	0.03
S_13a	CHANNEL	684.16	0	01:25	8.92	0.05	0.19
S_13b1	CHANNEL	670.19	0	01:25	10.50	0.03	0.17
S_13b2	CHANNEL	607.74	0	01:30	8.44	0.04	0.18
S_14a1	CHANNEL	45.62	0	01:05	6.20	0.00	0.06
S_14a2	CHANNEL	26.56	0	01:15	8.18	0.00	0.05

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

S_15	CHANNEL	636.45	0	01:35	13.59	0.03	0.15
S_15a	CHANNEL	70.60	0	01:10	8.23	0.00	0.07
S_15b	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
S_15c	CONDUIT	357.45	0	00:50	11.74	0.00	0.05
S_Beeler	CHANNEL	460.14	0	01:10	9.28	0.03	0.16
C317_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C318_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C363_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C_EC_Colfax_Out	CHANNEL	232.24	0	01:30	7.47	0.02	0.13
S_AR2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
d_16thAve_E	DUMMY	463.95	0	01:30			
d_72	DUMMY	547.66	0	01:00			
C72_Overflow	CHANNEL	61.00	0	01:00	8.43	0.00	0.07
C_04b	CONDUIT	133.84	0	00:45	12.23	1.01	0.82
S_04a	CHANNEL	171.65	0	00:45	2.35	0.02	0.14
d_04c	DUMMY	165.87	0	00:55			
S_04b	CHANNEL	40.02	0	00:50	15.22	0.00	0.04
C_04c	CONDUIT	62.17	0	00:40	9.98	1.00	0.90
O_10a	ORIFICE	25.21	0	01:15			0.00
W_10a	WEIR	416.91	0	01:15			0.00
OUT30	DUMMY	19.63	0	02:10			
OUT201	DUMMY	49.50	0	11:30			
OUT130	DUMMY	95.61	0	04:50			
OUT156	DUMMY	17.61	0	01:40			
OUT04	DUMMY	22.10	0	02:25			

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C_03a	0.58	0.58	0.58	0.58	0.58
C_05b	1.50	1.50	1.50	1.50	1.50
C_05c	2.17	2.17	2.17	2.25	2.17
C_06a	1.75	1.75	1.75	0.08	1.75
C_07a	1.92	1.92	1.92	1.92	1.92
C_08a	1.00	1.00	1.00	0.92	1.00
C_08b	2.00	2.00	2.00	2.00	2.00
C_10c	2.17	2.17	2.17	2.08	2.17
C_11a	1.00	1.00	1.00	1.00	1.00
C_13a	2.25	2.25	2.25	2.17	2.25
C_14a	1.33	1.33	1.33	1.42	1.33
C_15a	1.17	1.17	1.17	1.25	1.17

Table B.4– SWMM Output Reports for 100-year (Future) Event (Continued)

C125	0.83	0.83	0.83	0.83	0.83
C129	0.50	0.50	0.50	0.17	0.50
C135	0.75	0.75	0.75	0.75	0.75
C162	0.67	0.67	0.67	0.08	0.67
C164	0.58	0.58	0.58	0.58	0.58
C17th	1.25	1.25	1.25	1.25	1.25
C342	1.08	1.08	1.08	1.17	1.08
C344	1.08	1.08	1.08	1.08	1.08
C376	6.83	6.83	6.83	6.92	6.83
C399	1.42	1.42	1.42	0.08	1.42
C70	1.92	1.92	1.92	0.08	1.92
C71	1.83	1.83	1.83	1.92	1.83
C72	1.75	1.75	1.75	1.67	1.75
C73	1.92	1.92	1.92	1.92	1.92
CColfax	0.75	0.75	0.75	0.67	0.75
C_04b	0.01	0.01	0.01	0.08	0.01
C_04c	0.01	0.01	0.01	0.08	0.01

Analysis begun on: Mon May 3 14:20:42 2021
Analysis ended on: Mon May 3 14:20:43 2021
Total elapsed time: 00:00:01

Westerly Creek Lower FHAD **Hydrology Acceptance Memo**

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

Ken MacKenzie, Executive Director
2480 W. 26th Avenue, Suite 156B
Denver, CO 80211-5304

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MEMORANDUM

TO: Robert Krehbiel, Matrix Design Group

FROM: Shea Thomas, UDFCD

DATE: 8/7/17

RE: Westerly Creek (Lower) FHAD

We reviewed the hydrology information you submitted for the Westerly Creek (Downstream of Westerly Creek Dam) Flood Hazard Area Delineation (FHAD) study. The hydrologic parameters submitted on July 15, 2016 are approved (summary of results attached). You may proceed with hydraulic modeling using the approved hydrology.

Data Collection

Westerly Creek Drainageway Update (Downstream of Westerly Creek Dam) Major Drainageway Plan, July 2010, by Kiowa Engineering Corporation

- CUHP-SWMM
  - Input files of CUHP are not available
  - Output files of CUHP 2005 Version 1.2.1 for return periods of 2-, 5-, 10-, 25-, 50- and 100-year events were provided by UDFCD.
  - Input file of EPA-SWMM was provided by UDFCD
  - Westerly Creek subcatchment delineation was provided in CAD by UDFCD

- Kelly Road Dam
  - South Platte River Basin Kelly Road Dam – Westerly Creek, Plans for Dam Rehabilitation, June 1978, US Army CORPS.
  - Draft Emergency Action Plan, Kelly Road Dam and Reservoir, Denver Colorado, Revised April 15, 2016 was provided by UDFCD.
  - Kelly Road Dam Rating Curve in Excel spreadsheet was provided by UDFCD.

Easterly Creek Outfall Systems Plan, December 2012, by SHE

- CUHP-SWMM
  - Input files of CUHP 2005 Version 1.3.3 were provided by UDFCD.
  - Input files of EPA-SWMM 5.0 were provided by UDFCD.
  - Easterly Creek subcatchment delineation was provided in GIS by UDFCD.

Hydrologic Analysis

1. A QA/QC was completed for the CUHP model hydrologic parameters for both the Westerly Creek MDP 2010 and Easterly Creek OSP 2012.
2. Converted CUHP-SWMM models of both Westerly Creek MDP 2010 and Easterly Creek OSP 2012 to the latest CUHP 2005 Version 1.4.4 and EPA-SWMM 5.1.010
3. Revised CUHP-SWMM models of both Westerly Creek MDP 2010 and Easterly Creek OSP 2012 with new hydrologic parameters derived from the QA/QC process.
4. A split flow analysis was done using FLO-2D to determine directions and discharges of flow splits at key design points in the Easterly Creek watershed into the Westerly Creek watershed.
   - The revised CUHP-SWMM hydrologic model of the Easterly Creek OSP 2012 was used as the base model for separating pipe flow out of the inflow hydrographs for the FLO-2D analysis.
   - The hydrograph routing in SWMM was revised to separate the pipe flow and surface flow at those design points associated with the inflow locations in the FLO-2D model. The surface flows were diverted out of the system and used for input hydrographs in the FLO-2D model, however, pipe flows were continued to be routed to the downstream design points.
   - The floodplain cross sections and results of the FLO-2D analysis are shown on **Figure B-2**. The rating curves of flow splits were determined from the hydrographs calculated at

each floodplain cross section in the FLO-2D model. **Table B-4a to B-4i** show the flood hydrographs at each floodplain cross section and the rating curves.

5. Sub-basin delineation
    - Sub-basins AD8, AR3, AR4, AR5, 7a and 5C of the Westerly Creek MDP 2010 were removed and replaced with sub-basins of the Easterly Creek OSP 2012.
    - The boundary of sub-basins ST4 and ST6 were revised at their east boundary to reflect the 100-year drainage system of the Stapleton development.
    - The boundary of sub-basins ST6, ST8, ST9, AD1, AD3, AD4, 7D and AR2 in the Westerly Creek MDP 2010 were revised to match the delineation of the Easterly Creek OSP 2012.
6. Original CUHP and EPA-SWMM (CUHP 1.4.4 with NOAA Atlas 2 Volume 3, no Ct/Cp adjustment)
    - Combined the EPA-SWMM model of Westerly Creek MDP 2010 with the Easterly Creek OSP 2012 by removing common design points and conveyance elements for Easterly Creek within the Westerly Creek model and replaced them with the design points and conveyance elements from the Easterly Creek OSP 2012.
    - Revised flow split design points and conveyance elements based on FLO-2D results.
    - Inserted rating curves for split flow from the FLO-2D analysis.
    - Revised Manning's n by increasing 25% for engineered conveyance elements in the SWMM model to comply with the USDCM of UDFCD.
    - Added overflow elements to resolve flooding at design points which are mostly located in the Lowry Development Authority.
    - Compared rating curves for Kelly Road Dam using the 2016 EAP. The rating curves of the 2016 EAP and the Westerly Creek MDP 2010 are similar; however, the rating curve of 2016 EAP was used in this study to replace the rating curve of 2010 MDP. **Table B-3a** and **Table B-3b** shows the comparison of the rating curves.
    - The final sub-basin delineation and flood routing schematics are shown on **Figure B-1,** Hydrology Work Map.
7. Adjusted CUHP and EPA-SWMM (C_t & C_p adjustment)
    - The C_t and C_p of the CUHP model were adjusted using spreadsheet, CpCtOverride_Version2.0, provided by UDFCD.
8. New CUHP Version 1.5.2b and NOAA Atlas 14
    - New CUHP Version 1.5.2b was provided by UDFCD which has been integrated with new equations for calculating Ct/Cp.
    - Point rainfall depths were derived from NOAA Atlas 14.

Results of Analysis

- The original peak flows, the adjusted peak flows and NOAA 14 peak flows of this hydrologic analysis were compared to the Regulatory Hydrology (FEMA), Westerly Creek MDP 2010 Baseline Hydrology at the locations where direct comparisons are possible. **Table 3-1** shows the locations and peak flow comparisons. **Figure 3-1** shows the discharge profile comparison.
- **Figure 3-2** shows the discharge profiles calculated using new CUHP and NOAA 14 for all events.
- **Table B-5** shows peak discharges and total volumes calculated using new CUHP and NOAA 14 at all design points.
- **Figure B-3** shows comparison of peak flow diversion to the previous studies.

Figure 3-1 Westerly Creek _ Peak Discharges vs. Channel Stations - Hydrology Comparison

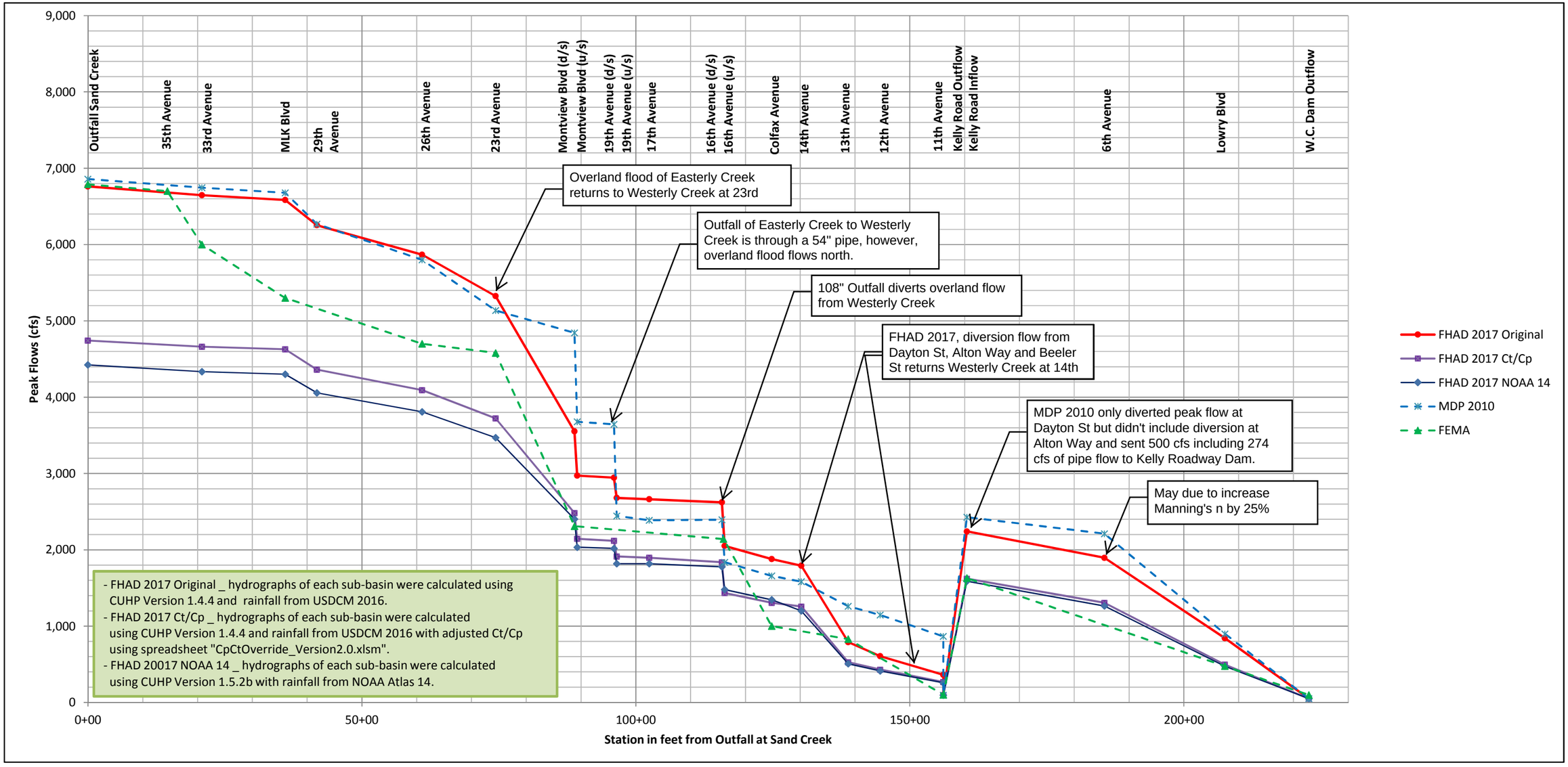
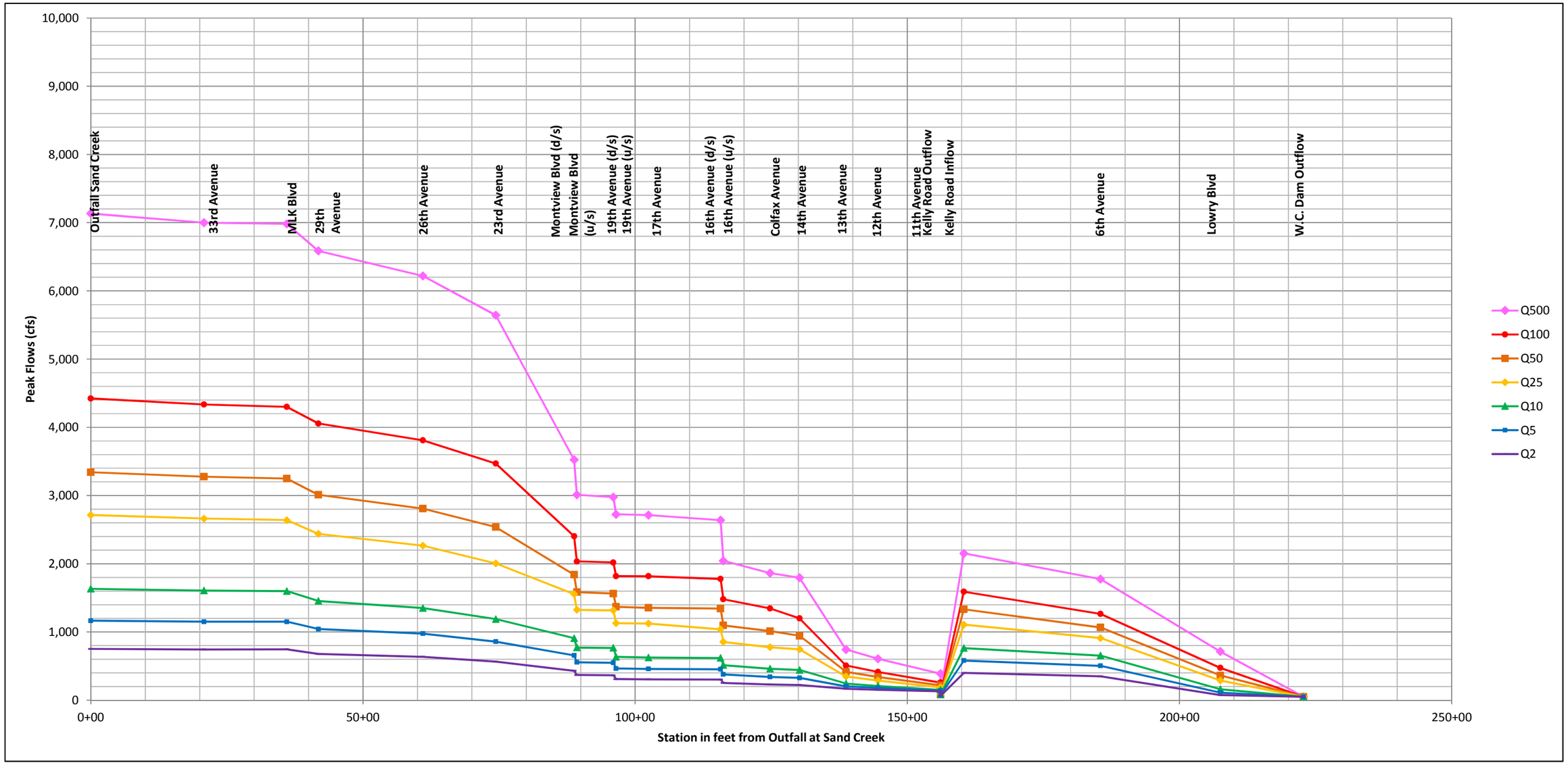


Figure 3-2 Westerly Creek _ Peak Discharges vs. Channel Stations _ Future Conditions _ NOAA 14



E 35TH AVE
N QUEBEC ST
N SYRACUSE ST
E MARTIN LUTHER KING BLVD
E 26TH AVE
E 24TH AVE
E 23RD AVE
E MONTVIEW BLVD
E 17TH AVE
E 14TH AVE
E 13TH AVE
N QUEBEC ST
N SYRACUSE ST
YOSEMITE ST
DAYTON ST
HAVANA ST
MOLINE ST
17TH AVE
11TH AVE
E 8TH AVE
E 6TH AVENUE PKWY
E 1ST AVE
1ST AVE
N HAVANA WAY
25TH AVE
PEORIA ST
MONTVIEW BLVD
ALAMEDA AVE
City and County of Denver
City of Aurora
Sand Creek
Pond #223
Bluff Lake
Lowhamed Ditch
Baranimoi Ditch
Easterly Creek
Kelly Pond
Westerly Creek
Westerly Creek Dam Pond
High Line Canal

Legend

- City Boundary
- Watershed Boundary (8.6 Sq. Mi.)
- Subbasin
- Lakes or Ponds Detention
- Surface Flow
- Storm Drain

SWMM Routing Elements

- Design Point
- Detention
- Outfall
- Split Flow
- Conveyence
- Basin ID / Area, %Imp

Matrix Design Group
AN EMPLOYEE-OWNED COMPANY

0 200 400 800
Feet

Layer Control Instructions

The Map Controls above set the visibility of the layers automatically for the selected map. Additional layer control is available through the "Layers" Navigation Panel which can be accessed from the View Menu under Navigation Panels. In the Panel, the visibility of layers and layer groups can be changed by clicking the square left of the layer/group. An eye in the square indicates that the layer is on. An empty square indicates that the layer is off. Layer groups can be expanded and reduced by clicking the +/- symbol left of the layer/group.

Interactive Figures (Select from Below)

Study Area Map

Baseline Hydrology SWMM Routing Map

Figure B-1
Hydrology Map
Westerly Creek Flood Hazard Area Delineation

FILE: O:\gis_projects\UDFCD_Westerly_Creek_FHADelineation\mxd\Hydrology\Fig B-1_UDFCD_WC_Hydrology_Map.mxd, 7/15/2016, Andrea_Spargo

Westerly Creek FHAD Baseline Hydrology
Figure B-2 FLO-2D Split Flow Analysis

E 38TH AVE
E MARTIN LUTHER KING BLVD
E 26TH AVE
E MONTVIEW BLVD
E COLFAX AVE
E 13TH AVE
E 11TH AVE
E 6TH AVE PKWY
E 1ST AVE
E ALAMEDA AVE

City and County of Denver
City of Aurora

Cross Section 1
Q100= 260 cfs
Peak Time = 0.86 hours

Cross Section 2
Q100 = 315 cfs
Peak Time = 0.96 hours

Cross Section 3
Q100= 876 cfs
Peak Time = 0.94 hours

Cross Section 4
Q100 = 30 cfs
Peak Time = 1.16 hours

Cross Section 5
Q100= 190 cfs
Peak Time = 0.69 hours

Cross Section 6
Q100 = 57 cfs
Peak Time = 0.86 hours

Cross Section 7
Q100= 331 cfs
Peak Time = 1.04 hours

Cross Section 8
Q100 = 497 cfs
Peak Time = 1.06 hours

Cross Section 9
Q100= 164 cfs
Peak Time = 0.80 hours

Cross Section 10
Q100 = 110 cfs
Peak Time = 0.83 hours

Cross Section 11
Q100= 85 cfs
Peak Time = 0.95 hours

Cross Section 12
Q100 = 60 cfs
Peak Time = 0.91 hours

Cross Section 13
Q100= 52 cfs
Peak Time = 1.20 hours

Cross Section 14
Q100 = 1.9 cfs
Peak Time = 1.32 hours
Ignored in SWMM

Cross Section 16
Q100=1,032 cfs
Peak Time = 1.62 hours

Cross Section 17
Q100 = 89 cfs
Peak Time = 1.69 hours

Cross Section 19
Q100=1,046 cfs
Peak Time = 1.70 hours

Cross Section 20
Q100 = 3.5 cfs
Peak Time = 1.95 hours
Ignored in SWMM

Cross Section 21
Q100 = 993 cfs
Peak Time = 1.75 hours

Cross Section 22
Q100 = 17 cfs
Peak Time = 2.03 hours
Ignored in SWMM

Cross Section 23
Q100 = 942 cfs
Peak Time = 1.47 hours

Cross Section 24
Q100 = 401 cfs
Peak Time = 1.48 hours

Cross Section 25
Q100 = 328 cfs
Peak Time = 0.86 hours

Cross Section 26
Q100 = 44 cfs
Peak Time = 0.93 hours

Westerly Creek
Easterly Creek
Sand Creek
Barnum Interceptor Ditch
High Line Canal Greenway

Legend

- Study Area
- Easterly Creek Subcatchment
- Westerly Creek Subcatchment
- Lowry Redevelopment Authority
- City and County Boundary
- Parks and Open Space
- East Corridor Commuter Rail

Flow Depth at Cell
Var
- 0.010 - 0.500
- 0.501 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 3.000

Existing Storm Sewer
- Horiz. Diam. 0 - 18 in.
- Horiz. Diam. 18 - 30 in.
- Horiz. Diam. 30 - 48 in.
- Horiz. Diam. 48 - 60 in.
- Horiz. Diam. >60 in.
- Surface Flow
- Existing Detention Basin

FLO-2D Flow Diversion Analysis
Inflow Hydrograph Design point

0 600 1,200 1,800 Feet
1 inch = 600 feet

Matrix Design Group
AN EMPLOYEE-OWNED COMPANY

FILE: R:\16.155.027 (Westerly Creek FHAD)\GIS\Westerly_Creek_FLO-2D_Work Map.mxd, 7/15/2016, hungteng_ho

Easterly Creek Outfall at 23rd Ave
Westerly MDP 2010 No Flow 0 cfs
Westerly FHAD 2017 Original 1,577 cfs

Easterly Creek Outfall at 19th Ave
Westerly MDP 2010 1,327 cfs
Easterly OSP 2012 1,488 cfs
Westerly FHAD 2017 Original 581 cfs

Easterly Creek Diversion at Colfax Ave
Westerly MDP 2010 No Flow 0 cfs
Easterly OSP 2012 394 cfs
Westerly FHAD 2017 Original 0 cfs

Westerly MDP 2010 No Flow 0 cfs
Westerly FHAD 2017 Original 716 cfs

Westerly MDP 2010 Text 739 cfs
Model 734 cfs
Westerly FHAD 2017 Original 236 cfs

Westerly MDP 2010 Text 467 cfs
Model 291 cfs
Westerly FHAD 2017 Original 507 cfs

Westerly MDP 2010 Text 275 cfs (Pipe)
23 cfs (Street)
Model 503 cfs
Westerly FHAD 2017 Original 240 cfs (72" Pipe)

Westerly MDP 2010 457 cfs
Easterly OSP 2012 722 cfs
Westerly FHAD 2017 Original 273 cfs (Pipe 236 cfs, Surface 37 cfs)

City and County of Denver
City of Aurora

Note:
Westerly FHAD 2017 Original was calculated utilizing CUHP Version 1.4.4 and point rainfalls from NOAA Atlas 2 Volume 3.

Legend
- City Boundary
- Watershed Boundary (8.6 Sq. Mi.)
- Subbasin
- Lakes or Ponds Detention
- Surface Flow
- Storm Drain

SWMM Routing Elements
- Design Point
- Detention
- Outfall
- Split Flow
- Conveyence

Basin ID
Area, %Imp

Layer Control Instructions

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Interactive Figures (Select from Below)

Study Area Map

Baseline Hydrology SWMM Routing Map

0 200 400 800
Feet

Figure B-3
Hydrology Map _ Diversion Comparison
Westerly Creek Flood Hazard Area Delineation

FILE: 6/25/2018, hydromap_Mp

Table 3-1 Westerly Creek Baseline Hydrology Peak Flows at Key Points

Locations	Design Points / Conveyance Elements	Total Drainage Area		Station	FHAD 2017 _ NOAA 14 _ Future Conditions Peak Flow (cfs)							100-Year Hydrology Comparison (cfs)				
		(acres)	(mi^2)	(ft)	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}	MDP 2010	FEMA	FHAD 2017 NOAA 14	FHAD 2017 Ct/Cp	FHAD 2017 Original
Outfall	JSandCreek	11,602	18.13	0+00	752	1,165	1,632	2,714	3,342	4,424	7,134	6,859	6,900	4,424	4,742	6,762
33rd Avenue	J33rd	11,492	17.96	20+80	744	1,150	1,606	2,662	3,277	4,335	6,999	6746	6,000	4,335	4,662	6,647
MLK Blvd	JMLK	11,410	17.83	36+00	746	1,151	1,599	2,640	3,249	4,300	6,984	6679	5,300	4,300	4,628	6,584
29th Avenue	J29th	11,132	17.39	41+80	678	1,043	1,455	2,438	3,011	4,056	6,586	6,268		4,056	4,362	6,254
26th Avenue	J26th	10,851	16.95	61+00	637	977	1,351	2,266	2,809	3,809	6,218	5800	4,700	3,809	4,093	5,867
23rd Avenue	J23rd	10,508	16.42	74+40	565	859	1,188	2,005	2,538	3,469	5,644	5136	4,580	3,469	3,722	5,325
Montview Blvd (d/s)	JMontview-ds	9,987	15.60	88+80	431	655	907	1,554	1,840	2,403	3,523	4844	2,310	2,403	2,481	3,552
Montview Blvd (u/s)	JMontview-us	9,707	15.17	89+30	370	556	771	1,325	1,585	2,034	3,010	3,678		2,034	2,144	2,971
19th Avenue (d/s)	J19th-ds	9,683	15.13	96+00	365	548	766	1,316	1,563	2,019	2,975	3,645		2,019	2,118	2,945
19th Avenue (u/s)	J19th-us	7,584	11.85	96+50	310	465	635	1,128	1,369	1,819	2725	2444		1819	1913	2680
17th Avenue	J17th	7,568	11.83	102+45	306	458	625	1,124	1,354	1,818	2712	2387		1818	1897	2663
16th Avenue (d/s)	J16th-DIV	7,553	11.80	115+70	303	453	618	1,039	1,343	1,778	2637	2394	2140	1778	1837	2623
16th Avenue (u/s)	J16th-us	7,316	11.43	116+20	253	379	514	854	1,097	1,480	2043	1837		1480	1435	2052
Colfax Avenue	JColfax-DIV	7,231	11.30	124+80	231	341	461	775	1,012	1,345	1863	1659	1000	1345	1306	1878
14th Avenue	J14th-DIV	7,189	11.23	130+20	222	327	442	745	943	1,200	1795	1583		1200	1257	1790
13th Avenue	J13th-DIV	7,027	10.98	138+75	167	204	244	348	416	507	743	1261	830	507	526	790
12th Avenue	J12th	6,950	10.86	144+60	153	179	209	287	340	413	606	1146		413	430	605
11th Avenue	J11th	6,841	10.69	156+10	131	140	151	189	217	258	388	865		258	268	361
Kelly Road Outflow	OUT130	6,612	10.33	156+12	66	74	81	86	91	95	130	96	100	95	94	97
Kelly Road Inflow	RES130	6,612	10.33	160+40	400	581	763	1,108	1,332	1,590	2151	2428	1630	1590	1621	2240
6th Avenue	J151	6,405	10.01	185+50	351	504	654	910	1,066	1,264	1775	2211		1264	1306	1895
Lowry Blvd	J347	5,821	9.10	207+50	75	109	161	289	362	473	714	898	475	473	496	842
W.C. Dam Outflow	J202	5,546	8.67	222+80	50	50	50	50	50	50	50	50	98	50	50	50

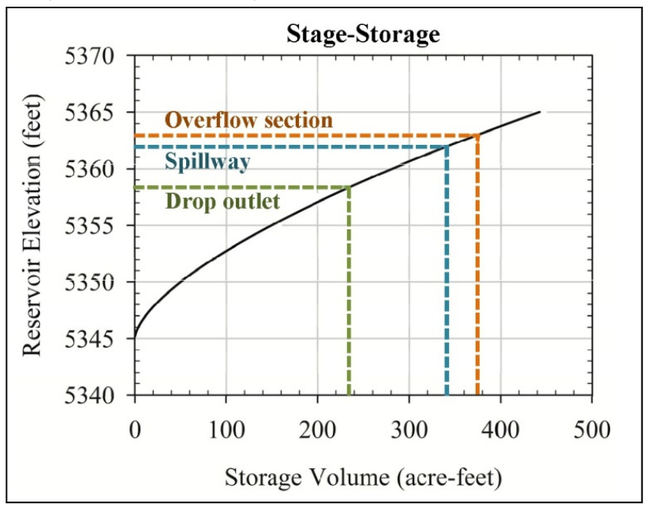
1. FHAD 2017 Original _ hydrographs of each sub-basin were calculated using CUHP Version 1.4.4 and rainfall from USDCM 2016.
2. FHAD 2017 Ct/Cp _ hydrographs of each sub-basin were calculated using CUHP Version 1.4.4 and rainfall from USDCM 2016 with adjusted Ct/Cp using spreadsheet "CpCtOverride_Version2.0.xlsm".
3. FHAD 20017 NOAA 14 _ hydrographs of each sub-basin were calculated using CUHP Version 1.5.2b with rainfall from NOAA Atlas 14.

Table B-3a Rating Curves for Kelly Road Dam Hydraulic Structures

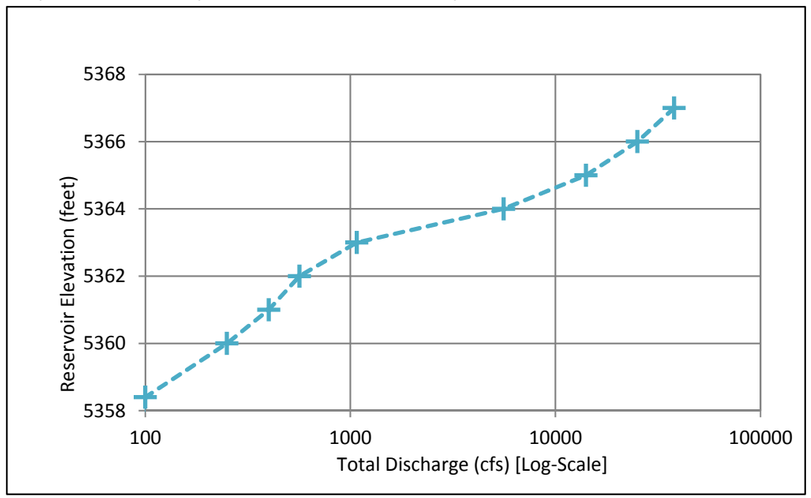
(Source: EMERGENCY ACTION PLAN KELLY ROAD DAM AND RESERVOIR, Denver County, Colorado, Revised April 15, 2016)

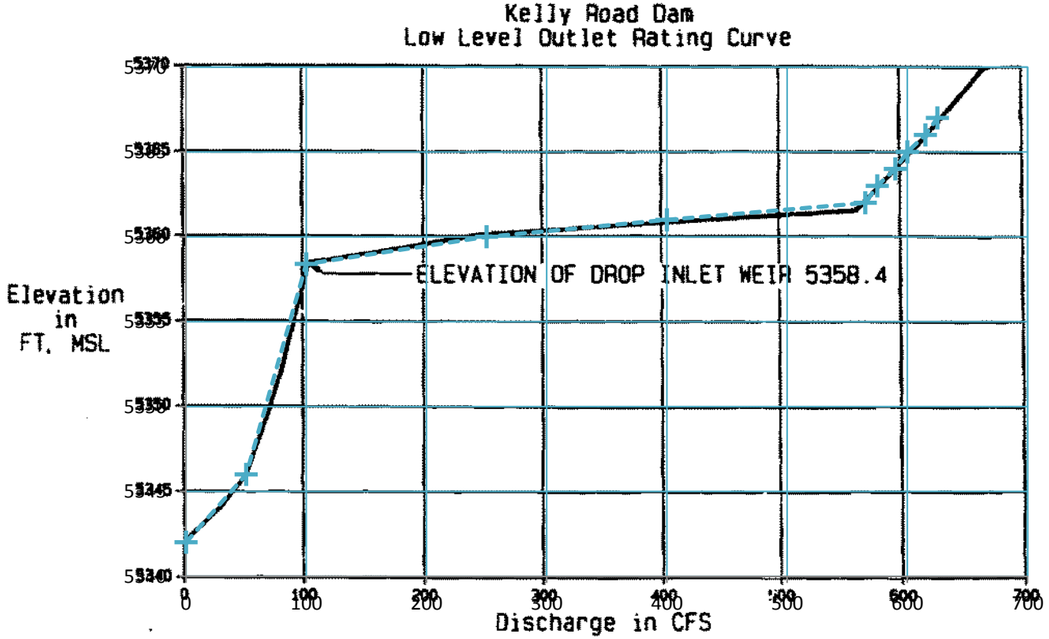
Elevation (feet)	Low-Level Outlet Discharge (cfs)	Combined Spillway Discharge (cfs)	Total Discharge (cfs)	Storage* (ac-ft)
5342	0		0	0
5346	50		50	3.8
5358.4	100		100	233
5360	250		250	282
5361	400		400	310
5362	565	0	565	341
5363	575	500	1075	375
5364	590	5000	5590	409
5365	600	13500	14100	442
5366	615	24500	25115	-
5367	625	37300	37925	-

* Storage was derived from Stage-Storage Curve next to this table.



As presented in Kelly Road Dam EAP: Revised April 15, 2016





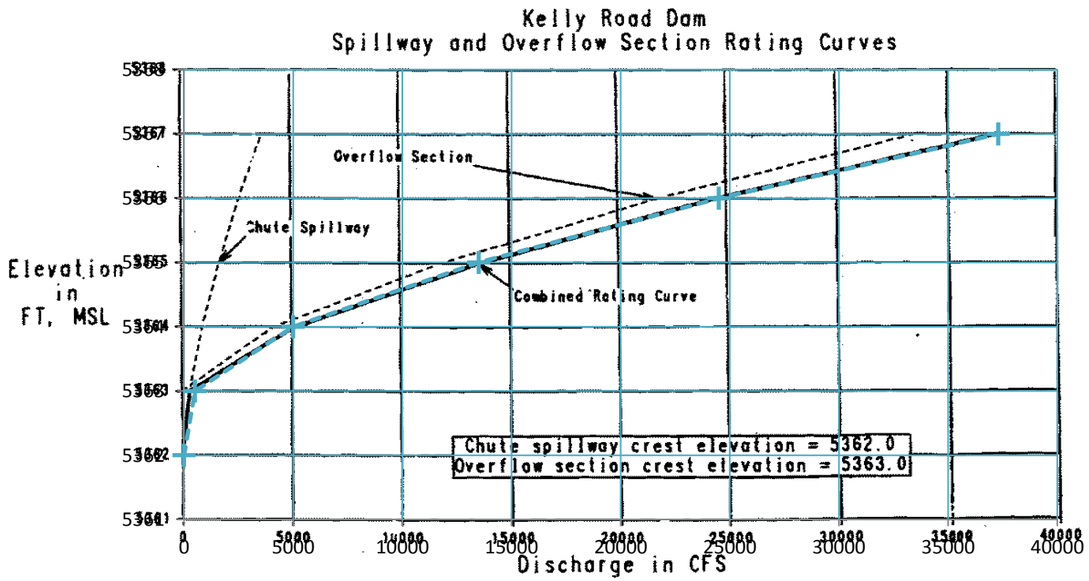


Table B-3b Rating Curves Comparison for Kelly Road Dam Hydraulic Structures

Rating Curve for Kelly Road Dam from SWMM Westerly Creek _ MDP 2010

Head (ft)	Storage (ac-ft)	Outflow (cfs)
0	0	0
1	1	5
5	5	30
15	15	55
85	85	80
250	250	105
300	300	250
345	345	565
700	700	670

Rating Curves for Kelly Road Dam Hydraulic Structures Kelly Road Dam EAP

Head (ft)	Storage (ac-ft)	Outflow (cfs)
0	0	0
3.8	3.8	50
233	233	100
282	282	250
310	310	400
341	341	565
375	375	575
409	409	590
442	442	600

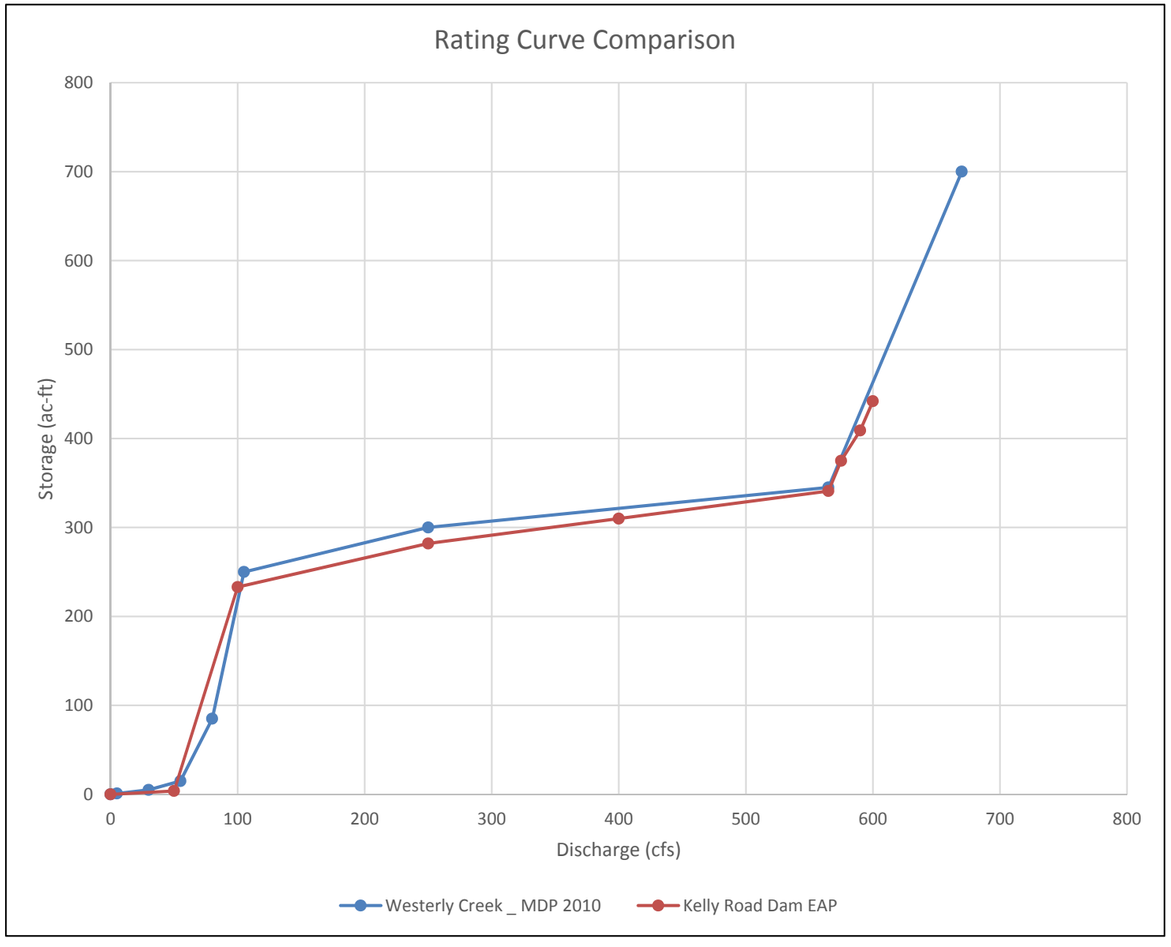


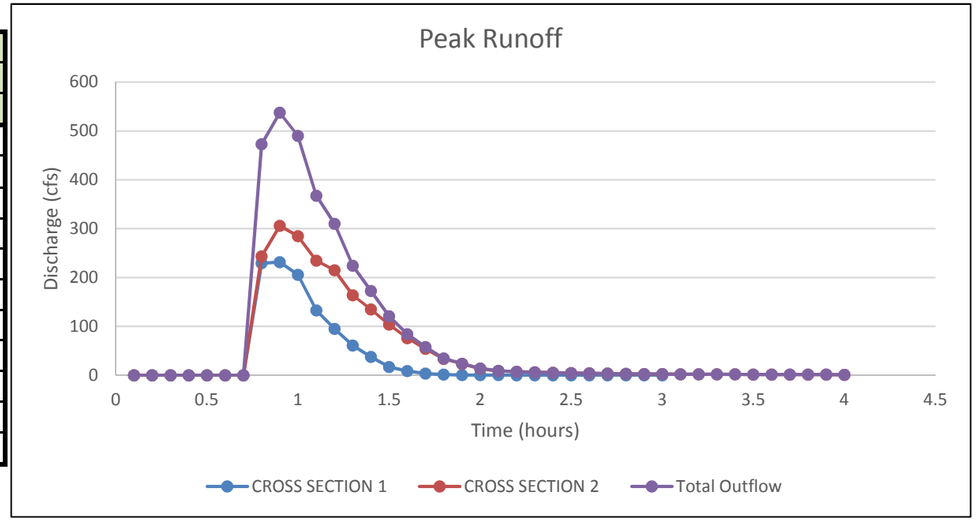
Table B-4a _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_06b**
Location Moline St/Oakland Ct/E 6th Ave
FLO-2D Cross Section 1 represents the northern split flow which flows mainly in Lima St, also in Moline St, Macon St, Lansing St and Kingston St.
FLO-2D Cross Section 2 represents the eastern split flow which flows mainly in Oakland Ct and E 6th Avenue.

CROSS SECTION	1		CROSS SECTION	2		
MAXIMUM	254.18 CFS		MAXIMUM	320.91 CFS		Total Outflow
TOTAL VOLUME	8.75 AF		TOTAL VOLUME	16.79 AF		(CFS)
AT TIME:	0.86 HOURS		AT TIME:	0.87 HOURS		
TIME	DISCHARGE	Percent	TIME	DISCHARGE	Percent	
(HRS)	(CFS)	(%)	(HRS)	(CFS)	(%)	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	0	#DIV/0!	0.6	0	#DIV/0!	0
0.7	0	#DIV/0!	0.7	0	#DIV/0!	0
0.8	229.54	0.49	0.8	243.38	0.51	472.92
0.9	231.4	0.43	0.9	305.97	0.57	537.37
1	205.41	0.42	1	284.75	0.58	490.16
1.1	132.75	0.36	1.1	234.45	0.64	367.2
1.2	95.06	0.31	1.2	214.97	0.69	310.03
1.3	60.68	0.27	1.3	163.75	0.73	224.43
1.4	37.76	0.22	1.4	134.83	0.78	172.59
1.5	17.02	0.14	1.5	103.92	0.86	120.94
1.6	8.72	0.10	1.6	75.62	0.90	84.34
1.7	3.58	0.06	1.7	54.23	0.94	57.81
1.8	1.4	0.04	1.8	33.32	0.96	34.72
1.9	0.47	0.02	1.9	23.16	0.98	23.63
2	0.35	0.03	2	13.29	0.97	13.64
2.1	0.2	0.02	2.1	8.85	0.98	9.05
2.2	0	0	2.2	7.23	1	7.23
2.3	0	0	2.3	5.83	1	5.83
2.4	0	0	2.4	5.19	1	5.19
2.5	0	0	2.5	4.61	1	4.61
2.6	0	0	2.6	3.96	1	3.96
2.7	0	0	2.7	3.39	1	3.39
2.8	0	0	2.8	2.74	1	2.74
2.9	0	0	2.9	2.55	1	2.55
3	0	0	3	2.46	1	2.46

Rating Curve at D_06b

Inflow	Cross Section	
	1	2
(cfs)	(cfs)	(cfs)
0	0	0
100	11	89
200	39	161
300	81	219
400	136	264
500	201	299
600	276	324
700	358	342
800	446	354
900	540	360
1000	638	362



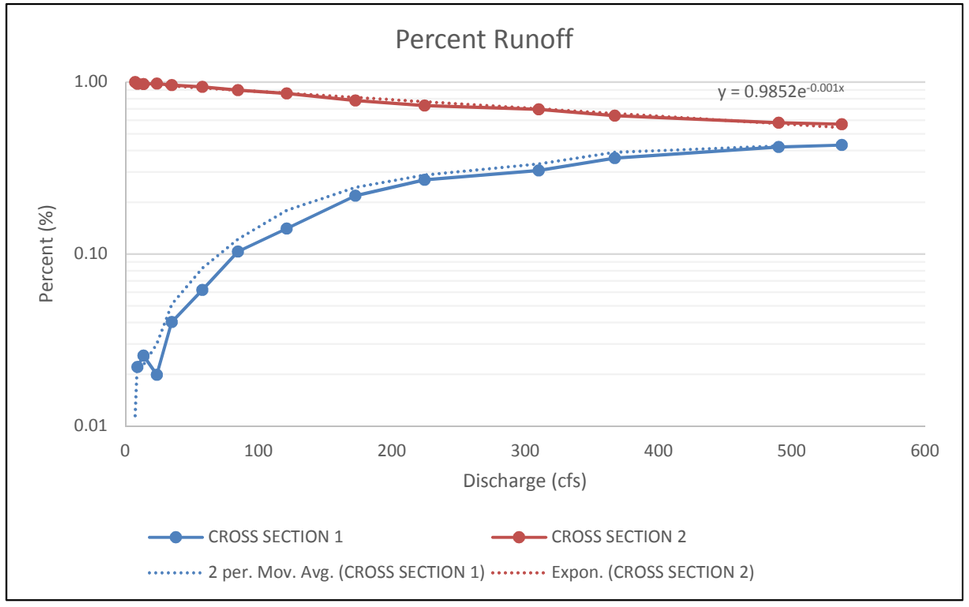


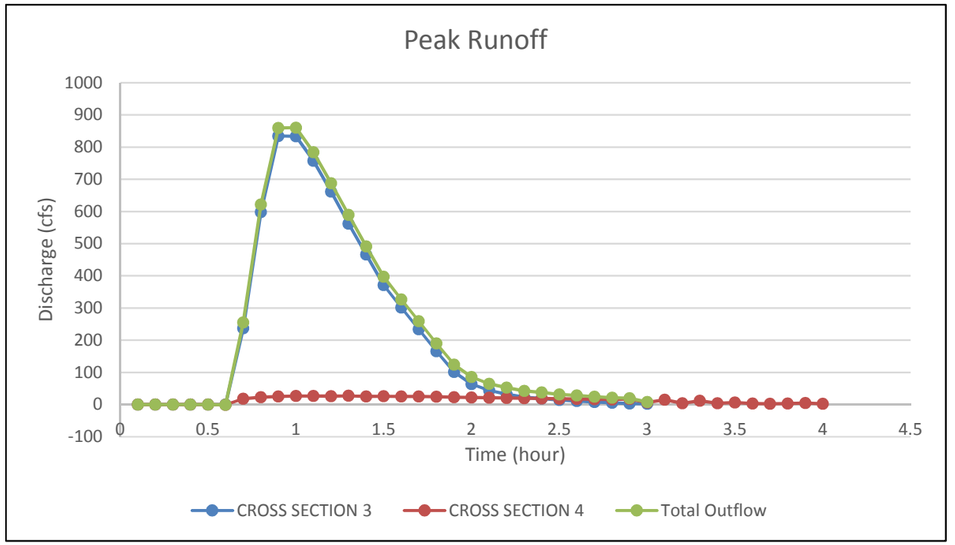
Table B-4b _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_05c**
Location Kenton St/Oakland Ct/E 6th Ave
FLO-2D Cross Section 3 represents the northern split flow which flows mainly in Jamaica St, also in Kenton St, Joliet St, Ironton St and Lola St.
FLO-2D Cross Section 4 represents the eastern split flow which flows mainly in Oakland Ct and E 6th Avenue.

CROSS SECTION	3		CROSS SECTION	4		Total Outflow
MAXIMUM	877.03 CFS		MAXIMUM	29.59 CFS		(CFS)
TOTAL VOLUME	53.2 AF		TOTAL VOLUME	5.34 AF		
AT TIME:	0.94 HOURS		AT TIME:	1.08 HOURS		
TIME	DISCHARGE	Percent	TIME	DISCHARGE	Percent	
(HRS)	(CFS)	(%)	(HRS)	(CFS)	(%)	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	0	0.00	0.6	-1	1.00	-1
0.7	237	0.93	0.7	18	0.07	255
0.8	598	0.96	0.8	23	0.04	622
0.9	835	0.97	0.9	25	0.03	860
1	834	0.97	1	27	0.03	861
1.1	757	0.97	1.1	27	0.03	784
1.2	662	0.96	1.2	26	0.04	688
1.3	562	0.95	1.3	27	0.05	589
1.4	466	0.95	1.4	25	0.05	491
1.5	371	0.94	1.5	26	0.06	397
1.6	301	0.92	1.6	25	0.08	326
1.7	234	0.90	1.7	25	0.10	259
1.8	165	0.87	1.8	25	0.13	190
1.9	101	0.81	1.9	23	0.19	124
2	63	0.74	2	22	0.26	85
2.1	44	0.68	2.1	21	0.32	64
2.2	32	0.61	2.2	20	0.39	52
2.3	23	0.54	2.3	20	0.46	42
2.4	19	0.50	2.4	19	0.50	38
2.5	14	0.43	2.5	18	0.57	32
2.6	11	0.39	2.6	17	0.61	28
2.7	8	0.33	2.7	16	0.67	24
2.8	6	0.26	2.8	16	0.74	21
2.9	3	0.15	2.9	17	0.85	20
3	2	0.27	3	6	0.73	8

Rating Curve at D_05c

Inflow	Cross Section	
	3	4
(cfs)	(cfs)	(cfs)
0	0	0
200	177	23
400	375	25
600	574	26
800	773	27
1000	973	27
1200	1172	28
1400	1372	28
1600	1571	29
1800	1771	29
2000	1971	29



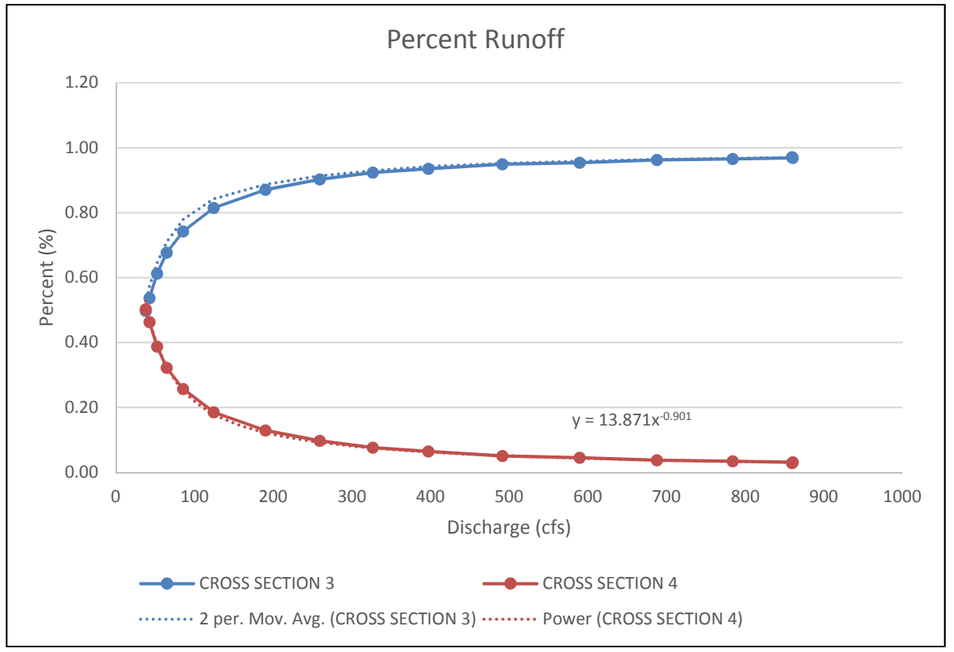


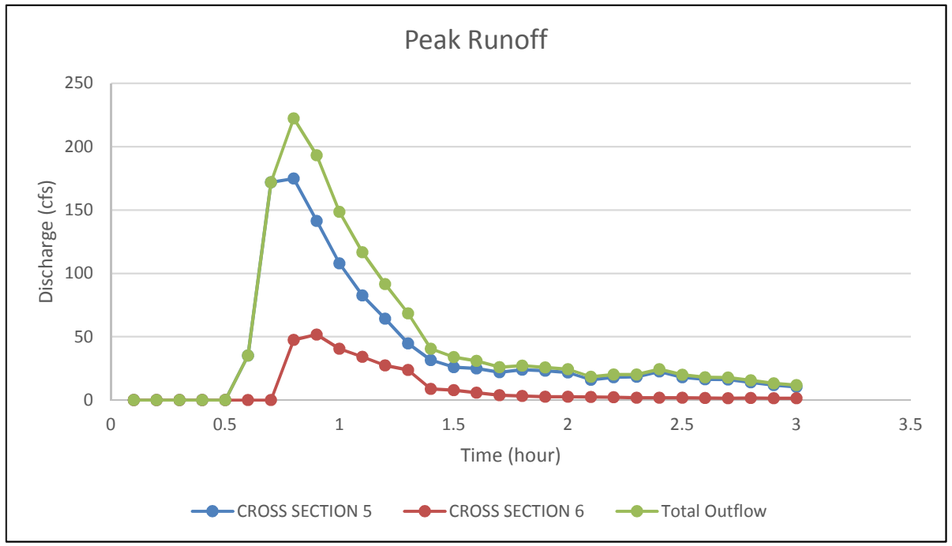
Table B-4c _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_03b**
Location Havana St/E 6th Ave
FLO-2D Cross Section 5 represents the northern split flow which flows mainly in Havana St, also in ally Havana/Hanover St, Geneva St, and Galena St.
FLO-2D Cross Section 6 represents the eastern split flow which flows mainly in E 6th Avenue and E 7th Avenue.

CROSS SECTION	**5**		**CROSS SECTION**	**6**		
MAXIMUM	**188.15 CFS**		**MAXIMUM**	**57.11 CFS**		**Total Outflow**
TOTAL VOLUME	**10.53 AF**		**TOTAL VOLUME**	**2.53 AF**		**(CFS)**
AT TIME:	**0.69 HOURS**		**AT TIME:**	**0.86 HOURS**		
TIME	**DISCHARGE**	**Percent**	**TIME**	**DISCHARGE**	**Percent**	
(HRS)	(CFS)	**(%)**	(HRS)	(CFS)	**(%)**	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	35	1.00	0.6	0	0.00	35
0.7	172	1.00	0.7	0	0.00	172
0.8	175	0.79	0.8	48	0.21	222
0.9	141	0.73	0.9	52	0.27	193
1	108	0.73	1	41	0.27	148
1.1	83	0.71	1.1	34	0.29	117
1.2	64	0.70	1.2	27	0.30	92
1.3	45	0.65	1.3	24	0.35	68
1.4	32	0.78	1.4	9	0.22	40
1.5	26	0.77	1.5	8	0.23	34
1.6	25	0.81	1.6	6	0.19	31
1.7	22	0.85	1.7	4	0.15	26
1.8	24	0.88	1.8	3	0.12	27
1.9	23	0.90	1.9	3	0.10	26
2	22	0.89	2	3	0.11	24
2.1	16	0.87	2.1	2	0.13	18
2.2	18	0.89	2.2	2	0.11	20
2.3	18	0.91	2.3	2	0.09	20
2.4	23	0.93	2.4	2	0.07	24
2.5	18	0.90	2.5	2	0.10	20
2.6	16	0.90	2.6	2	0.10	18
2.7	16	0.91	2.7	2	0.09	18
2.8	14	0.90	2.8	2	0.10	16
2.9	12	0.89	2.9	1	0.11	13
3	10	0.88	3	1	0.12	12

Rating Curve at D_03b

Inflow	**Cross Section**	
	5	**6**
(cfs)	**(cfs)**	**(cfs)**
0	0	0
50	39	11
100	75	25
150	108	42
200	141	59
250	173	77
300	205	95
350	235	115
400	266	134
450	296	154
500	326	174



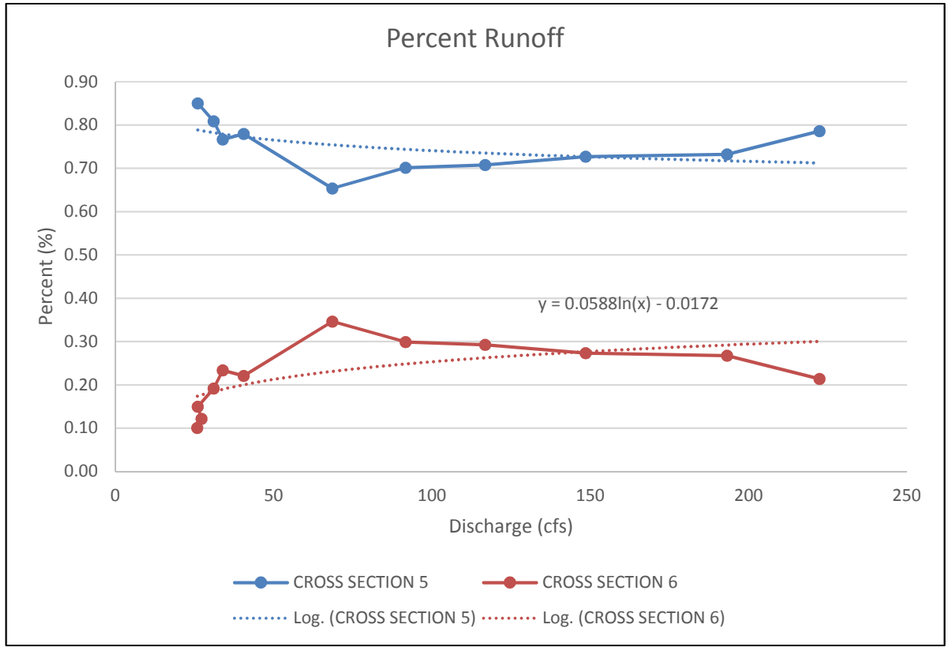


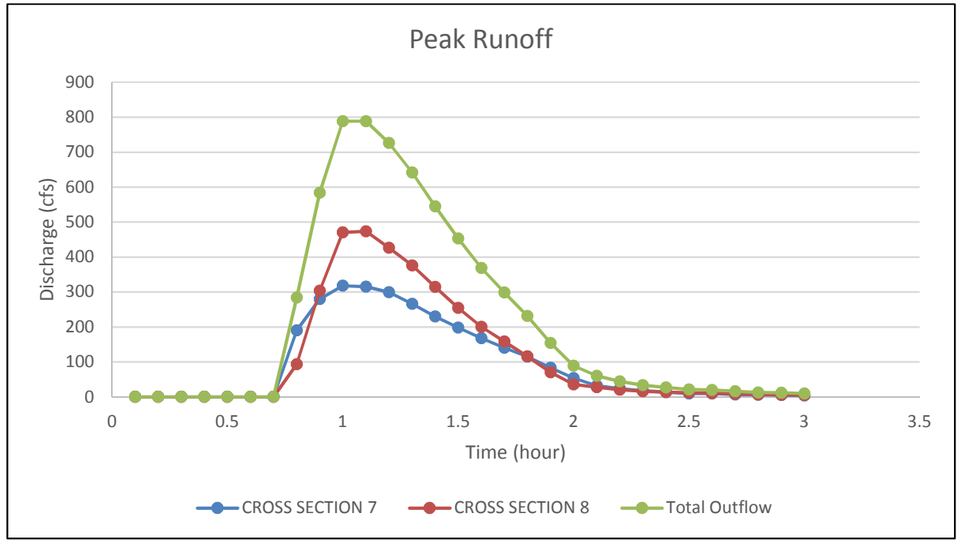
Table B-4d _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_05_07**
Location Jamaica St/E Lowry Pl
FLO-2D Cross Section 7 represents the northern split flow which flows mainly in Jamaica St, also in Kenton St.
FLO-2D Cross Section 8 represents the eastern split flow which flows mainly in E Lowry Pl to Havana St, then northeasterly to Geneva St and E 11th Avenue.

CROSS SECTION	**7**		**CROSS SECTION**	**8**		
MAXIMUM	**328.2 CFS**		**MAXIMUM**	**498.21 CFS**		**Total Outflow**
TOTAL VOLUME	**23.4 AF**		**TOTAL VOLUME**	**28.49 AF**		**(CFS)**
AT TIME:	**1.05 HOURS**		**AT TIME:**	**1.03 HOURS**		
TIME	**DISCHARGE**	**Percent**	**TIME**	**DISCHARGE**	**Percent**	
(HRS)	(CFS)	**(%)**	(HRS)	(CFS)	**(%)**	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	0	#DIV/0!	0.6	0	#DIV/0!	0
0.7	0	#DIV/0!	0.7	0	#DIV/0!	0
0.8	190	0.67	0.8	94	0.33	284
0.9	280	0.48	0.9	304	0.52	584
1	318	0.40	1	471	0.60	789
1.1	315	0.40	1.1	474	0.60	789
1.2	300	0.41	1.2	427	0.59	726
1.3	266	0.41	1.3	376	0.59	642
1.4	230	0.42	1.4	315	0.58	545
1.5	198	0.44	1.5	255	0.56	453
1.6	168	0.46	1.6	201	0.54	369
1.7	141	0.47	1.7	158	0.53	299
1.8	115	0.50	1.8	116	0.50	232
1.9	84	0.54	1.9	70	0.46	154
2	54	0.60	2	35	0.40	89
2.1	32	0.53	2.1	28	0.47	60
2.2	23	0.53	2.2	21	0.47	44
2.3	18	0.52	2.3	16	0.48	34
2.4	14	0.51	2.4	13	0.49	27
2.5	10	0.45	2.5	12	0.55	22
2.6	10	0.50	2.6	10	0.50	20
2.7	7	0.41	2.7	9	0.59	16
2.8	6	0.47	2.8	7	0.53	13
2.9	5	0.45	2.9	6	0.55	12
3	4	0.43	3	5	0.57	10

Rating Curve at D_05-07

Inflow	**Cross Section**	
	7	**8**
(cfs)	**(cfs)**	**(cfs)**
0	0	0
100	56	44
200	101	99
300	142	158
400	180	220
500	217	283
600	253	347
700	287	413
800	319	481
900	351	549
1000	383	617
1100	413	687
1200	443	757



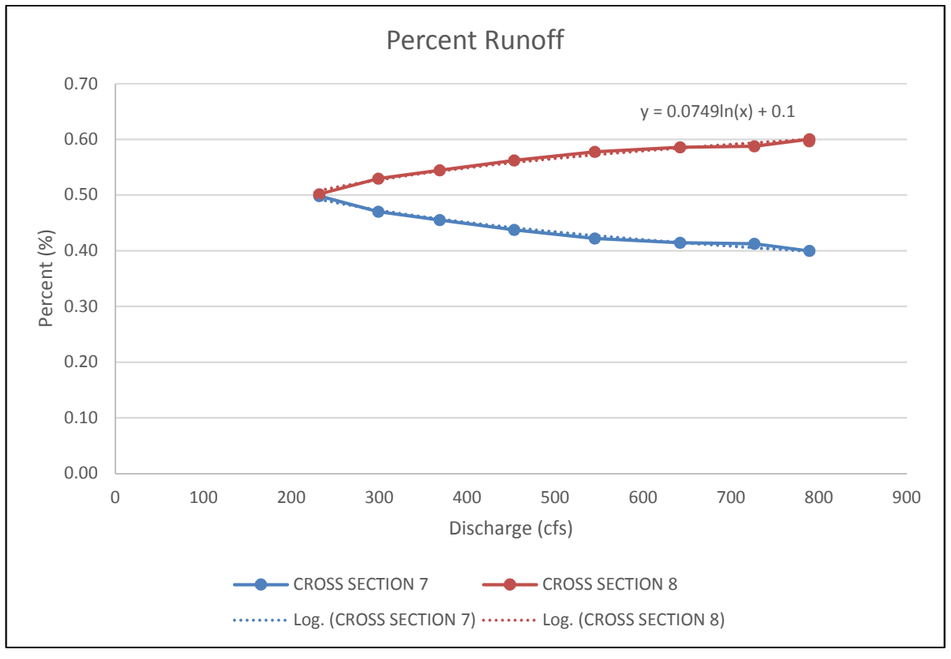


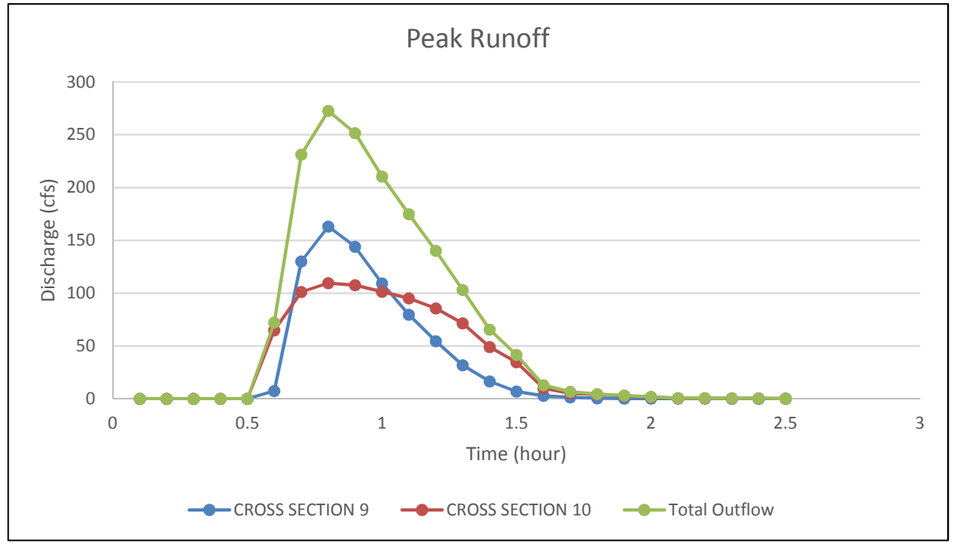
Table B-4e _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_12a**
Location Hanover St/E Colfax Avenue
FLO-2D Cross Section 9 represents the northern split flow which flows mainly in Geneva St, also in Hanover St and Galena St.
FLO-2D Cross Section 10 represents the eastern split flow which flows mainly in E Colfax Avenue, and southern split flow which flows mainly in Geneva St.

CROSS SECTION	**9**		**CROSS SECTION**	**10**		**Total Outflow**
MAXIMUM	**163.57 CFS**		**MAXIMUM**	**110.11 CFS**		**(CFS)**
TOTAL VOLUME	**6.27 AF**		**TOTAL VOLUME**	**6.89 AF**		
AT TIME:	**0.81 HOURS**		**AT TIME:**	**0.84 HOURS**		
TIME	**DISCHARGE**	**Percent**	**TIME**	**DISCHARGE**	**Percent**	
(HRS)	(CFS)	**(%)**	(HRS)	(CFS)	**(%)**	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	7	0.10	0.6	65	0.90	72
0.7	130	0.56	0.7	101	0.44	231
0.8	163	0.60	0.8	110	0.40	273
0.9	144	0.57	0.9	108	0.43	252
1	109	0.52	1	101	0.48	211
1.1	80	0.46	1.1	95	0.54	175
1.2	54	0.39	1.2	86	0.61	140
1.3	32	0.31	1.3	71	0.69	103
1.4	17	0.25	1.4	49	0.75	66
1.5	7	0.16	1.5	35	0.84	41
1.6	3	0.22	1.6	10	0.78	13
1.7	1	0.21	1.7	5	0.79	7
1.8	0	0.07	1.8	4	0.93	4
1.9	0	0.08	1.9	3	0.92	3
2	0	0.11	2	2	0.89	2
2.1	0	0.24	2.1	1	0.76	1
2.2	0	0.21	2.2	0	0.79	1
2.3	0	0.00	2.3	0	1.00	0
2.4	0	0.00	2.4	0	1.00	0
2.5	0	0.00	2.5	0	1.00	0

Rating Curve at D_10c

Inflow	**Cross Section**	
	9	**10**
(cfs)	**(cfs)**	**(cfs)**
0	0	0
50	10	40
100	30	70
150	58	92
200	96	104
250	142	108
300	190	110
350	240	110
400	290	110
450	340	110



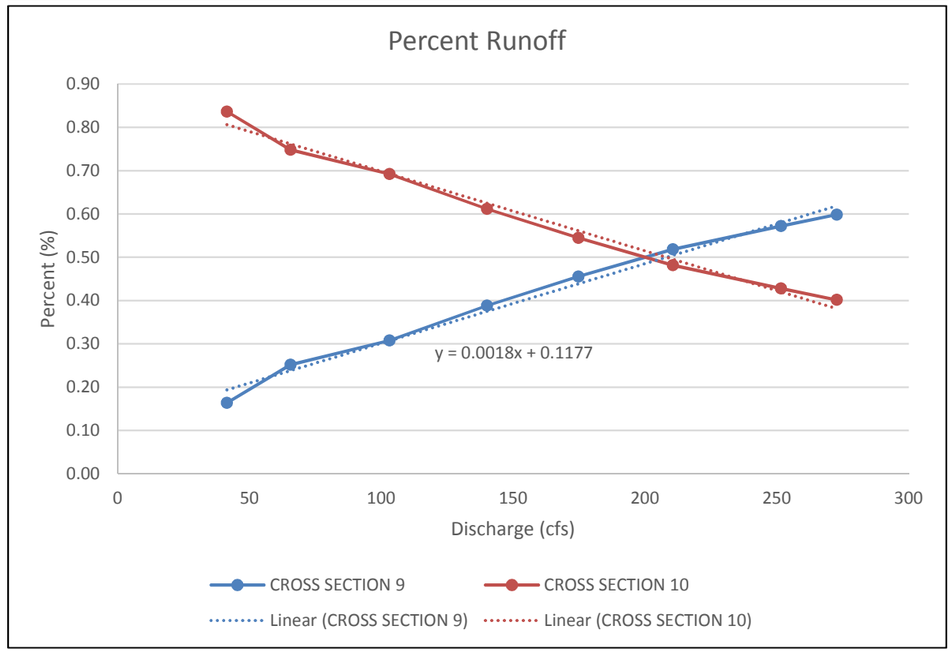


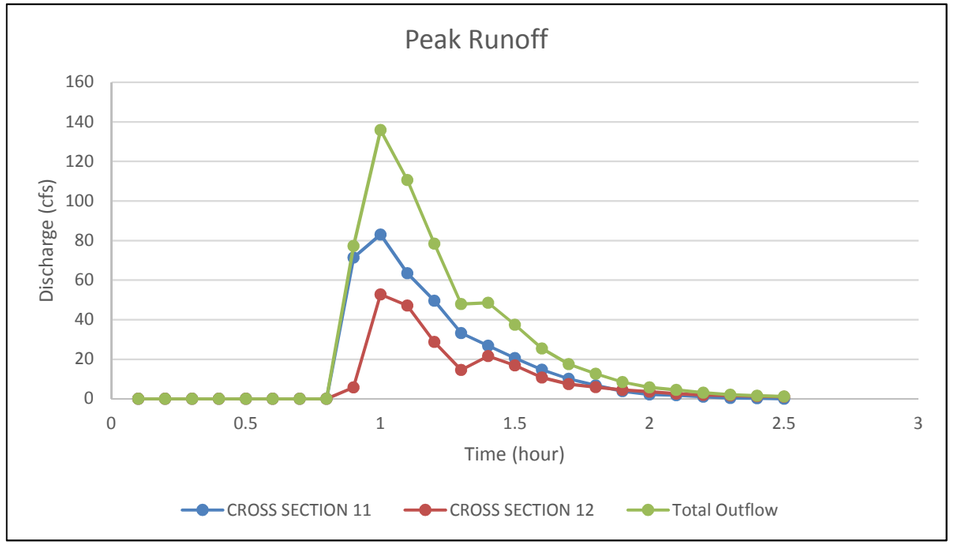
Table B-4f _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_12_14**
Location Galena St/16th Avenue
FLO-2D Cross Section 11 represents the northern split flow which flows mainly in Galena St and Geneva St.
FLO-2D Cross Section 12 represents the eastern split flow which flows mainly in E 16th Avenue.

CROSS SECTION	11		CROSS SECTION	12		Total Outflow
MAXIMUM	84.9 CFS		MAXIMUM	60.45 CFS		(CFS)
TOTAL VOLUME	3.25 AF		TOTAL VOLUME	2.14 AF		
AT TIME:	0.99 HOURS		AT TIME:	0.91 HOURS		
TIME	DISCHARGE	Percent	TIME	DISCHARGE	Percent	
(HRS)	(CFS)	(%)	(HRS)	(CFS)	(%)	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	0	#DIV/0!	0.6	0	#DIV/0!	0
0.7	0	#DIV/0!	0.7	0	#DIV/0!	0
0.8	0	#DIV/0!	0.8	0	#DIV/0!	0
0.9	71	0.92	0.9	6	0.08	77
1	83	0.61	1	53	0.39	136
1.1	63	0.57	1.1	47	0.43	111
1.2	50	0.63	1.2	29	0.37	78
1.3	33	0.70	1.3	15	0.30	48
1.4	27	0.55	1.4	22	0.45	49
1.5	21	0.55	1.5	17	0.45	38
1.6	15	0.58	1.6	11	0.42	25
1.7	10	0.58	1.7	7	0.42	18
1.8	7	0.53	1.8	6	0.47	13
1.9	4	0.46	1.9	5	0.54	8
2	2	0.38	2	4	0.62	6
2.1	2	0.41	2.1	3	0.59	5
2.2	1	0.36	2.2	2	0.64	3
2.3	0	0.21	2.3	2	0.79	2
2.4	0	0.18	2.4	1	0.83	2
2.5	0	0.06	2.5	1	0.94	1

Rating Curve at D_12-14

Inflow	Cross Section	
	11	12
(cfs)	(cfs)	(cfs)
0	0	0
50	30	20
100	60	40
150	92	58
200	125	75
250	159	91
300	193	107
350	229	121
400	266	134
450	304	146



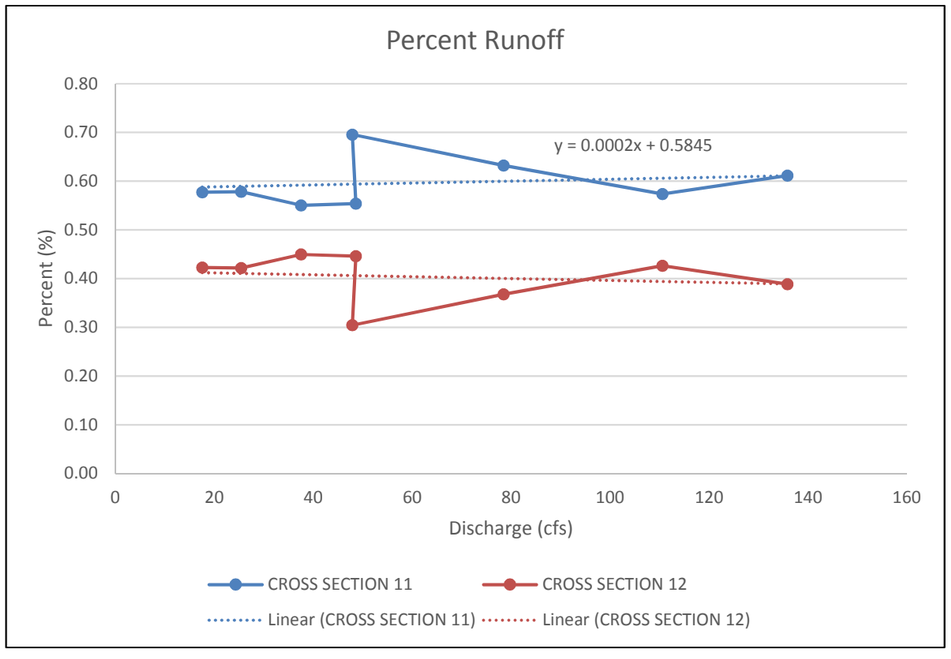


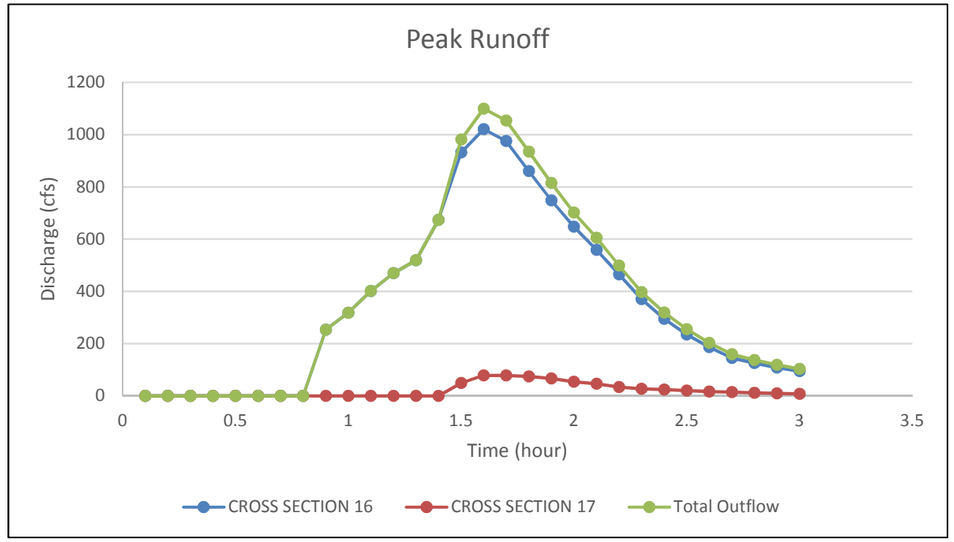
Table B-4g _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_10_13**
Location Del Mar PKWY/17th Avenue
FLO-2D Cross Section 16 represents the northern split flow which flows mainly in Del Mar PKWY, also in .
FLO-2D Cross Section 17 represents the eastern split flow which flows mainly in E 17th Avenue.

CROSS SECTION	16		CROSS SECTION	17		Total Outflow
MAXIMUM	1027.45 CFS		MAXIMUM	89.12 CFS		(CFS)
TOTAL VOLUME	96.39 AF		TOTAL VOLUME	5.81 AF		
AT TIME:	1.62 HOURS		AT TIME:	1.68 HOURS		
TIME	DISCHARGE	Percent	TIME	DISCHARGE	Percent	
(HRS)	(CFS)	(%)	(HRS)	(CFS)	(%)	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	0	#DIV/0!	0.6	0	#DIV/0!	0
0.7	0	#DIV/0!	0.7	0	#DIV/0!	0
0.8	0	#DIV/0!	0.8	0	#DIV/0!	0
0.9	253	1.00	0.9	0	0.00	253
1	319	1.00	1	0	0.00	319
1.1	401	1.00	1.1	0	0.00	401
1.2	470	1.00	1.2	0	0.00	470
1.3	519	1.00	1.3	0	0.00	519
1.4	674	1.00	1.4	0	0.00	674
1.5	932	0.95	1.5	50	0.05	982
1.6	1021	0.93	1.6	79	0.07	1100
1.7	976	0.93	1.7	78	0.07	1054
1.8	860	0.92	1.8	75	0.08	935
1.9	749	0.92	1.9	67	0.08	815
2	648	0.92	2	54	0.08	702
2.1	559	0.92	2.1	46	0.08	605
2.2	465	0.93	2.2	34	0.07	498
2.3	370	0.93	2.3	28	0.07	398
2.4	295	0.93	2.4	24	0.07	319
2.5	235	0.92	2.5	20	0.08	255
2.6	187	0.92	2.6	16	0.08	203
2.7	145	0.91	2.7	14	0.09	160
2.8	125	0.91	2.8	12	0.09	137
2.9	109	0.92	2.9	10	0.08	119
3	95	0.92	3	8	0.08	103

Rating Curve at D_10-13

Inflow	Cross Section	
	16	17
(cfs)	(cfs)	(cfs)
0	0	0
200	184	16
400	368	32
600	552	48
800	736	64
1000	920	80
1200	1104	96
1400	1288	112
1600	1472	128
1800	1656	144
2000	1840	160
2200	2024	176
2400	2208	192
2600	2392	208
2800	2576	224



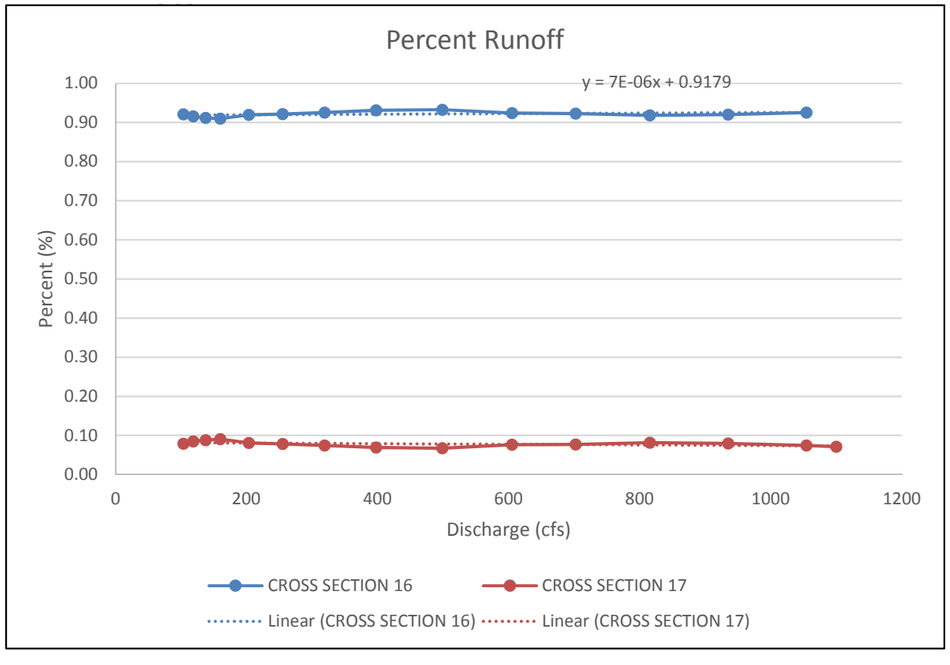


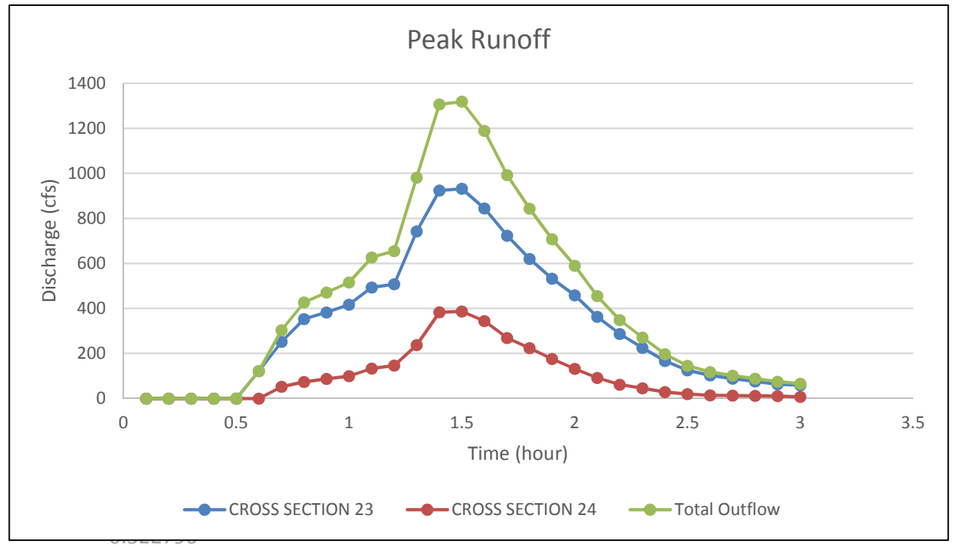
Table B-4h _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_10d**
Location Colfax Ave/Florence St
FLO-2D Cross Section 23 represents the northern split flow which flows mainly in Florence St.
FLO-2D Cross Section 24 represents the eastern split flow which flows mainly in E Colfax Ave than turn north in Elmira St and Dayton St.

CROSS SECTION	23		CROSS SECTION	24		Total Outflow
MAXIMUM	961.56 CFS		MAXIMUM	402.18 CFS		(CFS)
TOTAL VOLUME	87.97 AF		TOTAL VOLUME	26.09 AF		
AT TIME:	1.41 HOURS		AT TIME:	1.48 HOURS		
TIME	DISCHARGE	Percent	TIME	DISCHARGE	Percent	
(HRS)	(CFS)	(%)	(HRS)	(CFS)	(%)	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	122	1.00	0.6	0	0.00	122
0.7	252	0.83	0.7	53	0.17	304
0.8	353	0.83	0.8	74	0.17	427
0.9	383	0.81	0.9	88	0.19	470
1	417	0.81	1	99	0.19	516
1.1	493	0.79	1.1	134	0.21	626
1.2	508	0.78	1.2	147	0.22	655
1.3	743	0.76	1.3	238	0.24	981
1.4	924	0.71	1.4	383	0.29	1307
1.5	931	0.71	1.5	387	0.29	1318
1.6	844	0.71	1.6	344	0.29	1188
1.7	723	0.73	1.7	269	0.27	992
1.8	620	0.73	1.8	224	0.27	844
1.9	532	0.75	1.9	175	0.25	707
2	458	0.78	2	132	0.22	590
2.1	364	0.80	2.1	91	0.20	455
2.2	287	0.82	2.2	62	0.18	349
2.3	226	0.83	2.3	45	0.17	271
2.4	167	0.85	2.4	29	0.15	197
2.5	126	0.86	2.5	20	0.14	146
2.6	103	0.88	2.6	14	0.12	117
2.7	88	0.87	2.7	13	0.13	101
2.8	76	0.86	2.8	12	0.14	88
2.9	64	0.85	2.9	11	0.15	75
3	59	0.89	3	7	0.11	66

Rating Curve at D_10d

Inflow	Cross Section	
	23	24
(cfs)	(cfs)	(cfs)
0	0	0
200	166	34
400	316	84
600	459	141
800	598	202
1000	735	265
1200	868	332
1400	1000	400
1600	1130	470
1800	1259	541
2000	1386	614
2200	1512	688
2400	1637	763
2600	1761	839
2800	1884	916



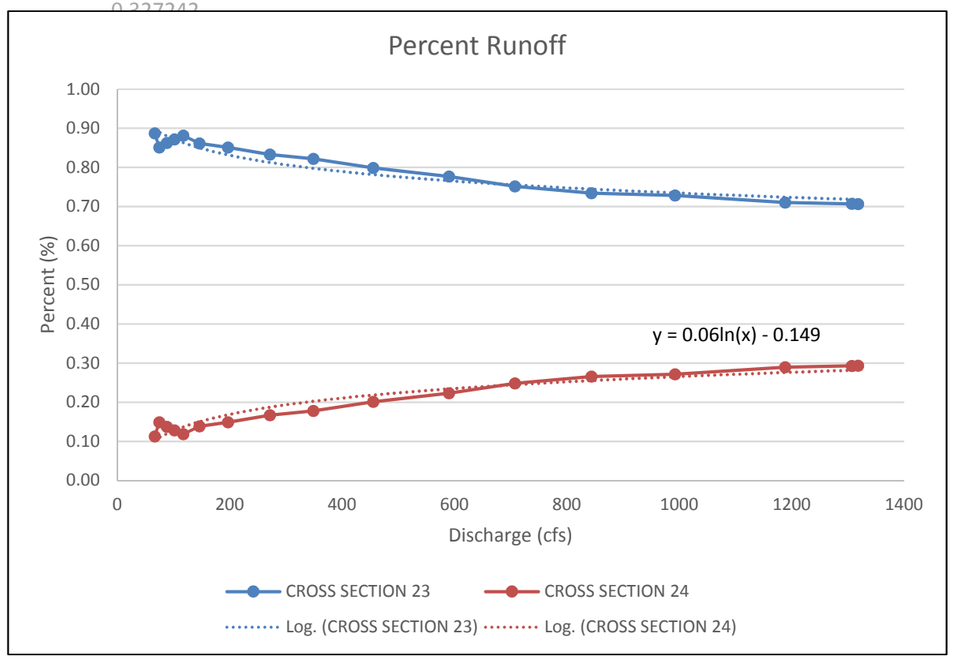


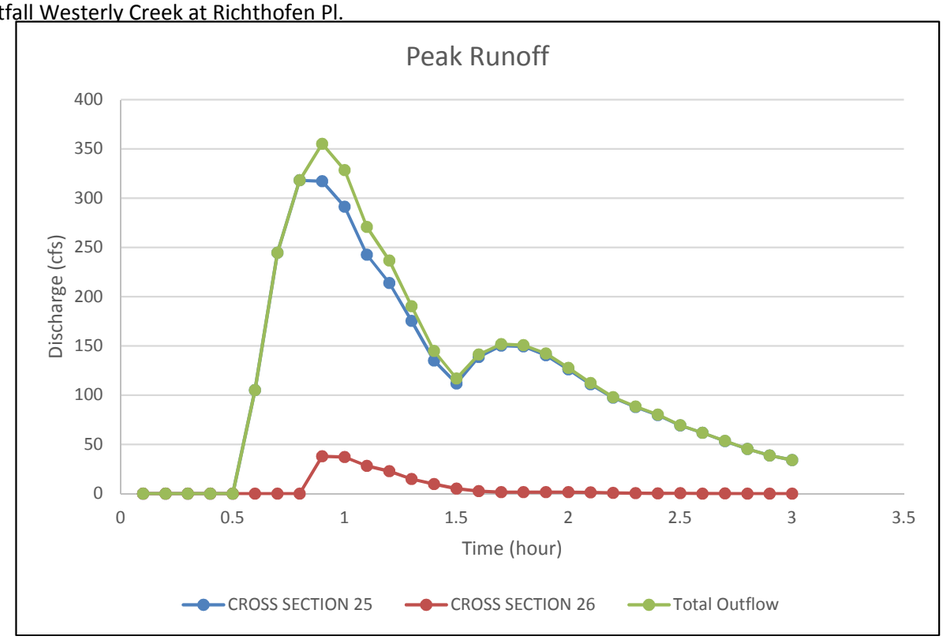
Table B-4i _ Rating Curve of Split Flow _ FLO-2D Analysis

Design Point **D_72**
Location 11th Ave/Beeler St
FLO-2D Cross Section 25 represents the northern split flow which flows mainly in Beeler St.
FLO-2D Cross Section 26 represents the western split flow which flows across Yosemite St south of 11th Ave than turn north in Xenia St to outfall Westerly Creek at Richthofen Pl.

CROSS SECTION	25		CROSS SECTION	26		Total Outflow
MAXIMUM	327.99 CFS		MAXIMUM	43.8 CFS		(CFS)
TOTAL VOLUME	34.61 AF		TOTAL VOLUME	1.47 AF		
AT TIME:	0.86 HOURS		AT TIME:	0.93 HOURS		
TIME	DISCHARGE	Percent	TIME	DISCHARGE	Percent	
(HRS)	(CFS)	(%)	(HRS)	(CFS)	(%)	
0.1	0	#DIV/0!	0.1	0	#DIV/0!	0
0.2	0	#DIV/0!	0.2	0	#DIV/0!	0
0.3	0	#DIV/0!	0.3	0	#DIV/0!	0
0.4	0	#DIV/0!	0.4	0	#DIV/0!	0
0.5	0	#DIV/0!	0.5	0	#DIV/0!	0
0.6	105	1.00	0.6	0	0.00	105
0.7	245	1.00	0.7	0	0.00	245
0.8	318	1.00	0.8	0	0.00	318
0.9	317	0.89	0.9	38	0.11	355
1	291	0.89	1	37	0.11	328
1.1	243	0.90	1.1	28	0.10	271
1.2	214	0.90	1.2	23	0.10	237
1.3	175	0.92	1.3	15	0.08	190
1.4	135	0.93	1.4	10	0.07	145
1.5	112	0.96	1.5	5	0.04	117
1.6	139	0.98	1.6	3	0.02	141
1.7	150	0.99	1.7	2	0.01	152
1.8	149	0.99	1.8	1	0.01	151
1.9	141	0.99	1.9	2	0.01	142
2	126	0.99	2	2	0.01	128
2.1	111	0.99	2.1	1	0.01	112
2.2	97	0.99	2.2	1	0.01	98
2.3	88	0.99	2.3	1	0.01	88
2.4	80	1.00	2.4	0	0.00	80
2.5	69	1.00	2.5	0	0.00	69
2.6	62	1.00	2.6	0	0.00	62
2.7	53	1.00	2.7	0	0.00	54
2.8	45	1.00	2.8	0	0.00	45
2.9	39	1.00	2.9	0	0.00	39
3	34	1.00	3	0	0.00	34

Rating Curve at DIV72

Inflow	Cross Section	
	25	26
(cfs)	(cfs)	(cfs)
0	0	0
100	97	3
200	188	12
300	275	25
400	361	39
500	446	54
600	530	70
700	612	88
800	694	106
900	776	124
1000	857	143
1100	937	163
1200	1017	183
1300	1096	204
1400	1175	225



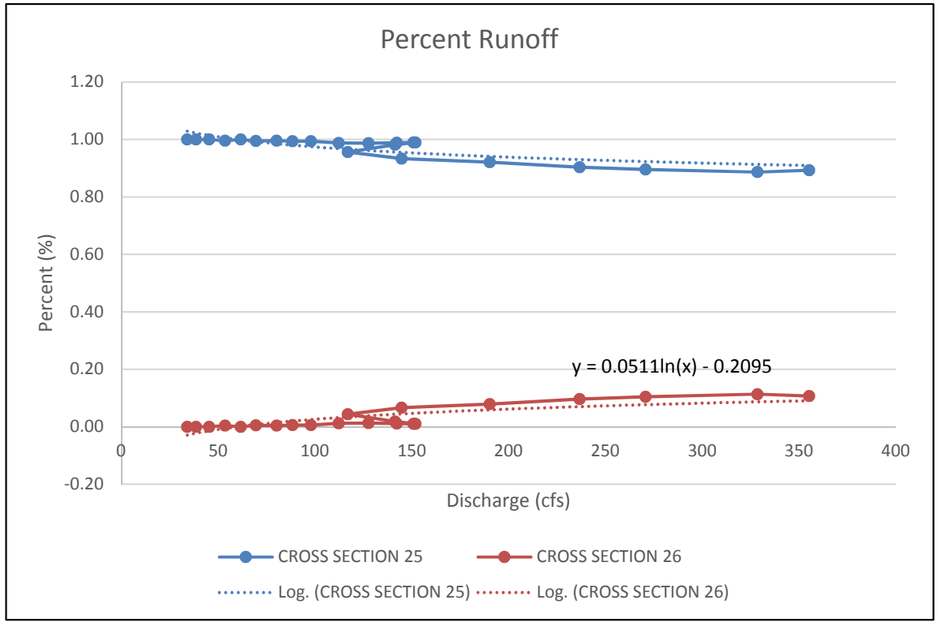


Table B-5 Peak Discharges and Runoff Volume _ NOAA 14 (All Design Points)

Design Point		Drainage Area	Future Conditions Peak Flow (cfs)						Future Conditions Runoff Volume (ac-ft)					
Number	Type	(acres)	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}
D_02a	DIVIDER	110	74	103	131	192	233	282	6	8	10	14	17	21
D_03a	DIVIDER	666	129	149	168	215	243	278	18	22	26	30	34	37
D_03b	DIVIDER	666	0	0	0	0	15	50	0	0	0	0	0	2
D_05-07	DIVIDER	589	55	118	188	363	464	587	2	7	14	27	37	49
D_05a	DIVIDER	119	55	80	106	162	199	245	6	8	11	16	19	23
D_05b	DIVIDER	356	75	110	151	256	321	402	9	13	18	26	33	41
D_05c	DIVIDER	589	63	135	213	392	495	616	3	8	16	30	40	53
D_05d	DIVIDER	589	152	224	302	482	584	706	16	24	33	48	59	72
D_06a	DIVIDER	233	84	125	170	269	335	416	8	12	16	24	30	37
D_06b	DIVIDER	233	17	58	104	203	269	350	0	2	5	12	18	24
D_07a	DIVIDER	1,255	22	52	89	190	260	359	1	3	7	14	20	28
D_08a	DIVIDER	324	20	36	56	122	175	247	2	4	6	10	14	19
D_08b	DIVIDER	1,669	74	136	197	362	472	615	6	13	20	34	45	58
D_10_13	DIVIDER	2,038	0	0	78	324	521	769	0	0	3	23	39	61
D_10a	DIVIDER	1,746	28	102	188	499	708	982	8	17	28	52	70	95
D_10a1	DIVIDER	0	0	43	104	268	379	522	0	1	6	18	27	40
D_10b	DIVIDER	1,746	28	100	187	493	707	978	8	17	28	52	70	95
D_10c	DIVIDER	186	0	0	0	44	83	128	0	0	0	2	5	9
D_10d	DIVIDER	2,038	27	43	133	461	733	1,078	3	5	12	38	60	89
D_11a	DIVIDER	118	17	28	42	77	98	127	3	4	7	11	14	18
D_12_14	DIVIDER	186	0	0	0	9	23	46	0	0	0	0	1	3
D_12a	DIVIDER	186	46	70	96	159	199	243	6	9	12	19	24	30
D_13a	DIVIDER	2,038	42	122	208	457	646	892	10	21	34	58	76	99
D_14a	DIVIDER	271	75	112	151	202	224	264	9	14	19	27	33	38
D_15a	DIVIDER	271	74	111	149	202	203	200	9	14	19	27	31	34
D_AR2	DIVIDER	237	51	79	109	226	345	508	8	13	18	32	44	60
DIV1	DIVIDER	15	8	11	14	21	26	32	1	1	1	2	2	3
DIV105	DIVIDER	160	171	218	249	240	242	247	23	30	37	40	42	44
DIV123	DIVIDER	13	4	7	11	18	23	28	0	1	1	1	2	2
DIV125	DIVIDER	43	12	19	27	45	57	73	1	2	3	4	5	7
DIV135	DIVIDER	13	1	2	3	7	9	12	0	0	1	1	1	2
DIV136	DIVIDER	31	9	14	20	34	44	55	1	1	2	3	4	5
DIV162	DIVIDER	62	19	29	41	68	85	106	2	3	4	6	8	10
DIV164	DIVIDER	70	21	33	47	77	96	100	2	3	4	7	9	11
DIV316	DIVIDER	63	9	13	16	18	19	20	3	5	6	8	10	12
DIV342	DIVIDER	160	42	64	89	148	186	234	5	8	11	16	21	26
DIV344	DIVIDER	83	52	82	117	196	242	311	7	10	15	24	30	38
DIV376	DIVIDER	6,022	124	195	276	457	554	708	103	113	125	147	164	185
DIV389	DIVIDER	24	3	5	7	11	13	18	1	1	1	2	3	4
DIV395	DIVIDER	50	13	21	30	51	65	84	1	2	3	5	6	8
DIV396	DIVIDER	10	3	4	6	11	14	17	0	0	1	1	1	2

Table B-5 Peak Discharges and Runoff Volume _ NOAA 14 (All Design Points)

Design Point		Drainage Area	Future Conditions Peak Flow (cfs)						Future Conditions Runoff Volume (ac-ft)					
Number	Type	(acres)	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}
DIV397	DIVIDER	70	21	33	47	77	96	118	2	3	4	7	9	11
DIV399	DIVIDER	160	177	226	274	386	451	509	23	30	37	47	54	62
DIV70	DIVIDER	112	69	100	131	295	391	501	5	7	10	21	29	38
DIV71	DIVIDER	76	50	72	99	252	337	428	3	5	8	17	24	32
DIV72	DIVIDER	131	33	76	123	302	415	548	1	3	6	18	27	38
EC_Out_19thAv	JUNCTION	2,099	56	141	165	189	205	223	13	25	36	42	46	50
EC_Out_23rd	JUNCTION	444	136	199	265	527	780	1,074	17	25	37	69	94	125
E-J-01	JUNCTION	54	49	67	85	119	144	175	3	4	5	7	9	10
E-J-02	JUNCTION	110	74	103	131	192	233	282	6	8	10	14	17	21
E-J-03	JUNCTION	78	41	59	77	116	143	174	3	5	7	9	11	14
E-J-04	JUNCTION	64	18	27	37	60	75	94	2	3	5	7	9	11
E-J-05	JUNCTION	119	22	38	57	101	130	167	3	4	6	11	14	18
E-J-06	JUNCTION	122	24	40	61	108	139	178	3	4	7	11	14	18
E-J-07	JUNCTION	77	9	16	25	47	61	80	1	3	4	7	9	11
E-J-08	JUNCTION	91	14	25	39	72	93	121	2	3	5	8	10	13
E-J-09	JUNCTION	91	20	33	50	88	113	144	2	3	5	8	11	14
E-J-10	JUNCTION	106	27	43	60	100	127	160	3	5	7	11	13	17
E-J-11	JUNCTION	118	17	28	42	77	98	127	3	4	7	11	14	18
E-J-12	JUNCTION	68	33	47	62	93	114	138	3	4	6	8	10	12
E-J-13	JUNCTION	61	20	29	38	59	73	90	3	4	5	7	9	11
E-J-14	JUNCTION	85	31	44	57	89	109	136	4	5	7	10	12	15
E-J-15	JUNCTION	84	37	51	66	101	124	152	4	6	7	10	12	15
E-J-16	JUNCTION	89	36	51	68	108	134	167	4	5	7	10	12	15
HavanaPnd	STORAGE	1,669	74	102	122	287	397	540	6	11	15	26	35	48
J_01a	JUNCTION	54	49	67	85	120	146	177	4	5	6	9	10	12
J_02a	JUNCTION	110	67	93	118	172	209	254	5	7	9	13	15	19
J_03a	JUNCTION	78	41	59	77	116	143	174	3	5	7	9	11	14
J_04a	JUNCTION	119	55	80	106	162	199	245	6	8	11	16	19	23
J_05_07	JUNCTION	1,255	24	53	91	195	265	363	1	3	7	14	20	28
J_05a	JUNCTION	237	22	39	80	185	250	331	3	5	8	15	21	29
J_06a	JUNCTION	233	84	125	170	269	335	416	8	12	16	24	30	37
J_07a	JUNCTION	666	0	0	0	0	12	39	0	0	0	0	0	1
J_07b	JUNCTION	1,255	5	35	73	174	244	342	0	2	4	11	17	25
J_07c	JUNCTION	77	12	50	95	217	298	414	2	4	8	18	25	36
J_08a	JUNCTION	415	59	119	181	345	455	598	5	11	18	31	42	55
J_08b	JUNCTION	1,669	74	102	108	102	106	101	6	11	15	16	18	19
J_09a	JUNCTION	324	20	36	56	122	175	247	2	4	6	10	14	19
J_10a	JUNCTION	1,669	0	43	75	268	389	545	0	1	8	21	32	45
J_10b	JUNCTION	1,669	0	0	55	193	314	471	0	0	3	13	22	34
J_10c	JUNCTION	0	18	22	23	24	25	25	6	11	12	13	13	13
J_14a	JUNCTION	271	75	112	151	202	224	264	9	14	19	27	33	38
J_15	JUNCTION	271	0	0	69	295	482	740	0	0	3	22	38	60

Table B-5 Peak Discharges and Runoff Volume _ NOAA 14 (All Design Points)

Design Point		Drainage Area	Future Conditions Peak Flow (cfs)						Future Conditions Runoff Volume (ac-ft)					
Number	Type	(acres)	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}
J_15a	JUNCTION	355	105	155	207	296	323	358	13	20	27	37	44	49
J_16thAve_E	JUNCTION	237	50	78	109	224	343	509	8	13	18	32	44	60
J_17thAv_Out	JUNCTION	0	0	0	5	25	39	59	0	0	0	2	3	5
J_7b	JUNCTION	160	50	77	107	174	219	274	5	8	11	17	21	26
J_AD1	JUNCTION	24	7	11	14	24	30	38	1	1	2	2	3	4
J_AD3	JUNCTION	15	5	8	11	17	22	27	0	1	1	2	2	2
J_AD4	JUNCTION	15	6	9	13	20	26	32	1	1	1	2	2	3
J_AD7	JUNCTION	25	10	16	21	35	43	54	1	1	2	3	3	4
J_AR1	JUNCTION	115	50	77	106	171	214	266	4	6	8	12	15	19
J_AR2	JUNCTION	237	47	73	100	167	210	267	8	12	16	25	31	39
J_DE1	JUNCTION	279	73	112	155	256	321	403	9	14	19	29	36	46
J_DE2	JUNCTION	60	19	29	41	66	83	104	2	3	4	6	8	10
J_DE3	JUNCTION	42	9	14	19	32	40	51	1	2	3	4	5	7
J_DE4	JUNCTION	47	10	15	20	34	43	54	2	2	3	5	6	8

APPENDIX C – HYDRAULIC ANALYSIS

(No additional information required for Appendix C. All required information, tables and figures supporting the Hydraulic Analysis included in Section 4)

APPENDIX D – WETLAND AND RIPARIAN INVENTORY

(Not a part of this study. See *Westerly Creek Lower FHAD)*

APPENDIX E – ALTERNATIVES ANALYSIS

Bohannan Huston

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 3			
REACH :	22nd Ave			
JURISDICTION :	Aurora			
REACH ID:	B3-Reach22nd Ave	Casey Bangs	DATE :	3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
60-inch	1100	1	1100	L.F.	$347.00	$381,700.00	E 22nd Ave storm drain.
18-inch	20	18	360	L.F.	$78.00	$28,080.00	Storm drain laterals. Assumed 20 feet per inlet.
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
60-inch	Yes	1	1	EA	$2,275.80	$2,276.00	Outfall only
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
60-inch		1	1	EA	$12,821.22	$12,821.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			2	EA	$17,360.00	$34,720.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			1	EA	$21,701.00	$21,701.00	
Storm Inlet, Type R/Type 14, 5-foot			18	EA	$6,655.00	$119,790.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		4400	S.Y.	$85.00	$374,000.00	36-foot width

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$601,088.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$0.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$374,000.00
Subtotal Capital Improvement Costs				**$975,088.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$48,754.00
Traffic Control	$29,252.64	L.S.		$29,253.00
Utility Coordination/Relocation	$146,263.20	L.S.		$146,263.00
Stormwater Management/Erosion Control	5%			$48,754.00
Subtotal Additional Capital Improvement Costs				**$273,024.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$187,217.00
Legal/Administrative	5%			$62,406.00
Contract Admin/Construction Management	10%			$124,811.00
Contingency	25%			$312,028.00
Subtotal Other Costs				**$686,462.00**
Total Capital Improvement Costs				**$1,934,574.00**

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	21	EA	$72.00	$3,024.00	
Total Annual Operation and Maintenance Cost				**$3,024.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$64,962.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	**Westerly Creek OSP**			
DRAINAGEWAY :	**Basin 3**			
REACH :	**Dayton St**			
JURISDICTION :	**Aurora**			
REACH ID:	**B3-ReachDayton St**	**Casey Bangs**	**DATE :**	**3/16/2022**

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
30-inch	950	1	950	L.F.	$130.00	$123,500.00	
18-inch	20	2	40	L.F.	$78.00	$3,120.00	Inlet laterals
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			2	EA	$17,360.00	$34,720.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			1	EA	$21,701.00	$21,701.00	
Storm Inlet, Type R/Type 14, 5-foot			8	EA	$6,655.00	$53,240.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		3800	S.Y.	$85.00	$323,000.00	36-foot width

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$236,281.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$0.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$323,000.00
Subtotal Capital Improvement Costs				**$559,281.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$27,964.00
Traffic Control	$16,778.43	L.S.		$16,778.00
Utility Coordination/Relocation	$27,964.05	L.S.		$27,964.00
Stormwater Management/Erosion Control	5%			$27,964.00
Subtotal Additional Capital Improvement Costs				**$100,670.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$98,993.00
Legal/Administrative	5%			$32,998.00
Contract Admin/Construction Management	10%			$65,995.00
Contingency	25%			$164,988.00
Subtotal Other Costs				**$362,974.00**
Total Capital Improvement Costs				**$1,022,925.00**

Master Plan Operation and Maintenance Cost Summary				
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	11	EA	$72.00	$1,584.00
Total Annual Operation and Maintenance Cost				**$1,584.00**
Effective Interest Rate				4.00%
Total Operation and Maintenance Costs Over 50 Years				**$34,028.00**

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 3			
REACH :	23rd Ave			
JURISDICTION :	Aurora			
REACH ID:	B3-Reach23rd Ave	Casey Bangs	DATE :	3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
36-inch	850	1	850	L.F.	$156.00	$132,600.00	
48-inch	20	1	20	L.F.	$208.00	$4,160.00	
120-inch	520	1	520	L.F.	$1,215.00	$631,800.00	
18-inch	20	25	500	L.F.	$78.00	$39,000.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			2	EA	$17,360.00	$34,720.00	
Storm Inlet, Type R/Type 14, 5-foot			25	EA	$6,655.00	$166,375.00	
Removals							
Removal of culvert pipe (48"<D<84")			850	L.F.	$72.00	$61,200.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		3400	S.Y.	$85.00	$289,000.00	36-foot width

Master Plan Capital Improvement Cost Summary			
Capital Improvement Costs			
Pipe Culverts and Storm Drains			$1,008,655.00
Concrete Box Culverts			$0.00
Hydraulic Structures			$0.00
Channel Improvements			$0.00
Detention/Water Quality Facilities			$0.00
Removals			$61,200.00
Landscaping and Maintenance Improvements			$0.00
Special Items (User Defined)			$289,000.00
Subtotal Capital Improvement Costs			**$1,358,855.00**
Additional Capital Improvement Costs			
Dewatering		L.S.	$0.00
Mobilization	5%		$67,943.00
Traffic Control	$40,765.65	L.S.	$40,766.00
Utility Coordination/Relocation	$203,828.25	L.S.	$203,828.00
Stormwater Management/Erosion Control	5%		$67,943.00
Subtotal Additional Capital Improvement Costs			**$380,480.00**
Land Acquisition Costs			
ROW/Easements			$0.00
Subtotal Land Acquisition Costs			**$0.00**
Other Costs (percentage of Capital Improvement Costs)			
Engineering	15%		$260,900.00
Legal/Administrative	5%		$86,967.00
Contract Admin/Construction Management	10%		$173,934.00
Contingency	25%		$434,834.00
Subtotal Other Costs			**$956,635.00**
Total Capital Improvement Costs			**$2,695,970.00**

Master Plan Operation and Maintenance Cost Summary				
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	27	EA	$72.00	$3,888.00
Total Annual Operation and Maintenance Cost				**$3,888.00**
Effective Interest Rate				4.00%
Total Operation and Maintenance Costs Over 50 Years				**$83,523.00**

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 5			
REACH :	Chesapeake Pond			
JURISDICTION :	Aurora			
REACH ID:	B5-ReachChesapeake Pond	Casey Bangs	DATE :	3/16/2022

DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Detention/Water Quality Facilities						
Detention (Complete-in-Place)						
Detention Facility 1 (Complete-in-Place)		19	AC-FT	$65,970.00	$1,253,430.00	
Landscaping and Maintenance Improvements						
Reclamation & seeding (native grasses)		4	ACRE	$1,447.00	$5,788.00	
Land Acquisition						
Easement/ROW Acquisition		3.00	ACRE	$1,045.00	$3,135.00	Arapahoe County appraised value

Master Plan Capital Improvement Cost Summary					
Capital Improvement Costs					
Pipe Culverts and Storm Drains					$0.00
Concrete Box Culverts					$0.00
Hydraulic Structures					$0.00
Channel Improvements					$0.00
Detention/Water Quality Facilities					$1,253,430.00
Removals					$0.00
Landscaping and Maintenance Improvements					$5,788.00
Special Items (User Defined)					$0.00
Subtotal Capital Improvement Costs					**$1,259,218.00**
Additional Capital Improvement Costs					
Dewatering			L.S.		$0.00
Mobilization		5%			$62,961.00
Traffic Control			L.S.		$0.00
Utility Coordination/Relocation		$62,960.90	L.S.		$62,961.00
Stormwater Management/Erosion Control		5%			$62,961.00
Subtotal Additional Capital Improvement Costs					**$188,883.00**
Land Acquisition Costs					
ROW/Easements					$3,135.00
Subtotal Land Acquisition Costs					**$3,135.00**
Other Costs (percentage of Capital Improvement Costs)					
Engineering		15%			$217,215.00
Legal/Administrative		5%			$72,405.00
Contract Admin/Construction Management		10%			$144,810.00
Contingency		25%			$362,025.00
Subtotal Other Costs					**$796,455.00**
Total Capital Improvement Costs					**$2,247,691.00**

Master Plan Operation and Maintenance Cost Summary					
Description		**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**
Detention/WQ Maintenance (e.g. sediment & debris removal, mucking out, tree & weed removal, str		6	ACRE	$2,170.00	$13,020.00
Mowing (e.g. channels, ponds, etc.)		6	ACRE	$72.00	$432.00
Total Annual Operation and Maintenance Cost					**$13,452.00**
Effective Interest Rate					4.00%
Total Operation and Maintenance Costs Over 50 Years					**$288,978.00**

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	**Westerly Creek OSP**			
DRAINAGEWAY :	**Basin 5**			
REACH :	**Havana Park Pond**			
JURISDICTION :	**Aurora**			
REACH ID:	**B5-ReachHavana Park Pond**	**Casey Bangs**	**DATE :**	**3/16/2022**

DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Special Items (User Defined)						
Desing Complete for Pond	**<----User Defined Items**	1	LS	$1,554,251.00	$1,554,251.00	$2,650,000 total capital cost (including contingency) provided by MHFD (Mark Schutte) based on 90% design estimate. Unit cost adjusted to reach target total capital cost

Master Plan Capital Improvement Cost Summary					
Capital Improvement Costs					
Pipe Culverts and Storm Drains				$0.00	
Concrete Box Culverts				$0.00	
Hydraulic Structures				$0.00	
Channel Improvements				$0.00	
Detention/Water Quality Facilities				$0.00	
Removals				$0.00	
Landscaping and Maintenance Improvements				$0.00	
Special Items (User Defined)				$1,554,251.00	
Subtotal Capital Improvement Costs				**$1,554,251.00**	
Additional Capital Improvement Costs					
Dewatering			L.S.	$0.00	
Mobilization	5%			$77,713.00	
Traffic Control			L.S.	$0.00	
Utility Coordination/Relocation			L.S.	$0.00	
Stormwater Management/Erosion Control	5%			$77,713.00	
Subtotal Additional Capital Improvement Costs				**$155,426.00**	
Land Acquisition Costs					
ROW/Easements				$0.00	
Subtotal Land Acquisition Costs				**$0.00**	
Other Costs (percentage of Capital Improvement Costs)					
Engineering	15%			$256,452.00	
Legal/Administrative	5%			$85,484.00	
Contract Admin/Construction Management	10%			$170,968.00	
Contingency	25%			$427,419.00	
Subtotal Other Costs				**$940,323.00**	
Total Capital Improvement Costs				**$2,650,000.00**	

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Detention/WQ Maintenance (e.g. sediment & debris removal, mucking out, tree & weed removal, structu	4	ACRE	$2,170.00	$17,360.00	
Mowing (e.g. channels, ponds, etc.)	4	ACRE	$72.00	$576.00	
Total Annual Operation and Maintenance Cost				**$17,936.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$385,304.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 5			
REACH :	17th Ave			
JURISDICTION :	Aurora			
REACH ID:	B5-Reach17th Ave	Casey Bangs	DATE :	3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
60-inch	1950	1	1950	L.F.	$347.00	$676,650.00	E 17th Avenue Storm Drain.
18-inch	20	46	920	L.F.	$78.00	$71,760.00	Storm drain laterals. Assumed 20 feet per inlet.
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
60-inch	Yes	1	1	EA	$2,275.80	$2,276.00	Outfall only
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
60-inch		1	1	EA	$12,821.22	$12,821.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			5	EA	$17,360.00	$86,800.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			2	EA	$21,701.00	$43,402.00	
Storm Inlet, Type R/Type 14, 5-foot			46	EA	$6,655.00	$306,130.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		7800	S.Y.	$85.00	$663,000.00	36-foot width

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$1,199,839.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$0.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$663,000.00
Subtotal Capital Improvement Costs				**$1,862,839.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$93,142.00
Traffic Control	$55,885.17	L.S.		$55,885.00
Utility Coordination/Relocation	$93,141.95	L.S.		$93,142.00
Stormwater Management/Erosion Control	5%			$93,142.00
Subtotal Additional Capital Improvement Costs				**$335,311.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$329,723.00
Legal/Administrative	5%			$109,908.00
Contract Admin/Construction Management	10%			$219,815.00
Contingency	25%			$549,538.00
Subtotal Other Costs				**$1,208,984.00**
Total Capital Improvement Costs				**$3,407,134.00**

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	53	EA	$72.00	$7,632.00	
Total Annual Operation and Maintenance Cost				**$7,632.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$163,952.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	**Westerly Creek OSP**			
DRAINAGEWAY :	**Basin 5**			
REACH :	**ColfaxAve**			
JURISDICTION :	**Aurora**			
REACH ID:	**B5-ReachColfaxAve**	**Casey Bangs**	**DATE :**	**3/16/2022**

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
60-inch	3500	1	3500	L.F.	$347.00	$1,214,500.00	
18-inch	20	65	1300	L.F.	$78.00	$101,400.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			13	EA	$17,360.00	$225,680.00	
Storm Inlet, Type R/Type 14, 5-foot			65	EA	$6,655.00	$432,575.00	
Removals							
Removal of culvert pipe (D<48")			4260	L.F.	$29.00	$123,540.00	Removing existing trunk and 31 laterals
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		15556	S.Y.	$85.00	$1,322,222.00	40-ft width

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$1,974,155.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$123,540.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$1,322,222.00
Subtotal Capital Improvement Costs				**$3,419,917.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$170,996.00
Traffic Control	$239,394.19	L.S.		$239,394.00
Utility Coordination/Relocation	$1,025,975.10	L.S.		$1,025,975.00
Stormwater Management/Erosion Control	5%			$170,996.00
Subtotal Additional Capital Improvement Costs				**$1,607,361.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$754,092.00
Legal/Administrative	5%			$251,364.00
Contract Admin/Construction Management	10%			$502,728.00
Contingency	25%			$1,256,820.00
Subtotal Other Costs				**$2,765,004.00**
Total Capital Improvement Costs				**$7,792,282.00**

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	78	EA	$72.00	$11,232.00	
Total Annual Operation and Maintenance Cost				**$11,232.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$241,288.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP		
DRAINAGEWAY :	Basin 5		
REACH :	19th Ave		
JURISDICTION :	Aurora		
REACH ID:	B5-Reach19th Ave	Casey Bangs	DATE : 3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
60-inch	1750	1	1750	L.F.	$347.00	$607,250.00	
18-inch	20	30	600	L.F.	$78.00	$46,800.00	
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
60-inch	Yes	1	1	EA	$2,275.80	$2,276.00	Outfall only
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
60-inch		1	1	EA	$12,821.22	$12,821.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			5	EA	$17,360.00	$86,800.00	
Storm Inlet, Type R/Type 14, 5-foot			30	EA	$6,655.00	$199,650.00	
Removals							
Removal of culvert pipe (D>84")			1750	L.F.	$109.00	$190,750.00	
Special Items (User Defined)							
Asphalt Removals	**<----User Defined Items**		7000	S.Y.	$26.00	$182,000.00	36-foot width
Asphalt Replacement	**<----User Defined Items**		7000	S.Y.	$124.00	$868,000.00	36-foot width

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains			$955,597.00	
Concrete Box Culverts			$0.00	
Hydraulic Structures			$0.00	
Channel Improvements			$0.00	
Detention/Water Quality Facilities			$0.00	
Removals			$190,750.00	
Landscaping and Maintenance Improvements			$0.00	
Special Items (User Defined)			$1,050,000.00	
Subtotal Capital Improvement Costs			**$2,196,347.00**	
Additional Capital Improvement Costs				
Dewatering		L.S.	$0.00	
Mobilization	5%		$109,817.00	
Traffic Control	$65,890.41	L.S.	$65,890.00	
Utility Coordination/Relocation	$109,817.35	L.S.	$109,817.00	
Stormwater Management/Erosion Control	5%		$109,817.00	
Subtotal Additional Capital Improvement Costs			**$395,341.00**	
Land Acquisition Costs				
ROW/Easements			$0.00	
Subtotal Land Acquisition Costs			**$0.00**	
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%		$388,753.00	
Legal/Administrative	5%		$129,584.00	
Contract Admin/Construction Management	10%		$259,169.00	
Contingency	25%		$647,922.00	
Subtotal Other Costs			**$1,425,428.00**	
Total Capital Improvement Costs			**$4,017,116.00**	

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	35	EA	$72.00	$5,040.00	
Total Annual Operation and Maintenance Cost				**$5,040.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$108,270.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 7			
REACH :	11th Ave			
JURISDICTION :	Aurora			
REACH ID:	B7-Reach11th Ave	Casey Bangs	DATE :	3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
78-inch	2000	1	2000	L.F.	$564.00	$1,128,000.00	
18-inch	20	92	1840	L.F.	$78.00	$143,520.00	
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
78-inch	Yes	1	1	EA	$3,005.48	$3,005.00	
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
78-inch		1	1	EA	$19,026.82	$19,027.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			5	EA	$17,360.00	$86,800.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			1	EA	$21,701.00	$21,701.00	
Storm Inlet, Type R/Type 14, 5-foot			92	EA	$6,655.00	$612,260.00	
Special Items (User Defined)							
Asphalt Removals	**<----User Defined Items**		5556	S.Y.	$26.00	$144,444.00	25-foot width
Asphalt Replacement	**<----User Defined Items**		5556	S.Y.	$124.00	$688,889.00	25-foot width

Master Plan Capital Improvement Cost Summary

Capital Improvement Costs				
Pipe Culverts and Storm Drains			$2,014,313.00	
Concrete Box Culverts			$0.00	
Hydraulic Structures			$0.00	
Channel Improvements			$0.00	
Detention/Water Quality Facilities			$0.00	
Removals			$0.00	
Landscaping and Maintenance Improvements			$0.00	
Special Items (User Defined)			$833,333.00	
Subtotal Capital Improvement Costs			**$2,847,646.00**	
Additional Capital Improvement Costs				
Dewatering		L.S.	$0.00	
Mobilization	5%		$142,382.00	
Traffic Control	$199,335.22	L.S.	$199,335.00	
Utility Coordination/Relocation	$284,764.60	L.S.	$284,765.00	
Stormwater Management/Erosion Control	5%		$142,382.00	
Subtotal Additional Capital Improvement Costs			**$768,864.00**	
Land Acquisition Costs				
ROW/Easements			$0.00	
Subtotal Land Acquisition Costs			**$0.00**	
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%		$542,477.00	
Legal/Administrative	5%		$180,826.00	
Contract Admin/Construction Management	10%		$361,651.00	
Contingency	25%		$904,128.00	
Subtotal Other Costs			**$1,989,082.00**	
Total Capital Improvement Costs			**$5,605,592.00**	

Master Plan Operation and Maintenance Cost Summary

Description	Quantity	Unit	Unit Cost	Total Annual Cost	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	98	EA	$72.00	$14,112.00	
Total Annual Operation and Maintenance Cost				**$14,112.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$303,157.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP
DRAINAGEWAY :	Basin 7
REACH :	11th Ave Channel
JURISDICTION :	Aurora
REACH ID:	B7-Reach11th Ave Channel

Casey Bangs

DATE : 3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Concrete Box Culverts							
Box Culvert Pipe							
Individual Box Span (ft)	**Box Height (ft)**	**No. of Barrels**	**Length (ft)**				
9	4	2	120	L.F.	$1,933.08	$231,970.00	Yosemite St crossing structure.
9	4	2	75	L.F.	$1,933.08	$144,981.00	E 11th Ave crossing structure.
Headwall and Toewalls							
Individual Box Span (ft)	**No. of Barrels**	**Total Span (ft)**					
9	2	21.00	2	EA	$2,021.88	$4,044.00	
9	2	21.00	2	EA	$2,021.88	$4,044.00	
Wingwalls (includes wingwalls on either side of channel and concrete apron)							
Individual Box Span (ft)	**Box Rise (ft)**	**No. of Barrels**					
9	4	2	2	EA	$12,227.64	$24,455.30	
9	4	2	2	EA	$12,227.64	$24,455.30	
Detention/Water Quality Facilities							
Detention (User Entered Quantities)							
Excavation, Mid Range			3550	C.Y.	$35.00	$124,250.00	Channel excavation.
Landscaping and Maintenance Improvements							
Reclamation & seeding (native grasses)			1	ACRE	$1,447.00	$1,447.00	
Land Acquisition							
Easement/ROW Acquisition			2	ACRE	$914,760.00	$1,372,140.00	$16 per square foot

Master Plan Capital Improvement Cost Summary

Capital Improvement Costs			
Pipe Culverts and Storm Drains			$0.00
Concrete Box Culverts			$433,950.00
Hydraulic Structures			$0.00
Channel Improvements			$0.00
Detention/Water Quality Facilities			$124,250.00
Removals			$0.00
Landscaping and Maintenance Improvements			$1,447.00
Special Items (User Defined)			$0.00
Subtotal Capital Improvement Costs			**$559,647.00**
Additional Capital Improvement Costs			
Dewatering		L.S.	$0.00
Mobilization	5%		$27,982.00
Traffic Control	$27,982.35	L.S.	$27,982.00
Utility Coordination/Relocation	$55,964.70	L.S.	$55,965.00
Stormwater Management/Erosion Control	5%		$27,982.00
Subtotal Additional Capital Improvement Costs			**$139,911.00**
Land Acquisition Costs			
ROW/Easements			$1,372,140.00
Subtotal Land Acquisition Costs			**$1,372,140.00**
Other Costs (percentage of Capital Improvement Costs)			
Engineering	15%		$104,934.00
Legal/Administrative	5%		$34,978.00
Contract Admin/Construction Management	10%		$69,956.00
Contingency	25%		$174,890.00
Subtotal Other Costs			**$384,758.00**
Total Capital Improvement Costs			**$2,456,456.00**

Master Plan Operation and Maintenance Cost Summary

Description	Quantity	Unit	Unit Cost	Total Annual Cost
Channel Maintenance (e.g. sediment & debris removal, erosion, tree & weed removal, etc.)	2000	L.F.	$3.00	$6,000.00
Mowing (e.g. channels, ponds, etc.)	1.5	ACRE	$72.00	$108.00
Total Annual Operation and Maintenance Cost				**$6,108.00**
Effective Interest Rate				4.00%
Total Operation and Maintenance Costs Over 50 Years				**$131,213.00**

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP			
DRAINAGEWAY :	Basin 7			
REACH :	Alton St			
JURISDICTION :	Aurora			
REACH ID:	B7-ReachAlton St	Casey Bangs	DATE :	3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
78-inch	3600	1	3600	L.F.	$564.00	$2,030,400.00	
18-inch	20	106	2120	L.F.	$78.00	$165,360.00	
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
78-inch	Yes	1	1	EA	$3,005.48	$3,005.00	Outfall only
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
78-inch		1	1	EA	$19,026.82	$19,027.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			8	EA	$17,360.00	$138,880.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			3	EA	$21,701.00	$65,103.00	
Storm Inlet, Type R/Type 14, 5-foot			106	EA	$6,655.00	$705,430.00	
Removals							
Removal of culvert pipe (D<48")			1675	L.F.	$29.00	$48,575.00	
Removal of culvert pipe (48"<D<84")			250	L.F.	$72.00	$18,000.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		14400	S.Y.	$26.00	$374,400.00	36-foot width

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains				$3,127,205.00
Concrete Box Culverts				$0.00
Hydraulic Structures				$0.00
Channel Improvements				$0.00
Detention/Water Quality Facilities				$0.00
Removals				$66,575.00
Landscaping and Maintenance Improvements				$0.00
Special Items (User Defined)				$374,400.00
Subtotal Capital Improvement Costs				**$3,568,180.00**
Additional Capital Improvement Costs				
Dewatering		L.S.		$0.00
Mobilization	5%			$178,409.00
Traffic Control	$107,045.40	L.S.		$107,045.00
Utility Coordination/Relocation	$178,409.00	L.S.		$178,409.00
Stormwater Management/Erosion Control	5%			$178,409.00
Subtotal Additional Capital Improvement Costs				**$642,272.00**
Land Acquisition Costs				
ROW/Easements				$0.00
Subtotal Land Acquisition Costs				**$0.00**
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%			$631,568.00
Legal/Administrative	5%			$210,523.00
Contract Admin/Construction Management	10%			$421,045.00
Contingency	25%			$1,052,613.00
Subtotal Other Costs				**$2,315,749.00**
Total Capital Improvement Costs				**$6,526,201.00**

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	116	EA	$72.00	$16,704.00	
Total Annual Operation and Maintenance Cost				**$16,704.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$358,838.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	**Westerly Creek OSP**			
DRAINAGEWAY :	**Basin 4401-02**			
REACH :	**Verbena Park Pond**			
JURISDICTION :	**Denver**			
REACH ID:	**4401-02-ReachVerbena Park Pond**	**Casey Bangs**	**DATE :**	**3/16/2022**

DESCRIPTION		QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Master Plan Capital Improvement Cost Summary						
Capital Improvement Costs						
Pipe Culverts and Storm Drains					$0.00	
Concrete Box Culverts					$0.00	
Hydraulic Structures					$0.00	
Channel Improvements					$0.00	
Detention/Water Quality Facilities					$0.00	
Removals					$0.00	
Landscaping and Maintenance Improvements					$0.00	
Special Items (User Defined)					$0.00	
Subtotal Capital Improvement Costs					**$0.00**	
Additional Capital Improvement Costs						
Dewatering			L.S.		$0.00	
Mobilization		5%			$0.00	
Traffic Control			L.S.		$0.00	
Utility Coordination/Relocation			L.S.		$0.00	
Stormwater Management/Erosion Control		5%			$0.00	
Subtotal Additional Capital Improvement Costs					**$0.00**	
Land Acquisition Costs						
ROW/Easements					$0.00	
Subtotal Land Acquisition Costs					**$0.00**	
Other Costs (percentage of Capital Improvement Costs)						
Engineering		15%			$0.00	
Legal/Administrative		5%			$0.00	
Contract Admin/Construction Management		10%			$0.00	
Contingency		25%			$0.00	
Subtotal Other Costs					**$0.00**	
Total Capital Improvement Costs					**$0.00**	

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Detention/WQ Maintenance (e.g. sediment & debris removal, mucking out, tree & weed removal, struct	7.5	ACRE	$2,170.00	$32,550.00	
Mowing (e.g. channels, ponds, etc.)	7.5	ACRE	$72.00	$1,080.00	
Total Annual Operation and Maintenance Cost				**$33,630.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$722,446.00**	

MASTER PLAN COST ESTIMATE FOR INDIVIDUAL REACH

PROJECT :	Westerly Creek OSP		
DRAINAGEWAY :	Basin 4401-02		
REACH :	17thMontview		
JURISDICTION :	Denver		
REACH ID:	4401-02-Reach17thMontview	Casey Bangs	DATE : 3/16/2022

DESCRIPTION			QUANTITY	UNIT	UNIT COST	TOTAL COST	USER COMMENTS
Pipe Culverts and Storm Drains							
Circular Pipes							
Diameter (in)	**Length (ft)**	**No. of Barrels**					
66-inch	2350	1	2350	L.F.	$382.00	$897,700.00	Montview SD
18-inch	20	8	160	L.F.	$78.00	$12,480.00	Montview Blvd inlet laterals
66-inch	1350	1	1350	L.F.	$382.00	$515,700.00	E 17th from Uinta to Willow
72-inch	2150	1	2150	L.F.	$521.00	$1,120,150.00	E 17th downstream of Willow
18-inch	20	6	120	L.F.	$78.00	$9,360.00	E 17th inlet laterals
Headwalls							
Diameter (in)	**Applicable**	**No. of Barrels**					
66-inch	Yes	1	1	EA	$2,505.80	$2,506.00	
72-inch	Yes	1	1	EA	$2,743.80	$2,744.00	
Wingwalls (includes concrete apron)							
Diameter (in)		**No. of Barrels**					
66-inch		1	1	EA	$14,866.55	$14,867.00	
72-inch		1	1	EA	$16,680.89	$16,681.00	
Manholes and Inlets							
Type B Manhole (Pipe Dia. 48" and larger, deflection < 10 degrees)			12	EA	$17,360.00	$208,320.00	
Type P Manhole (Pipe Dia. 48" and larger, deflection > 10 degrees)			4	EA	$21,701.00	$86,804.00	
Storm Inlet, Type R/Type 14, 5-foot			14	EA	$6,655.00	$93,170.00	
Removals							
Removal of culvert pipe (D<48")			771	L.F.	$29.00	$22,359.00	
Removal of culvert pipe (48"<D<84")			2350	L.F.	$72.00	$169,200.00	
Special Items (User Defined)							
Remove and Replace Asphalt	**<----User Defined Items**		15128	S.Y.	$85.00	$1,285,861.00	

Master Plan Capital Improvement Cost Summary				
Capital Improvement Costs				
Pipe Culverts and Storm Drains			$2,980,482.00	
Concrete Box Culverts			$0.00	
Hydraulic Structures			$0.00	
Channel Improvements			$0.00	
Detention/Water Quality Facilities			$0.00	
Removals			$191,559.00	
Landscaping and Maintenance Improvements			$0.00	
Special Items (User Defined)			$1,285,861.00	
Subtotal Capital Improvement Costs			**$4,457,902.00**	
Additional Capital Improvement Costs				
Dewatering		L.S.	$0.00	
Mobilization	5%		$222,895.00	
Traffic Control	$208,887.34	L.S.	$208,887.00	
Utility Coordination/Relocation	$316,832.95	L.S.	$316,833.00	
Stormwater Management/Erosion Control	5%		$222,895.00	
Subtotal Additional Capital Improvement Costs			**$971,510.00**	
Land Acquisition Costs				
ROW/Easements			$0.00	
Subtotal Land Acquisition Costs			**$0.00**	
Other Costs (percentage of Capital Improvement Costs)				
Engineering	15%		$814,412.00	
Legal/Administrative	5%		$271,471.00	
Contract Admin/Construction Management	10%		$542,941.00	
Contingency	25%		$1,357,353.00	
Subtotal Other Costs			**$2,986,177.00**	
Total Capital Improvement Costs			**$8,415,589.00**	

Master Plan Operation and Maintenance Cost Summary					
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Annual Cost**	
Manhole and Inlet Maintenance (e.g. sediment & debris removal, structural repairs, etc.)	30	EA	$72.00	$4,320.00	
Hydraulic Structure Maintenance (e.g. debris removal, erosion, structural repairs, etc.)	2	EA	$723.00	$2,892.00	
Total Annual Operation and Maintenance Cost				**$7,212.00**	
Effective Interest Rate				4.00%	
Total Operation and Maintenance Costs Over 50 Years				**$154,930.00**	

HY-8 Culvert Analysis Report

Project Notes

Project Title:Westerly Creek OSP

Designer:Madeline Olivas

Project Date:Thursday, April 29, 2021

Notes:

Culvert sizing for 11th Avenue Open Channel Alternative (Aurora)

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 1 - Summary of Culvert Flows at Crossing: 11th Ave Channel @ Yosemite Street

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Box at Yosemite Street Discharge (cfs)	Roadway Discharge (cfs)	Iterations
0.74	None	1.00	1.00	0.00	1
5.99	Future 100-yr	537.00	537.00	0.00	1
6.00	Overtopping	538.08	538.08	0.00	Overtopping

Table 2 - Culvert Summary Table: Box at Yosemite Street

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
None	1.00	1.00	0.74	0.078	0.0*	1-S2n	0.028	0.046	0.046	0.154	1.215
Future 100-yr	537.00	537.00	5.99	5.331	5.217	5-S1f	2.403	3.024	4.000	4.258	7.458

* Full Flow Headwater elevation is below inlet invert.

****

Straight Culvert

Inlet Elevation (invert): 0.66 ft, Outlet Elevation (invert): 0.00 ft

Culvert Length: 120.00 ft, Culvert Slope: 0.0055

****

Site Data - Box at Yosemite Street

Site Data Option: Culvert Invert Data

Inlet Station: 120.00 ft

Inlet Elevation: 0.66 ft

Outlet Station: 0.00 ft

Outlet Elevation: 0.00 ft

Number of Barrels: 2

Culvert Data Summary - Box at Yosemite Street

Barrel Shape: Concrete Box

Barrel Span: 9.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: 11th Ave Channel @

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
1.00	0.15	0.15	0.75	0.05	0.35
537.00	4.26	4.26	5.04	1.46	0.56

Tailwater Channel Data - 11th Ave Channel @ Yosemite Street

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 8.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0055

Channel Manning's n: 0.0400

Channel Invert Elevation: 0.00 ft

Roadway Data for Crossing: 11th Ave Channel @ Yosemite Street

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 500.00 ft

Crest Elevation: 6.00 ft

Roadway Surface: Paved

Roadway Top Width: 100.00 ft

Building Type	Unit Cost	Unit	Source
Residential	410000	each	Averagerage 2021 home sale price for Aurora
Commercial	100	sqft	National median construction price
Garage/Shed	50	sqft	National median construction price
Public	100	sqft	National median construction price

Damage Reduction to Structures by Chesapeake Townhomes Pond

OBJECTID_1	Structure Removed from 1 ft Flooding Area	Area (sqft)	Unit Cost	Unit	Damgae
59062	Garage/Shed	90.20	$50.00	sqft	$4,509.90
59230	Garage/Shed	49.68	$50.00	sqft	$2,483.90
59666	Garage/Shed	171.72	$50.00	sqft	$8,586.16
59807	Garage/Shed	90.32	$50.00	sqft	$4,516.23
59827	Garage/Shed	110.41	$50.00	sqft	$5,520.26
59923	Garage/Shed	84.74	$50.00	sqft	$4,237.03
64105	Residential	2253.06	$410,000.00	each	$410,000.00
64315	Residential	1336.97	$410,000.00	each	$410,000.00
64318	Residential	1100.15	$410,000.00	each	$410,000.00
64319	Residential	2375.64	$410,000.00	each	$410,000.00
268895	Garage/Shed	713.73	$50.00	sqft	$35,686.65
275763	Commercial	12001.69	$100.00	sqft	$1,200,168.98
275805	Commercial	3306.21	$100.00	sqft	$330,620.56
275819	Commercial	4902.62	$100.00	sqft	$490,262.49
275821	Commercial	12808.73	$100.00	sqft	$1,280,873.42
275834	Commercial	17159.69	$100.00	sqft	$1,715,968.75
275907	Garage/Shed	584.57	$50.00	sqft	$29,228.45
278177	Residential	946.94	$410,000.00	each	$410,000.00
278617	Garage/Shed	157.96	$50.00	sqft	$7,897.80
286914	Garage/Shed	641.73	$50.00	sqft	$32,086.62
286915	Garage/Shed	843.58	$50.00	sqft	$42,179.17
286923	Garage/Shed	701.71	$50.00	sqft	$35,085.36
286924	Garage/Shed	574.28	$50.00	sqft	$28,713.87
286997	Garage/Shed	739.38	$50.00	sqft	$36,968.98
286998	Garage/Shed	664.63	$50.00	sqft	$33,231.39
287000	Garage/Shed	497.82	$50.00	sqft	$24,891.17
288445	Commercial	6191.99	$100.00	sqft	$619,198.97
288450	Public	5574.88	$100.00	sqft	$557,488.27
288466	Commercial	8924.12	$100.00	sqft	$892,412.13
288469	Commercial	2093.90	$100.00	sqft	$209,389.51
288470	Commercial	824.58	$100.00	sqft	$82,458.43
288532	Garage/Shed	522.78	$50.00	sqft	$26,139.18
289097	Garage/Shed	102.68	$50.00	sqft	$5,134.02
289119	Garage/Shed	333.02	$50.00	sqft	$16,651.09
289797	Residential	1110.42	$410,000.00	each	$410,000.00
289865	Residential	1478.79	$410,000.00	each	$410,000.00
				SUM	**$10,632,588.73**

Damage Reduction to Structures by Alton Street SD

OBJECTID_1	Structure Removed from 1 ft Flooding Area	Area (sqft)	Unit Cost	Unit	Damgae
288532	Garage/Shed	522.78	$50.00	sqft	$26,139.18
289097	Garage/Shed	102.68	$50.00	sqft	$5,134.02
289105	Garage/Shed	106.54	$50.00	sqft	$5,327.18
289118	Garage/Shed	304.84	$50.00	sqft	$15,241.87
289119	Garage/Shed	333.02	$50.00	sqft	$16,651.09
289149	Garage/Shed	110.51	$50.00	sqft	$5,525.35
289154	Garage/Shed	259.45	$50.00	sqft	$12,972.57
289406	Residential	1214.29	$410,000.00	each	$410,000.00
289542	Residential	1232.28	$410,000.00	each	$410,000.00
290184	Residential	709.80	$410,000.00	each	$410,000.00
290421	Garage/Shed	139.90	$50.00	sqft	$6,995.04
				SUM	**$1,323,986.30**

Damage Reduction to Structures by E 11th Ave SD

OBJECTID_1	Structure Removed from 1 ft Flooding Area	Area (sqft)	Unit Cost		Damgae
289097	Garage/Shed	102.68	$50.00	sqft	$5,134.02
289118	Garage/Shed	304.84	$50.00	sqft	$15,241.87
289119	Garage/Shed	333.02	$50.00	sqft	$16,651.09
289149	Garage/Shed	110.51	$50.00	sqft	$5,525.35
289154	Garage/Shed	259.45	$50.00	sqft	$12,972.57
289406	Residential	1214.29	$410,000.00	each	$410,000.00
289542	Residential	1232.28	$410,000.00	each	$410,000.00
290184	Residential	709.80	$410,000.00	each	$410,000.00
290421	Garage/Shed	139.90	$50.00	sqft	$6,995.04
				SUM	**$1,292,519.94**

Damage Reduction to Structures by E 11th Ave Channel

OBJECTID_1	Structure Removed from 1 ft Flooding Area	Area (sqft)	Unit Cost		Damgae
289097	Garage/Shed	102.68	$50.00	sqft	$5,134.02
289105	Garage/Shed	106.54	$50.00	sqft	$5,327.18
289118	Garage/Shed	304.84	$50.00	sqft	$15,241.87
289119	Garage/Shed	333.02	$50.00	sqft	$16,651.09
289149	Garage/Shed	110.51	$50.00	sqft	$5,525.35
289154	Garage/Shed	259.45	$50.00	sqft	$12,972.57
289406	Residential	1214.29	$410,000.00	each	$410,000.00
289542	Residential	1232.28	$410,000.00	each	$410,000.00
290184	Residential	709.80	$410,000.00	each	$410,000.00
290421	Garage/Shed	139.90	$50.00	sqft	$6,995.04
				SUM	**$1,297,847.12**

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
[TITLE]
;;Project Title/Notes
Lower Westerly Creek
Baseline Hydrology - with 1st and Havana Pond (100-year)
Bohannan Huston
February, 2021
Scenario ID = LowerWesterlyCreek_RevisedFHAD_BaselineHydrology_1stHavanaPond_100-yr

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/25/2005
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         0:05:00
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  SLOPE
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[FILES]
;;Interfacing Files
USE INFLOWS "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\CUHP\6_Fut_100yr_0mi^2_WC_FHAD_2017_NOAA14.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
EC_Out_23rd      5295       1          0          0          0
;CAR4 (Westerly Creek)
EC_Out_19thAv    5310       0          0          0          0
E-J-01           5467       1          0          0          0
E-J-02           5463       1          0          10         0
E-J-03           5415       1          0          10         0
E-J-04           5449.2     1          0          10         0
E-J-05           5415       1          0          10         0
E-J-06           5421.2     1          0          10         0
E-J-07           5387       1          0          0          0
E-J-08           5389       1          0          0          0
E-J-09           5409       1          0          0          0
E-J-10           5344       1          0          0          0
E-J-11           5371       1          0          0          0
E-J-12           5357       1          0          0          0
E-J-13           5315       1          0          0          0
E-J-14           5336       1          0          0          0
E-J-15           5303       1          0          0          0
;CAD8 (Westerly Creek)
E-J-16           5302       1          0          0          0
J_01a            5458       6          0          2          0
J_02a            5460       1          0          0          0
J_03a            5411       1          0          0          0
J_04a            5437       1          0          0          0
J_05_07          5396       0          0          0          0
J_05a            5415       1          0          0          0
J_06a            5421.2     1          0          0          0
;29 (Westerly Creek)
J_07a            5401       1          0          0          0
;break up flows in street upstream S_07d steeper than D/S
J_07b            5393       1          0          0          0
J_07c            5387       1          0          0          0
J_08a            5389       1          0          0          0
;Flows from 27"RCP & 48" RCP enter Heron Pond in a 4- x 4-ft RCB - since RCB will accomodate U/S flows easily, no need for another RCB element
J_08b            5388.9     1          0          0          0
J_09a            5409       1          0          0          0
;JAR5-DIV (Westerly Creek)
J_10a            5381       1          0          0          0
J_10b            5382.5     1          0          0          0
J_10c            5376       5          0          0          0
J_14a            5336       1          0          0          0
J_15             5323       0          0          0          0
J_15a            5303       1          0          0          0
J_17thAv_Out     5322       0          0          0          0
J_7b             5384       0          0          0          0
J_AD1            964.6      0          0          0          0
J_AD3            969.2      0          0          0          0
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
J_AD4             966.6      0          0          0          0
J_AD7             976        0          0          0          0
J_AR1             984.3      0          0          0          0
J_AR2             976        0          0          0          0
J_EC_Colfax_Out   5343       1          0          0          0
J_DE1             964.6      0          0          0          0
J_DE2             976        0          0          0          0
J_DE3             980.9      0          0          0          0
J_DE4             984.3      0          0          0          0
J_DE5             988        0          0          0          0
J_DE6             992        0          0          0          0
J_L1              1007       0          0          0          0
J_L2              5374       0          0          0          0
J_ST1             928        0          0          0          0
J_ST2             915        0          0          0          0
J_ST3             931        0          0          0          0
J_ST4             931        0          0          0          0
J_ST5             933        0          0          0          0
J_ST6             946        0          0          0          0
J_ST7             972        0          0          0          0
J_ST8             946        0          0          0          0
J_ST9             951        0          0          0          0
;BRW drainage basin 100 into intersection of 6th and Dayton.
;Revised to 7a, 7b, and 5c in '08 Revised model.
;J100 purposely left "disconnected" from model.
J100              1010.51    0          0          0          0
J101              1005.01    0          0          0          0
J102              1000.01    0          0          0          0
J104              1000       0          0          0          0
J106              1007.51    0          0          0          0
J107              1002.51    0          0          0          0
J-10a1            5388.5     1          0          0          0
J111              1001.16    0          0          0          0
J113              1008.615   0          0          0          0
J11th             1000       0          0          0          0
J121              1013.865   0          0          0          0
J122              1005.865   0          0          0          0
J124              1005.865   0          0          0          0
J126              1004.585   0          0          0          0
J128              1003.66    0          0          0          0
J12th             992        0          0          0          0
J131              1015.92    0          0          0          0
J132              1016.26    0          0          0          0
J133              1013.76    0          0          0          0
J134              1009.26    0          0          0          0
J14               1000.01    0          0          0          0
J140              1005.21    0          0          0          0
J141              1005.21    0          0          0          0
J150              1013.01    0          0          0          0
J151              1008.01    0          0          0          0
J154              1003.66    0          0          0          0
J155              1001.16    0          0          0          0
J157              1001.15    0          0          0          0
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

J159	1000	0	0	0	0
J160	1000.01	0	0	0	0
J161	1013.76	0	0	0	0
J163	1009.26	0	0	0	0
J165	1008.01	0	0	0	0
J166	1003.66	0	0	0	0
J167	1007.085	0	0	0	0
J168	1003.66	0	0	0	0
J169	1007.51	0	0	0	0
J16th-us	976	0	0	0	0
J170	1002.51	0	0	0	0
J171	1005.01	0	0	0	0
J17th	969.2	0	0	0	0
J19th-ds	966.6	0	0	0	0
J19th-us	966.6	0	0	0	0
J200	1031.145	0	0	0	0
J202	1031.135	0	0	0	0
J203	1025.735	0	0	0	0
J204	1025.735	0	0	0	0
J230	1023.198	0	0	0	0
J231	1023.198	0	0	0	0
J232	1024.206	0	0	0	0
J233	1025.582	0	0	0	0
J234	1022.412	0	0	0	0
J235	1019.614	0	0	0	0
J23rd	951	0	0	0	0
J24	1022.331	0	0	0	0
J242	1022.331	0	0	0	0
J245	1016.197	0	0	0	0
J247	1015.28	0	0	0	0
J248	1015.28	0	0	0	0
J25	1016.931	0	0	0	0
J251	1011.21	0	0	0	0
J252	1016.931	0	0	0	0
J253	1011.04	0	0	0	0
J254	1011.04	0	0	0	0
J26th	946	0	0	0	0
J29th	933	0	0	0	0
J31	1039.105	0	0	0	0
J311	1036.705	0	0	0	0
J314	1039.105	0	0	0	0
J315	1036.695	0	0	0	0
J32	1037.252	0	0	0	0
J33	1036.785	0	0	0	0
J33rd	928	0	0	0	0
J34	1018.235	0	0	0	0
J341	1034.985	0	0	0	0
J343	1024.235	0	0	0	0
J345	1018.235	0	0	0	0
J346	1018.235	0	0	0	0
J347	1016.135	0	0	0	0
J348	1016.135	0	0	0	0
J35	1036.705	0	0	0	0

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
J350             1032.335   0          0          0          0
J351             1036.695   0          0          0          0
J352             1030.455   0          0          0          0
J353             1022.735   0          0          0          0
J354             1013.11    0          0          0          0
J355             1036.705   0          0          0          0
J36              1023.8     0          0          0          0
J361             1030.455   0          0          0          0
J362             1027.235   0          0          0          0
J37              1016.81    0          0          0          0
J371             1019.614   0          0          0          0
J372             1016.81    0          0          0          0
J374             1014.81    0          0          0          0
J38              1024.235   0          0          0          0
J390             1016.21    0          0          0          0
J391             1016.21    0          0          0          0
J392             1013.01    0          0          0          0
J393             1008.01    0          0          0          0
J394             1016.21    0          0          0          0
J41              1008.01    0          0          0          0
J42              1018.235   0          0          0          0
J43              1022.735   0          0          0          0
J44              1013.11    0          0          0          0
J51              1013.61    0          0          0          0
J52              1005.01    0          0          0          0
J53              1005.01    0          0          0          0
J54              1011.61    0          0          0          0
J56              1013.61    0          0          0          0
J61              1013.85    0          0          0          0
J62              1009.85    0          0          0          0
J63              1007       0          0          0          0
J64              1000       0          0          0          0
J65              1000       0          0          0          0
J67              1009.85    0          0          0          0
J68              1003.4     0          0          0          0
J6th_Pipe        5372.45    0          0          0          0
J74              1006.6     0          0          0          0
J7b              5385       0          0          0          0
JL2              5374       0          0          0          0
JMLK             931        0          0          0          0
JMontview-ds     964.6      0          0          0          0
JMontview-us     964.6      0          0          0          0
J_16thAve_E      5334.64    0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;The names are derived from the swmm element IDs with ROOT_JUNCT_ appended to the front.
JSandCreek       915        NORMAL                      NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

DIV344	1024.235	C344-OVER	OVERFLOW	0	0	0	0	
DIV342	1034.985	C342-OVER	OVERFLOW	0	0	0	0	
DIV135	1015.92	C135-OVER	OVERFLOW	0	0	0	0	
DIV389	1001.15	C389-DIV	TABULAR	DIVCURVE_389	0	0	0	0
DIV397	1009.26	C397-DIV	TABULAR	DIVCURVE_397	0	0	0	0
DIV105	1010.51	C105-OVER	OVERFLOW	0	0	0	0	
DIV376	1013.01	C376-OVER	OVERFLOW	0	0	0	0	
DIV70	1009.85	C70-OVER	OVERFLOW	0	0	0	0	
DIV395	1003.66	C395-DIV	TABULAR	DIVCURVE_395	0	0	0	0
DIV1	1008.01	C1-DIV	TABULAR	DIVCURVE_1	0	0	0	0
DIV164	1009.26	C164-OVER	OVERFLOW	0	0	0	0	
DIV125	1005.865	C125-OVER	OVERFLOW	0	0	0	0	
DIV316	1032.335	C316-OVER	OVERFLOW	0	0	0	0	
DIV396	1005.21	C396-DIV	TABULAR	DIVCURVE_396	0	0	0	0
DIV71	1013.85	C71-OVER	OVERFLOW	0	0	0	0	
DIV399	5384	C399-DIV	OVERFLOW	0	0	0	0	
DIV162	1013.76	C162-OVER	OVERFLOW	0	0	0	0	
DIV136	1016.26	C136-OVER	OVERFLOW	0	0	0	0	
DIV123	1008.615	C123-OVER	OVERFLOW	0	0	0	0	
J13th-DIV	988	C14th-OVER	OVERFLOW	0	0	0	0	
J14th-DIV	984.3	CColf-OVER	OVERFLOW	0	0	0	0	
JColfax-DIV	980.9	C16th-OVER	OVERFLOW	0	0	0	0	
J16th-DIV	976	C17th-OVER	OVERFLOW	0	0	0	0	
D_02a	5460.2	S_02a	TABULAR	Chspk_Pond_DS	1	0	0	0
;split flow HECRAS								
D_03b	5409	S_07a	TABULAR	6thAv&Havana	1	0	0	0
D_05-07	5404	S_05_07b	TABULAR	Jamaica/Lowry	0	0	0	0
D_05a	5449	S_05a	OVERFLOW	1	0	0	0	
;increase RCP from 42 to 54								
D_05b	5415	S_05b	OVERFLOW	1	0	0	0	
;split flow FLO-2D								
D_05c	5414	S_05c	TABULAR	6thAv_Kenton	1	0	0	0
;combine flows 6th ave&Kenton SS, divert remainder onto 6th Ave street								
D_05d	5414	d_05c	OVERFLOW	1	0	0	0	
;discharge to 48" street flows to split flow diversion								
D_06a	5421.2	d_06c	OVERFLOW	1	0	0	0	
;Flow split HECRAS								
D_06b	5421.2	S_09a	TABULAR	6thAv_Moline	1	0	0	0
;divert street flow in Havana to 27" RCP								
D_07a	5394	S_07d	OVERFLOW	1	0	0	0	
D_08a	5409	S_08a	OVERFLOW	1	0	0	0	
;Cresdelmar (Westerly Creek)								
D_08b	5389	S_08b	OVERFLOW	1	0	0	0	
;Add up to 46 cfs to 42"RCP- below capacity of RCP								
D_10a	5371	S_10d	OVERFLOW	1	0	0	0	
D_10a1	5388.5	d_10a1	OVERFLOW	1	0	0	0	
;D/S RCP 48", flow full								
D_10b	5365	S_10e	OVERFLOW	1	0	0	0	
D_10c	5352	S_10g	TABULAR	Cofax_Galena	1	0	0	0
D_10d	5344	S_10i	TABULAR	Colfax_Florence	1	0	0	0
D_11a	5371	S_11a	OVERFLOW	1	0	0	0	
D_12a	5357	S_10f	OVERFLOW	1	0	0	0	
D_13a	5341	S_13b1	OVERFLOW	1	0	0	0	

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
D_14a            5336       S_15a            OVERFLOW   1          0          0          0
D_15a            5314       S_15b            OVERFLOW   1          0          0          0
D_03a            5409       d_03c            OVERFLOW   1          0          0          0
D_12_14          5349       S_12_14          TABULAR    Galena/16thAv    0          0          0          0
D_10_13          5331       S_10_13          TABULAR    17thAv/DelMar    0          0          0          0
J72              1006.5     d_72             OVERFLOW   0          0          0          0
J120             1013.865   C120_Overflow    OVERFLOW   0          0          0          0
J127             1004.585   C127_Overflow    OVERFLOW   0          0          0          0
J129             1003.66    C129_Overflow    OVERFLOW   0          0          0          0
J158             1000.42    C158_Overflow    OVERFLOW   0          0          0          0
J73              1003.4     C73_Overlfow     OVERFLOW   0          0          0          0
J236             1022.412   C236_Overflow    OVERFLOW   0          0          0          0
J244             1016.931   C244_Overflow    OVERFLOW   0          0          0          0
J241             1024.206   C241_Overflow    OVERFLOW   0          0          0          0
J243             1022.331   C243_Overflow    OVERFLOW   0          0          0          0
J246             1016.197   C246_Overflow    OVERFLOW   0          0          0          0
J375             1014.81    C375_Overflow    OVERFLOW   0          0          0          0
J330             1036.785   C330_Overflow    OVERFLOW   0          0          0          0
J320             1019.614   C320_Overflow    OVERFLOW   0          0          0          0
J319             1023.198   C319_Overflow    OVERFLOW   0          0          0          0
J321             1037.252   C321_Overflow    OVERFLOW   0          0          0          0
J373             1016.81    C373_Overflow    OVERFLOW   0          0          0          0
J57              1011.61    C57_Overflow     OVERFLOW   0          0          0          0
J250             1011.21    C250_Overflow    OVERFLOW   0          0          0          0
J317             1030.455   C317_Overflow    OVERFLOW   0          0          0          0
J318             1023.8     C318_Overflow    OVERFLOW   0          0          0          0
J322             1025.582   C322_Overflow    OVERFLOW   0          0          0          0
J363             1027.235   C363_Overflow    OVERFLOW   0          0          0          0
D_AR2            5338       S_AR2            OVERFLOW   0          0          0          0
DIV72            1006.45    S_Beeler         TABULAR    11thAv_Beeler    0          0          0          0
D_04a            5457.03    S_04b            OVERFLOW   4          0          0          0
D_04b            5440.1     C_04c            TABULAR    1st/HavanaPnd    5          0          0          0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------          -------- --------
;Because SWMM uses Stage-Area and Stage-Discharge, a sythetic
;rectangular basin has been generated to substitute for the
;volume of the system. The artificial pond is a rectangular
;prism with a cross-section of 1 acre. This creates a pond such
;that every 1 foot of stage equals 1 acre foot of volume. This
;is particularlly handy in the sense that it allows us to equate
;volume directly to stage. Also, the rectangular shape allows for
;the proper use of linier interpolation on the pond stage (and
;consequently volume), and as such, the results should reasonably
;mimic those of UDSWMM. Please note that CUHP objects will not
;appear on the map, as it is impossible to determine their placement.
RES30            1036.705 1297       0          FUNCTIONAL 0          0          43560    0        0
RES201           1031.145 950000     0          FUNCTIONAL 0          0          43560    0        0
RES130           1000.01  70000      0          FUNCTIONAL 0          0          43560    0        0
RES156           1001.16  709        0          FUNCTIONAL 0          0          43560    0        0
HavanaPnd        5376     11         0          TABULAR    HavanaPark                    0        0
1st/HavanaPnd    5436.06  20         0          TABULAR    1st/HavanaREV                 0        0
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
C_03a            D_03a            J7b              2438.93    0.019      0          0          0          235
;Increase Manning's n by 25% of engineered conveyance elements.
C_05a            D_05a            D_05b            2449.8     0.019      0          0          0          71
C_05b            D_05b            D_05d            193.7      0.019      0          0          0          140
C_05c            D_05d            D_03a            1131       0.019      0          0          0          140
;6th Ave
C_06a            D_06a            D_05d            1582.84    0.019      0          0          0          95
C_07a            D_07a            D_08b            815.55     0.019      0          0          0          24
C_08a            D_08a            J_08a            2002.62    0.019      0          0          0          101
C_08b            D_08b            J_08b            17.92      0.019      0          0          0          156
C_10a            J_10c            D_10a            989.94     0.019      0          0          0          0
C_10b            D_10a            D_10b            886.51     0.019      0          0          0          46
C_10c            D_10b            D_13a            2675.35    0.019      0          0          0          101
C_11a            D_11a            D_12a            1687.56    0.019      0          0          0          101
C_13a            D_13a            EC_Out_19thAv    3330.28    0.019      0          0          0          139
;Galena/ Fulton
C_14a            D_12a            J_14a            2956.51    0.019      0          0          0          139
;Montview
C_15a            D_14a            D_15a            3128.33    0.019      0          0          0          237
C_15b            D_15a            J_15a            1316.95    0.019      0          0          0          325
C_16a            E-J-16           EC_Out_23rd      95.8       0.02       0          0          0          0
C_16thAv         D_AR2            J_16thAve_E      1680       0.013      0          0          0          0
C_JL2            JL2              J61              400        0.01       0          0          0          0
C1               DIV1             J151             1          .01        0          0          0          0
C101             J101             J171             1          .01        0          0          0          0
C102             J102             J160             1          .01        0          0          0          0
C104             J104             J159             1          .01        0          0          0          0
C105             DIV105           J151             250        0.04       0          0          0          0
C105-OVER        DIV105           J151             250        0.04       0          0          0          0
C106             J106             J169             1          .01        0          0          0          0
C107             J107             J170             1          .01        0          0          0          0
C111             J111             RES156           1          .01        0          0          0          0
C113             J113             DIV123           1          .01        0          0          0          0
C120             J120             J113             1050       0.019      0          0          0          0
C120_Overflow    J120             J113             1050       0.020      0          0          0          0
C121             J121             J120             1          .01        0          0          0          0
C122             J122             J124             1          .01        0          0          0          0
C123             DIV123           J124             550        0.019      0          0          0          0
C123-OVER        DIV123           J124             550        0.020      0          0          0          0
C124             J124             DIV125           1          .01        0          0          0          0
C125             DIV125           J126             320        0.019      0          0          0          0
C125-OVER        DIV125           J126             320        0.020      0          0          0          0
C126             J126             J127             1          .01        0          0          0          0
C127             J127             J128             185        0.019      0          0          0          0
C127_Overflow    J127             J128             185        0.020      0          0          0          0
C128             J128             DIV395           1          .01        0          0          0          0
C129             J129             J107             230        0.019      0          0          0          0
C129_Overflow    J129             J107             400        0.01       0          0          0          0
C12th            J11th            J12th            1029       .044       0          0          0          0
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C131	J131	DIV135	1	.01	0	0	0	0
C132	J132	DIV136	1	.01	0	0	0	0
C133	J133	J161	1	.01	0	0	0	0
C134	J134	J163	1	.01	0	0	0	0
C135	DIV135	J161	540	0.019	0	0	0	0
C135-OVER	DIV135	J161	540	0.02	0	0	0	0
C136	DIV136	J161	500	0.019	0	0	0	0
C136-OVER	DIV136	J161	500	0.02	0	0	0	0
C13th	J12th	J13th-DIV	647	.044	0	0	0	0
C14	J14	RES130	1	.01	0	0	0	0
C140	J140	DIV396	1	.01	0	0	0	0
C141	J141	J107	540	0.019	0	0	0	0
C14th	J13th-DIV	J14th-DIV	737	.019	0	0	0	0
C14th-OVER	J13th-DIV	J14th-DIV	737	0.040	0	0	0	0
C150	J150	DIV376	1	.01	0	0	0	0
C151	J151	J165	1	.01	0	0	0	0
C154	J154	J128	1	.01	0	0	0	0
C155	J155	RES156	1	.01	0	0	0	0
C157	J157	J104	230	0.019	0	0	0	0
C158	J158	J159	60	0.019	0	0	0	0
C158_Overflow	J158	J159	60	0.01	0	0	0	0
C159	J159	J11th	1	.01	0	0	0	0
C160	J160	RES130	1	.01	0	0	0	0
C161	J161	DIV162	1	.01	0	0	0	0
C162	DIV162	J163	900	0.019	0	0	0	0
C162-OVER	DIV162	J163	900	0.02	0	0	0	0
C163	J163	DIV397	1	.01	0	0	0	0
C164	DIV164	J106	350	0.019	0	0	0	0
C164-OVER	DIV164	J106	350	.02	0	0	0	0
C165	J165	J101	300	0.044	0	0	0	0
C166	J166	RES156	250	0.044	0	0	0	0
C167	J167	J126	250	0.04	0	0	0	0
C168	J168	RES156	250	0.044	0	0	0	0
C169	J169	J101	250	0.044	0	0	0	0
C16th	JColfax-DIV	J16th-us	450	.044	0	0	0	0
C16th2	J16th-us	J16th-DIV	1	0.01	0	0	0	0
C16th-OVER	JColfax-DIV	J16th-us	450	0.04	0	0	0	0
C170	J170	J102	250	0.044	0	0	0	0
C171	J171	J102	500	0.044	0	0	0	0
C17th	J16th-DIV	J17th	1358	0.019	0	0	0	0
C17th-OVER	J16th-DIV	J17th	1358	0.044	0	0	0	0
C19th	J17th	J19th-us	661	0.044	0	0	0	0
C19th2	J19th-us	J19th-ds	1	0.01	0	0	0	0
C1-DIV	DIV1	J57	1	.01	4.599976	0	0	0
C20	J6th_Pipe	DIV105	400	0.01	0	0	0	0
C200	J200	RES201	1	.01	0	0	0	0
C202	J202	J203	900	0.015	0	0	0	0
C203	J203	J204	1	.01	0	0	0	0
;Overflow elements are now comprised by 2 conduits and 1 divider.								
;The additional conduit will have -OVERFLOW appended.								
;Diversion elements areo now comprised by 2 conduits and 1 divider.								
;The additional conduit will have -DIV appended.								
C204	J204	J345	1250	0.035	0	0	0	0

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C230	J230	J319	1	.01	0	0	0	0
C231	J231	J230	1	.01	0	0	0	0
C232	J232	J241	1	.01	0	0	0	0
C233	J233	J322	1	.01	0	0	0	0
C234	J234	J236	1	.01	0	0	0	0
C235	J235	J320	1	.01	0	0	0	0
C236	J236	J390	886	0.019	0	0	0	0
C236_Overflow	J236	J390	886	0.02	0	0	0	0
C23rd	JMontview-ds	J23rd	1683	0.044	0	0	0	0
C24	J24	J242	1	.01	0	0	0	0
C241	J241	J242	750	0.019	0	0	0	0
C241_Overflow	J241	J242	750	0.02	0	0	0	0
C242	J242	J243	1	.01	0	0	0	0
C243	J243	J25	1200	0.019	0	0	0	0
C243_Overflow	J243	J25	1200	0.02	0	0	0	0
C244	J244	J245	144	0.019	0	0	0	0
C244_Overflow	J244	J245	144	0.02	0	0	0	0
C245	J245	J246	1	.01	0	0	0	0
C246	J246	J247	382	0.019	0	0	0	0
C246_Overflow	J246	J247	382	.02	0	0	0	0
C247	J247	J248	1	.01	0	0	0	0
C248	J248	J253	212	0.019	0	0	0	0
C25	J25	J244	1	.01	0	0	0	0
C250	J250	J151	800	0.019	0	0	0	0
C250_Overflow	J250	J151	800	0.02	0	0	0	0
C251	J251	J250	1	.01	0	0	0	0
C252	J252	J25	1	.01	0	0	0	0
C253	J253	J254	1	.01	0	0	0	0
C254	J254	J151	505	0.044	0	0	0	0
C26th	J23rd	J26th	1020	0.044	0	0	0	0
C29th	J26th	J29th	2077	0.044	0	0	0	0
C31	J31	J314	1	.01	0	0	0	0
C311	J311	J355	1	.01	0	0	0	0
C314	J314	J355	800	0.035	0	0	0	0
C315	J315	J350	1090	0.019	0	0	0	0
C316	DIV316	J352	470	0.019	0	0	0	0
C316-OVER	DIV316	J352	470	0.044	0	0	0	0
C317	J317	J36	765	0.019	0	0	0	0
C318	J318	J230	188	0.019	0	0	0	0
C319	J319	J235	1120	0.019	0	0	0	0
C319_Overflow	J319	J235	1120	0.02	0	0	0	0
C32	J32	J321	1	.01	0	0	0	0
C320	J320	J372	701	0.019	0	0	0	0
C320_Overflow	J320	J372	701	0.02	0	0	0	0
C321	J321	J341	687	0.019	0	0	0	0
C321_Overflow	J321	J341	687	0.02	0	0	0	0
C322	J322	J36	594	0.019	0	0	0	0
C33	J33	J330	1	.01	0	0	0	0
C330	J330	J341	600	0.019	0	0	0	0
C330_Overflow	J330	J341	600	0.02	0	0	0	0
C34	J34	J345	1	.01	0	0	0	0
C341	J341	DIV342	1	.01	0	0	0	0
C342	DIV342	J343	2150	0.019	0	0	0	0

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C342-OVER	DIV342	J343	2150	0.03	0	0	0	0
C343	J343	DIV344	1	.01	0	0	0	0
C344	DIV344	J345	1200	0.019	0	0	0	0
C344-OVER	DIV344	J345	1200	0.03	0	0	0	0
C345	J345	J346	1	.01	0	0	0	0
C346	J346	J347	700	0.035	0	0	0	0
C347	J347	J348	1	.01	0	0	0	0
C348	J348	J150	1250	0.035	0	0	0	0
C35	J35	J355	1	.01	0	0	0	0
C350	J350	DIV316	1	.01	0	0	0	0
C351	J351	J315	1	.01	0	0	0	0
C352	J352	J317	1	.01	0	0	0	0
C353	J353	J345	1500	0.035	0	0	0	0
C354	J354	J151	1700	0.019	0	0	0	0
C355	J355	RES30	1	.01	0	0	0	0
C36	J36	J318	1	.01	0	0	0	0
C361	J361	J352	1	.01	0	0	0	0
C362	J362	J363	1	.01	0	0	0	0
C363	J363	J343	1000	0.019	0	0	0	0
C37	J37	J372	1	.01	0	0	0	0
C371	J371	J235	1	.01	0	0	0	0
C372	J372	J373	1	.01	0	0	0	0
C373	J373	J374	500	0.019	0	0	0	0
C373_Overflow	J373	J374	500	0.02	0	0	0	0
C374	J374	J375	1	.01	0	0	0	0
C375	J375	J150	450	0.019	0	0	0	0
C375_Overflow	J375	J150	450	0.02	0	0	0	0
C376	DIV376	J151	1250	0.019	0	0	0	0
C376-OVER	DIV376	J151	1250	0.044	0	0	0	0
C38	J38	J343	1	.01	0	0	0	0
C389	DIV389	J157	1	.01	0	0	0	0
C389-DIV	DIV389	J158	1	.01	0	0	0	0
C390	J390	J394	1	.01	0	0	0	0
C391	J391	J390	1	.01	0	0	0	0
C392	J392	J150	1	.01	0	0	0	0
C393	J393	J151	1	.01	0	0	0	0
C394	J394	J374	350	0.019	0	0	0	0
C395	DIV395	J129	1	.01	0	0	0	0
C395-DIV	DIV395	J168	1	.01	0	0	0	0
C396	DIV396	J141	1	.01	0	0	0	0
C396-DIV	DIV396	J167	1	.01	2.875	0	0	0
C397	DIV397	DIV164	1	.01	0	0	0	0
C397-DIV	DIV397	J166	1	.01	0	0	0	0
;Manning's n was not increased by 25% to maximize 72-inch pipe capacity for determining split flow into H.E.A.T.								
C399	DIV399	J6th_Pipe	3850	.013	0	0	0	0
C399-DIV	DIV399	JL2	1550	.040	0	0	0	0
C41	J41	J151	1	.01	0	0	0	0
C42	J42	J345	1	.01	0	0	0	0
C43	J43	J353	1	.01	0	0	0	0
C44	J44	J354	1	.01	0	0	0	0
C51	J51	J56	1	.01	0	0	0	0
C52	J52	J101	1	.01	0	0	0	0
C53	J53	J101	1	.01	0	0	0	0

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
C54             J54             J57             1         .01       0         0         0         0
C56             J56             DIV1            1400      0.019     0         0         0         0
C57             J57             J151            900       0.019     0         0         0         0
C57_Overflow    J57             J151            900       0.02      0         0         0         0
C61             J61             DIV71           1         .01       0         0         0         0
C62             J62             J67             1         .01       0         0         0         0
C63             J63             J72             1         .01       0         0         0         0
C64             J64             J65             1         .01       0         0         0         0
C65             J65             J104            1         .01       0         0         0         0
C67             J67             DIV70           1         .01       0         0         0         0
C68             J68             J73             1         .01       0         0         0         0
C70             DIV70           J74             860       0.019     0         0         0         0
C70-OVER        DIV70           J74             860       0.020     0         0         0         0
C71             DIV71           J67             800       0.019     0         0         0         0
C71-OVER        DIV71           J67             800       0.020     0         0         0         0
;Existing 42" pipe with zero slope per GIS data, however, the slope from MDP 2010 is used.
;Manning's n was not increased by 25% for flow diversion analysis.
C72             J72             J68             775       0.013     0         0         0         0
;48" CMP
C73             J73             J65             1066      0.03      0         0         0         0
C73_Overlfow    J73             J65             850       0.01      0         0         0         0
C74             J74             J72             1         .01       0         0         0         0
CAD1            J_AD1           JMontview-us    1         0.01      0         0         0         0
CAD3            J_AD3           J17th           1         0.01      0         0         0         0
CAD4            J_AD4           J19th-us        1         0.01      0         0         0         0
CAD7            J_AD7           J16th-us        1         0.01      0         0         0         0
CAR1            J_AR1           J14th-DIV       1         0.01      0         0         0         0
CAR2            J_AR2           D_AR2           1         0.01      0         0         0         0
CColfax         J14th-DIV       JColfax-DIV     686       .019      0         0         0         0
CColf-OVER      J14th-DIV       JColfax-DIV     686       0.040     0         0         0         0
CCPark          JMLK            J33rd           1164      0.044     0         0         0         0
CDE1            J_DE1           JMontview-ds    1         0.01      0         0         0         0
CDE2            J_DE2           J16th-us        1         0.01      0         0         0         0
CDE3            J_DE3           JColfax-DIV     1         0.01      0         0         0         0
CDE4            J_DE4           J14th-DIV       1         0.01      0         0         0         0
CDE5            J_DE5           J13th-DIV       1         0.01      0         0         0         0
CDE6            J_DE6           J12th           1         0.01      0         0         0         0
CDIV7b          J7b             DIV399          400       0.01      0         0         0         0
CJ_L1           J_L1            J72             400       0.01      0         0         0         0
CJ7b            J_7b            J7b             400       0.01      0         0         0         0
CJL2            J_L2            JL2             400       0.01      0         0         0         0
CMLK            J29th           JMLK            581       0.044     0         0         0         0
CMontview       J19th-ds        JMontview-us    651       0.044     0         0         0         0
CMontview2      JMontview-us    JMontview-ds    1         0.01      0         0         0         0
CSandCreek      J33rd           JSandCreek      2222      0.044     0         0         0         0
CST1            J_ST1           J33rd           1         0.01      0         0         0         0
CST2            J_ST2           JSandCreek      1         0.01      0         0         0         0
CST3            J_ST3           JMLK            1         0.01      0         0         0         0
CST4            J_ST4           JMLK            1         0.01      0         0         0         0
CST5            J_ST5           J29th           1         0.01      0         0         0         0
CST6            J_ST6           J26th           1         0.01      0         0         0         0
CST7            J_ST7           J26th           2336      0.044     0         0         0         0
CST8            J_ST8           J26th           1         0.01      0         0         0         0
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

CST9	J_ST9	J23rd	1	0.01	0	0	0	0
d_01a	E-J-01	J_01a	210.16	0.01	0	5	0	0
d_02a	E-J-02	D_02a	180.32	0.01	0	0	0	0
d_02b	D_02a	J_02a	1449.89	0.01	0	0	0	0
d_03a	E-J-03	J_03a	122.45	0.01	0	0	0	0
d_03b	J_03a	D_03a	156.31	0.01	0	0	0	0
d_03c	D_03a	D_03b	24.36	0.01	0	0	0	0
d_04b	E-J-04	D_04b	34.17	0.01	0	0	0	0
d_04d	J_04a	D_05a	9.97	0.01	0	0	0	0
d_05a	E-J-05	J_05a	82.72	0.01	0	0	0	0
d_05b	J_05a	D_05b	2.47	0.01	0	0	0	0
d_05c	D_05d	D_05c	5.17	0.01	0	0	0	0
d_06a	E-J-06	J_06a	10.71	0.01	0	0	0	0
d_06b	J_06a	D_06a	2.64	0.01	0	0	0	0
d_06c	D_06a	D_06b	4.4	0.01	0	0	0	0
d_07b	E-J-07	J_07c	50.84	0.01	0	0	0	0
d_08a	E-J-08	J_08a	157.2	0.01	0	0	0	0
d_08b	J_08a	D_08b	31.61	0.01	0	0	0	0
d_08c	J_08b	HavanaPnd	238.76	0.01	0	0	0	0
d_09a	E-J-09	J_09a	56.19	0.01	0	0	0	0
d_09b	J_09a	D_08a	11.44	0.01	0	0	0	0
d_10a	E-J-10	D_10d	48.16	0.01	0	0	0	0
d_10a1	D_10a1	HavanaPnd	255.05	0.01	0	0	0	0
d_10a2	D_10a1	J-10a1	47.06	0.01	0	0	0	75
d_11a	E-J-11	D_11a	89.25	0.01	0	0	0	0
d_12a	E-J-12	D_12a	103.6	0.01	0	0	0	0
d_13a	E-J-13	EC_Out_19thAv	235.9	0.01	0	0	0	0
d_14a	E-J-14	J_14a	584.55	0.01	0	0	0	0
d_14b	J_14a	D_14a	22.68	0.01	0	0	0	0
d_15a	E-J-15	J_15a	72.41	0.01	0	0	0	0
d_17thAv	J_17thAv_Out	J17th	400	0.01	0	0	0	0
d_EC_Out_23rd	EC_Out_23rd	J23rd	71.05	0.01	0	0	0	0
d_EC_Out_19thAv	EC_Out_19thAv	J19th-ds	400	0.01	0	0	0	0
;overflow path west of Highline for E02 between Hihline and raised elevation at homes								
;Raise Manning's n to 0.15 considering vegetation, fences and structures								
S_02a	D_02a	J_01a	1034.82	0.1	0	0	0	0
;6th Ave								
S_03a	D_03b	J7b	2422.91	0.01	0	0	0	0
S_05_07a	D_05-07	J_05_07	758	0.01	0	0	0	0
S_05_07b	D_05-07	J_08a	1280	0.01	0	0	0	0
;Kenton								
S_05a	D_05a	J_05a	2456	0.01	0	0	0	0
S_05b	D_05b	D_05d	199.6	0.01	0	0	0	0
S_05c	D_05c	D_05-07	1300	0.01	0	0	0	0
;6th Ave								
S_05d	D_05c	D_03a	1120.05	0.01	0	0	0	0
;Park East Rd								
S_06a	J_02a	J_06a	3268.93	0.01	0	0	0	0
S_06b	D_06b	D_05d	1349.1	0.01	0	0	0	0
S_07a	D_03b	J_07a	241.03	0.01	0	0	0	0
;Havana								
S_07b	J_07a	J_05_07	756	0.01	0	0	0	0
S_07b2	J_05_07	D_07a	1015.59	0.01	0	0	0	0

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

S_07d	D_07a	J_07b	98.37	0.01	0	0	0	0
;10th Ave								
S_07e	J_07b	J_07c	762.46	0.01	0	0	0	0
;Del Mar								
S_08a	D_08a	J_08a	2002.69	0.01	0	0	0	0
S_08b	D_08b	D_10a1	29.48	0.01	0	0	0	0
;Moline St								
S_09a	D_06b	J_09a	1335.64	0.01	0	0	0	0
S_10_13	D_10_13	J_17thAv_Out	1689	0.01	0	0	0	0
S_10a	J_10b	J_10a	194.52	0.01	0	0	0	0
S_10a1	J-10a1	J_10a	701.05	0.01	0	0	0	180
S_10b	J_10a	D_10a	800.87	0.01	0	0	0	0
;Flows from Havana reenter DelMar at Hanover								
;Assume 42" RCP flowing full D/S (probably actually full at Geneva next block D/S)								
S_10c	J_07c	D_10a	1481.34	0.01	0	0	0	0
;Del Mar								
S_10d	D_10a	D_10b	814.55	0.01	0	0	0	0
;Del Mar								
S_10e	D_10b	D_10d	2003.13	0.01	0	0	0	0
;Colfax								
S_10f	D_12a	D_10c	671.65	0.01	0	0	0	0
;Colfax								
S_10g	D_10c	D_10d	653.48	0.01	0	0	0	0
S_10i	D_10d	J_EC_Colfax_Out	1914.74	0.01	0	0	0	0
;Hanover								
S_11a	D_11a	D_12a	1673.04	0.01	0	0	0	0
S_12_14	D_12_14	D_13a	400	0.01	0	0	0	0
;Florence								
S_13a	D_10d	D_13a	671.79	0.01	0	0	0	0
S_13b1	D_13a	D_10_13	972	0.01	0	0	0	0
;Del Mar/ 19th								
S_13b2	D_10_13	J_15	1310	0.01	0	0	0	0
S_14a1	D_10c	D_12_14	665	0.01	0	0	0	0
S_14a2	D_12_14	J_14a	1660.01	0.01	0	0	0	0
S_15	J_15	EC_Out_23rd	2785	0.01	0	0	0	0
S_15a	D_14a	J_15	1640	0.01	0	0	0	0
S_15b	D_15a	J_15a	1286.74	0.02	0	0	0	0
S_15c	J_15a	EC_Out_23rd	105.3	0.02	0	0	0	0
S_Beeler	DIV72	J14th-DIV	3235	0.01	0	0	0	0
C317_Overflow	J317	J36	765	0.02	0	0	0	0
C318_Overflow	J318	J230	188	0.02	0	0	0	0
C322_Overflow	J322	J36	594	0.02	0	0	0	0
C363_Overflow	J363	J343	1000	0.035	0	0	0	0
C_EC_Colfax_Out	J_EC_Colfax_Out	D_AR2	1632	0.01	0	0	0	0
S_AR2	D_AR2	D_10_13	720	0.01	0	0	0	0
d_16thAve_E	J_16thAve_E	J16th-DIV	400	0.01	0	0	0	0
d_72	J72	DIV72	400	0.01	0	0	0	0
C72_Overflow	DIV72	J68	775	0.01	0	0	0	0
C_04b	D_04a	D_04b	2000	0.013	0	0	0	131.5
S_04a	J_01a	D_04a	632.95	0.01	0	0	0	0
d_04c	D_04b	1st/HavanaPnd	400	0.01	0	0	0	0
S_04b	D_04a	J_04a	400	0.01	0	0	0	0
C_04c	D_04b	J_04a	360	0.013	0	0	0	0

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
[ORIFICES]
;;Name           From Node        To Node          Type         Offset     Qcoeff     Gated    CloseTime
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- ----------
O_10a            HavanaPnd        J_10c            SIDE         0          0.65       NO       0

[WEIRS]
;;Name           From Node        To Node          Type         CrestHt    Qcoeff     Gated    EndCon   EndCoeff   Surcharge  RoadWidth  RoadSurf   Coeff. Curve
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- -------- ---------- ---------- ---------- ---------- ----------------
W_10a            HavanaPnd        J_10b            TRAPEZOIDAL  6.5        3.33       NO       0        0          YES

[OUTLETS]
;;Name           From Node        To Node          Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- --------
;These define our stage/discharge curves for the system.
;Note that 1 ft of stage exactly equals 1 acre-ft of
;volume. Thus this curve is the exact curve from the original
;UDSWMM input file.
OUT30            RES30            J351             0          TABULAR/DEPTH   RATINGCURVE_30              NO
OUT201           RES201           J202             0          TABULAR/DEPTH   RATINGCURVE_201             NO
OUT130           RES130           J104             0          TABULAR/DEPTH   RATINGCURVE_130             NO
OUT156           RES156           DIV389           0          TABULAR/DEPTH   RATINGCURVE_156             NO
OUT04            1st/HavanaPnd    J_04a            0          TABULAR/DEPTH   1st/HavanaOut               NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
C_03a            CIRCULAR     5.5              0          0          0          1
C_05a            CIRCULAR     3.5              0          0          0          1
C_05b            CIRCULAR     4.5              0          0          0          1
C_05c            CIRCULAR     4.5              0          0          0          1
C_06a            CIRCULAR     4                0          0          0          1
C_07a            CIRCULAR     2.25             0          0          0          1
C_08a            CIRCULAR     4                0          0          0          1
C_08b            RECT_CLOSED  4                4          0          0          1
C_10a            CIRCULAR     3.5              0          0          0          1
C_10b            CIRCULAR     3.5              0          0          0          1
C_10c            CIRCULAR     4                0          0          0          1
C_11a            CIRCULAR     4                0          0          0          1
C_13a            CIRCULAR     4.5              0          0          0          1
C_14a            CIRCULAR     4.5              0          0          0          1
C_15a            CIRCULAR     5.5              0          0          0          1
C_15b            RECT_CLOSED  6.5              10         0          0          1
C_16a            TRAPEZOIDAL  10               8          3          3          1
C_16thAv         CIRCULAR     9                0          0          0          1
C_JL2            DUMMY        0                0          0          0          1
C1               DUMMY        0                0          0          0          1
C101             DUMMY        0                0          0          0          1
C102             DUMMY        0                0          0          0          1
C104             DUMMY        0                0          0          0          1
C105             TRAPEZOIDAL  6                15         3.33       3.33       1
C105-OVER        TRAPEZOIDAL  10               109.96     10         10         1
C106             DUMMY        0                0          0          0          1
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C107	DUMMY	0	0	0	0	1
C111	DUMMY	0	0	0	0	1
C113	DUMMY	0	0	0	0	1
C120	CIRCULAR	3	0	0	0	1
C120_Overflow	TRAPEZOIDAL	4	13.5	20	20	1
C121	DUMMY	0	0	0	0	1
C122	DUMMY	0	0	0	0	1
C123	CIRCULAR	3.5	0	0	0	1
C123-OVER	TRAPEZOIDAL	4	13.5	20	20	1
C124	DUMMY	0	0	0	0	1
C125	CIRCULAR	3.5	0	0	0	1
C125-OVER	TRAPEZOIDAL	6	23.5	20	20	1
C126	DUMMY	0	0	0	0	1
C127	CIRCULAR	4.5	0	0	0	1
C127_Overflow	TRAPEZOIDAL	6	23.5	20	20	1
C128	DUMMY	0	0	0	0	1
C129	CIRCULAR	4	0	0	0	1
C129_Overflow	TRAPEZOIDAL	5	10	4	4	1
C12th	TRAPEZOIDAL	10	25	3	3.5	1
C131	DUMMY	0	0	0	0	1
C132	DUMMY	0	0	0	0	1
C133	DUMMY	0	0	0	0	1
C134	DUMMY	0	0	0	0	1
C135	CIRCULAR	2	0	0	0	1
C135-OVER	TRAPEZOIDAL	3.5	3	50	50	1
C136	CIRCULAR	4	0	0	0	1
C136-OVER	TRAPEZOIDAL	5	5	50	50	1
C13th	TRAPEZOIDAL	10	20	3	3	1
C14	DUMMY	0	0	0	0	1
C140	DUMMY	0	0	0	0	1
C141	CIRCULAR	3	0	0	0	1
C14th	RECT_CLOSED	6	9	0	0	2
C14th-OVER	TRAPEZOIDAL	10	20	20	20	1
C150	DUMMY	0	0	0	0	1
C151	DUMMY	0	0	0	0	1
C154	DUMMY	0	0	0	0	1
C155	DUMMY	0	0	0	0	1
C157	CIRCULAR	4	0	0	0	1
C158	CIRCULAR	4	0	0	0	1
C158_Overflow	TRAPEZOIDAL	5	1	20	20	1
C159	DUMMY	0	0	0	0	1
C160	DUMMY	0	0	0	0	1
C161	DUMMY	0	0	0	0	1
C162	CIRCULAR	4	0	0	0	1
C162-OVER	TRAPEZOIDAL	5	5	50	50	1
C163	DUMMY	0	0	0	0	1
C164	CIRCULAR	4.5	0	0	0	1
C164-OVER	TRAPEZOIDAL	5.5	5.5	50	50	1
C165	TRAPEZOIDAL	10	10	4	4	1
C166	TRAPEZOIDAL	10	55	10	10	1
C167	TRAPEZOIDAL	10	55	10	10	1
C168	TRAPEZOIDAL	10	55	10	10	1
C169	TRAPEZOIDAL	10	55	10	10	1

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C16th	TRAPEZOIDAL	6	8	4	4	1
C16th2	DUMMY	0	0	0	0	1
C16th-OVER	TRAPEZOIDAL	10	55	100	4	1
C170	TRAPEZOIDAL	10	55	10	10	1
C171	TRAPEZOIDAL	10	10	4	4	1
C17th	RECT_CLOSED	6	9	0	0	2
C17th-OVER	TRAPEZOIDAL	10	20	20	20	1
C19th	TRAPEZOIDAL	12	13	4	4	1
C19th2	DUMMY	0	0	0	0	1
C1-DIV	DUMMY	0	0	0	0	1
C20	DUMMY	0	0	0	0	1
C200	DUMMY	0	0	0	0	1
C202	CIRCULAR	4	0	0	0	1
C203	DUMMY	0	0	0	0	1
C204	TRAPEZOIDAL	10	20	5	5	1
C230	DUMMY	0	0	0	0	1
C231	DUMMY	0	0	0	0	1
C232	DUMMY	0	0	0	0	1
C233	DUMMY	0	0	0	0	1
C234	DUMMY	0	0	0	0	1
C235	DUMMY	0	0	0	0	1
C236	CIRCULAR	3	0	0	0	1
C236_Overflow	TRAPEZOIDAL	10	1	20	20	1
C23rd	TRAPEZOIDAL	10	14	19	5	1
C24	DUMMY	0	0	0	0	1
C241	CIRCULAR	5.5	0	0	0	1
C241_Overflow	TRAPEZOIDAL	10	1	20	20	1
C242	DUMMY	0	0	0	0	1
C243	CIRCULAR	6.7	0	0	0	1
C243_Overflow	TRAPEZOIDAL	10	1	20	20	1
C244	CIRCULAR	6.7	0	0	0	1
C244_Overflow	TRAPEZOIDAL	10	1	20	20	1
C245	DUMMY	0	0	0	0	1
C246	CIRCULAR	8	0	0	0	1
C246_Overflow	TRAPEZOIDAL	10	1	20	20	1
C247	DUMMY	0	0	0	0	1
C248	CIRCULAR	8	0	0	0	1
C25	DUMMY	0	0	0	0	1
C250	CIRCULAR	4	0	0	0	1
C250_Overflow	TRAPEZOIDAL	10	1	20	20	1
C251	DUMMY	0	0	0	0	1
C252	DUMMY	0	0	0	0	1
C253	DUMMY	0	0	0	0	1
C254	TRAPEZOIDAL	5	8	3	3	1
C26th	TRAPEZOIDAL	10	13	30	7	1
C29th	TRAPEZOIDAL	10	20	18	20	1
C31	DUMMY	0	0	0	0	1
C311	DUMMY	0	0	0	0	1
C314	TRAPEZOIDAL	4	5	4	4	1
C315	CIRCULAR	4	0	0	0	1
C316	CIRCULAR	5	0	0	0	1
C316-OVER	TRAPEZOIDAL	6	6	50	50	1
C317	CIRCULAR	5	0	0	0	1

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C318	CIRCULAR	6.7	0	0	0	1
C319	CIRCULAR	7.1	0	0	0	1
C319_Overflow	TRAPEZOIDAL	10	1	20	20	1
C32	DUMMY	0	0	0	0	1
C320	CIRCULAR	7.1	0	0	0	1
C320_Overflow	TRAPEZOIDAL	10	1	20	20	1
C321	CIRCULAR	7.1	0	0	0	1
C321_Overflow	TRAPEZOIDAL	10	1	20	20	1
C322	CIRCULAR	4.5	0	0	0	1
C33	DUMMY	0	0	0	0	1
C330	CIRCULAR	5.5	0	0	0	1
C330_Overflow	TRAPEZOIDAL	10	1	20	20	1
C34	DUMMY	0	0	0	0	1
C341	DUMMY	0	0	0	0	1
C342	CIRCULAR	5	0	0	0	1
C342-OVER	TRAPEZOIDAL	8.5	9	10	20	1
C343	DUMMY	0	0	0	0	1
C344	CIRCULAR	6	0	0	0	1
C344-OVER	TRAPEZOIDAL	9.5	10	10	20	1
C345	DUMMY	0	0	0	0	1
C346	TRAPEZOIDAL	8	10	4	4	1
C347	DUMMY	0	0	0	0	1
C348	TRAPEZOIDAL	8	20	4	4	1
C35	DUMMY	0	0	0	0	1
C350	DUMMY	0	0	0	0	1
C351	DUMMY	0	0	0	0	1
C352	DUMMY	0	0	0	0	1
C353	TRAPEZOIDAL	5	8	4	4	1
C354	CIRCULAR	4	0	0	0	1
C355	DUMMY	0	0	0	0	1
C36	DUMMY	0	0	0	0	1
C361	DUMMY	0	0	0	0	1
C362	DUMMY	0	0	0	0	1
C363	CIRCULAR	4.5	0	0	0	1
C37	DUMMY	0	0	0	0	1
C371	DUMMY	0	0	0	0	1
C372	DUMMY	0	0	0	0	1
C373	CIRCULAR	8.3	0	0	0	1
C373_Overflow	TRAPEZOIDAL	10	1	20	20	1
C374	DUMMY	0	0	0	0	1
C375	CIRCULAR	8.3	0	0	0	1
C375_Overflow	TRAPEZOIDAL	10	1	20	20	1
C376	CIRCULAR	4	0	0	0	1
C376-OVER	TRAPEZOIDAL	10	24	4	4	1
C38	DUMMY	0	0	0	0	1
C389	DUMMY	0	0	0	0	1
C389-DIV	DUMMY	0	0	0	0	1
C390	DUMMY	0	0	0	0	1
C391	DUMMY	0	0	0	0	1
C392	DUMMY	0	0	0	0	1
C393	DUMMY	0	0	0	0	1
C394	CIRCULAR	8.3	0	0	0	1
C395	DUMMY	0	0	0	0	1

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C395-DIV	DUMMY	0	0	0	0	1
C396	DUMMY	0	0	0	0	1
C396-DIV	DUMMY	0	0	0	0	1
C397	DUMMY	0	0	0	0	1
C397-DIV	DUMMY	0	0	0	0	1
C399	CIRCULAR	6	0	0	0	1
C399-DIV	IRREGULAR	36ftStreet	0	0	0	1
C41	DUMMY	0	0	0	0	1
C42	DUMMY	0	0	0	0	1
C43	DUMMY	0	0	0	0	1
C44	DUMMY	0	0	0	0	1
C51	DUMMY	0	0	0	0	1
C52	DUMMY	0	0	0	0	1
C53	DUMMY	0	0	0	0	1
C54	DUMMY	0	0	0	0	1
C56	CIRCULAR	5	0	0	0	1
C57	CIRCULAR	5	0	0	0	1
C57_Overflow	TRAPEZOIDAL	10	1	20	20	1
C61	DUMMY	0	0	0	0	1
C62	DUMMY	0	0	0	0	1
C63	DUMMY	0	0	0	0	1
C64	DUMMY	0	0	0	0	1
C65	DUMMY	0	0	0	0	1
C67	DUMMY	0	0	0	0	1
C68	DUMMY	0	0	0	0	1
C70	CIRCULAR	3	0	0	0	1
C70-OVER	IRREGULAR	36ftStreet	0	0	0	1
C71	CIRCULAR	2.5	0	0	0	1
C71-OVER	IRREGULAR	36ftStreet	0	0	0	1
C72	CIRCULAR	3.5	0	0	0	1
C73	CIRCULAR	4	0	0	0	1
C73_Overlfow	IRREGULAR	50ftStreet	0	0	0	1
C74	DUMMY	0	0	0	0	1
CAD1	DUMMY	0	0	0	0	1
CAD3	DUMMY	0	0	0	0	1
CAD4	DUMMY	0	0	0	0	1
CAD7	DUMMY	0	0	0	0	1
CAR1	DUMMY	0	0	0	0	1
CAR2	DUMMY	0	0	0	0	1
CColfax	RECT_CLOSED	6	9	0	0	2
CColf-OVER	TRAPEZOIDAL	10	20	20	20	1
CCPark	TRAPEZOIDAL	14	14	7	8	1
CDE1	DUMMY	0	0	0	0	1
CDE2	DUMMY	0	0	0	0	1
CDE3	DUMMY	0	0	0	0	1
CDE4	DUMMY	0	0	0	0	1
CDE5	DUMMY	0	0	0	0	1
CDE6	DUMMY	0	0	0	0	1
CDIV7b	DUMMY	0	0	0	0	1
CJ_L1	DUMMY	0	0	0	0	1
CJ7b	DUMMY	0	0	0	0	1
CJL2	DUMMY	0	0	0	0	1
CMLK	TRAPEZOIDAL	14	15	9	5	1

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

CMontview	TRAPEZOIDAL	20	13	4	4	1
CMontview2	DUMMY	0	0	0	0	1
CSandCreek	TRAPEZOIDAL	14	19	5	4	1
CST1	DUMMY	0	0	0	0	1
CST2	DUMMY	0	0	0	0	1
CST3	DUMMY	0	0	0	0	1
CST4	DUMMY	0	0	0	0	1
CST5	DUMMY	0	0	0	0	1
CST6	DUMMY	0	0	0	0	1
CST7	TRAPEZOIDAL	10	13	9	70	1
CST8	DUMMY	0	0	0	0	1
CST9	DUMMY	0	0	0	0	1
d_01a	DUMMY	0	0	0	0	1
d_02a	DUMMY	0	0	0	0	1
d_02b	DUMMY	0	0	0	0	1
d_03a	DUMMY	0	0	0	0	1
d_03b	DUMMY	0	0	0	0	1
d_03c	DUMMY	0	0	0	0	1
d_04b	DUMMY	0.1	0	0	0	1
d_04d	DUMMY	0	0	0	0	1
d_05a	DUMMY	0	0	0	0	1
d_05b	DUMMY	0	0	0	0	1
d_05c	DUMMY	0	0	0	0	1
d_06a	DUMMY	0.1	0	0	0	1
d_06b	DUMMY	0	0	0	0	1
d_06c	DUMMY	0	0	0	0	1
d_07b	DUMMY	0	0	0	0	1
d_08a	DUMMY	0	0	0	0	1
d_08b	DUMMY	0	0	0	0	1
d_08c	DUMMY	0	0	0	0	1
d_09a	DUMMY	0	0	0	0	1
d_09b	DUMMY	0	0	0	0	1
d_10a	DUMMY	0	0	0	0	1
d_10a1	DUMMY	0	0	0	0	1
d_10a2	DUMMY	0	0	0	0	1
d_11a	DUMMY	0	0	0	0	1
d_12a	DUMMY	0	0	0	0	1
d_13a	DUMMY	0	0	0	0	1
d_14a	DUMMY	0	0	0	0	1
d_14b	DUMMY	0	0	0	0	1
d_15a	DUMMY	0	0	0	0	1
d_17thAv	DUMMY	0	0	0	0	1
d_EC_Out_23rd	DUMMY	0	0	0	0	1
d_EC_Out_19thAv	DUMMY	0	0	0	0	1
S_02a	TRAPEZOIDAL	3	15	4	4	1
S_03a	IRREGULAR	6thAve	0	0	0	1
S_05_07a	IRREGULAR	36ftStreet	0	0	0	1
S_05_07b	IRREGULAR	36ftStreet	0	0	0	1
S_05a	IRREGULAR	36ftStreet	0	0	0	1
S_05b	IRREGULAR	50ftStreet	0	0	0	1
S_05c	IRREGULAR	36ftStreet	0	0	0	1
S_05d	IRREGULAR	6thAve	0	0	0	1
S_06a	IRREGULAR	36ftStreet	0	0	0	1

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
S_06b            IRREGULAR    6thAve          0         0         0         1
S_07a            IRREGULAR    50ftStreet      0         0         0         1
S_07b            IRREGULAR    50ftStreet      0         0         0         1
S_07b2           IRREGULAR    50ftStreet      0         0         0         1
S_07d            IRREGULAR    36ftStreet      0         0         0         1
S_07e            IRREGULAR    36ftStreet      0         0         0         1
S_08a            IRREGULAR    DelMarPkwy      0         0         0         1
S_08b            IRREGULAR    DelMarPkwy      0         0         0         1
S_09a            IRREGULAR    50ftStreet      0         0         0         1
S_10_13          IRREGULAR    50ftStreet      0         0         0         1
S_10a            IRREGULAR    36ftStreet      0         0         0         1
S_10a1           IRREGULAR    DelMarPkwy      0         0         0         1
S_10b            IRREGULAR    DelMarPkwy      0         0         0         1
S_10c            IRREGULAR    36ftStreet      0         0         0         1
S_10d            IRREGULAR    DelMarPkwy      0         0         0         1
S_10e            IRREGULAR    DelMarPkwy      0         0         0         1
S_10f            IRREGULAR    Colfax          0         0         0         1
S_10g            IRREGULAR    Colfax          0         0         0         1
S_10i            DUMMY        0               0         0         0         1
S_11a            IRREGULAR    36ftStreet      0         0         0         1
S_12_14          IRREGULAR    50ftStreet      0         0         0         1
S_13a            IRREGULAR    50ftStreet      0         0         0         1
S_13b1           IRREGULAR    DelMarPkwy      0         0         0         1
S_13b2           IRREGULAR    DelMarPkwy      0         0         0         1
S_14a1           IRREGULAR    36ftStreet      0         0         0         1
S_14a2           IRREGULAR    36ftStreet      0         0         0         1
S_15             IRREGULAR    50ftStreet      0         0         0         1
S_15a            IRREGULAR    36ftStreet      0         0         0         1
S_15b            TRAPEZOIDAL  10              50        20        20        1
S_15c            TRAPEZOIDAL  10              50        20        20        1
S_Beeler         IRREGULAR    36ftStreet      0         0         0         1
C317_Overflow    TRAPEZOIDAL  10              1         20        20        1
C318_Overflow    TRAPEZOIDAL  10              1         20        20        1
C322_Overflow    TRAPEZOIDAL  10              1         20        20        1
C363_Overflow    TRAPEZOIDAL  10              1         20        20        1
C_EC_Colfax_Out  IRREGULAR    50ftStreet      0         0         0         1
S_AR2            IRREGULAR    36ftStreet      0         0         0         1
d_16thAve_E      DUMMY        0               0         0         0         1
d_72             DUMMY        0               0         0         0         1
C72_Overflow     IRREGULAR    50ftStreet      0         0         0         1
C_04b            CIRCULAR     4               0         0         0         1
S_04a            IRREGULAR    36ftStreet      0         0         0         1
d_04c            DUMMY        0               0         0         0         1
S_04b            IRREGULAR    36ftStreet      0         0         0         1
C_04c            CIRCULAR     3               0         0         0         1
O_10a            CIRCULAR     1.5             0         0         0
W_10a            TRAPEZOIDAL  6.5             55        50        50

[TRANSECTS]
;;Transect Data in HEC-2 format
;
;Full street, width = 50ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.27ft.
NC 0.05     0.05     0.02
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
X1 50ftStreet        9        30       80       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.27     0        0.67     30       0        30       0.5      55
GR 0        80       0.67     80       1.27     110      10       110
;
;Full street, width = 36ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.67ft.
NC 0.05     0.05     0.02
X1 36ftStreet        9        50       86       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.67     0        0.67     50       0        50       0.36     68
GR 0        86       0.67     86       1.67     136      10       136
;
;Full street, width = 82ft, curb = .67ft , cross-slope = 0.02ft/ft, bank-slope = 0.01ft/ft, bank-height = .87ft.
;Increase Manning's n by 25% for roadway per UDFCD USDCM.
;Increase Manning's n to 0.10 for overbank area considering the lawn area, fences and vegetation.
NC 0.1      0.1      0.02
X1 6thAve            9        20       102      0.0      0.0      0.0      0.0      0.0
GR 6        0        0.87     0        0.67     20       0        20       0.82     61
GR 0        102      0.67     102      0.87     122      6        122
;
;Full street, width = 32ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 0.75ft.
NC 0.1      0.1      0.02
X1 DelMarPkwy        15       4        88       0.0      0.0      0.0      0.0      0.0
GR 8        -16      1.07     -16      0.67     4        0        4        0.32     20
GR 0        36       0.67     36       0.87     46       0.67     56       0        56
GR 0.32     72       0        88       0.67     88       1.07     108      8        108
;
;Full street, width = 80ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = .77ft.
NC 0.02     0.02     0.02
X1 Colfax            12       5        87       0.0      0.0      0.0      0.0      0.0
GR 10       0        0.77     0        0.67     5        0        5        0.8      45
GR 3.3      45       3.3      47       0.8      47       0        87       0.67     87
GR 0.77     92       10       92

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
J200             FLOW             INFLOW_200       FLOW     1.0      1.0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
DIVCURVE_389     DIVERSION  0          0
DIVCURVE_389                16         0
DIVCURVE_389                17         1
DIVCURVE_389                50         34
DIVCURVE_389                200        184
;
DIVCURVE_397     DIVERSION  0          0
DIVCURVE_397                100        0
DIVCURVE_397                101        1
DIVCURVE_397                200        100
DIVCURVE_397                600        500
;
DIVCURVE_395     DIVERSION  0          0
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
DIVCURVE_395                78          0
DIVCURVE_395                79          1
DIVCURVE_395                178         100
DIVCURVE_395                578         500
;
DIVCURVE_1      DIVERSION   0           0
DIVCURVE_1                  36          0
DIVCURVE_1                  37          1
DIVCURVE_1                  100         64
;
DIVCURVE_396    DIVERSION   0           0
DIVCURVE_396                16          0
DIVCURVE_396                17          1
DIVCURVE_396                50          34
DIVCURVE_396                200         184
;
DIVCURVE_399    Diversion   0           0
DIVCURVE_399                275         0
DIVCURVE_399                455         72
DIVCURVE_399                626         165
DIVCURVE_399                845         317
DIVCURVE_399                1155        502
DIVCURVE_399                1543        739
DIVCURVE_399                1977        1004
;
DIVCURVE_7a     Diversion   0           0
DIVCURVE_7a                 105         0
DIVCURVE_7a                 592         0
DIVCURVE_7a                 930         25
DIVCURVE_7a                 1363        101
;
DIV7a2          Diversion   0           0
DIV7a2                      127         0
DIV7a2                      137         10
DIV7a2                      192         59
DIV7a2                      300         133
DIV7a2                      447         243
DIV7a2                      645         383
DIV7a2                      1399        890
DIV7a2                      2302        1501
;
6thAv_Moline    Diversion   0           0
6thAv_Moline                100         11
6thAv_Moline                200         39
6thAv_Moline                300         81
6thAv_Moline                400         136
6thAv_Moline                500         201
6thAv_Moline                600         276
6thAv_Moline                700         358
6thAv_Moline                800         446
6thAv_Moline                900         540
6thAv_Moline                1000        638
;
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
Cofax_Galena     Diversion  0          0
Cofax_Galena                50         40
Cofax_Galena                100        70
Cofax_Galena                150        92
Cofax_Galena                200        104
Cofax_Galena                250        108
Cofax_Galena                300        110
Cofax_Galena                350        110
Cofax_Galena                400        110
Cofax_Galena                450        110
;
Colfax_Florence  Diversion  0          0
Colfax_Florence             200        34
Colfax_Florence             400        84
Colfax_Florence             600        141
Colfax_Florence             800        202
Colfax_Florence             1000       265
Colfax_Florence             1200       332
Colfax_Florence             1400       400
Colfax_Florence             1600       470
Colfax_Florence             1800       541
Colfax_Florence             2000       614
Colfax_Florence             2200       688
Colfax_Florence             2400       763
Colfax_Florence             2600       839
Colfax_Florence             2800       916
;
;street flows leaving Easterly Creek to Westerly Creek
6thAv&Havana     Diversion  0          0
6thAv&Havana                50         39
6thAv&Havana                100        75
6thAv&Havana                150        108
6thAv&Havana                200        141
6thAv&Havana                250        173
6thAv&Havana                300        205
6thAv&Havana                350        235
6thAv&Havana                400        266
6thAv&Havana                450        296
6thAv&Havana                500        326
;
;divides flow from Chsp Pond 10% to E04 90% to E06 - relative weir length to high point and direct basin contribution
Chspk_Pond_DS    Diversion  00         0
Chspk_Pond_DS               100        10
Chspk_Pond_DS               1000       100
;
Jamaica/Lowry    Diversion  0          0
Jamaica/Lowry               100        56
Jamaica/Lowry               200        101
Jamaica/Lowry               300        142
Jamaica/Lowry               400        180
Jamaica/Lowry               500        217
Jamaica/Lowry               600        253
Jamaica/Lowry               700        287
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
Jamaica/Lowry              800        319
Jamaica/Lowry              900        351
Jamaica/Lowry              1000       383
Jamaica/Lowry              1100       413
Jamaica/Lowry              1200       443
;
6thAv_Kenton     Diversion  0          0
6thAv_Kenton               200        177
6thAv_Kenton               400        375
6thAv_Kenton               600        574
6thAv_Kenton               800        773
6thAv_Kenton               1000       973
6thAv_Kenton               1200       1172
6thAv_Kenton               1400       1372
6thAv_Kenton               1600       1571
6thAv_Kenton               1800       1771
6thAv_Kenton               2000       1971
;
Galena/16thAv    Diversion  0          0
Galena/16thAv              50         20
Galena/16thAv              100        40
Galena/16thAv              150        58
Galena/16thAv              200        75
Galena/16thAv              250        91
Galena/16thAv              300        107
Galena/16thAv              350        121
Galena/16thAv              400        134
Galena/16thAv              450        146
;
17thAv/DelMar    Diversion  0          0
17thAv/DelMar              200        16
17thAv/DelMar              400        32
17thAv/DelMar              600        48
17thAv/DelMar              800        64
17thAv/DelMar              1000       80
17thAv/DelMar              1200       96
17thAv/DelMar              1400       112
17thAv/DelMar              1600       128
17thAv/DelMar              1800       144
17thAv/DelMar              2000       160
17thAv/DelMar              2200       176
17thAv/DelMar              2400       192
17thAv/DelMar              2600       208
17thAv/DelMar              2800       224
;
11thAv_Beeler    Diversion  0          0
11thAv_Beeler              100        97
11thAv_Beeler              200        188
11thAv_Beeler              300        275
11thAv_Beeler              400        361
11thAv_Beeler              500        446
11thAv_Beeler              600        530
11thAv_Beeler              700        612
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
11thAv_Beeler               800        694
11thAv_Beeler               900        776
11thAv_Beeler               1000       857
11thAv_Beeler               1100       937
11thAv_Beeler               1200       1017
11thAv_Beeler               1300       1096
11thAv_Beeler               1400       1175
;
1st/HavanaPnd    Diversion  0          0
1st/HavanaPnd               64.066     27.066
1st/HavanaPnd               90.536     22.336
1st/HavanaPnd               91         60
1st/HavanaPnd               225.868    60
;
;Curves are named using RATINGCURVE_ for rating (outflow) curves
;and DIVCURVE_ for diversion curves.
RATINGCURVE_30   RATING     0          0
RATINGCURVE_30              0.04       0.5
RATINGCURVE_30              1.12       5
RATINGCURVE_30              3.56       16
RATINGCURVE_30              7.55       19.5
RATINGCURVE_30              12.97      20
;
RATINGCURVE_201  RATING     0          0
RATINGCURVE_201             1          1
RATINGCURVE_201             50         10
RATINGCURVE_201             150        25
RATINGCURVE_201             175        34
RATINGCURVE_201             400        44
RATINGCURVE_201             500        48
RATINGCURVE_201             1150       58
RATINGCURVE_201             2150       67
RATINGCURVE_201             3100       76
RATINGCURVE_201             4500       83
RATINGCURVE_201             5850       90
RATINGCURVE_201             7500       96
RATINGCURVE_201             9500       102
;
RATINGCURVE_130  RATING     0          0
RATINGCURVE_130             1          5
RATINGCURVE_130             5          30
RATINGCURVE_130             15         55
RATINGCURVE_130             85         80
RATINGCURVE_130             250        105
RATINGCURVE_130             300        250
RATINGCURVE_130             345        565
RATINGCURVE_130             700        670
;
RATINGCURVE_156  RATING     0          0
RATINGCURVE_156             1.11       12
RATINGCURVE_156             3.49       25
RATINGCURVE_156             7.09       109
;
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
;OUTdelmar2
OUTdelmar2       Rating     0          0
OUTdelmar2                  1.06       4.7
OUTdelmar2                  2.06       9.7
OUTdelmar2                  3.06       12.9
OUTdelmar2                  4.06       15.5
OUTdelmar2                  5.06       17.7
OUTdelmar2                  6.06       19.6
OUTdelmar2                  7.06       21.4
OUTdelmar2                  7.31       52
OUTdelmar2                  7.56       139
OUTdelmar2                  7.81       266
OUTdelmar2                  8.06       443
OUTdelmar2                  8.31       673
OUTdelmar2                  8.56       988
OUTdelmar2                  8.81       1413
OUTdelmar2                  9.06       1976
;
1st/HavanaOut    Rating     0          0
1st/HavanaOut               1          0.09
1st/HavanaOut               2          0.2
1st/HavanaOut               3          0.32
1st/HavanaOut               4          0.43
1st/HavanaOut               5          0.83
1st/HavanaOut               6          2.68
1st/HavanaOut               7          3.63
1st/HavanaOut               8          4.37
1st/HavanaOut               9          4.99
1st/HavanaOut               10         5.55
1st/HavanaOut               11         23.64
1st/HavanaOut               12         87.08
;
Out              Rating     0          163
Out                         5          163
;
;RESdelmar2
RESdelmar2       Storage    1.06       2550
RESdelmar2                  2.06       12300
RESdelmar2                  3.06       29600
RESdelmar2                  4.06       53925
RESdelmar2                  5.06       84425
RESdelmar2                  6.06       103200
RESdelmar2                  7.06       165000
RESdelmar2                  7.31       180000
RESdelmar2                  7.56       195000
RESdelmar2                  7.81       208000
RESdelmar2                  8.06       220000
RESdelmar2                  8.31       235000
RESdelmar2                  8.56       250000
RESdelmar2                  8.81       265000
RESdelmar2                  9.06       280000
;
HavanaPark       Storage    0          0
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
HavanaPark                 2          24145
HavanaPark                 4          77005
HavanaPark                 6          91130
HavanaPark                 8          105770
HavanaPark                 10         121890
;
1st/Havana       Storage   0          244.1673255
1st/Havana                 1          3026.130127
1st/Havana                 2          6949.90645
1st/Havana                 3          13086.27921
1st/Havana                 4          25268.49063
1st/Havana                 4.1        33726.61398
1st/Havana                 5          40414.9381
1st/Havana                 5.64       51343.50432
1st/Havana                 6          61564.8495
1st/Havana                 7          74632.48013
1st/Havana                 8          76112.53524
1st/Havana                 9          78893.93142
1st/Havana                 10         83164.86615
1st/Havana                 10.34      88613.1849
1st/Havana                 10.85      109542.2679
1st/Havana                 11         127115.93
1st/Havana                 12         135520.17
;
1st/HavanaREV    Storage   0          243.25
1st/HavanaREV              1          2899.85
1st/HavanaREV              2          8448.85
1st/HavanaREV              3          14051.31
1st/HavanaREV              4          21356.73
1st/HavanaREV              4.1        30011.16
1st/HavanaREV              5          41058.61
1st/HavanaREV              5.64       55019.53
1st/HavanaREV              6          62505.00
1st/HavanaREV              7          74533.80
1st/HavanaREV              8          76137.61
1st/HavanaREV              9          78504.32
1st/HavanaREV              10         82353.65
1st/HavanaREV              10.34      86880.06
1st/HavanaREV              10.85      111275.23
1st/HavanaREV              11         119000
1st/HavanaREV              12         127116
1st/HavanaREV              13         135520

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Timeseries INFLOW_200
INFLOW_200                 0          0
INFLOW_200                 0.5        80
INFLOW_200                 0.83       1350
INFLOW_200                 1          3280
INFLOW_200                 1.33       2860
INFLOW_200                 1.48       2610
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
INFLOW_200                  1.55       1800
INFLOW_200                  1.67       1600
INFLOW_200                  1.83       1400
INFLOW_200                  2.06       1200
INFLOW_200                  2.33       1100
INFLOW_200                  2.9        1080
INFLOW_200                  3.18       1000
INFLOW_200                  3.5        830
INFLOW_200                  3.98       720
INFLOW_200                  4.16       700
INFLOW_200                  5          625
INFLOW_200                  11.93      0

[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       D_05a            Major_System
Node       D_06b            Major_System
Link       C_05a            Storm_Sewer
Link       C_05b            Storm_Sewer
Link       C_05c            Storm_Sewer
Link       C_06a            Storm_Sewer
Link       C_07a            Storm_Sewer
Link       C_08a            Storm_Sewer
Link       C_08b            Storm_Sewer
Link       C_10a            storm_sewer
Link       C_10b            Storm_Sewer
Link       C_10c            Storm_Sewer
Link       C_11a            Storm_Sewer
Link       C_13a            Storm_Sewer
Link       C_14a            Storm_Sewer
Link       C_15a            Storm_Sewer
Link       C_15b            Storm_Sewer
Link       C_16a            Major_System
Link       d_01a            Dummy
Link       d_02a            Dummy
Link       d_02b            Dummy
Link       d_03a            Dummy
Link       d_03b            Dummy
Link       d_03c            Dummy
Link       d_04b            Dummy
Link       d_04d            Dummy
Link       d_05a            Dummy
Link       d_05b            Dummy
Link       d_05c            Dummy
Link       d_06a            Dummy
Link       d_06b            Dummy
Link       d_06c            Dummy
Link       d_07b            Dummy
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
Link       d_08a            Dummy
Link       d_08b            Dummy
Link       d_08c            Dummy
Link       d_09a            Dummy
Link       d_09b            Dummy
Link       d_10a            Dummy
Link       d_10a1           dummy
Link       d_10a2           dummy
Link       d_11a            Dummy
Link       d_12a            Dummy
Link       d_13a            Dummy
Link       d_14a            Dummy
Link       d_14b            Dummy
Link       d_15a            dummy
Link       d_EC_Out_23rd    dummy
Link       S_02a            Major_System
Link       S_03a            Major_System
Link       S_05a            Major_System
Link       S_05b            Major_System
Link       S_05d            Major_System
Link       S_06a            Major_System
Link       S_06b            Major_System
Link       S_07a            Major_System
Link       S_07b            Major_System
Link       S_07d            Major_System
Link       S_07e            Major_System
Link       S_08a            Major_System
Link       S_08b            Major_System
Link       S_09a            Major_System
Link       S_10a            Major_System
Link       S_10a1           Major_System
Link       S_10b            Major_System
Link       S_10c            Major_System
Link       S_10d            Major_System
Link       S_10e            Major_System
Link       S_10f            Major_System
Link       S_10g            Major_System
Link       S_10i            Dummy
Link       S_11a            Major_System
Link       S_13a            Major_System
Link       S_13b2           Major_System
Link       S_14a2           Major_System
Link       S_15a            Major_System
Link       S_15b            Major_System
Link       S_15c            Major_System
Link       S_04a            Major_System
Link       O_10a            orifice

[MAP]
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
Units      None

[COORDINATES]
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

;;Node	X-Coord	Y-Coord
EC_Out_23rd	3174521.509	1699077.830
EC_Out_19thAv	3174457.567	1697083.194
E-J-01	3181383.716	1685758.763
E-J-02	3181690.538	1686708.934
E-J-03	3178574.934	1688917.803
E-J-04	3179702.026	1686913.000
E-J-05	3179839.389	1689382.701
E-J-06	3180865.876	1689410.897
E-J-07	3177535.385	1691600.056
E-J-08	3179241.043	1691903.960
E-J-09	3181239.307	1690987.377
E-J-10	3176536.499	1694830.918
E-J-11	3178364.362	1693571.563
E-J-12	3178084.501	1695058.327
E-J-13	3174523.362	1696775.802
E-J-14	3176620.329	1696763.482
E-J-15	3174702.172	1698637.894
E-J-16	3174617.300	1699076.888
J_01a	3181271.416	1685936.409
J_02a	3182594.638	1687816.368
J_03a	3178501.780	1689593.752
J_04a	3179228.492	1687184.457
J_05_07	3178378.880	1690796.429
J_05a	3179629.094	1689505.601
J_06a	3180864.918	1689604.416
J_07a	3178378.880	1690032.680
J_07b	3178256.491	1691783.663
J_07c	3177686.786	1691958.317
J_08a	3179152.260	1691856.403
J_08b	3179109.611	1691998.393
J_09a	3180834.384	1690977.968
J_10a	3178587.731	1692428.820
J_10b	3178770.814	1692348.675
J_10c	3178793.264	1692391.228
J_14a	3177008.599	1696919.585
J_15	3175998.600	1697755.205
J_15a	3174525.821	1698972.614
J_17thAv_Out	3174362.115	1696418.297
J_7b	3176715.915	1688684.249
J_AD1	3173538.576	1697378.478
J_AD3	3173644.612	1696024.963
J_AD4	3173531.287	1696813.017
J_AD7	3173909.314	1695285.787
J_AR1	3174257.099	1694121.463
J_AR2	3176061.147	1693891.756
J_EC_Colfax_Out	3176281.246	1695091.821
J_DE1	3170656.900	1697690.347
J_DE2	3171948.041	1695656.957
J_DE3	3171399.213	1694801.912
J_DE4	3170773.226	1694249.812
J_DE5	3170779.463	1693626.073

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

J_DE6	3170742.039	1692921.247
J_L1	3174784.459	1692597.053
J_L2	3175669.580	1691420.211
J_ST1	3173309.381	1702734.958
J_ST2	3176374.052	1703239.480
J_ST3	3171743.217	1702135.822
J_ST4	3176651.035	1701357.935
J_ST5	3171732.706	1701063.683
J_ST6	3177553.497	1699806.993
J_ST7	3171701.635	1700154.778
J_ST8	3173214.231	1699673.838
J_ST9	3173123.018	1698521.700
J100	3175856.701	1689634.141
J101	3171638.866	1690958.108
J102	3171682.052	1691599.727
J104	3172129.334	1692459.258
J106	3171248.062	1690918.870
J107	3171171.769	1691632.757
J-10a1	3178871.305	1691930.921
J111	3170010.141	1692290.701
J113	3170016.311	1691559.626
J11th	3172376.236	1692784.025
J121	3168726.904	1691920.536
J122	3170282.612	1691251.791
J124	3170461.343	1691463.978
J126	3170742.204	1691600.447
J128	3170936.782	1691611.012
J12th	3172525.933	1693389.052
J131	3169390.116	1691130.852
J132	3168908.902	1690137.577
J133	3170059.497	1690208.525
J134	3170827.588	1690223.948
J14	3171351.988	1691978.044
J140	3170673.353	1691198.715
J141	3170898.537	1691405.391
J150	3171881.826	1688711.969
J151	3171444.529	1690091.306
J154	3170952.630	1691496.554
J155	3170793.657	1692089.093
J157	3171324.226	1692462.342
J159	3172203.367	1692576.476
J160	3171703.645	1691775.555
J161	3170185.970	1690739.094
J163	3170876.944	1690745.264
J165	3171577.172	1690334.998
J166	3170941.722	1691123.580
J167	3170746.606	1691501.837
J168	3170963.315	1691783.707
J169	3171373.581	1690918.007
J16th-us	3173397.302	1695711.821
J170	3171246.021	1691453.849
J171	3171657.374	1691143.191
J17th	3174101.141	1696418.297

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

J19th-ds	3174272.220	1697085.197
J19th-us	3174241.978	1696737.412
J200	3174812.838	1684923.600
J202	3174005.358	1687159.698
J203	3173936.316	1687606.796
J204	3173749.139	1687866.242
J230	3169578.765	1687307.093
J231	3169569.447	1687158.011
J232	3170010.141	1688518.106
J233	3168240.099	1687118.285
J234	3170187.798	1688400.880
J235	3170328.523	1687867.120
J23rd	3174255.876	1699237.221
J24	3169562.859	1689273.859
J242	3169732.518	1689230.673
J245	3171092.873	1689449.687
J247	3171348.904	1689684.125
J248	3171429.106	1689751.988
J25	3170926.299	1689289.283
J251	3170947.892	1689751.988
J252	3170602.405	1688986.982
J253	3171426.021	1689866.123
J254	3171429.106	1689958.664
J26th	3174249.639	1700197.780
J29th	3174904.565	1701632.380
J31	3167150.264	1685083.819
J311	3167787.145	1685828.149
J314	3167146.763	1685668.834
J315	3167715.298	1686655.960
J32	3170356.172	1685746.608
J33	3171078.245	1685568.031
J33rd	3175149.244	1703027.785
J34	3173228.936	1687874.006
J341	3170657.370	1686107.712
J343	3172398.164	1687478.031
J345	3173228.936	1688145.754
J346	3173096.944	1688316.567
J347	3172871.781	1688619.372
J348	3172739.790	1688829.006
J35	3166924.972	1686296.721
J350	3168514.994	1686652.836
J351	3167709.319	1686248.518
J352	3168830.500	1686652.836
J353	3174021.329	1688641.125
J354	3172935.984	1688889.590
J355	3167315.449	1685884.378
J36	3169302.627	1687124.371
J361	3168761.776	1686362.321
J362	3170930.725	1687423.681
J37	3171060.030	1687748.485
J371	3170644.359	1687552.980
J372	3171045.016	1688372.927
J374	3171482.942	1688596.550

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

J38	3172343.814	1687198.519
J390	3171147.509	1688792.219
J391	3170644.359	1688512.691
J392	3171697.631	1688145.214
J393	3171558.663	1689202.911
J394	3171250.003	1688754.949
J41	3171892.088	1689585.521
J42	3173997.594	1688091.405
J43	3174871.463	1688584.449
J44	3173444.752	1688937.040
J51	3172975.241	1690559.216
J52	3171943.693	1690479.118
J53	3172419.296	1690757.602
J54	3173006.063	1690004.426
J56	3172840.397	1690555.363
J61	3174871.637	1691083.479
J62	3175007.364	1691709.674
J63	3173696.364	1691558.524
J64	3172585.534	1691673.130
J65	3172157.054	1692352.276
J67	3174402.762	1691688.081
J68	3173065.185	1692165.261
J6th_Pipe	3172308.592	1689796.409
J74	3173927.691	1692295.707
J7b	3176080.853	1689820.134
JL2	3175090.696	1690751.809
JMLK	3175060.500	1702237.407
JMontview-ds	3174262.114	1697958.555
JMontview-us	3174393.748	1697665.173
J_16thAve_E	3174326.556	1695736.397
JSandCreek	3175194.607	1705114.495
DIV344	3172545.684	1687571.202
DIV342	3170762.820	1686245.117
DIV135	3169784.958	1691047.565
DIV389	3171113.818	1692471.002
DIV397	3170978.739	1690769.941
DIV105	3172095.068	1689796.409
DIV376	3171849.910	1688860.593
DIV70	3174304.051	1691811.470
DIV395	3170984.908	1691623.302
DIV1	3172408.893	1690204.766
DIV164	3171049.687	1690806.958
DIV125	3170535.300	1691534.413
DIV316	3168593.090	1686655.960
DIV396	3170751.009	1691399.705
DIV71	3174788.350	1691194.528
DIV399	3175674.894	1689817.498
DIV162	3170466.678	1690680.485
DIV136	3169710.925	1690621.875
DIV123	3170099.598	1691485.593
J13th-DIV	3172719.293	1693975.367
J14th-DIV	3173058.297	1694509.277
JColfax-DIV	3173101.958	1695064.405

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

J16th-DIV	3174006.888	1695767.840
D_02a	3181545.309	1686815.819
D_03b	3178378.880	1689848.330
D_05-07	3179108.136	1690800.495
D_05a	3179220.387	1687205.087
D_05b	3179514.388	1689597.093
D_05c	3179511.150	1689852.184
D_05d	3179515.514	1689750.342
D_06a	3180863.552	1689700.875
D_06b	3180859.456	1689811.484
D_07a	3178375.954	1691732.808
D_08a	3180828.541	1690987.804
D_08b	3179086.534	1691897.386
D_10a	3178190.607	1693124.289
D_10a1	3179013.427	1691925.179
D_10b	3177506.187	1693480.664
D_10c	3177341.037	1695074.458
D_10d	3176685.570	1695087.272
D_11a	3178362.251	1693755.318
D_12a	3177993.794	1695108.374
D_13a	3176709.038	1695756.424
D_14a	3177004.000	1697100.082
D_15a	3174530.826	1697704.714
D_03a	3178387.658	1689757.618
D_12_14	3177323.333	1695759.004
D_10_13	3176022.859	1696423.569
J72	3173768.342	1692354.378
J120	3169095.103	1691833.239
J127	3170790.629	1691601.327
J129	3171058.751	1691620.951
J158	3171203.922	1692582.646
J73	3172904.425	1692314.718
J236	3170318.244	1688531.326
J244	3171012.671	1689369.485
J241	3170062.581	1688678.511
J243	3169855.906	1689236.843
J246	3171157.652	1689508.297
J375	3171626.786	1688641.125
J330	3170884.140	1685909.657
J320	3170607.225	1688082.717
J319	3169824.412	1687497.074
J321	3170356.998	1685915.985
J373	3171184.779	1688428.833
J57	3172528.327	1690039.100
J250	3171037.348	1689742.734
J317	3168874.233	1686780.913
J318	3169395.803	1687189.594
J322	3168883.335	1687459.804
J363	3171326.700	1687501.323
D_AR2	3175710.036	1695767.840
DIV72	3173768.342	1692488.300
D_04a	3181048.480	1686498.275
D_04b	3179638.775	1687031.540

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
RES30            3167421.659        1686068.683
RES201           3173966.537        1686243.519
RES130           3171786.932        1692058.246
RES156           3170880.028        1692235.176
HavanaPnd        3178969.825        1692186.983
1st/HavanaPnd    3179472.003        1686941.310

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
C_05a            3179202.673        1687395.185
C_05a            3179474.407        1688139.203
C_06a            3180789.812        1689774.615
C_07a            3179013.848        1691738.869
C_08a            3180499.807        1691251.254
C_08a            3180410.327        1691339.549
C_08a            3180052.999        1691511.991
C_08a            3179533.304        1691650.656
C_10a            3178638.063        1692446.141
C_10a            3178219.026        1693123.966
C_10b            3178204.984        1693171.581
C_10b            3178070.600        1693354.343
C_10b            3177963.093        1693418.847
C_10b            3177533.064        1693515.604
C_10c            3177485.697        1693534.317
C_10c            3177385.019        1693649.377
C_10c            3177367.041        1694278.615
C_10c            3177298.724        1694433.228
C_10c            3177172.876        1694544.692
C_10c            3176788.142        1694681.327
C_10c            3176744.995        1694738.857
C_11a            3178014.263        1693769.232
C_13a            3176145.272        1696219.002
C_13a            3176070.309        1696434.113
C_13a            3176062.401        1697069.414
C_14a            3177360.707        1695139.372
C_14a            3177356.773        1696412.077
C_14a            3177028.270        1696408.142
C_15a            3176340.001        1697072.030
C_15a            3176310.691        1697687.533
C105             3171846.398        1689804.085
C105-OVER        3171855.182        1689896.581
C120_Overflow    3169643.887        1691810.991
C123-OVER        3170290.850        1691519.525
C125-OVER        3170597.811        1691638.306
C127_Overflow    3170863.820        1691684.919
C129_Overflow    3171112.839        1691670.308
C135-OVER        3170087.259        1690967.362
C136             3169982.379        1690618.791
C136-OVER        3169966.955        1690655.807
C14th-OVER       3172721.477        1694315.918
C158_Overflow    3171866.470        1692663.957
C162-OVER        3170642.506        1690773.026
```

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

C164-OVER	3171084.576	1690951.567
C16th-OVER	3172958.498	1695370.037
C17th-OVER	3174255.876	1696031.201
C236_Overflow	3170752.103	1688794.835
C241_Overflow	3169955.112	1689061.177
C243_Overflow	3170418.668	1689355.982
C244_Overflow	3171004.212	1689480.004
C246_Overflow	3171246.156	1689677.218
C250_Overflow	3171196.249	1690045.332
C316-OVER	3168699.299	1686693.446
C319_Overflow	3169922.244	1687751.971
C320_Overflow	3170796.530	1688355.431
C321_Overflow	3170433.793	1686137.964
C330_Overflow	3170884.156	1686106.582
C342-OVER	3171171.416	1686864.657
C344-OVER	3172607.798	1687835.185
C373_Overflow	3171273.737	1688574.678
C375_Overflow	3171740.187	1688755.736
C376-OVER	3171834.094	1689242.828
C57_Overflow	3172177.409	1690105.872
C70-OVER	3174211.510	1692119.940
C71-OVER	3174717.402	1691465.983
C72	3173335.213	1692354.908
C73_Overlfow	3172565.113	1692506.003
CAR2	3175746.719	1694552.054
CColf-OVER	3172839.988	1694852.333
S_02a	3181468.641	1686779.095
S_02a	3181528.949	1686446.584
S_02a	3181541.989	1686348.787
S_02a	3181533.839	1686281.959
S_02a	3181512.650	1686234.690
S_02a	3181436.042	1686068.435
S_03a	3177069.391	1689978.300
S_05_07b	3179132.743	1691195.476
S_05_07b	3179326.084	1691652.464
S_05a	3179234.171	1687384.206
S_05a	3179303.252	1687583.772
S_05a	3179514.331	1688132.579
S_05a	3179563.548	1689187.428
S_05b	3179610.082	1689676.143
S_05c	3179115.166	1690193.617
S_05d	3178742.971	1689856.549
S_05d	3178558.754	1689802.156
S_06a	3182530.569	1687868.314
S_06a	3181468.453	1688716.080
S_06a	3181734.774	1689095.066
S_06a	3181745.698	1689613.975
S_06b	3180209.453	1689905.707
S_07e	3177671.816	1691781.168
S_08a	3180416.373	1691342.352
S_08a	3180060.941	1691530.777
S_08a	3179538.644	1691669.844
S_09a	3180891.830	1690539.534

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

S_09a	3181082.469	1690752.104
S_10a1	3178772.450	1691994.867
S_10a1	3178659.181	1692211.683
S_10c	3177680.886	1692440.532
S_10c	3177791.081	1692445.908
S_10c	3177796.456	1692838.309
S_10c	3177858.273	1692932.377
S_10d	3178049.098	1693322.091
S_10d	3177952.342	1693383.907
S_10e	3177360.510	1693638.048
S_10e	3177332.412	1694260.218
S_10e	3177240.090	1694412.750
S_10e	3177143.754	1694509.086
S_10e	3176774.467	1694649.576
S_10e	3176718.271	1694733.870
S_10f	3177899.689	1695066.590
S_11a	3178038.405	1693764.584
S_11a	3178018.645	1695050.566
S_13a	3176683.266	1695627.055
S_13a	3176683.665	1695634.637
S_13a	3176690.773	1695671.104
S_13b1	3176102.757	1696187.510
S_13b2	3176005.195	1697052.949
S_14a2	3177325.300	1696382.570
S_14a2	3176975.159	1696374.702
S_15	3175686.129	1697752.534
S_15	3175683.459	1698393.499
S_15	3175341.610	1698412.194
S_15	3175333.598	1699061.171
S_15a	3176351.603	1697097.283
S_15a	3176340.448	1697725.827
S_15b	3174604.636	1698350.559
S_Beeler	3174018.463	1692856.587
S_Beeler	3174022.231	1694003.333
C317_Overflow	3169000.267	1687073.398
C318_Overflow	3169453.276	1687333.709
C322_Overflow	3169172.681	1687404.703
C363_Overflow	3171868.299	1687641.707
C_EC_Colfax_Out	3176019.223	1695138.985
C_EC_Colfax_Out	3176034.944	1695767.840
C72_Overflow	3173307.491	1692407.553
C_04b	3180977.006	1686912.924
C_04b	3180859.404	1686989.973
C_04b	3179908.449	1686981.863
S_04a	3181064.194	1686264.084
S_04b	3181039.102	1686912.924
S_04b	3180905.279	1687036.609
S_04b	3180069.898	1687018.360
S_04b	3179875.246	1687016.333
S_04b	3179674.511	1687135.963
S_04b	3179441.335	1687135.963

Table E.1 – Existing Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
[BACKDROP]
FILE       "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\Background\Westerly_Creek_SWMM_Background.jpg"
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
[TITLE]
;;Project Title/Notes
Basis of model: Westerly Creek FHAD 100-year SWMM
Alternative Plan 6:
-48" SD in E 23rd Ave
-48" x 76" Elliptical SD in E 23rd Ave
-60" SD in E 22nd Ave
-54" SD in Dayton St/E 22nd Ave
-60" SD in E 17th Ave
-78" SD in Alton St/E 14th Ave/ Akron St
-Havana Park Pond
-Chesapeake Townhomes Pond
Pipe sizes increased to meet criteria for street flooding (<1') within Aurora for Westerly Creek OSP Alternatives Analysis
All alternatives recommended by the Denver SDMP are excluded from this model. See WesterlyCreek_SDMP_RevisedAlternatives100yr.inp for alternatives assessed within Denver.
04/2021 BHI Job # 20210239

[OPTIONS]
;;Option            Value
FLOW_UNITS          CFS
INFILTRATION        HORTON
FLOW_ROUTING        DYNWAVE
LINK_OFFSETS        DEPTH
MIN_SLOPE           0
ALLOW_PONDING       NO
SKIP_STEADY_STATE   NO

START_DATE          04/15/2021
START_TIME          00:00:00
REPORT_START_DATE   04/15/2021
REPORT_START_TIME   00:00:00
END_DATE            04/15/2021
END_TIME            23:00:00
SWEEP_START         01/01
SWEEP_END           12/31
DRY_DAYS            0
REPORT_STEP         00:01:00
WET_STEP            00:05:00
DRY_STEP            01:00:00
ROUTING_STEP        0:00:30
RULE_STEP           00:00:00

INERTIAL_DAMPING    FULL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP       0.75
LENGTHENING_STEP    0
MIN_SURFAREA        12.566
MAX_TRIALS          8
HEAD_TOLERANCE      0.005
SYS_FLOW_TOL        5
LAT_FLOW_TOL        5
MINIMUM_STEP        0.5
THREADS             4
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
D_10d            5337.92    0          0          0          0
D_10b            5352.3     1          0          0          0
E-J-10           5344       0          0          0          0
D_10c            5352       0          0          0          0
D_13a            5327.36    0          0          0          0
D_10_13_a        5321.51    0          0          0          0
D_16a            5302.18    0          0          0          0
D_16b            5304.9     0          0          0          0
J_15             5313.96    0          0          0          0
D_14a            5322.34    0          0          0          0
D_12_14          5349       0          0          0          0
J_AR1_b          5338.82    0          0          0          0
DIV72            5360.37    0          0          0          0
D_10_13_b        5331.2     0          0          0          0
D_AR2_b          5346.8     0          0          0          0
E-J-16_b         5312.265   0          0          0          0
E-J-16_a         5308.09    0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
D_AR2_a          5338.2     FREE                        NO
EC_Out_19thAv    5311.47    FREE                        NO
EC_Out_23rd      5298.8     NORMAL                      NO
EC_Out_23rd_OF   5305.8     NORMAL                      NO
J_17thAve_Out_OF 5322.84    FREE                        NO
J14th-DIV        5333.28    FREE                        NO
D_15a            5314.4     FREE                        NO

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
S_10e            D_10b            D_10d            2675.35    0.01       13.2       9.02       0          0
C_10c            D_10b            D_10d            2675.35    0.019      0          1          0          0
C_10c_2          D_10d            D_13a            671.79     0.019      0          7.2        0          0
d_10a            E-J-10           D_10d            48.16      0.01       0          0          0          0
J_EC_Colfax_Out  D_AR2_b          D_AR2_a          300        0.01       0          0.5        0          0
S_13a            D_10d            D_13a            671.79     0.01       9.03       12.96      0          0
S_10g            D_10c            D_10d            653.48     0.01       0          11.2       0          0
S_13_b1          D_13a            D_10_13_a        972        0.01       12.96      9.94       0          0
C_13a            D_13a            D_10_13_a        972        0.019      2          3          0          0
C_13a_2          D_10_13_a        EC_Out_19thAv    2300       0.019      1.9        0          0          0
S_13b2           D_10_13_a        J_15             1310       0.01       9.94       5.92       0          0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
S_15_a           D_16a           EC_Out_23rd_OF   812       0.01      5.95      0         0         0
C_15_a           D_16a           EC_Out_23rd      812       0.019     0.72      0         0         0
C_15_b           D_16b           D_16a            670       0.019     2.275     1.72      0         0
S_15_b           D_16b           D_16a            670       0.01      7.36      5.95      0         0
S_15_c           J_15            D_16b            1674      0.01      5.92      7.375     0         0
S_15a            D_14a           J_15             1640      0.01      14.53     5.92      0         0
S_10_13_b        D_10_13_b       J_17thAve_Out_OF 379       0.01      0         0         0         0
S_12_14          D_12_14         D_13a            400       0.01      0         12.96     0         0
S_AR1_a          J_AR1_b         J14th-DIV        720       0.01      0         0         0         0
S_AR1_c          DIV72           J_AR1_b          2454      0.01      0         0         0         0
S_10_13_a        D_10_13_a       D_10_13_b        1310      0.01      9.94      0         0         0
S_10i            D_10d           D_AR2_b          340       0.01      8.98      0         0         0
C_16a_1          E-J-16_b        D_16b            400       0.01      0         0         0         0
C_16a_2          E-J-16_a        D_16a            400       0.01      0         0         0         0
C_15a            D_14a           D_15a            1675      0.019     0         0         0         0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
S_10e            IRREGULAR    DelMarPkwy       0          0          0          1
C_10c            CIRCULAR     4                0          0          0          1
C_10c_2          CIRCULAR     4                0          0          0          1
d_10a            DUMMY        0                0          0          0          1
J_EC_Colfax_Out  IRREGULAR    50ftStreet       0          0          0          1
S_13a            IRREGULAR    50ftStreet       0          0          0          1
S_10g            IRREGULAR    Colfax           0          0          0          1
S_13_b1          IRREGULAR    DelMarPkwy       0          0          0          1
C_13a            CIRCULAR     4.5              0          0          0          1
C_13a_2          CIRCULAR     4.5              0          0          0          1
S_13b2           IRREGULAR    DelMarPkwy       0          0          0          1
S_15_a           IRREGULAR    36ftStreet       0          0          0          1
C_15_a           CIRCULAR     4                0          0          0          1
C_15_b           CIRCULAR     2.5              0          0          0          1
S_15_b           IRREGULAR    36ftStreet       0          0          0          1
S_15_c           IRREGULAR    36ftStreet       0          0          0          1
S_15a            IRREGULAR    50ftStreet       0          0          0          1
S_10_13_b        IRREGULAR    50ftStreet       0          0          0          1
S_12_14          IRREGULAR    50ftStreet       0          0          0          1
S_AR1_a          IRREGULAR    36ftStreet       0          0          0          1
S_AR1_c          IRREGULAR    36ftStreet       0          0          0          1
S_10_13_a        IRREGULAR    50ftStreet       0          0          0          1
S_10i            IRREGULAR    50ftStreet       0          0          0          1
C_16a_1          DUMMY        0                0          0          0          1
C_16a_2          DUMMY        0                0          0          0          1
C_15a            CIRCULAR     5.5              0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.1      0.1      0.02
X1 DelMarPkwy        15       4        88       0.0      0.0      0.0      0.0      0.0
GR 8        -16      1.07     -16      0.67     4        0        4        0.32     20
GR 0        36       0.67     36       0.87     46       0.67     56       0        56
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
GR 0.32     72       0        88       0.67     88       1.07     108      8        108
;
NC 0.05     0.05     0.02
X1 50ftStreet        9        30       80       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.27     0        0.67     30       0        30       0.5      55
GR 0        80       0.67     80       1.27     110      10       110
;
NC 0.02     0.02     0.02
X1 Colfax            12       5        87       0.0      0.0      0.0      0.0      0.0
GR 10       0        0.77     0        0.67     5        0        5        0.8      45
GR 3.3      45       3.3      47       0.8      47       0        87       0.67     87
GR 0.77     92       10       92
;
NC 0.05     0.05     0.02
X1 36ftStreet        9        50       86       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.67     0        0.67     50       0        50       0.36     68
GR 0        86       0.67     86       1.67     136      10       136

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
S_10_13_a        0          0          0          YES        0

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
D_10b            FLOW             D_10b            FLOW     1.0      1.0
E-J-10           FLOW             E-J-10           FLOW     1.0      1.0
D_10c            FLOW             D_10c            FLOW     1.0      1.0
D_14a            FLOW             D_14a            FLOW     1.0      1.0
D_12_14          FLOW             D_12_14          FLOW     1.0      1.0
DIV72            FLOW             DIV72            FLOW     1.0      1.0
E-J-16_b         FLOW             E-J-16_b         FLOW     1.0      1.0
E-J-16_a         FLOW             E-J-16_a         FLOW     1.0      1.0

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
D_10c                       0:05:00    0
D_10c                       0:10:00    0
D_10c                       0:15:00    0
D_10c                       0:20:00    0
D_10c                       0:25:00    0
D_10c                       0:30:00    0
D_10c                       0:35:00    0
D_10c                       0:40:00    1.66
D_10c                       0:45:00    29.79
D_10c                       0:50:00    71.06
D_10c                       0:55:00    79.94
D_10c                       1:00:00    81.24
D_10c                       1:05:00    82.32
D_10c                       1:10:00    81.48
D_10c                       1:15:00    78.35
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_10c	1:20:00	73.74
D_10c	1:25:00	67.34
D_10c	1:30:00	58.46
D_10c	1:35:00	49.94
D_10c	1:40:00	42.35
D_10c	1:45:00	34.99
D_10c	1:50:00	27.5
D_10c	1:55:00	18.93
D_10c	2:00:00	10.26
D_10c	2:05:00	4.29
D_10c	2:10:00	1.44
D_10c	2:15:00	0.71
D_10c	2:20:00	0.41
D_10c	2:25:00	0.26
D_10c	2:30:00	0.18
D_10c	2:35:00	0.13
D_10c	2:40:00	0.1
D_10c	2:45:00	0.08
D_10c	2:50:00	0.06
D_10c	2:55:00	0.05
D_10c	3:00:00	0.08
D_10c	3:05:00	0.06
D_10c	3:10:00	0.04
D_10c	3:15:00	0.03
D_10c	3:20:00	0.03
D_10c	3:25:00	0
D_10c	3:30:00	0
D_10c	3:35:00	0
D_10c	3:40:00	0
D_10c	3:45:00	0
D_10c	3:50:00	0
D_10c	3:55:00	0
D_10c	4:00:00	0
D_10c	4:05:00	0
D_10c	4:10:00	0
D_10c	4:15:00	0
D_10c	4:20:00	0
D_10c	4:25:00	0
D_10c	4:30:00	0
D_10c	4:35:00	0
D_10c	4:40:00	0
D_10c	4:45:00	0
D_10c	4:50:00	0
D_10c	4:55:00	0
D_10c	5:00:00	0
D_10c	5:05:00	0
D_10c	5:10:00	0
D_10c	5:15:00	0
D_10c	5:20:00	0
D_10c	5:25:00	0
D_10c	5:30:00	0
D_10c	5:35:00	0
D_10c	5:40:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    5:45:00    0
D_10c                    5:50:00    0
D_10c                    5:55:00    0
D_10c                    6:00:00    0
D_10c                    6:05:00    0
D_10c                    6:10:00    0
D_10c                    6:15:00    0
D_10c                    6:20:00    0
D_10c                    6:25:00    0
D_10c                    6:30:00    0
D_10c                    6:35:00    0
D_10c                    6:40:00    0
D_10c                    6:45:00    0
D_10c                    6:50:00    0
D_10c                    6:55:00    0
D_10c                    7:00:00    0
D_10c                    7:05:00    0
D_10c                    7:10:00    0
D_10c                    7:15:00    0
D_10c                    7:20:00    0
D_10c                    7:25:00    0
D_10c                    7:30:00    0
D_10c                    7:35:00    0
D_10c                    7:40:00    0
D_10c                    7:45:00    0
D_10c                    7:50:00    0
D_10c                    7:55:00    0
D_10c                    8:00:00    0
D_10c                    8:05:00    0
D_10c                    8:10:00    0
D_10c                    8:15:00    0
D_10c                    8:20:00    0
D_10c                    8:25:00    0
D_10c                    8:30:00    0
D_10c                    8:35:00    0
D_10c                    8:40:00    0
D_10c                    8:45:00    0
D_10c                    8:50:00    0
D_10c                    8:55:00    0
D_10c                    9:00:00    0
D_10c                    9:05:00    0
D_10c                    9:10:00    0
D_10c                    9:15:00    0
D_10c                    9:20:00    0
D_10c                    9:25:00    0
D_10c                    9:30:00    0
D_10c                    9:35:00    0
D_10c                    9:40:00    0
D_10c                    9:45:00    0
D_10c                    9:50:00    0
D_10c                    9:55:00    0
D_10c                    10:00:00   0
D_10c                    10:05:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    10:10:00   0
D_10c                    10:15:00   0
D_10c                    10:20:00   0
D_10c                    10:25:00   0
D_10c                    10:30:00   0
D_10c                    10:35:00   0
D_10c                    10:40:00   0
D_10c                    10:45:00   0
D_10c                    10:50:00   0
D_10c                    10:55:00   0
D_10c                    11:00:00   0
D_10c                    11:05:00   0
D_10c                    11:10:00   0
D_10c                    11:15:00   0
D_10c                    11:20:00   0
D_10c                    11:25:00   0
D_10c                    11:30:00   0
D_10c                    11:35:00   0
D_10c                    11:40:00   0
D_10c                    11:45:00   0
D_10c                    11:50:00   0
D_10c                    11:55:00   0
D_10c                    12:00:00   0
D_10c                    12:05:00   0
D_10c                    12:10:00   0
D_10c                    12:15:00   0
D_10c                    12:20:00   0
D_10c                    12:25:00   0
D_10c                    12:30:00   0
D_10c                    12:35:00   0
D_10c                    12:40:00   0
D_10c                    12:45:00   0
D_10c                    12:50:00   0
D_10c                    12:55:00   0
D_10c                    13:00:00   0
D_10c                    13:05:00   0
D_10c                    13:10:00   0
D_10c                    13:15:00   0
D_10c                    13:20:00   0
D_10c                    13:25:00   0
D_10c                    13:30:00   0
D_10c                    13:35:00   0
D_10c                    13:40:00   0
D_10c                    13:45:00   0
D_10c                    13:50:00   0
D_10c                    13:55:00   0
D_10c                    14:00:00   0
D_10c                    14:05:00   0
D_10c                    14:10:00   0
D_10c                    14:15:00   0
D_10c                    14:20:00   0
D_10c                    14:25:00   0
D_10c                    14:30:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    14:35:00   0
D_10c                    14:40:00   0
D_10c                    14:45:00   0
D_10c                    14:50:00   0
D_10c                    14:55:00   0
D_10c                    15:00:00   0
D_10c                    15:05:00   0
D_10c                    15:10:00   0
D_10c                    15:15:00   0
D_10c                    15:20:00   0
D_10c                    15:25:00   0
D_10c                    15:30:00   0
D_10c                    15:35:00   0
D_10c                    15:40:00   0
D_10c                    15:45:00   0
D_10c                    15:50:00   0
D_10c                    15:55:00   0
D_10c                    16:00:00   0
D_10c                    16:05:00   0
D_10c                    16:10:00   0
D_10c                    16:15:00   0
D_10c                    16:20:00   0
D_10c                    16:25:00   0
D_10c                    16:30:00   0
D_10c                    16:35:00   0
D_10c                    16:40:00   0
D_10c                    16:45:00   0
D_10c                    16:50:00   0
D_10c                    16:55:00   0
D_10c                    17:00:00   0
D_10c                    17:05:00   0
D_10c                    17:10:00   0
D_10c                    17:15:00   0
D_10c                    17:20:00   0
D_10c                    17:25:00   0
D_10c                    17:30:00   0
D_10c                    17:35:00   0
D_10c                    17:40:00   0
D_10c                    17:45:00   0
D_10c                    17:50:00   0
D_10c                    17:55:00   0
D_10c                    18:00:00   0
D_10c                    18:05:00   0
D_10c                    18:10:00   0
D_10c                    18:15:00   0
D_10c                    18:20:00   0
D_10c                    18:25:00   0
D_10c                    18:30:00   0
D_10c                    18:35:00   0
D_10c                    18:40:00   0
D_10c                    18:45:00   0
D_10c                    18:50:00   0
D_10c                    18:55:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    19:00:00   0
D_10c                    19:05:00   0
D_10c                    19:10:00   0
D_10c                    19:15:00   0
D_10c                    19:20:00   0
D_10c                    19:25:00   0
D_10c                    19:30:00   0
D_10c                    19:35:00   0
D_10c                    19:40:00   0
D_10c                    19:45:00   0
D_10c                    19:50:00   0
D_10c                    19:55:00   0
D_10c                    20:00:00   0
D_10c                    20:05:00   0
D_10c                    20:10:00   0
D_10c                    20:15:00   0
D_10c                    20:20:00   0
D_10c                    20:25:00   0
D_10c                    20:30:00   0
D_10c                    20:35:00   0
D_10c                    20:40:00   0
D_10c                    20:45:00   0
D_10c                    20:50:00   0
D_10c                    20:55:00   0
D_10c                    21:00:00   0
D_10c                    21:05:00   0
D_10c                    21:10:00   0
D_10c                    21:15:00   0
D_10c                    21:20:00   0
D_10c                    21:25:00   0
D_10c                    21:30:00   0
D_10c                    21:35:00   0
D_10c                    21:40:00   0
D_10c                    21:45:00   0
D_10c                    21:50:00   0
D_10c                    21:55:00   0
D_10c                    22:00:00   0
D_10c                    22:05:00   0
D_10c                    22:10:00   0
D_10c                    22:15:00   0
D_10c                    22:20:00   0
D_10c                    22:25:00   0
D_10c                    22:30:00   0
D_10c                    22:35:00   0
D_10c                    22:40:00   0
D_10c                    22:45:00   0
D_10c                    22:50:00   0
D_10c                    22:55:00   0
D_10c                    23:00:00   0
D_10c                    23:05:00   0
D_10c                    23:10:00   0
D_10c                    23:15:00   0
D_10c                    23:20:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    23:25:00   0
D_10c                    23:30:00   0
D_10c                    23:35:00   0
D_10c                    23:40:00   0
D_10c                    23:45:00   0
D_10c                    23:50:00   0
D_10c                    23:55:00   0
;
E-J-10                   0:05       0
E-J-10                   0:10       0
E-J-10                   0:15       0
E-J-10                   0:20       2.4
E-J-10                   0:25       8.84
E-J-10                   0:30       25.28
E-J-10                   0:35       71.04
E-J-10                   0:40       120.81
E-J-10                   0:45       148.23
E-J-10                   0:50       159.09
E-J-10                   0:55       159.62
E-J-10                   1:00       154.12
E-J-10                   1:05       148.01
E-J-10                   1:10       142.02
E-J-10                   1:15       133.51
E-J-10                   1:20       124.17
E-J-10                   1:25       114.38
E-J-10                   1:30       104.14
E-J-10                   1:35       94.26
E-J-10                   1:40       84.97
E-J-10                   1:45       76.14
E-J-10                   1:50       68.19
E-J-10                   1:55       62.2
E-J-10                   2:00       57.38
E-J-10                   2:05       53.18
E-J-10                   2:10       48.68
E-J-10                   2:15       43.85
E-J-10                   2:20       39.15
E-J-10                   2:25       34.71
E-J-10                   2:30       30.6
E-J-10                   2:35       26.7
E-J-10                   2:40       22.93
E-J-10                   2:45       19.25
E-J-10                   2:50       15.69
E-J-10                   2:55       12.28
E-J-10                   3:00       9.17
E-J-10                   3:05       6.85
E-J-10                   3:10       5.25
E-J-10                   3:15       4.06
E-J-10                   3:20       3.15
E-J-10                   3:25       2.45
E-J-10                   3:30       1.9
E-J-10                   3:35       1.48
E-J-10                   3:40       1.18
E-J-10                   3:45       0.94
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-10	3:50	0.76
E-J-10	3:55	0.59
E-J-10	4:00	0.45
E-J-10	4:05	0.33
E-J-10	4:10	0.23
E-J-10	4:15	0.14
E-J-10	4:20	0.08
E-J-10	4:25	0.03
E-J-10	4:30	0.01
E-J-10	4:35	0
E-J-10	4:40	0
E-J-10	4:45	0
E-J-10	4:50	0
E-J-10	4:55	0
E-J-10	5:00	0
E-J-10	5:05	0
E-J-10	5:10	0
E-J-10	5:15	0
E-J-10	5:20	0
E-J-10	5:25	0
E-J-10	5:30	0
E-J-10	5:35	0
E-J-10	5:40	0
E-J-10	5:45	0
E-J-10	5:50	0
E-J-10	5:55	0
E-J-10	6:00	0
E-J-10	6:05	0
E-J-10	6:10	0
E-J-10	6:15	0
E-J-10	6:20	0
E-J-10	6:25	0
E-J-10	6:30	0
E-J-10	6:35	0
E-J-10	6:40	0
E-J-10	6:45	0
E-J-10	6:50	0
E-J-10	6:55	0
E-J-10	7:00	0
E-J-10	7:05	0
E-J-10	7:10	0
E-J-10	7:15	0
E-J-10	7:20	0
E-J-10	7:25	0
E-J-10	7:30	0
E-J-10	7:35	0
E-J-10	7:40	0
E-J-10	7:45	0
E-J-10	7:50	0
E-J-10	7:55	0
E-J-10	8:00	0
E-J-10	8:05	0
E-J-10	8:10	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-10	8:15	0
E-J-10	8:20	0
E-J-10	8:25	0
E-J-10	8:30	0
E-J-10	8:35	0
E-J-10	8:40	0
E-J-10	8:45	0
E-J-10	8:50	0
E-J-10	8:55	0
E-J-10	9:00	0
E-J-10	9:05	0
E-J-10	9:10	0
E-J-10	9:15	0
E-J-10	9:20	0
E-J-10	9:25	0
E-J-10	9:30	0
E-J-10	9:35	0
E-J-10	9:40	0
E-J-10	9:45	0
E-J-10	9:50	0
E-J-10	9:55	0
E-J-10	10:00	0
E-J-10	10:05	0
E-J-10	10:10	0
E-J-10	10:15	0
E-J-10	10:20	0
E-J-10	10:25	0
E-J-10	10:30	0
E-J-10	10:35	0
E-J-10	10:40	0
E-J-10	10:45	0
E-J-10	10:50	0
E-J-10	10:55	0
E-J-10	11:00	0
E-J-10	11:05	0
E-J-10	11:10	0
E-J-10	11:15	0
E-J-10	11:20	0
E-J-10	11:25	0
E-J-10	11:30	0
E-J-10	11:35	0
E-J-10	11:40	0
E-J-10	11:45	0
E-J-10	11:50	0
E-J-10	11:55	0
E-J-10	12:00	0
E-J-10	12:05	0
E-J-10	12:10	0
E-J-10	12:15	0
E-J-10	12:20	0
E-J-10	12:25	0
E-J-10	12:30	0
E-J-10	12:35	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-10	12:40	0
E-J-10	12:45	0
E-J-10	12:50	0
E-J-10	12:55	0
E-J-10	13:00	0
E-J-10	13:05	0
E-J-10	13:10	0
E-J-10	13:15	0
E-J-10	13:20	0
E-J-10	13:25	0
E-J-10	13:30	0
E-J-10	13:35	0
E-J-10	13:40	0
E-J-10	13:45	0
E-J-10	13:50	0
E-J-10	13:55	0
E-J-10	14:00	0
E-J-10	14:05	0
E-J-10	14:10	0
E-J-10	14:15	0
E-J-10	14:20	0
E-J-10	14:25	0
E-J-10	14:30	0
E-J-10	14:35	0
E-J-10	14:40	0
E-J-10	14:45	0
E-J-10	14:50	0
E-J-10	14:55	0
E-J-10	15:00	0
E-J-10	15:05	0
E-J-10	15:10	0
E-J-10	15:15	0
E-J-10	15:20	0
E-J-10	15:25	0
E-J-10	15:30	0
E-J-10	15:35	0
E-J-10	15:40	0
E-J-10	15:45	0
E-J-10	15:50	0
E-J-10	15:55	0
E-J-10	16:00	0
E-J-10	16:05	0
E-J-10	16:10	0
E-J-10	16:15	0
E-J-10	16:20	0
E-J-10	16:25	0
E-J-10	16:30	0
E-J-10	16:35	0
E-J-10	16:40	0
E-J-10	16:45	0
E-J-10	16:50	0
E-J-10	16:55	0
E-J-10	17:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-10	17:05	0
E-J-10	17:10	0
E-J-10	17:15	0
E-J-10	17:20	0
E-J-10	17:25	0
E-J-10	17:30	0
E-J-10	17:35	0
E-J-10	17:40	0
E-J-10	17:45	0
E-J-10	17:50	0
E-J-10	17:55	0
E-J-10	18:00	0
E-J-10	18:05	0
E-J-10	18:10	0
E-J-10	18:15	0
E-J-10	18:20	0
E-J-10	18:25	0
E-J-10	18:30	0
E-J-10	18:35	0
E-J-10	18:40	0
E-J-10	18:45	0
E-J-10	18:50	0
E-J-10	18:55	0
E-J-10	19:00	0
E-J-10	19:05	0
E-J-10	19:10	0
E-J-10	19:15	0
E-J-10	19:20	0
E-J-10	19:25	0
E-J-10	19:30	0
E-J-10	19:35	0
E-J-10	19:40	0
E-J-10	19:45	0
E-J-10	19:50	0
E-J-10	19:55	0
E-J-10	20:00	0
E-J-10	20:05	0
E-J-10	20:10	0
E-J-10	20:15	0
E-J-10	20:20	0
E-J-10	20:25	0
E-J-10	20:30	0
E-J-10	20:35	0
E-J-10	20:40	0
E-J-10	20:45	0
E-J-10	20:50	0
E-J-10	20:55	0
E-J-10	21:00	0
E-J-10	21:05	0
E-J-10	21:10	0
E-J-10	21:15	0
E-J-10	21:20	0
E-J-10	21:25	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-10                  21:30      0
E-J-10                  21:35      0
E-J-10                  21:40      0
E-J-10                  21:45      0
E-J-10                  21:50      0
E-J-10                  21:55      0
E-J-10                  22:00      0
E-J-10                  22:05      0
E-J-10                  22:10      0
E-J-10                  22:15      0
E-J-10                  22:20      0
E-J-10                  22:25      0
E-J-10                  22:30      0
E-J-10                  22:35      0
E-J-10                  22:40      0
E-J-10                  22:45      0
E-J-10                  22:50      0
E-J-10                  22:55      0
E-J-10                  23:00      0
E-J-10                  23:05      0
E-J-10                  23:10      0
E-J-10                  23:15      0
E-J-10                  23:20      0
E-J-10                  23:25      0
E-J-10                  23:30      0
E-J-10                  23:35      0
E-J-10                  23:40      0
E-J-10                  23:45      0
E-J-10                  23:50      0
E-J-10                  23:55      0
;
D_12_14                 0:05:00    0
D_12_14                 0:10:00    0
D_12_14                 0:15:00    0
D_12_14                 0:20:00    0
D_12_14                 0:25:00    0
D_12_14                 0:30:00    0
D_12_14                 0:35:00    0
D_12_14                 0:40:00    0
D_12_14                 0:45:00    0.18
D_12_14                 0:50:00    6.42
D_12_14                 0:55:00    15.37
D_12_14                 1:00:00    17.95
D_12_14                 1:05:00    17.94
D_12_14                 1:10:00    18.11
D_12_14                 1:15:00    16.9
D_12_14                 1:20:00    14.83
D_12_14                 1:25:00    12.43
D_12_14                 1:30:00    10.19
D_12_14                 1:35:00    8.08
D_12_14                 1:40:00    6.14
D_12_14                 1:45:00    4.59
D_12_14                 1:50:00    3.21
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 1:55:00    2.74
D_12_14                 2:00:00    2
D_12_14                 2:05:00    1.32
D_12_14                 2:10:00    0.79
D_12_14                 2:15:00    0.42
D_12_14                 2:20:00    0.26
D_12_14                 2:25:00    0.17
D_12_14                 2:30:00    0.12
D_12_14                 2:35:00    0.09
D_12_14                 2:40:00    0.07
D_12_14                 2:45:00    0.05
D_12_14                 2:50:00    0.05
D_12_14                 2:55:00    0.04
D_12_14                 3:00:00    0.03
D_12_14                 3:05:00    0
D_12_14                 3:10:00    0
D_12_14                 3:15:00    0
D_12_14                 3:20:00    0
D_12_14                 3:25:00    0
D_12_14                 3:30:00    0
D_12_14                 3:35:00    0
D_12_14                 3:40:00    0
D_12_14                 3:45:00    0
D_12_14                 3:50:00    0
D_12_14                 3:55:00    0
D_12_14                 4:00:00    0
D_12_14                 4:05:00    0
D_12_14                 4:10:00    0
D_12_14                 4:15:00    0
D_12_14                 4:20:00    0
D_12_14                 4:25:00    0
D_12_14                 4:30:00    0
D_12_14                 4:35:00    0
D_12_14                 4:40:00    0
D_12_14                 4:45:00    0
D_12_14                 4:50:00    0
D_12_14                 4:55:00    0
D_12_14                 5:00:00    0
D_12_14                 5:05:00    0
D_12_14                 5:10:00    0
D_12_14                 5:15:00    0
D_12_14                 5:20:00    0
D_12_14                 5:25:00    0
D_12_14                 5:30:00    0
D_12_14                 5:35:00    0
D_12_14                 5:40:00    0
D_12_14                 5:45:00    0
D_12_14                 5:50:00    0
D_12_14                 5:55:00    0
D_12_14                 6:00:00    0
D_12_14                 6:05:00    0
D_12_14                 6:10:00    0
D_12_14                 6:15:00    0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 6:20:00    0
D_12_14                 6:25:00    0
D_12_14                 6:30:00    0
D_12_14                 6:35:00    0
D_12_14                 6:40:00    0
D_12_14                 6:45:00    0
D_12_14                 6:50:00    0
D_12_14                 6:55:00    0
D_12_14                 7:00:00    0
D_12_14                 7:05:00    0
D_12_14                 7:10:00    0
D_12_14                 7:15:00    0
D_12_14                 7:20:00    0
D_12_14                 7:25:00    0
D_12_14                 7:30:00    0
D_12_14                 7:35:00    0
D_12_14                 7:40:00    0
D_12_14                 7:45:00    0
D_12_14                 7:50:00    0
D_12_14                 7:55:00    0
D_12_14                 8:00:00    0
D_12_14                 8:05:00    0
D_12_14                 8:10:00    0
D_12_14                 8:15:00    0
D_12_14                 8:20:00    0
D_12_14                 8:25:00    0
D_12_14                 8:30:00    0
D_12_14                 8:35:00    0
D_12_14                 8:40:00    0
D_12_14                 8:45:00    0
D_12_14                 8:50:00    0
D_12_14                 8:55:00    0
D_12_14                 9:00:00    0
D_12_14                 9:05:00    0
D_12_14                 9:10:00    0
D_12_14                 9:15:00    0
D_12_14                 9:20:00    0
D_12_14                 9:25:00    0
D_12_14                 9:30:00    0
D_12_14                 9:35:00    0
D_12_14                 9:40:00    0
D_12_14                 9:45:00    0
D_12_14                 9:50:00    0
D_12_14                 9:55:00    0
D_12_14                 10:00:00   0
D_12_14                 10:05:00   0
D_12_14                 10:10:00   0
D_12_14                 10:15:00   0
D_12_14                 10:20:00   0
D_12_14                 10:25:00   0
D_12_14                 10:30:00   0
D_12_14                 10:35:00   0
D_12_14                 10:40:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 10:45:00   0
D_12_14                 10:50:00   0
D_12_14                 10:55:00   0
D_12_14                 11:00:00   0
D_12_14                 11:05:00   0
D_12_14                 11:10:00   0
D_12_14                 11:15:00   0
D_12_14                 11:20:00   0
D_12_14                 11:25:00   0
D_12_14                 11:30:00   0
D_12_14                 11:35:00   0
D_12_14                 11:40:00   0
D_12_14                 11:45:00   0
D_12_14                 11:50:00   0
D_12_14                 11:55:00   0
D_12_14                 12:00:00   0
D_12_14                 12:05:00   0
D_12_14                 12:10:00   0
D_12_14                 12:15:00   0
D_12_14                 12:20:00   0
D_12_14                 12:25:00   0
D_12_14                 12:30:00   0
D_12_14                 12:35:00   0
D_12_14                 12:40:00   0
D_12_14                 12:45:00   0
D_12_14                 12:50:00   0
D_12_14                 12:55:00   0
D_12_14                 13:00:00   0
D_12_14                 13:05:00   0
D_12_14                 13:10:00   0
D_12_14                 13:15:00   0
D_12_14                 13:20:00   0
D_12_14                 13:25:00   0
D_12_14                 13:30:00   0
D_12_14                 13:35:00   0
D_12_14                 13:40:00   0
D_12_14                 13:45:00   0
D_12_14                 13:50:00   0
D_12_14                 13:55:00   0
D_12_14                 14:00:00   0
D_12_14                 14:05:00   0
D_12_14                 14:10:00   0
D_12_14                 14:15:00   0
D_12_14                 14:20:00   0
D_12_14                 14:25:00   0
D_12_14                 14:30:00   0
D_12_14                 14:35:00   0
D_12_14                 14:40:00   0
D_12_14                 14:45:00   0
D_12_14                 14:50:00   0
D_12_14                 14:55:00   0
D_12_14                 15:00:00   0
D_12_14                 15:05:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 15:10:00   0
D_12_14                 15:15:00   0
D_12_14                 15:20:00   0
D_12_14                 15:25:00   0
D_12_14                 15:30:00   0
D_12_14                 15:35:00   0
D_12_14                 15:40:00   0
D_12_14                 15:45:00   0
D_12_14                 15:50:00   0
D_12_14                 15:55:00   0
D_12_14                 16:00:00   0
D_12_14                 16:05:00   0
D_12_14                 16:10:00   0
D_12_14                 16:15:00   0
D_12_14                 16:20:00   0
D_12_14                 16:25:00   0
D_12_14                 16:30:00   0
D_12_14                 16:35:00   0
D_12_14                 16:40:00   0
D_12_14                 16:45:00   0
D_12_14                 16:50:00   0
D_12_14                 16:55:00   0
D_12_14                 17:00:00   0
D_12_14                 17:05:00   0
D_12_14                 17:10:00   0
D_12_14                 17:15:00   0
D_12_14                 17:20:00   0
D_12_14                 17:25:00   0
D_12_14                 17:30:00   0
D_12_14                 17:35:00   0
D_12_14                 17:40:00   0
D_12_14                 17:45:00   0
D_12_14                 17:50:00   0
D_12_14                 17:55:00   0
D_12_14                 18:00:00   0
D_12_14                 18:05:00   0
D_12_14                 18:10:00   0
D_12_14                 18:15:00   0
D_12_14                 18:20:00   0
D_12_14                 18:25:00   0
D_12_14                 18:30:00   0
D_12_14                 18:35:00   0
D_12_14                 18:40:00   0
D_12_14                 18:45:00   0
D_12_14                 18:50:00   0
D_12_14                 18:55:00   0
D_12_14                 19:00:00   0
D_12_14                 19:05:00   0
D_12_14                 19:10:00   0
D_12_14                 19:15:00   0
D_12_14                 19:20:00   0
D_12_14                 19:25:00   0
D_12_14                 19:30:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 19:35:00   0
D_12_14                 19:40:00   0
D_12_14                 19:45:00   0
D_12_14                 19:50:00   0
D_12_14                 19:55:00   0
D_12_14                 20:00:00   0
D_12_14                 20:05:00   0
D_12_14                 20:10:00   0
D_12_14                 20:15:00   0
D_12_14                 20:20:00   0
D_12_14                 20:25:00   0
D_12_14                 20:30:00   0
D_12_14                 20:35:00   0
D_12_14                 20:40:00   0
D_12_14                 20:45:00   0
D_12_14                 20:50:00   0
D_12_14                 20:55:00   0
D_12_14                 21:00:00   0
D_12_14                 21:05:00   0
D_12_14                 21:10:00   0
D_12_14                 21:15:00   0
D_12_14                 21:20:00   0
D_12_14                 21:25:00   0
D_12_14                 21:30:00   0
D_12_14                 21:35:00   0
D_12_14                 21:40:00   0
D_12_14                 21:45:00   0
D_12_14                 21:50:00   0
D_12_14                 21:55:00   0
D_12_14                 22:00:00   0
D_12_14                 22:05:00   0
D_12_14                 22:10:00   0
D_12_14                 22:15:00   0
D_12_14                 22:20:00   0
D_12_14                 22:25:00   0
D_12_14                 22:30:00   0
D_12_14                 22:35:00   0
D_12_14                 22:40:00   0
D_12_14                 22:45:00   0
D_12_14                 22:50:00   0
D_12_14                 22:55:00   0
D_12_14                 23:00:00   0
D_12_14                 23:05:00   0
D_12_14                 23:10:00   0
D_12_14                 23:15:00   0
D_12_14                 23:20:00   0
D_12_14                 23:25:00   0
D_12_14                 23:30:00   0
D_12_14                 23:35:00   0
D_12_14                 23:40:00   0
D_12_14                 23:45:00   0
D_12_14                 23:50:00   0
D_12_14                 23:55:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
;
E-J-16_a                  0:05:00    0
E-J-16_a                  0:10:00    0
E-J-16_a                  0:15:00    0
E-J-16_a                  0:20:00    1.422
E-J-16_a                  0:25:00    5.4612
E-J-16_a                  0:30:00    13.2588
E-J-16_a                  0:35:00    32.94
E-J-16_a                  0:40:00    51.4656
E-J-16_a                  0:45:00    59.2956
E-J-16_a                  0:50:00    60.1956
E-J-16_a                  0:55:00    57.8772
E-J-16_a                  1:00:00    54.5688
E-J-16_a                  1:05:00    51.0768
E-J-16_a                  1:10:00    48.3696
E-J-16_a                  1:15:00    44.7084
E-J-16_a                  1:20:00    40.2732
E-J-16_a                  1:25:00    35.5428
E-J-16_a                  1:30:00    30.978
E-J-16_a                  1:35:00    27.2088
E-J-16_a                  1:40:00    24.3252
E-J-16_a                  1:45:00    22.0068
E-J-16_a                  1:50:00    19.89
E-J-16_a                  1:55:00    17.9928
E-J-16_a                  2:00:00    16.1928
E-J-16_a                  2:05:00    14.4972
E-J-16_a                  2:10:00    12.4848
E-J-16_a                  2:15:00    10.1916
E-J-16_a                  2:20:00    8.082
E-J-16_a                  2:25:00    6.1488
E-J-16_a                  2:30:00    4.7484
E-J-16_a                  2:35:00    3.6504
E-J-16_a                  2:40:00    2.8872
E-J-16_a                  2:45:00    2.25
E-J-16_a                  2:50:00    1.7532
E-J-16_a                  2:55:00    1.35
E-J-16_a                  3:00:00    1.044
E-J-16_a                  3:05:00    0.8244
E-J-16_a                  3:10:00    0.6696
E-J-16_a                  3:15:00    0.5364
E-J-16_a                  3:20:00    0.4248
E-J-16_a                  3:25:00    0.3276
E-J-16_a                  3:30:00    0.2412
E-J-16_a                  3:35:00    0.1692
E-J-16_a                  3:40:00    0.1116
E-J-16_a                  3:45:00    0.0648
E-J-16_a                  3:50:00    0.0324
E-J-16_a                  3:55:00    0.0108
E-J-16_a                  4:00:00    0.0036
E-J-16_a                  4:05:00    0
E-J-16_a                  4:10:00    0
E-J-16_a                  4:15:00    0
E-J-16_a                  4:20:00    0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_a	4:25:00	0
E-J-16_a	4:30:00	0
E-J-16_a	4:35:00	0
E-J-16_a	4:40:00	0
E-J-16_a	4:45:00	0
E-J-16_a	4:50:00	0
E-J-16_a	4:55:00	0
E-J-16_a	5:00:00	0
E-J-16_a	5:05:00	0
E-J-16_a	5:10:00	0
E-J-16_a	5:15:00	0
E-J-16_a	5:20:00	0
E-J-16_a	5:25:00	0
E-J-16_a	5:30:00	0
E-J-16_a	5:35:00	0
E-J-16_a	5:40:00	0
E-J-16_a	5:45:00	0
E-J-16_a	5:50:00	0
E-J-16_a	5:55:00	0
E-J-16_a	6:00:00	0
E-J-16_a	6:05:00	0
E-J-16_a	6:10:00	0
E-J-16_a	6:15:00	0
E-J-16_a	6:20:00	0
E-J-16_a	6:25:00	0
E-J-16_a	6:30:00	0
E-J-16_a	6:35:00	0
E-J-16_a	6:40:00	0
E-J-16_a	6:45:00	0
E-J-16_a	6:50:00	0
E-J-16_a	6:55:00	0
E-J-16_a	7:00:00	0
E-J-16_a	7:05:00	0
E-J-16_a	7:10:00	0
E-J-16_a	7:15:00	0
E-J-16_a	7:20:00	0
E-J-16_a	7:25:00	0
E-J-16_a	7:30:00	0
E-J-16_a	7:35:00	0
E-J-16_a	7:40:00	0
E-J-16_a	7:45:00	0
E-J-16_a	7:50:00	0
E-J-16_a	7:55:00	0
E-J-16_a	8:00:00	0
E-J-16_a	8:05:00	0
E-J-16_a	8:10:00	0
E-J-16_a	8:15:00	0
E-J-16_a	8:20:00	0
E-J-16_a	8:25:00	0
E-J-16_a	8:30:00	0
E-J-16_a	8:35:00	0
E-J-16_a	8:40:00	0
E-J-16_a	8:45:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_a                 8:50:00    0
E-J-16_a                 8:55:00    0
E-J-16_a                 9:00:00    0
E-J-16_a                 9:05:00    0
E-J-16_a                 9:10:00    0
E-J-16_a                 9:15:00    0
E-J-16_a                 9:20:00    0
E-J-16_a                 9:25:00    0
E-J-16_a                 9:30:00    0
E-J-16_a                 9:35:00    0
E-J-16_a                 9:40:00    0
E-J-16_a                 9:45:00    0
E-J-16_a                 9:50:00    0
E-J-16_a                 9:55:00    0
E-J-16_a                 10:00:00   0
E-J-16_a                 10:05:00   0
E-J-16_a                 10:10:00   0
E-J-16_a                 10:15:00   0
E-J-16_a                 10:20:00   0
E-J-16_a                 10:25:00   0
E-J-16_a                 10:30:00   0
E-J-16_a                 10:35:00   0
E-J-16_a                 10:40:00   0
E-J-16_a                 10:45:00   0
E-J-16_a                 10:50:00   0
E-J-16_a                 10:55:00   0
E-J-16_a                 11:00:00   0
E-J-16_a                 11:05:00   0
E-J-16_a                 11:10:00   0
E-J-16_a                 11:15:00   0
E-J-16_a                 11:20:00   0
E-J-16_a                 11:25:00   0
E-J-16_a                 11:30:00   0
E-J-16_a                 11:35:00   0
E-J-16_a                 11:40:00   0
E-J-16_a                 11:45:00   0
E-J-16_a                 11:50:00   0
E-J-16_a                 11:55:00   0
E-J-16_a                 12:00:00   0
E-J-16_a                 12:05:00   0
E-J-16_a                 12:10:00   0
E-J-16_a                 12:15:00   0
E-J-16_a                 12:20:00   0
E-J-16_a                 12:25:00   0
E-J-16_a                 12:30:00   0
E-J-16_a                 12:35:00   0
E-J-16_a                 12:40:00   0
E-J-16_a                 12:45:00   0
E-J-16_a                 12:50:00   0
E-J-16_a                 12:55:00   0
E-J-16_a                 13:00:00   0
E-J-16_a                 13:05:00   0
E-J-16_a                 13:10:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_a                  13:15:00   0
E-J-16_a                  13:20:00   0
E-J-16_a                  13:25:00   0
E-J-16_a                  13:30:00   0
E-J-16_a                  13:35:00   0
E-J-16_a                  13:40:00   0
E-J-16_a                  13:45:00   0
E-J-16_a                  13:50:00   0
E-J-16_a                  13:55:00   0
E-J-16_a                  14:00:00   0
E-J-16_a                  14:05:00   0
E-J-16_a                  14:10:00   0
E-J-16_a                  14:15:00   0
E-J-16_a                  14:20:00   0
E-J-16_a                  14:25:00   0
E-J-16_a                  14:30:00   0
E-J-16_a                  14:35:00   0
E-J-16_a                  14:40:00   0
E-J-16_a                  14:45:00   0
E-J-16_a                  14:50:00   0
E-J-16_a                  14:55:00   0
E-J-16_a                  15:00:00   0
E-J-16_a                  15:05:00   0
E-J-16_a                  15:10:00   0
E-J-16_a                  15:15:00   0
E-J-16_a                  15:20:00   0
E-J-16_a                  15:25:00   0
E-J-16_a                  15:30:00   0
E-J-16_a                  15:35:00   0
E-J-16_a                  15:40:00   0
E-J-16_a                  15:45:00   0
E-J-16_a                  15:50:00   0
E-J-16_a                  15:55:00   0
E-J-16_a                  16:00:00   0
E-J-16_a                  16:05:00   0
E-J-16_a                  16:10:00   0
E-J-16_a                  16:15:00   0
E-J-16_a                  16:20:00   0
E-J-16_a                  16:25:00   0
E-J-16_a                  16:30:00   0
E-J-16_a                  16:35:00   0
E-J-16_a                  16:40:00   0
E-J-16_a                  16:45:00   0
E-J-16_a                  16:50:00   0
E-J-16_a                  16:55:00   0
E-J-16_a                  17:00:00   0
E-J-16_a                  17:05:00   0
E-J-16_a                  17:10:00   0
E-J-16_a                  17:15:00   0
E-J-16_a                  17:20:00   0
E-J-16_a                  17:25:00   0
E-J-16_a                  17:30:00   0
E-J-16_a                  17:35:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_a                  17:40:00   0
E-J-16_a                  17:45:00   0
E-J-16_a                  17:50:00   0
E-J-16_a                  17:55:00   0
E-J-16_a                  18:00:00   0
E-J-16_a                  18:05:00   0
E-J-16_a                  18:10:00   0
E-J-16_a                  18:15:00   0
E-J-16_a                  18:20:00   0
E-J-16_a                  18:25:00   0
E-J-16_a                  18:30:00   0
E-J-16_a                  18:35:00   0
E-J-16_a                  18:40:00   0
E-J-16_a                  18:45:00   0
E-J-16_a                  18:50:00   0
E-J-16_a                  18:55:00   0
E-J-16_a                  19:00:00   0
E-J-16_a                  19:05:00   0
E-J-16_a                  19:10:00   0
E-J-16_a                  19:15:00   0
E-J-16_a                  19:20:00   0
E-J-16_a                  19:25:00   0
E-J-16_a                  19:30:00   0
E-J-16_a                  19:35:00   0
E-J-16_a                  19:40:00   0
E-J-16_a                  19:45:00   0
E-J-16_a                  19:50:00   0
E-J-16_a                  19:55:00   0
E-J-16_a                  20:00:00   0
E-J-16_a                  20:05:00   0
E-J-16_a                  20:10:00   0
E-J-16_a                  20:15:00   0
E-J-16_a                  20:20:00   0
E-J-16_a                  20:25:00   0
E-J-16_a                  20:30:00   0
E-J-16_a                  20:35:00   0
E-J-16_a                  20:40:00   0
E-J-16_a                  20:45:00   0
E-J-16_a                  20:50:00   0
E-J-16_a                  20:55:00   0
E-J-16_a                  21:00:00   0
E-J-16_a                  21:05:00   0
E-J-16_a                  21:10:00   0
E-J-16_a                  21:15:00   0
E-J-16_a                  21:20:00   0
E-J-16_a                  21:25:00   0
E-J-16_a                  21:30:00   0
E-J-16_a                  21:35:00   0
E-J-16_a                  21:40:00   0
E-J-16_a                  21:45:00   0
E-J-16_a                  21:50:00   0
E-J-16_a                  21:55:00   0
E-J-16_a                  22:00:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_a                  22:05:00   0
E-J-16_a                  22:10:00   0
E-J-16_a                  22:15:00   0
E-J-16_a                  22:20:00   0
E-J-16_a                  22:25:00   0
E-J-16_a                  22:30:00   0
E-J-16_a                  22:35:00   0
E-J-16_a                  22:40:00   0
E-J-16_a                  22:45:00   0
E-J-16_a                  22:50:00   0
E-J-16_a                  22:55:00   0
E-J-16_a                  23:00:00   0
E-J-16_a                  23:05:00   0
E-J-16_a                  23:10:00   0
E-J-16_a                  23:15:00   0
E-J-16_a                  23:20:00   0
E-J-16_a                  23:25:00   0
E-J-16_a                  23:30:00   0
E-J-16_a                  23:35:00   0
E-J-16_a                  23:40:00   0
E-J-16_a                  23:45:00   0
E-J-16_a                  23:50:00   0
E-J-16_a                  23:55:00   0
;
E-J-16_b                  0:05:00    0
E-J-16_b                  0:10:00    0
E-J-16_b                  0:15:00    0
E-J-16_b                  0:20:00    0.948
E-J-16_b                  0:25:00    3.6408
E-J-16_b                  0:30:00    8.8392
E-J-16_b                  0:35:00    21.96
E-J-16_b                  0:40:00    34.3104
E-J-16_b                  0:45:00    39.5304
E-J-16_b                  0:50:00    40.1304
E-J-16_b                  0:55:00    38.5848
E-J-16_b                  1:00:00    36.3792
E-J-16_b                  1:05:00    34.0512
E-J-16_b                  1:10:00    32.2464
E-J-16_b                  1:15:00    29.8056
E-J-16_b                  1:20:00    26.8488
E-J-16_b                  1:25:00    23.6952
E-J-16_b                  1:30:00    20.652
E-J-16_b                  1:35:00    18.1392
E-J-16_b                  1:40:00    16.2168
E-J-16_b                  1:45:00    14.6712
E-J-16_b                  1:50:00    13.26
E-J-16_b                  1:55:00    11.9952
E-J-16_b                  2:00:00    10.7952
E-J-16_b                  2:05:00    9.6648
E-J-16_b                  2:10:00    8.3232
E-J-16_b                  2:15:00    6.7944
E-J-16_b                  2:20:00    5.388
E-J-16_b                  2:25:00    4.0992
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_b	2:30:00	3.1656
E-J-16_b	2:35:00	2.4336
E-J-16_b	2:40:00	1.9248
E-J-16_b	2:45:00	1.5
E-J-16_b	2:50:00	1.1688
E-J-16_b	2:55:00	0.9
E-J-16_b	3:00:00	0.696
E-J-16_b	3:05:00	0.5496
E-J-16_b	3:10:00	0.4464
E-J-16_b	3:15:00	0.3576
E-J-16_b	3:20:00	0.2832
E-J-16_b	3:25:00	0.2184
E-J-16_b	3:30:00	0.1608
E-J-16_b	3:35:00	0.1128
E-J-16_b	3:40:00	0.0744
E-J-16_b	3:45:00	0.0432
E-J-16_b	3:50:00	0.0216
E-J-16_b	3:55:00	0.0072
E-J-16_b	4:00:00	0.0024
E-J-16_b	4:05:00	0
E-J-16_b	4:10:00	0
E-J-16_b	4:15:00	0
E-J-16_b	4:20:00	0
E-J-16_b	4:25:00	0
E-J-16_b	4:30:00	0
E-J-16_b	4:35:00	0
E-J-16_b	4:40:00	0
E-J-16_b	4:45:00	0
E-J-16_b	4:50:00	0
E-J-16_b	4:55:00	0
E-J-16_b	5:00:00	0
E-J-16_b	5:05:00	0
E-J-16_b	5:10:00	0
E-J-16_b	5:15:00	0
E-J-16_b	5:20:00	0
E-J-16_b	5:25:00	0
E-J-16_b	5:30:00	0
E-J-16_b	5:35:00	0
E-J-16_b	5:40:00	0
E-J-16_b	5:45:00	0
E-J-16_b	5:50:00	0
E-J-16_b	5:55:00	0
E-J-16_b	6:00:00	0
E-J-16_b	6:05:00	0
E-J-16_b	6:10:00	0
E-J-16_b	6:15:00	0
E-J-16_b	6:20:00	0
E-J-16_b	6:25:00	0
E-J-16_b	6:30:00	0
E-J-16_b	6:35:00	0
E-J-16_b	6:40:00	0
E-J-16_b	6:45:00	0
E-J-16_b	6:50:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_b	6:55:00	0
E-J-16_b	7:00:00	0
E-J-16_b	7:05:00	0
E-J-16_b	7:10:00	0
E-J-16_b	7:15:00	0
E-J-16_b	7:20:00	0
E-J-16_b	7:25:00	0
E-J-16_b	7:30:00	0
E-J-16_b	7:35:00	0
E-J-16_b	7:40:00	0
E-J-16_b	7:45:00	0
E-J-16_b	7:50:00	0
E-J-16_b	7:55:00	0
E-J-16_b	8:00:00	0
E-J-16_b	8:05:00	0
E-J-16_b	8:10:00	0
E-J-16_b	8:15:00	0
E-J-16_b	8:20:00	0
E-J-16_b	8:25:00	0
E-J-16_b	8:30:00	0
E-J-16_b	8:35:00	0
E-J-16_b	8:40:00	0
E-J-16_b	8:45:00	0
E-J-16_b	8:50:00	0
E-J-16_b	8:55:00	0
E-J-16_b	9:00:00	0
E-J-16_b	9:05:00	0
E-J-16_b	9:10:00	0
E-J-16_b	9:15:00	0
E-J-16_b	9:20:00	0
E-J-16_b	9:25:00	0
E-J-16_b	9:30:00	0
E-J-16_b	9:35:00	0
E-J-16_b	9:40:00	0
E-J-16_b	9:45:00	0
E-J-16_b	9:50:00	0
E-J-16_b	9:55:00	0
E-J-16_b	10:00:00	0
E-J-16_b	10:05:00	0
E-J-16_b	10:10:00	0
E-J-16_b	10:15:00	0
E-J-16_b	10:20:00	0
E-J-16_b	10:25:00	0
E-J-16_b	10:30:00	0
E-J-16_b	10:35:00	0
E-J-16_b	10:40:00	0
E-J-16_b	10:45:00	0
E-J-16_b	10:50:00	0
E-J-16_b	10:55:00	0
E-J-16_b	11:00:00	0
E-J-16_b	11:05:00	0
E-J-16_b	11:10:00	0
E-J-16_b	11:15:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_b                 11:20:00   0
E-J-16_b                 11:25:00   0
E-J-16_b                 11:30:00   0
E-J-16_b                 11:35:00   0
E-J-16_b                 11:40:00   0
E-J-16_b                 11:45:00   0
E-J-16_b                 11:50:00   0
E-J-16_b                 11:55:00   0
E-J-16_b                 12:00:00   0
E-J-16_b                 12:05:00   0
E-J-16_b                 12:10:00   0
E-J-16_b                 12:15:00   0
E-J-16_b                 12:20:00   0
E-J-16_b                 12:25:00   0
E-J-16_b                 12:30:00   0
E-J-16_b                 12:35:00   0
E-J-16_b                 12:40:00   0
E-J-16_b                 12:45:00   0
E-J-16_b                 12:50:00   0
E-J-16_b                 12:55:00   0
E-J-16_b                 13:00:00   0
E-J-16_b                 13:05:00   0
E-J-16_b                 13:10:00   0
E-J-16_b                 13:15:00   0
E-J-16_b                 13:20:00   0
E-J-16_b                 13:25:00   0
E-J-16_b                 13:30:00   0
E-J-16_b                 13:35:00   0
E-J-16_b                 13:40:00   0
E-J-16_b                 13:45:00   0
E-J-16_b                 13:50:00   0
E-J-16_b                 13:55:00   0
E-J-16_b                 14:00:00   0
E-J-16_b                 14:05:00   0
E-J-16_b                 14:10:00   0
E-J-16_b                 14:15:00   0
E-J-16_b                 14:20:00   0
E-J-16_b                 14:25:00   0
E-J-16_b                 14:30:00   0
E-J-16_b                 14:35:00   0
E-J-16_b                 14:40:00   0
E-J-16_b                 14:45:00   0
E-J-16_b                 14:50:00   0
E-J-16_b                 14:55:00   0
E-J-16_b                 15:00:00   0
E-J-16_b                 15:05:00   0
E-J-16_b                 15:10:00   0
E-J-16_b                 15:15:00   0
E-J-16_b                 15:20:00   0
E-J-16_b                 15:25:00   0
E-J-16_b                 15:30:00   0
E-J-16_b                 15:35:00   0
E-J-16_b                 15:40:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_b                  15:45:00   0
E-J-16_b                  15:50:00   0
E-J-16_b                  15:55:00   0
E-J-16_b                  16:00:00   0
E-J-16_b                  16:05:00   0
E-J-16_b                  16:10:00   0
E-J-16_b                  16:15:00   0
E-J-16_b                  16:20:00   0
E-J-16_b                  16:25:00   0
E-J-16_b                  16:30:00   0
E-J-16_b                  16:35:00   0
E-J-16_b                  16:40:00   0
E-J-16_b                  16:45:00   0
E-J-16_b                  16:50:00   0
E-J-16_b                  16:55:00   0
E-J-16_b                  17:00:00   0
E-J-16_b                  17:05:00   0
E-J-16_b                  17:10:00   0
E-J-16_b                  17:15:00   0
E-J-16_b                  17:20:00   0
E-J-16_b                  17:25:00   0
E-J-16_b                  17:30:00   0
E-J-16_b                  17:35:00   0
E-J-16_b                  17:40:00   0
E-J-16_b                  17:45:00   0
E-J-16_b                  17:50:00   0
E-J-16_b                  17:55:00   0
E-J-16_b                  18:00:00   0
E-J-16_b                  18:05:00   0
E-J-16_b                  18:10:00   0
E-J-16_b                  18:15:00   0
E-J-16_b                  18:20:00   0
E-J-16_b                  18:25:00   0
E-J-16_b                  18:30:00   0
E-J-16_b                  18:35:00   0
E-J-16_b                  18:40:00   0
E-J-16_b                  18:45:00   0
E-J-16_b                  18:50:00   0
E-J-16_b                  18:55:00   0
E-J-16_b                  19:00:00   0
E-J-16_b                  19:05:00   0
E-J-16_b                  19:10:00   0
E-J-16_b                  19:15:00   0
E-J-16_b                  19:20:00   0
E-J-16_b                  19:25:00   0
E-J-16_b                  19:30:00   0
E-J-16_b                  19:35:00   0
E-J-16_b                  19:40:00   0
E-J-16_b                  19:45:00   0
E-J-16_b                  19:50:00   0
E-J-16_b                  19:55:00   0
E-J-16_b                  20:00:00   0
E-J-16_b                  20:05:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_b                  20:10:00   0
E-J-16_b                  20:15:00   0
E-J-16_b                  20:20:00   0
E-J-16_b                  20:25:00   0
E-J-16_b                  20:30:00   0
E-J-16_b                  20:35:00   0
E-J-16_b                  20:40:00   0
E-J-16_b                  20:45:00   0
E-J-16_b                  20:50:00   0
E-J-16_b                  20:55:00   0
E-J-16_b                  21:00:00   0
E-J-16_b                  21:05:00   0
E-J-16_b                  21:10:00   0
E-J-16_b                  21:15:00   0
E-J-16_b                  21:20:00   0
E-J-16_b                  21:25:00   0
E-J-16_b                  21:30:00   0
E-J-16_b                  21:35:00   0
E-J-16_b                  21:40:00   0
E-J-16_b                  21:45:00   0
E-J-16_b                  21:50:00   0
E-J-16_b                  21:55:00   0
E-J-16_b                  22:00:00   0
E-J-16_b                  22:05:00   0
E-J-16_b                  22:10:00   0
E-J-16_b                  22:15:00   0
E-J-16_b                  22:20:00   0
E-J-16_b                  22:25:00   0
E-J-16_b                  22:30:00   0
E-J-16_b                  22:35:00   0
E-J-16_b                  22:40:00   0
E-J-16_b                  22:45:00   0
E-J-16_b                  22:50:00   0
E-J-16_b                  22:55:00   0
E-J-16_b                  23:00:00   0
E-J-16_b                  23:05:00   0
E-J-16_b                  23:10:00   0
E-J-16_b                  23:15:00   0
E-J-16_b                  23:20:00   0
E-J-16_b                  23:25:00   0
E-J-16_b                  23:30:00   0
E-J-16_b                  23:35:00   0
E-J-16_b                  23:40:00   0
E-J-16_b                  23:45:00   0
E-J-16_b                  23:50:00   0
E-J-16_b                  23:55:00   0
;
D_10b                     0:05:00    0
D_10b                     0:10:00    0
D_10b                     0:15:00    0
D_10b                     0:20:00    0
D_10b                     0:25:00    0
D_10b                     0:30:00    0.17
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_10b	0:35:00	4.08
D_10b	0:40:00	24.22
D_10b	0:45:00	52.77
D_10b	0:50:00	132.16
D_10b	0:55:00	185.9
D_10b	1:00:00	252.33
D_10b	1:05:00	439.44
D_10b	1:10:00	693.16
D_10b	1:15:00	834.67
D_10b	1:20:00	833.39
D_10b	1:25:00	795.51
D_10b	1:30:00	741.23
D_10b	1:35:00	682.99
D_10b	1:40:00	626.94
D_10b	1:45:00	571.32
D_10b	1:50:00	514.84
D_10b	1:55:00	458.72
D_10b	2:00:00	406.01
D_10b	2:05:00	356.08
D_10b	2:10:00	310.54
D_10b	2:15:00	270.34
D_10b	2:20:00	233.68
D_10b	2:25:00	203.05
D_10b	2:30:00	178.83
D_10b	2:35:00	157.3
D_10b	2:40:00	138.5
D_10b	2:45:00	122.38
D_10b	2:50:00	107.65
D_10b	2:55:00	94.3
D_10b	3:00:00	82.08
D_10b	3:05:00	71.63
D_10b	3:10:00	63.47
D_10b	3:15:00	57.54
D_10b	3:20:00	51.63
D_10b	3:25:00	44.17
D_10b	3:30:00	38.58
D_10b	3:35:00	35.8
D_10b	3:40:00	34.13
D_10b	3:45:00	32.81
D_10b	3:50:00	31.55
D_10b	3:55:00	30.48
D_10b	4:00:00	29.41
D_10b	4:05:00	28.35
D_10b	4:10:00	27.31
D_10b	4:15:00	26.35
D_10b	4:20:00	25.27
D_10b	4:25:00	24.18
D_10b	4:30:00	23.27
D_10b	4:35:00	22.34
D_10b	4:40:00	21.76
D_10b	4:45:00	21.28
D_10b	4:50:00	20.91
D_10b	4:55:00	20.57

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_10b	5:00:00	20.25
D_10b	5:05:00	19.95
D_10b	5:10:00	19.8
D_10b	5:15:00	19.52
D_10b	5:20:00	19.34
D_10b	5:25:00	19.14
D_10b	5:30:00	18.9
D_10b	5:35:00	18.72
D_10b	5:40:00	18.59
D_10b	5:45:00	18.4
D_10b	5:50:00	18.22
D_10b	5:55:00	18.12
D_10b	6:00:00	18.01
D_10b	6:05:00	17.78
D_10b	6:10:00	17.6
D_10b	6:15:00	17.43
D_10b	6:20:00	17.18
D_10b	6:25:00	17.04
D_10b	6:30:00	16.9
D_10b	6:35:00	16.76
D_10b	6:40:00	16.52
D_10b	6:45:00	16.33
D_10b	6:50:00	16.23
D_10b	6:55:00	16.04
D_10b	7:00:00	15.83
D_10b	7:05:00	15.63
D_10b	7:10:00	15.47
D_10b	7:15:00	15.25
D_10b	7:20:00	15.06
D_10b	7:25:00	14.78
D_10b	7:30:00	14.62
D_10b	7:35:00	14.37
D_10b	7:40:00	14.18
D_10b	7:45:00	13.91
D_10b	7:50:00	13.68
D_10b	7:55:00	13.44
D_10b	8:00:00	13.1
D_10b	8:05:00	12.82
D_10b	8:10:00	12.57
D_10b	8:15:00	12.2
D_10b	8:20:00	11.86
D_10b	8:25:00	11.49
D_10b	8:30:00	11.01
D_10b	8:35:00	10.57
D_10b	8:40:00	10.12
D_10b	8:45:00	9.51
D_10b	8:50:00	8.97
D_10b	8:55:00	8.32
D_10b	9:00:00	7.51
D_10b	9:05:00	6.64
D_10b	9:10:00	5.78
D_10b	9:15:00	4.99
D_10b	9:20:00	4.32

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_10b	9:25:00	3.68
D_10b	9:30:00	3.08
D_10b	9:35:00	2.62
D_10b	9:40:00	2.18
D_10b	9:45:00	1.78
D_10b	9:50:00	1.46
D_10b	9:55:00	1.18
D_10b	10:00:00	0.92
D_10b	10:05:00	0.72
D_10b	10:10:00	0.57
D_10b	10:15:00	0.44
D_10b	10:20:00	0.33
D_10b	10:25:00	0.25
D_10b	10:30:00	0.18
D_10b	10:35:00	0.13
D_10b	10:40:00	0.1
D_10b	10:45:00	0.07
D_10b	10:50:00	0.05
D_10b	10:55:00	0.03
D_10b	11:00:00	0.02
D_10b	11:05:00	0.02
D_10b	11:10:00	0.01
D_10b	11:15:00	0.01
D_10b	11:20:00	0.01
D_10b	11:25:00	0.01
D_10b	11:30:00	0.01
D_10b	11:35:00	0
D_10b	11:40:00	0
D_10b	11:45:00	0
D_10b	11:50:00	0
D_10b	11:55:00	0
D_10b	12:00:00	0
D_10b	12:05:00	0
D_10b	12:10:00	0
D_10b	12:15:00	0
D_10b	12:20:00	0
D_10b	12:25:00	0
D_10b	12:30:00	0
D_10b	12:35:00	0
D_10b	12:40:00	0
D_10b	12:45:00	0
D_10b	12:50:00	0
D_10b	12:55:00	0
D_10b	13:00:00	0
D_10b	13:05:00	0
D_10b	13:10:00	0
D_10b	13:15:00	0
D_10b	13:20:00	0
D_10b	13:25:00	0
D_10b	13:30:00	0
D_10b	13:35:00	0
D_10b	13:40:00	0
D_10b	13:45:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10b                    13:50:00   0
D_10b                    13:55:00   0
D_10b                    14:00:00   0
D_10b                    14:05:00   0
D_10b                    14:10:00   0
D_10b                    14:15:00   0
D_10b                    14:20:00   0
D_10b                    14:25:00   0
D_10b                    14:30:00   0
D_10b                    14:35:00   0
D_10b                    14:40:00   0
D_10b                    14:45:00   0
D_10b                    14:50:00   0
D_10b                    14:55:00   0
D_10b                    15:00:00   0
D_10b                    15:05:00   0
D_10b                    15:10:00   0
D_10b                    15:15:00   0
D_10b                    15:20:00   0
D_10b                    15:25:00   0
D_10b                    15:30:00   0
D_10b                    15:35:00   0
D_10b                    15:40:00   0
D_10b                    15:45:00   0
D_10b                    15:50:00   0
D_10b                    15:55:00   0
D_10b                    16:00:00   0
D_10b                    16:05:00   0
D_10b                    16:10:00   0
D_10b                    16:15:00   0
D_10b                    16:20:00   0
D_10b                    16:25:00   0
D_10b                    16:30:00   0
D_10b                    16:35:00   0
D_10b                    16:40:00   0
D_10b                    16:45:00   0
D_10b                    16:50:00   0
D_10b                    16:55:00   0
D_10b                    17:00:00   0
D_10b                    17:05:00   0
D_10b                    17:10:00   0
D_10b                    17:15:00   0
D_10b                    17:20:00   0
D_10b                    17:25:00   0
D_10b                    17:30:00   0
D_10b                    17:35:00   0
D_10b                    17:40:00   0
D_10b                    17:45:00   0
D_10b                    17:50:00   0
D_10b                    17:55:00   0
D_10b                    18:00:00   0
D_10b                    18:05:00   0
D_10b                    18:10:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10b                    18:15:00   0
D_10b                    18:20:00   0
D_10b                    18:25:00   0
D_10b                    18:30:00   0
D_10b                    18:35:00   0
D_10b                    18:40:00   0
D_10b                    18:45:00   0
D_10b                    18:50:00   0
D_10b                    18:55:00   0
D_10b                    19:00:00   0
D_10b                    19:05:00   0
D_10b                    19:10:00   0
D_10b                    19:15:00   0
D_10b                    19:20:00   0
D_10b                    19:25:00   0
D_10b                    19:30:00   0
D_10b                    19:35:00   0
D_10b                    19:40:00   0
D_10b                    19:45:00   0
D_10b                    19:50:00   0
D_10b                    19:55:00   0
D_10b                    20:00:00   0
D_10b                    20:05:00   0
D_10b                    20:10:00   0
D_10b                    20:15:00   0
D_10b                    20:20:00   0
D_10b                    20:25:00   0
D_10b                    20:30:00   0
D_10b                    20:35:00   0
D_10b                    20:40:00   0
D_10b                    20:45:00   0
D_10b                    20:50:00   0
D_10b                    20:55:00   0
D_10b                    21:00:00   0
D_10b                    21:05:00   0
D_10b                    21:10:00   0
D_10b                    21:15:00   0
D_10b                    21:20:00   0
D_10b                    21:25:00   0
D_10b                    21:30:00   0
D_10b                    21:35:00   0
D_10b                    21:40:00   0
D_10b                    21:45:00   0
D_10b                    21:50:00   0
D_10b                    21:55:00   0
D_10b                    22:00:00   0
D_10b                    22:05:00   0
D_10b                    22:10:00   0
D_10b                    22:15:00   0
D_10b                    22:20:00   0
D_10b                    22:25:00   0
D_10b                    22:30:00   0
D_10b                    22:35:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10b                    22:40:00   0
D_10b                    22:45:00   0
D_10b                    22:50:00   0
D_10b                    22:55:00   0
D_10b                    23:00:00   0
D_10b                    23:05:00   0
D_10b                    23:10:00   0
D_10b                    23:15:00   0
D_10b                    23:20:00   0
D_10b                    23:25:00   0
D_10b                    23:30:00   0
D_10b                    23:35:00   0
D_10b                    23:40:00   0
D_10b                    23:45:00   0
D_10b                    23:50:00   0
D_10b                    23:55:00   0
;
DIV72                    0:05:00    0
DIV72                    0:10:00    0
DIV72                    0:15:00    0
DIV72                    0:20:00    0
DIV72                    0:25:00    0
DIV72                    0:30:00    0
DIV72                    0:35:00    0
DIV72                    0:40:00    34.04
DIV72                    0:45:00    144.91
DIV72                    0:50:00    237.28
DIV72                    0:55:00    320.37
DIV72                    1:00:00    402.63
DIV72                    1:05:00    448.94
DIV72                    1:10:00    460.14
DIV72                    1:15:00    450.27
DIV72                    1:20:00    429.04
DIV72                    1:25:00    399.52
DIV72                    1:30:00    364.18
DIV72                    1:35:00    322.85
DIV72                    1:40:00    274.85
DIV72                    1:45:00    223.42
DIV72                    1:50:00    173.97
DIV72                    1:55:00    127.78
DIV72                    2:00:00    89.03
DIV72                    2:05:00    59.5
DIV72                    2:10:00    43.89
DIV72                    2:15:00    26.3
DIV72                    2:20:00    14.8
DIV72                    2:25:00    9.5
DIV72                    2:30:00    6.66
DIV72                    2:35:00    4.9
DIV72                    2:40:00    3.72
DIV72                    2:45:00    2.91
DIV72                    2:50:00    2.18
DIV72                    2:55:00    1.61
DIV72                    3:00:00    1.23
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

DIV72	3:05:00	0.97
DIV72	3:10:00	0.78
DIV72	3:15:00	0.64
DIV72	3:20:00	0.54
DIV72	3:25:00	0.46
DIV72	3:30:00	0.39
DIV72	3:35:00	0.34
DIV72	3:40:00	0.3
DIV72	3:45:00	0.26
DIV72	3:50:00	0.23
DIV72	3:55:00	0.2
DIV72	4:00:00	0.18
DIV72	4:05:00	0.16
DIV72	4:10:00	0.15
DIV72	4:15:00	0.13
DIV72	4:20:00	0.12
DIV72	4:25:00	0.11
DIV72	4:30:00	0.1
DIV72	4:35:00	0.09
DIV72	4:40:00	0.09
DIV72	4:45:00	0.08
DIV72	4:50:00	0.07
DIV72	4:55:00	0.07
DIV72	5:00:00	0.06
DIV72	5:05:00	0.06
DIV72	5:10:00	0.06
DIV72	5:15:00	0.05
DIV72	5:20:00	0.05
DIV72	5:25:00	0.05
DIV72	5:30:00	0.04
DIV72	5:35:00	0.04
DIV72	5:40:00	0.04
DIV72	5:45:00	0.04
DIV72	5:50:00	0.04
DIV72	5:55:00	0.03
DIV72	6:00:00	0.03
DIV72	6:05:00	0.03
DIV72	6:10:00	0.03
DIV72	6:15:00	0.03
DIV72	6:20:00	0.03
DIV72	6:25:00	0.02
DIV72	6:30:00	0.02
DIV72	6:35:00	0.02
DIV72	6:40:00	0.02
DIV72	6:45:00	0.02
DIV72	6:50:00	0.02
DIV72	6:55:00	0.02
DIV72	7:00:00	0.02
DIV72	7:05:00	0.02
DIV72	7:10:00	0
DIV72	7:15:00	0
DIV72	7:20:00	0
DIV72	7:25:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
DIV72                    7:30:00    0
DIV72                    7:35:00    0
DIV72                    7:40:00    0
DIV72                    7:45:00    0
DIV72                    7:50:00    0
DIV72                    7:55:00    0
DIV72                    8:00:00    0
DIV72                    8:05:00    0
DIV72                    8:10:00    0
DIV72                    8:15:00    0
DIV72                    8:20:00    0
DIV72                    8:25:00    0
DIV72                    8:30:00    0
DIV72                    8:35:00    0
DIV72                    8:40:00    0
DIV72                    8:45:00    0
DIV72                    8:50:00    0
DIV72                    8:55:00    0
DIV72                    9:00:00    0
DIV72                    9:05:00    0
DIV72                    9:10:00    0
DIV72                    9:15:00    0
DIV72                    9:20:00    0
DIV72                    9:25:00    0
DIV72                    9:30:00    0
DIV72                    9:35:00    0
DIV72                    9:40:00    0
DIV72                    9:45:00    0
DIV72                    9:50:00    0
DIV72                    9:55:00    0
DIV72                    10:00:00   0
DIV72                    10:05:00   0
DIV72                    10:10:00   0
DIV72                    10:15:00   0
DIV72                    10:20:00   0
DIV72                    10:25:00   0
DIV72                    10:30:00   0
DIV72                    10:35:00   0
DIV72                    10:40:00   0
DIV72                    10:45:00   0
DIV72                    10:50:00   0
DIV72                    10:55:00   0
DIV72                    11:00:00   0
DIV72                    11:05:00   0
DIV72                    11:10:00   0
DIV72                    11:15:00   0
DIV72                    11:20:00   0
DIV72                    11:25:00   0
DIV72                    11:30:00   0
DIV72                    11:35:00   0
DIV72                    11:40:00   0
DIV72                    11:45:00   0
DIV72                    11:50:00   0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
DIV72                    11:55:00   0
DIV72                    12:00:00   0
DIV72                    12:05:00   0
DIV72                    12:10:00   0
DIV72                    12:15:00   0
DIV72                    12:20:00   0
DIV72                    12:25:00   0
DIV72                    12:30:00   0
DIV72                    12:35:00   0
DIV72                    12:40:00   0
DIV72                    12:45:00   0
DIV72                    12:50:00   0
DIV72                    12:55:00   0
DIV72                    13:00:00   0
DIV72                    13:05:00   0
DIV72                    13:10:00   0
DIV72                    13:15:00   0
DIV72                    13:20:00   0
DIV72                    13:25:00   0
DIV72                    13:30:00   0
DIV72                    13:35:00   0
DIV72                    13:40:00   0
DIV72                    13:45:00   0
DIV72                    13:50:00   0
DIV72                    13:55:00   0
DIV72                    14:00:00   0
DIV72                    14:05:00   0
DIV72                    14:10:00   0
DIV72                    14:15:00   0
DIV72                    14:20:00   0
DIV72                    14:25:00   0
DIV72                    14:30:00   0
DIV72                    14:35:00   0
DIV72                    14:40:00   0
DIV72                    14:45:00   0
DIV72                    14:50:00   0
DIV72                    14:55:00   0
DIV72                    15:00:00   0
DIV72                    15:05:00   0
DIV72                    15:10:00   0
DIV72                    15:15:00   0
DIV72                    15:20:00   0
DIV72                    15:25:00   0
DIV72                    15:30:00   0
DIV72                    15:35:00   0
DIV72                    15:40:00   0
DIV72                    15:45:00   0
DIV72                    15:50:00   0
DIV72                    15:55:00   0
DIV72                    16:00:00   0
;
D_14a                    0:05:00    0
D_14a                    0:10:00    0
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_14a	0:15:00	0
D_14a	0:20:00	2.54
D_14a	0:25:00	11.02
D_14a	0:30:00	36.2
D_14a	0:35:00	102.62
D_14a	0:40:00	200.98
D_14a	0:45:00	238.55
D_14a	0:50:00	247.75
D_14a	0:55:00	255.66
D_14a	1:00:00	262.58
D_14a	1:05:00	264.01
D_14a	1:10:00	261.79
D_14a	1:15:00	255.46
D_14a	1:20:00	246.32
D_14a	1:25:00	235.63
D_14a	1:30:00	224.27
D_14a	1:35:00	213.29
D_14a	1:40:00	202.94
D_14a	1:45:00	193.22
D_14a	1:50:00	184.47
D_14a	1:55:00	184.39
D_14a	2:00:00	179.51
D_14a	2:05:00	168.01
D_14a	2:10:00	150.4
D_14a	2:15:00	134.22
D_14a	2:20:00	118.75
D_14a	2:25:00	104.87
D_14a	2:30:00	92.8
D_14a	2:35:00	82.19
D_14a	2:40:00	72.86
D_14a	2:45:00	64.76
D_14a	2:50:00	57.54
D_14a	2:55:00	51.03
D_14a	3:00:00	45.15
D_14a	3:05:00	40.01
D_14a	3:10:00	35.92
D_14a	3:15:00	32.5
D_14a	3:20:00	29.5
D_14a	3:25:00	26.84
D_14a	3:30:00	24.4
D_14a	3:35:00	22.13
D_14a	3:40:00	20.01
D_14a	3:45:00	18.08
D_14a	3:50:00	16.3
D_14a	3:55:00	14.53
D_14a	4:00:00	12.79
D_14a	4:05:00	11.23
D_14a	4:10:00	9.68
D_14a	4:15:00	8.1
D_14a	4:20:00	6.76
D_14a	4:25:00	5.48
D_14a	4:30:00	4.35
D_14a	4:35:00	3.4

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_14a	4:40:00	2.75
D_14a	4:45:00	2.19
D_14a	4:50:00	1.79
D_14a	4:55:00	1.48
D_14a	5:00:00	1.22
D_14a	5:05:00	1.01
D_14a	5:10:00	0.84
D_14a	5:15:00	0.71
D_14a	5:20:00	0.58
D_14a	5:25:00	0.49
D_14a	5:30:00	0.42
D_14a	5:35:00	0.36
D_14a	5:40:00	0.31
D_14a	5:45:00	0.26
D_14a	5:50:00	0.22
D_14a	5:55:00	0.19
D_14a	6:00:00	0.16
D_14a	6:05:00	0.13
D_14a	6:10:00	0.11
D_14a	6:15:00	0.09
D_14a	6:20:00	0.08
D_14a	6:25:00	0.06
D_14a	6:30:00	0.05
D_14a	6:35:00	0.05
D_14a	6:40:00	0.04
D_14a	6:45:00	0.03
D_14a	6:50:00	0.03
D_14a	6:55:00	0.03
D_14a	7:00:00	0.02
D_14a	7:05:00	0.02
D_14a	7:10:00	0.02
D_14a	7:15:00	0.02
D_14a	7:20:00	0.01
D_14a	7:25:00	0.01
D_14a	7:30:00	0.01
D_14a	7:35:00	0.01
D_14a	7:40:00	0.01
D_14a	7:45:00	0.01
D_14a	7:50:00	0.01
D_14a	7:55:00	0.01
D_14a	8:00:00	0.01
D_14a	8:05:00	0.01
D_14a	8:10:00	0.01
D_14a	8:15:00	0
D_14a	8:20:00	0
D_14a	8:25:00	0
D_14a	8:30:00	0
D_14a	8:35:00	0
D_14a	8:40:00	0
D_14a	8:45:00	0
D_14a	8:50:00	0
D_14a	8:55:00	0
D_14a	9:00:00	0

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
D_10d            3176694.350        1695093.073
D_10b            3177506.439        1693478.148
E-J-10           3176585.491        1695008.163
D_10c            3177299.607        1695096.883
D_13a            3176505.538        1695746.944
D_10_13_a        3176073.115        1696399.900
D_16a            3175356.836        1699055.129
D_16b            3175370.188        1698400.874
J_15             3175990.100        1697713.244
D_14a            3177012.220        1697081.768
D_12_14          3177350.643        1695768.074
J_AR1_b          3173703.036        1694541.913
DIV72            3174047.138        1692404.931
D_10_13_b        3175688.427        1696392.662
D_AR2_b          3176305.152        1695088.601
E-J-16_b         3175294.558        1698200.521
E-J-16_a         3175430.773        1699175.999
D_AR2_a          3175696.221        1695753.942
EC_Out_19thAv    3174341.381        1697071.869
EC_Out_23rd      3174549.031        1699077.383
EC_Out_23rd_OF   3174593.539        1699012.847
J_17thAve_Out_OF 3174143.132        1696363.352
J14th-DIV        3173081.644        1694539.710
D_15a            3174513.955        1697697.094

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
S_10e            3177418.632        1693512.349
S_10e            3177361.473        1693604.684
S_10e            3177321.901        1694343.363
S_10e            3177255.947        1694448.888
S_10e            3177093.262        1694528.032
S_10e            3176807.464        1694620.367
S_10e            3176688.747        1694743.480
C_10c            3177418.632        1693609.080
C_10c            3177392.251        1694413.713
```

Table E.2 – Existing Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
C_10c            3177115.246        1694563.207
C_10c            3176803.067        1694708.305
C_10c_2          3176604.559        1695538.220
C_13a            3176361.289        1696184.816
C_13a_2          3175935.730        1697075.882
S_15_b           3175469.956        1698717.574
S_15_c           3175679.436        1697642.979
S_15_c           3175641.605        1698315.037
S_15a            3176361.838        1697079.518
S_15a            3176348.336        1697720.898
S_10_13_b        3174686.549        1696228.062
S_AR1_c          3173917.951        1692645.920
S_10_13_a        3175824.128        1696355.151
C_15a            3176322.185        1696997.134
C_15a            3176214.499        1697629.790


[BACKDROP]
FILE       "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\Background\Westerly_Creek_SWMM_Background.jpg"
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
[TITLE]
;;Project Title/Notes
Denver SDMP - Basin 4401-02 - Updated by Enginuity 2018
100-Year Existing Conditions

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/01/2005
END_TIME             06:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:00:30
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         0:00:05

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              4

[FILES]
;;Interfacing Files
USE INFLOWS "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\CUHP\6_Fut_100yr_0mi^2_WC_FHAD_2017_NOAA14.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
19071STMH        5304.43    9.369      0          0          0
19079STMH        5304.61    10.039     0          0          0
19097STMH        5306.42    13.756     0          0          0
19111STMH        5308.24    13.493     0          0          0
19132STMH        5313.44    9.163      0          0          0
19134STMH        5315.66    7.915      0          0          0
19139STMH        5309.07    13.499     0          0          0
19143STMH        5317.36    7.613      0          0          0
19150STMH        5318.95    7.866      0          0          0
19154STMH        5320.49    7.835      0          0          0
19162STMH        5321.94    7.527      0          0          0
19171STMH        5323.1     7.411      0          0          0
19179STMH        5324.36    7.035      0          0          0
19214STMH        5324.57    6.805      0          0          0
20135STMH        5328.82    10.184     0          0          0
20209STFT        5329.74    8.664      0          0          0
20818STMH        5332.32    8.638      0          0          0
20841STMH        5332.52    8.73       0          0          0
23839STMH        5333.38    7.559      0          0          0
23840STMH        5330.19    8.223      0          0          0
23841STMH        5330.48    8.305      0          0          0
23843STMH        5328.82    8.694      0          0          0
23845STMH        5335.33    6.982      0          0          0
23849STMH        5337.72    6.657      0          0          0
23852STMH        5335.67    7.2        0          0          0
23855STMH        5339.55    6.367      0          0          0
23856STMH        5339.16    6.555      0          0          0
23861STMH        5341.79    6.539      0          0          0
23862STMH        5341.65    6.487      0          0          0
23868STMH        5343.15    7.42       0          0          0
24788STMH        5341.35    4.772      0          0          0
24791STMH        5337.7     3.864      0          0          0
24796STMH        5342.67    4.897      0          0          0
24797STIL        5343.91    5.209      0          0          0
24800STMH        5341.13    4.648      0          0          0
405658STFT       5324.68    12.61      0          0          0
405659STFT       5326.98    11.733     0          0          0
407540STMH       5324.28    12.858     0          0          0
407541STMH       5323.97    12.814     0          0          0
407542STMH       5323.54    11.935     0          0          0
407543STMH       5326.58    12.1       0          0          0
407544STMH       5323.33    11.651     0          0          0
407546STMH       5328.26    11.773     0          0          0
;4401-02-210
J_DE6_2          5348.421   0          0          0          0
;4401-02-220
J_DE5            5354.476   0          0          0          0
;4401-02-230
J_DE3            5341.25    0          0          0          0
;4401-02-240
J_DE2            5327.533   0          0          0          0
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
;4401-02-250
J_AD4             5315       0          0          0          0
;4401-02-260
J_AD1             5336.76    0          0          0          0
;4401-02-261
J_DE1             5348.234   0          0          0          0
773032STMH        5322.91    9.173      0          0          0
773050STMH        5322.77    8.551      0          0          0
773052STMH        5321.85    5.748      0          0          0
773389STMH        5320.69    5.041      0          0          0
773392STMH        5320.51    5.354      0          0          0
773410STMH        5319.46    4.806      0          0          0
773412STMH        5318.49    6.958      0          0          0
J_DE4             984.3      0          0          0          0
J_12th            5344       0          0          0          0
J_DE6_1           0          0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
18979STOF         5304.32    FREE                        NO
18979STOF2        5304.32    FREE                        NO
23842STFT         5325.94    FREE                        NO
24773STOF         5335.3     FREE                        NO
24773STOF2        5335.3     FREE                        NO
407544STMH-OF     5322.61    FREE                        NO
407550STMH        5322.61    FREE                        NO
4401-02-250-OF    5309.4     FREE                        NO
773412STMH-OF     5318       FREE                        NO
12th_Out          5336.2     FREE                        NO

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
19071STMH         19071STMH        18979STOF        64.055     0.019      5304.43    5304.32    0          0
19071STMH-OF      19071STMH        18979STOF2       64.055     0.021      5313.799   5304.32    0          0
;4.76' - 15" - RCP - 1%
35191STGM         24791STMH        24773STOF        4.76       0.019      5337.7     5335.3     0          0
35191STGM-OF      24791STMH        24773STOF2       4.76       0.021      5337.7     5335.3     0          0
;35.' - 15" - .35%
35325STGM         24788STMH        24800STMH        35         0.019      5341.35    5341.23    0          0
35325STGM-OF      24788STMH        24800STMH        35         0.021      5346.122   5345.778   0          0
;343' - 15" - RCP - 1%
35326STGM         24800STMH        24791STMH        343        0.019      5341.13    5337.7     0          0
35326STGM-OF      24800STMH        24791STMH        343        0.021      5345.778   5341.564   0          0
;322.67' - 15" - RCP - 0.35%
35328STGM         24797STIL        24796STMH        322.67     0.019      5343.91    5342.79    0          0
35328STGM-OF      24797STIL        24796STMH        322.67     0.021      5349.119   5347.567   0          0
;346.42' - 15" - RCP - 0.35%
35329STGM         24796STMH        24788STMH        346.42     0.019      5342.67    5341.46    0          0
35329STGM-OF      24796STMH        24788STMH        346.42     0.021      5347.567   5346.122   0          0
;276.22' - 42" - RCP - .45%
35355STGM         23868STMH        23861STMH        276.22     0.019      5343.15    5341.91    0          0
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
35355STGM-OF     23868STMH        23861STMH        276.22     0.021      5350.604   5348.329   0          0
;37.52' - 42" - RCP - 0.67%
35357STGM        23861STMH        23862STMH        37.52      0.019      5341.79    5341.54    0          0
35357STGM-OF     23861STMH        23862STMH        37.52      0.021      5348.329   5348.101   0          0
;318.84' - 42" - RCP - 0.47%
35358STGM        23862STMH        23855STMH        318.84     0.019      5341.19    5339.7     0          0
35358STGM-OF     23862STMH        23855STMH        318.84     0.021      5348.101   5345.912   0          0
;30.' - 42" - RCP - .52%
35362STGM        23855STMH        23856STMH        30         0.019      5339.55    5339.42    0          0
35362STGM-OF     23855STMH        23856STMH        30         0.021      5345.912   5345.711   0          0
;291.13' - 42" - RCP - .45%
35363STGM        23856STMH        23849STMH        291.13     0.019      5339.16    5337.86    0          0
35363STGM-OF     23856STMH        23849STMH        291.13     0.021      5345.711   5344.431   0          0
;326.65' - 42" - RCP - .63%
35365STGM        23849STMH        23852STMH        326.65     0.019      5337.72    5335.67    0          0
35365STGM-OF     23849STMH        23852STMH        326.65     0.021      5344.431   5342.863   0          0
;56.7' - 42" - RCP - .6%
35367STGM        23852STMH        23845STMH        56.7       0.019      5335.67    5335.33    0          0
35367STGM-OF     23852STMH        407546STMH       536.006    0.021      5342.863   5340.033   0          0
;287.08' - 42" - RCP - .64%
35368STGM        23845STMH        23839STMH        287.08     0.019      5335.33    5333.49    0          0
35368STGM-OF     23845STMH        23839STMH        287.08     0.021      5342.46    5340.939   0          0
;325.87' - 42" - RCP - .58%
35369STGM        23839STMH        23841STMH        325.87     0.019      5333.38    5330.48    0          0
35369STGM-OF     23839STMH        23841STMH        325.87     0.021      5340.939   5338.785   0          0
;53.48' - 34" - RCP - .82%
35370STGM        23841STMH        23840STMH        53.48      0.019      5330.63    5330.19    0          0
35370STGM-OF     23841STMH        23840STMH        53.48      0.021      5338.785   5338.413   0          0
;143.76' - 48" - RCP - .31%
35371STGM        23843STMH        23842STFT        143.76     0.019      5328.82    5325.94    0          0
;136.61' - 48" - RCP - 1.%
35372STGM        23840STMH        23843STMH        136.61     0.019      5330.19    5328.82    0          0
35372STGM-OF     23840STMH        23843STMH        136.61     0.021      5338.413   5337.514   0          0
;92.' - 60" - RCP - .41%
36715STGM        19139STMH        19111STMH        92         0.019      5309.07    5308.69    0          0
36715STGM-OF     19139STMH        19111STMH        92         0.021      5322.569   5321.733   0          0
;581.' - 60" - RCP - .28%
36716STGM        19097STMH        19079STMH        581        0.019      5306.42    5304.79    0          0
36716STGM-OF     19097STMH        19079STMH        581        0.021      5320.176   5314.649   0          0
;18.5' - 60" - RCP - .38%
36717STGM        19079STMH        19071STMH        18.5       0.019      5304.68    5304.61    0          0
36717STGM-OF     19079STMH        19071STMH        18.5       0.035      5314.649   5313.799   0          0
;552.7' - 60" - RCP - .31%
36718STGM        19111STMH        19097STMH        552.7      0.019      5308.24    5306.55    0          0
36718STGM-OF     19111STMH        19097STMH        552.7      0.021      5321.733   5320.176   0          0
;572' - 48" - RCP - 0.52%
36939STGM        20818STMH        20209STFT        572        0.019      5332.32    5329.74    0          0
36939STGM-OF     20818STMH        20209STFT        572        0.021      5340.958   5338.404   0          0
;46' - 48" - RCP - 0.91%
37665STGM        20209STFT        20135STMH        46         0.019      5329.74    5328.84    0          0
37665STGM-OF     20209STFT        20135STMH        46         0.021      5338.404   5339.004   0          0
;44' - 48" - RCP - 0.5%
37666STGM        20841STMH        20818STMH        44         0.019      5332.52    5332.36    0          0
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
37666STGM-OF     20841STMH       20818STMH       44         0.021     5341.25   5340.958  0         0
;630.' - 48" - RCP - .59%
37673STGM        20135STMH       19214STMH       630        0.019     5328.82   5324.57   0         0
37673STGMF-OFE   20135STMH       19162STMH       1312.732   0.021     5339.004  5329.467  0         0
;39.2' - 54" - RCP - .1%
37750STGM        19214STMH       19179STMH       39.2       0.019     5324.57   5324.53   0         0
37750STGM-OF     19214STMH       19179STMH       39.2       0.021     5331.375  5331.395  0         0
;317.3' - 54" - RCP - .38%
37757STGM        19171STMH       19162STMH       317.3      0.019     5323.13   5321.94   0         0
37757STGM-OF     19171STMH       19162STMH       317.3      0.021     5330.511  5329.467  0         0
;316.5' - 54" - RCP - .4%
37758STGM        19179STMH       19171STMH       316.5      0.019     5324.36   5323.1    0         0
37758STGM-OF     19179STMH       19171STMH       316.5      0.021     5331.395  5330.511  0         0
;340.5' - 54" - RCP - .41%
37759STGM        19162STMH       19154STMH       340.5      0.019     5321.94   5320.54   0         0
37759STGM-OF     19162STMH       19154STMH       340.5      0.021     5329.467  5328.325  0         0
;293.2' - 54" - RCP - .41%
37760STGM        19154STMH       19150STMH       293.2      0.019     5320.49   5319.28   0         0
37760STGM-OF     19154STMH       19150STMH       293.2      0.021     5328.325  5326.816  0         0
;329.2' - 54" - RCP - .45%
37761STGM        19150STMH       19143STMH       329.2      0.019     5318.98   5317.5    0         0
;328.5' - 54" - RCP - .48%
37762STGM        19143STMH       19134STMH       328.5      0.019     5317.36   5315.79   0         0
37762STGM-OF     19143STMH       19134STMH       328.5      0.021     5324.973  5323.575  0         0
;185.' - 60" - RCP - .37%
37763STGM        19134STMH       19132STMH       185        0.019     5315.66   5313.44   0         0
37763STGM-OF     19134STMH       19132STMH       185        0.021     5323.575  5322.603  0         0
;161.5' - 60" - RCP - 1.74%
37764STGM        19132STMH       19139STMH       161.5      0.019     5313.44   5309.07   0         0
37764STGM-OF     19132STMH       19139STMH       161.5      0.021     5322.603  5322.569  0         0
;135' - 36" - RCP - 0.0814814814812389%
406193STGM       407542STMH      407544STMH      130        0.019     5323.54   5323.43   0         0
406193STGM-OF    407542STMH      407544STMH      135        0.021     5335.475  5334.981  0         0
;164.3' - 36" - RCP - .19%
406197STGM       407541STMH      407542STMH      164.3      0.019     5323.97   5323.65   0         0
406197STGM-OF    407541STMH      407542STMH      164.3      0.021     5336.784  5335.475  0         0
;36.6' - 24" - .82%
406199STGM       407540STMH      407541STMH      36.6       0.019     5324.28   5323.98   0         0
406199STGM-OF    407540STMH      407541STMH      36.6       0.021     5337.138  5336.784  0         0
;20.1' - 30" - RCP - .52%
406200STGM       405658STFT      407540STMH      20.1       0.019     5324.68   5324.28   0         0
406200STGM-OF    405658STFT      407540STMH      20.1       0.021     5337.29   5337.138  0         0
;304.7' - 30" - RCP - .52%
406201STGM       407543STMH      405658STFT      304.7      0.019     5326.58   5324.68   0         0
406201STGM-OF    407543STMH      405658STFT      304.7      0.021     5338.68   5337.29   0         0
;20.12' - 30" - RCP - .48%
406205STGM       405659STFT      407543STMH      20.12      0.019     5326.98   5326.68   0         0
406205STGM-OF    405659STFT      407543STMH      20.12      0.021     5338.713  5338.68   0         0
;307.58' - 30" - RCP - .48%
406206STGM       407546STMH      405659STFT      307.58     0.019     5328.26   5326.98   0         0
407544STMH       407544STMH      407550STMH      35         0.019     5323.33   5322.61   0         0
407544STMH-OF    407544STMH      407544STMH-OF   36.24      0.021     5334.981  5322.61   0         0
4401-02-210      J_DE6_2         24797STIL       233.052    0.01      5348.421  5342.06   0         0
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
4401-02-220      J_DE5           23868STMH       419.058    0.01       5354.476   5342.23    0          0
4401-02-230      J_DE3           773032STMH      1661.078   0.01       5341.25    5326.58    0          0
4401-02-240      J_DE2           773032STMH      326.993    0.01       5327.533   5321.85    0          0
4401-02-250      J_AD4           4401-02-250-OF  959.793    0.01       5315       5309.4     0          0
4401-02-260      J_AD1           19111STMH       507.372    0.01       5336.76    5308.24    0          0
4401-02-261      J_DE1           20841STMH       1172.966   0.01       5348.234   5332.52    0          0
;37.7' - 29" - RCP - 0.27%
773049STMN       773032STMH      773050STMH      37.7       0.019      5322.91    5322.77    0          0
773049STMN-OF    773032STMH      773050STMH      37.7       0.021      5332.083   5331.321   0          0
;291.25' - 34" - RCP - 0.17%
773051STMN       773050STMH      773052STMH      291.25     0.019      5322.77    5321.85    0          0
773051STMN-OF    773050STMH      773052STMH      291.25     0.021      5331.321   5327.598   0          0
;329.41' - 34" - RCP - 0.28%
773387STMN       773052STMH      773389STMH      329.41     0.019      5321.85    5320.69    0          0
773387STMN-OF    773052STMH      773389STMH      329.41     0.021      5327.598   5325.731   0          0
;20.62' - 34" - RCP - 0.29%
773391STMN       773389STMH      773392STMH      20.62      0.019      5320.69    5320.63    0          0
773391STMN-OF    773389STMH      773392STMH      20.62      0.021      5325.731   5325.864   0          0
;285.15' - 34" - RCP - 0.32%
773393STMN       773392STMH      773410STMH      285.153    0.019      5320.51    5319.59    0          0
773393STMN-OF    773392STMH      773410STMH      285.15     0.021      5325.864   5324.266   0          0
;49.47' - 34" - RCP - 0.49%
773411STMN       773410STMH      773412STMH      49.47      0.019      5319.46    5318.49    0          0
773411STMN-OF    773410STMH      773412STMH      49.47      0.021      5324.266   5325.448   0          0
773413STMN       773412STMH      773412STMH-OF   15.71      0.019      5318.49    5318       0          0
CDE4             J_DE4           23862STMH       1          0.01       *          *          0          0
C_12th           J_12th          12th_Out        1200       0.01       *          *          0          0
D_12th           J_DE6_1         J_12th          400        0.01       *          *          0          0
37761STGM-OF_BHI 19150STMH       19143STMH       329.2      0.01       5326.816   5324.973   0          0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
19071STMH        CIRCULAR     5                0          0          0          1
19071STMH-OF     IRREGULAR    19071STMH-OF     0          0          0          1
35191STGM        CIRCULAR     1.25             0          0          0          1
35191STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35325STGM        CIRCULAR     1.25             0          0          0          1
35325STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35326STGM        CIRCULAR     1.25             0          0          0          1
35326STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35328STGM        CIRCULAR     1.25             0          0          0          1
35328STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35329STGM        CIRCULAR     1.25             0          0          0          1
35329STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35355STGM        CIRCULAR     3.5              0          0          0          1
35355STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35357STGM        CIRCULAR     3.5              0          0          0          1
35357STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35358STGM        CIRCULAR     3.5              0          0          0          1
35358STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35362STGM        CIRCULAR     3.5              0          0          0          1
35362STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
35363STGM        CIRCULAR     3.5              0          0          0          1
35363STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35365STGM        CIRCULAR     3.5              0          0          0          1
35365STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35367STGM        CIRCULAR     3.5              0          0          0          1
35367STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35368STGM        CIRCULAR     3.5              0          0          0          1
35368STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35369STGM        CIRCULAR     3.5              0          0          0          1
35369STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35370STGM        HORIZ_ELLIPSE 2.833            4.417      0          0          1
35370STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
35371STGM        CIRCULAR     4                0          0          0          1
35372STGM        CIRCULAR     4                0          0          0          1
35372STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
36715STGM        CIRCULAR     5                0          0          0          1
36715STGM-OF     IRREGULAR    Montview         0          0          0          1
36716STGM        CIRCULAR     5                0          0          0          1
36716STGM-OF     IRREGULAR    Montview         0          0          0          1
36717STGM        CIRCULAR     5                0          0          0          1
36717STGM-OF     IRREGULAR    Montview         0          0          0          1
36718STGM        CIRCULAR     5                0          0          0          1
36718STGM-OF     IRREGULAR    Montview         0          0          0          1
36939STGM        CIRCULAR     4                0          0          0          1
36939STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37665STGM        CIRCULAR     4                0          0          0          1
37665STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37666STGM        CIRCULAR     4                0          0          0          1
37666STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37673STGM        CIRCULAR     4                0          0          0          1
37673STGMF-OFE   IRREGULAR    36ftStreet       0          0          0          1
37750STGM        CIRCULAR     4.5              0          0          0          1
37750STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37757STGM        CIRCULAR     4.5              0          0          0          1
37757STGM-OF     IRREGULAR    Montview         0          0          0          1
37758STGM        CIRCULAR     4.5              0          0          0          1
37758STGM-OF     IRREGULAR    Montview         0          0          0          1
37759STGM        CIRCULAR     4.5              0          0          0          1
37759STGM-OF     IRREGULAR    Montview         0          0          0          1
37760STGM        CIRCULAR     4.5              0          0          0          1
37760STGM-OF     IRREGULAR    Montview         0          0          0          1
37761STGM        CIRCULAR     4.5              0          0          0          1
37762STGM        CIRCULAR     4.5              0          0          0          1
37762STGM-OF     IRREGULAR    Montview         0          0          0          1
37763STGM        CIRCULAR     5                0          0          0          1
37763STGM-OF     IRREGULAR    Montview         0          0          0          1
37764STGM        CIRCULAR     5                0          0          0          1
37764STGM-OF     IRREGULAR    Montview         0          0          0          1
406193STGM       CIRCULAR     3                0          0          0          1
406193STGM-OF    IRREGULAR    36ftStreet       0          0          0          1
406197STGM       CIRCULAR     3                0          0          0          1
406197STGM-OF    IRREGULAR    36ftStreet       0          0          0          1
406199STGM       CIRCULAR     2                0          0          0          1
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
406199STGM-OF    IRREGULAR    36ftStreet       0          0          0          1
406200STGM       CIRCULAR     2.5              0          0          0          1
406200STGM-OF    IRREGULAR    36ftStreet       0          0          0          1
406201STGM       CIRCULAR     2.5              0          0          0          1
406201STGM-OF    IRREGULAR    36ftStreet       0          0          0          1
406205STGM       CIRCULAR     2.5              0          0          0          1
406205STGM-OF    IRREGULAR    36ftStreet       0          0          0          1
406206STGM       CIRCULAR     2.5              0          0          0          1
407544STMH       CIRCULAR     3                0          0          0          1
407544STMH-OF    IRREGULAR    36ftStreet       0          0          0          1
4401-02-210      DUMMY        0                0          0          0          1
4401-02-220      DUMMY        0                0          0          0          1
4401-02-230      DUMMY        0                0          0          0          1
4401-02-240      DUMMY        0                0          0          0          1
4401-02-250      DUMMY        0                0          0          0          1
4401-02-260      DUMMY        0                0          0          0          1
4401-02-261      DUMMY        0                0          0          0          1
773049STMN       HORIZ_ELLIPSE 2.417            3.75       0          0          1
773049STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773051STMN       HORIZ_ELLIPSE 2.833            4.417      0          0          1
773051STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773387STMN       HORIZ_ELLIPSE 2.833            4.417      0          0          1
773387STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773391STMN       HORIZ_ELLIPSE 2.833            4.417      0          0          1
773391STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773393STMN       HORIZ_ELLIPSE 2.833            4.417      0          0          1
773393STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773411STMN       HORIZ_ELLIPSE 2.833            4.417      0          0          1
773411STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773413STMN       HORIZ_ELLIPSE 2.83             4.417      0          0          1
CDE4             DUMMY        0                0          0          0          1
C_12th           IRREGULAR    36ftStreet       0          0          0          1
D_12th           DUMMY        0                0          0          0          1
37761STGM-OF_BHI IRREGULAR    Montview         0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.01     0.01     0.021
X1 19071STMH-OF      137      2        165.93   0.0      0.0      0        0        0
GR 5330     -1       5320     0        5314.877 2        5314.979 3        5314.979 5
GR 5314.622 6        5314.548 7        5314.548 8        5314.441 9        5314.441 11
GR 5314.267 12       5314.267 14       5314.079 15       5314.28  16       5314.28  17
GR 5314.255 18       5314.255 20       5314.304 21       5314.304 23       5314.246 24
GR 5314.323 25       5314.323 26       5314.233 27       5314.233 28       5314.314 29
GR 5314.257 30       5314.257 32       5314.169 33       5314.26  34       5314.26  35
GR 5314.148 36       5314.148 37       5314.172 38       5313.998 39       5313.998 41
GR 5314.041 42       5314.041 44       5313.978 45       5313.978 46       5314.03  47
GR 5313.789 48       5313.789 50       5313.817 51       5313.817 54       5313.9   55
GR 5313.9   57       5313.891 58       5313.891 59       5314.049 60       5314.04  61
GR 5314.04  63       5314.158 64       5314.158 66       5314.104 67       5314.305 68
GR 5314.305 69       5313.975 70       5313.975 72       5314.017 73       5314.017 75
GR 5314.03  76       5314.128 77       5314.128 78       5314.031 79       5314.031 81
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
GR 5313.997 82       5313.997 84       5313.993 85       5314.169 86       5314.169 87
GR 5314.095 88       5314.095 89       5314.25  90       5314.234 91       5314.234 93
GR 5314.034 94       5314.152 95       5314.152 96       5313.982 97       5313.982 98
GR 5314.088 99       5313.964 100      5313.964 102      5314.122 103      5314.122 105
GR 5314.167 106      5314.167 107      5314.356 108      5314.356 109      5314.341 110
GR 5314.341 111      5314.477 112      5314.391 113      5314.391 115      5314.418 116
GR 5314.418 118      5314.394 119      5314.394 120      5314.559 121      5314.628 122
GR 5314.628 124      5314.802 125      5314.802 127      5314.851 128      5314.946 129
GR 5314.946 130      5314.87  131      5314.87  133      5315.01  134      5315.01  136
GR 5314.874 137      5314.958 138      5314.958 139      5314.893 140      5314.893 141
GR 5314.997 142      5315.062 143      5315.062 145      5315.068 146      5315.211 147
GR 5315.211 148      5315.186 149      5315.186 150      5315.456 151      5315.415 152
GR 5315.415 154      5315.376 155      5315.45  156      5315.45  157      5315.432 158
GR 5315.432 159      5315.642 160      5315.615 161      5315.615 163      5315.64  164
GR 5320     165.93   5330     166
;
;Full street, width = 50ft, curb = 0.5ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.27ft.
NC 0.05     0.05     0.02
X1 50ftStreet        9        30       80       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.27     0        0.5      30       0        30       0.5      55
GR 0        80       0.5      80       1.27     110      10       110
;
;Full street, width = 36ft, curb = 0.5ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.5ft.
NC 0.05     0.05     0.02
X1 36ftStreet        9        50       86       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.5      0        .5       50       0        50       0.36     68
GR 0        86       .5       86       1.5      136      10       136
;
NC 0.05     0.05     0.02
X1 Montview          166      69.5824181116 134.19466353 0.0      0.0      0.0      0.0      0.0
GR 5332     0        5332     2.48508635381 5332     4.97017272234 5332     7.45525907596 5332     9.94034542963
GR 5332     12.4254318131 5332     14.9105181667 5332     17.3956045205 5332     19.8806908742 5331.7492 22.3657772576
GR 5331     24.8508636112 5331     27.3359499648 5331     29.8210363485 5331     32.3061227021 5331     34.7912090558
GR 5331     37.2762954094 5331     39.7613817929 5331     42.2464681467 5331     44.7315545003 5330.8089 47.2166408539
GR 5330     49.7017272374 5330     52.186813591 5330     54.6718999446 5330     57.1569863134 5330     59.642072667
GR 5330     62.1271590504 5330     64.6122454041 5330     67.0973317577 5330     69.5824181116 5329.8686 72.067504495
GR 5329     74.5525908486 5329     77.0376772022 5329     79.5227635857 5329     82.0078499395 5329     84.4929362931
GR 5329     86.9780226468 5329     89.4631090302 5329     91.9481953839 5329     94.4332817375 5329.0717 96.9183680913
GR 5330     99.4034544748 5330     101.888540828 5329.9462 104.373627182 5329     106.858713551 5329     109.343799904
GR 5329     111.828886288 5329     114.313972641 5329     116.799058995 5329     119.284145349 5329     121.769231732
GR 5329     124.254318086 5329     126.73940444 5329     129.224490823 5329.9881 131.709577177 5330     134.19466353
GR 5330     136.679749884 5330     139.164836268 5330     141.649922621 5330     144.135008975 5330.9523 146.620095329
GR 5331     149.105181712 5331     151.590268066 5331     154.075354419 5331     156.560440803 5331     159.045527142
GR 5331     161.530613525 5331     164.015699879 5331     166.500786232 5331     168.985872586 5331     171.47095897
GR 5331     173.956045323 5331     176.441131677 5331     178.92621806 5331     181.411304414 5331     183.896390768
GR 5331     186.381477121 5331     188.866563505 5331     191.351649859 5331     193.836736212 5331     196.321822566
GR 5331     198.806908949 5331     201.291995303 5331     203.777081657 5331     206.26216804 5331     208.747254379
GR 5331     211.232340762 5331     213.717427116 5331     216.20251347 5331     218.687599823 5331     221.172686207
GR 5331     223.657772561 5331     226.142858914 5331     228.627945268 5331     231.113031651 5331     233.598118005
GR 5331     236.083204359 5331     238.568290742 5331     241.053377096 5331     243.53846345 5331     246.023549803
GR 5331     248.508636187 5331     250.99372254 5331     253.478808894 5331     255.963895278 5331     258.448981631
GR 5331     260.934068 5331     263.419154353 5331     265.904240707 5331     268.389327061 5331     270.874413444
GR 5331     273.359499798 5331     275.844586152 5331     278.329672505 5331     280.814758889 5331     283.299845243
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
GR 5331     285.784931596 5331     288.27001798 5331     290.755104333 5331     293.240190687 5331     295.725277041
GR 5331     298.210363424 5331     300.695449778 5331     303.180536131 5331     305.665622515 5331     308.150708869
GR 5331     310.635795237 5331     313.120881591 5331     315.605967944 5331     318.091054298 5331     320.576140682
GR 5331     323.061227035 5331     325.546313389 5331     328.031399743 5331     330.516486126 5331     333.00157248
GR 5331     335.486658834 5331     337.971745217 5331     340.456831571 5331     342.941917924 5331     345.427004278
GR 5331     347.912090661 5331     350.397177015 5331     352.882263369 5331     355.367349722 5331     357.852436106
GR 5331     360.33752246 5331     362.822608828 5331     365.307695182 5331     367.792781535 5331     370.277867919
GR 5331     372.762954273 5331     375.248040626 5331     377.73312698 5331     380.218213363 5331     382.703299717
GR 5331     385.188386071 5331     387.673472454 5331     390.158558808 5331     392.643645162 5331     395.128731515
GR 5331     397.613817899 5331     400.098904253 5331     402.583990606 5331     405.06907696 5331     407.554163343
GR 5332     408

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
J_DE6_2          FLOW             J_DE6_2          FLOW     1.0      1.0
J_DE6_1          FLOW             J_DE6_1          FLOW     1.0      1.0

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
J_DE6_1                     0:00:30    0
J_DE6_1                     0:01:00    0
J_DE6_1                     0:01:30    0
J_DE6_1                     0:02:00    0
J_DE6_1                     0:02:30    0
J_DE6_1                     0:03:00    0
J_DE6_1                     0:03:30    0
J_DE6_1                     0:04:00    0
J_DE6_1                     0:04:30    0
J_DE6_1                     0:05:00    0
J_DE6_1                     0:05:30    0
J_DE6_1                     0:06:00    0
J_DE6_1                     0:06:30    0
J_DE6_1                     0:07:00    0
J_DE6_1                     0:07:30    0
J_DE6_1                     0:08:00    0
J_DE6_1                     0:08:30    0
J_DE6_1                     0:09:00    0
J_DE6_1                     0:09:30    0
J_DE6_1                     0:10:00    0
J_DE6_1                     0:10:30    0.143
J_DE6_1                     0:11:00    0.312
J_DE6_1                     0:11:30    0.4875
J_DE6_1                     0:12:00    0.6695
J_DE6_1                     0:12:30    0.832
J_DE6_1                     0:13:00    1.001
J_DE6_1                     0:13:30    1.196
J_DE6_1                     0:14:00    1.3715
J_DE6_1                     0:14:30    1.5405
J_DE6_1                     0:15:00    1.716
J_DE6_1                     0:15:30    2.184
J_DE6_1                     0:16:00    2.652
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	0:16:30	3.1265
J_DE6_1	0:17:00	3.601
J_DE6_1	0:17:30	4.0755
J_DE6_1	0:18:00	4.5435
J_DE6_1	0:18:30	5.018
J_DE6_1	0:19:00	5.4925
J_DE6_1	0:19:30	5.9605
J_DE6_1	0:20:00	6.435
J_DE6_1	0:20:30	7.579
J_DE6_1	0:21:00	8.7295
J_DE6_1	0:21:30	9.88
J_DE6_1	0:22:00	11.037
J_DE6_1	0:22:30	12.1875
J_DE6_1	0:23:00	13.338
J_DE6_1	0:23:30	14.495
J_DE6_1	0:24:00	15.6455
J_DE6_1	0:24:30	16.796
J_DE6_1	0:25:00	17.953
J_DE6_1	0:25:30	20.969
J_DE6_1	0:26:00	24.0175
J_DE6_1	0:26:30	27.066
J_DE6_1	0:27:00	30.121
J_DE6_1	0:27:30	33.1695
J_DE6_1	0:28:00	36.218
J_DE6_1	0:28:30	39.2665
J_DE6_1	0:29:00	42.3215
J_DE6_1	0:29:30	45.37
J_DE6_1	0:30:00	48.4185
J_DE6_1	0:30:30	51.792
J_DE6_1	0:31:00	55.172
J_DE6_1	0:31:30	58.5455
J_DE6_1	0:32:00	61.9255
J_DE6_1	0:32:30	65.299
J_DE6_1	0:33:00	68.679
J_DE6_1	0:33:30	72.059
J_DE6_1	0:34:00	75.4325
J_DE6_1	0:34:30	78.8125
J_DE6_1	0:35:00	82.186
J_DE6_1	0:35:30	84.1425
J_DE6_1	0:36:00	86.0665
J_DE6_1	0:36:30	87.997
J_DE6_1	0:37:00	89.921
J_DE6_1	0:37:30	91.845
J_DE6_1	0:38:00	93.7755
J_DE6_1	0:38:30	95.6995
J_DE6_1	0:39:00	97.63
J_DE6_1	0:39:30	99.554
J_DE6_1	0:40:00	101.4845
J_DE6_1	0:40:30	102.271
J_DE6_1	0:41:00	103.038
J_DE6_1	0:41:30	103.8115
J_DE6_1	0:42:00	104.5785
J_DE6_1	0:42:30	105.3455

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	0:43:00	106.1125
J_DE6_1	0:43:30	106.886
J_DE6_1	0:44:00	107.653
J_DE6_1	0:44:30	108.42
J_DE6_1	0:45:00	109.1935
J_DE6_1	0:45:30	109.2455
J_DE6_1	0:46:00	109.291
J_DE6_1	0:46:30	109.33
J_DE6_1	0:47:00	109.3755
J_DE6_1	0:47:30	109.421
J_DE6_1	0:48:00	109.46
J_DE6_1	0:48:30	109.5055
J_DE6_1	0:49:00	109.5445
J_DE6_1	0:49:30	109.59
J_DE6_1	0:50:00	109.6355
J_DE6_1	0:50:30	109.2585
J_DE6_1	0:51:00	108.8815
J_DE6_1	0:51:30	108.498
J_DE6_1	0:52:00	108.1145
J_DE6_1	0:52:30	107.7375
J_DE6_1	0:53:00	107.354
J_DE6_1	0:53:30	106.977
J_DE6_1	0:54:00	106.5935
J_DE6_1	0:54:30	106.2165
J_DE6_1	0:55:00	105.833
J_DE6_1	0:55:30	105.4105
J_DE6_1	0:56:00	104.9815
J_DE6_1	0:56:30	104.559
J_DE6_1	0:57:00	104.13
J_DE6_1	0:57:30	103.7075
J_DE6_1	0:58:00	103.285
J_DE6_1	0:58:30	102.856
J_DE6_1	0:59:00	102.4335
J_DE6_1	0:59:30	102.0045
J_DE6_1	1:00:00	101.582
J_DE6_1	1:00:30	101.166
J_DE6_1	1:01:00	100.7435
J_DE6_1	1:01:30	100.3275
J_DE6_1	1:02:00	99.9115
J_DE6_1	1:02:30	99.489
J_DE6_1	1:03:00	99.073
J_DE6_1	1:03:30	98.657
J_DE6_1	1:04:00	98.241
J_DE6_1	1:04:30	97.8185
J_DE6_1	1:05:00	97.4025
J_DE6_1	1:05:30	96.8305
J_DE6_1	1:06:00	96.2585
J_DE6_1	1:06:30	95.68
J_DE6_1	1:07:00	95.108
J_DE6_1	1:07:30	94.536
J_DE6_1	1:08:00	93.9575
J_DE6_1	1:08:30	93.3855
J_DE6_1	1:09:00	92.8135

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	1:09:30	92.2415
J_DE6_1	1:10:00	91.663
J_DE6_1	1:10:30	91.0325
J_DE6_1	1:11:00	90.402
J_DE6_1	1:11:30	89.7715
J_DE6_1	1:12:00	89.141
J_DE6_1	1:12:30	88.504
J_DE6_1	1:13:00	87.8735
J_DE6_1	1:13:30	87.243
J_DE6_1	1:14:00	86.6125
J_DE6_1	1:14:30	85.9755
J_DE6_1	1:15:00	85.345
J_DE6_1	1:15:30	84.6755
J_DE6_1	1:16:00	84.006
J_DE6_1	1:16:30	83.3365
J_DE6_1	1:17:00	82.667
J_DE6_1	1:17:30	81.9975
J_DE6_1	1:18:00	81.328
J_DE6_1	1:18:30	80.6585
J_DE6_1	1:19:00	79.989
J_DE6_1	1:19:30	79.3195
J_DE6_1	1:20:00	78.65
J_DE6_1	1:20:30	77.948
J_DE6_1	1:21:00	77.246
J_DE6_1	1:21:30	76.544
J_DE6_1	1:22:00	75.8355
J_DE6_1	1:22:30	75.1335
J_DE6_1	1:23:00	74.4315
J_DE6_1	1:23:30	73.7295
J_DE6_1	1:24:00	73.021
J_DE6_1	1:24:30	72.319
J_DE6_1	1:25:00	71.617
J_DE6_1	1:25:30	70.9345
J_DE6_1	1:26:00	70.252
J_DE6_1	1:26:30	69.563
J_DE6_1	1:27:00	68.8805
J_DE6_1	1:27:30	68.198
J_DE6_1	1:28:00	67.5155
J_DE6_1	1:28:30	66.833
J_DE6_1	1:29:00	66.1505
J_DE6_1	1:29:30	65.468
J_DE6_1	1:30:00	64.779
J_DE6_1	1:30:30	64.142
J_DE6_1	1:31:00	63.4985
J_DE6_1	1:31:30	62.8615
J_DE6_1	1:32:00	62.218
J_DE6_1	1:32:30	61.581
J_DE6_1	1:33:00	60.9375
J_DE6_1	1:33:30	60.294
J_DE6_1	1:34:00	59.657
J_DE6_1	1:34:30	59.0135
J_DE6_1	1:35:00	58.3765
J_DE6_1	1:35:30	57.7655

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	1:36:00	57.161
J_DE6_1	1:36:30	56.5565
J_DE6_1	1:37:00	55.9455
J_DE6_1	1:37:30	55.341
J_DE6_1	1:38:00	54.73
J_DE6_1	1:38:30	54.1255
J_DE6_1	1:39:00	53.521
J_DE6_1	1:39:30	52.91
J_DE6_1	1:40:00	52.3055
J_DE6_1	1:40:30	51.7595
J_DE6_1	1:41:00	51.22
J_DE6_1	1:41:30	50.6805
J_DE6_1	1:42:00	50.141
J_DE6_1	1:42:30	49.6015
J_DE6_1	1:43:00	49.0555
J_DE6_1	1:43:30	48.516
J_DE6_1	1:44:00	47.9765
J_DE6_1	1:44:30	47.437
J_DE6_1	1:45:00	46.8975
J_DE6_1	1:45:30	46.4945
J_DE6_1	1:46:00	46.098
J_DE6_1	1:46:30	45.7015
J_DE6_1	1:47:00	45.305
J_DE6_1	1:47:30	44.902
J_DE6_1	1:48:00	44.5055
J_DE6_1	1:48:30	44.109
J_DE6_1	1:49:00	43.7125
J_DE6_1	1:49:30	43.316
J_DE6_1	1:50:00	42.9195
J_DE6_1	1:50:30	42.588
J_DE6_1	1:51:00	42.263
J_DE6_1	1:51:30	41.938
J_DE6_1	1:52:00	41.613
J_DE6_1	1:52:30	41.2945
J_DE6_1	1:53:00	40.9695
J_DE6_1	1:53:30	40.6445
J_DE6_1	1:54:00	40.3195
J_DE6_1	1:54:30	39.9945
J_DE6_1	1:55:00	39.6695
J_DE6_1	1:55:30	39.3835
J_DE6_1	1:56:00	39.0975
J_DE6_1	1:56:30	38.8115
J_DE6_1	1:57:00	38.5255
J_DE6_1	1:57:30	38.2395
J_DE6_1	1:58:00	37.9535
J_DE6_1	1:58:30	37.6675
J_DE6_1	1:59:00	37.3815
J_DE6_1	1:59:30	37.0955
J_DE6_1	2:00:00	36.8095
J_DE6_1	2:00:30	36.4975
J_DE6_1	2:01:00	36.192
J_DE6_1	2:01:30	35.88
J_DE6_1	2:02:00	35.5745

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	2:02:30	35.2625
J_DE6_1	2:03:00	34.9505
J_DE6_1	2:03:30	34.645
J_DE6_1	2:04:00	34.333
J_DE6_1	2:04:30	34.0275
J_DE6_1	2:05:00	33.7155
J_DE6_1	2:05:30	33.3775
J_DE6_1	2:06:00	33.0395
J_DE6_1	2:06:30	32.7015
J_DE6_1	2:07:00	32.37
J_DE6_1	2:07:30	32.032
J_DE6_1	2:08:00	31.694
J_DE6_1	2:08:30	31.356
J_DE6_1	2:09:00	31.018
J_DE6_1	2:09:30	30.68
J_DE6_1	2:10:00	30.342
J_DE6_1	2:10:30	30.017
J_DE6_1	2:11:00	29.6855
J_DE6_1	2:11:30	29.354
J_DE6_1	2:12:00	29.0225
J_DE6_1	2:12:30	28.691
J_DE6_1	2:13:00	28.3595
J_DE6_1	2:13:30	28.028
J_DE6_1	2:14:00	27.6965
J_DE6_1	2:14:30	27.365
J_DE6_1	2:15:00	27.0335
J_DE6_1	2:15:30	26.7215
J_DE6_1	2:16:00	26.4095
J_DE6_1	2:16:30	26.0975
J_DE6_1	2:17:00	25.7855
J_DE6_1	2:17:30	25.467
J_DE6_1	2:18:00	25.155
J_DE6_1	2:18:30	24.843
J_DE6_1	2:19:00	24.531
J_DE6_1	2:19:30	24.219
J_DE6_1	2:20:00	23.907
J_DE6_1	2:20:30	23.6145
J_DE6_1	2:21:00	23.3285
J_DE6_1	2:21:30	23.036
J_DE6_1	2:22:00	22.7435
J_DE6_1	2:22:30	22.4575
J_DE6_1	2:23:00	22.165
J_DE6_1	2:23:30	21.879
J_DE6_1	2:24:00	21.5865
J_DE6_1	2:24:30	21.3005
J_DE6_1	2:25:00	21.008
J_DE6_1	2:25:30	20.735
J_DE6_1	2:26:00	20.462
J_DE6_1	2:26:30	20.1825
J_DE6_1	2:27:00	19.9095
J_DE6_1	2:27:30	19.6365
J_DE6_1	2:28:00	19.357
J_DE6_1	2:28:30	19.084

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	2:29:00	18.811
J_DE6_1	2:29:30	18.5315
J_DE6_1	2:30:00	18.2585
J_DE6_1	2:30:30	17.992
J_DE6_1	2:31:00	17.7255
J_DE6_1	2:31:30	17.459
J_DE6_1	2:32:00	17.199
J_DE6_1	2:32:30	16.9325
J_DE6_1	2:33:00	16.666
J_DE6_1	2:33:30	16.3995
J_DE6_1	2:34:00	16.133
J_DE6_1	2:34:30	15.8665
J_DE6_1	2:35:00	15.6
J_DE6_1	2:35:30	15.34
J_DE6_1	2:36:00	15.0865
J_DE6_1	2:36:30	14.8265
J_DE6_1	2:37:00	14.5665
J_DE6_1	2:37:30	14.3065
J_DE6_1	2:38:00	14.0465
J_DE6_1	2:38:30	13.7865
J_DE6_1	2:39:00	13.5265
J_DE6_1	2:39:30	13.2665
J_DE6_1	2:40:00	13.0065
J_DE6_1	2:40:30	12.7595
J_DE6_1	2:41:00	12.5125
J_DE6_1	2:41:30	12.259
J_DE6_1	2:42:00	12.012
J_DE6_1	2:42:30	11.765
J_DE6_1	2:43:00	11.518
J_DE6_1	2:43:30	11.2645
J_DE6_1	2:44:00	11.0175
J_DE6_1	2:44:30	10.7705
J_DE6_1	2:45:00	10.5235
J_DE6_1	2:45:30	10.283
J_DE6_1	2:46:00	10.049
J_DE6_1	2:46:30	9.8085
J_DE6_1	2:47:00	9.5745
J_DE6_1	2:47:30	9.334
J_DE6_1	2:48:00	9.1
J_DE6_1	2:48:30	8.8595
J_DE6_1	2:49:00	8.6255
J_DE6_1	2:49:30	8.3915
J_DE6_1	2:50:00	8.151
J_DE6_1	2:50:30	7.943
J_DE6_1	2:51:00	7.7285
J_DE6_1	2:51:30	7.5205
J_DE6_1	2:52:00	7.306
J_DE6_1	2:52:30	7.098
J_DE6_1	2:53:00	6.89
J_DE6_1	2:53:30	6.6755
J_DE6_1	2:54:00	6.4675
J_DE6_1	2:54:30	6.253
J_DE6_1	2:55:00	6.045

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	2:55:30	5.8955
J_DE6_1	2:56:00	5.7525
J_DE6_1	2:56:30	5.6095
J_DE6_1	2:57:00	5.4665
J_DE6_1	2:57:30	5.317
J_DE6_1	2:58:00	5.174
J_DE6_1	2:58:30	5.031
J_DE6_1	2:59:00	4.8815
J_DE6_1	2:59:30	4.7385
J_DE6_1	3:00:00	4.5955
J_DE6_1	3:00:30	4.4915
J_DE6_1	3:01:00	4.3875
J_DE6_1	3:01:30	4.2835
J_DE6_1	3:02:00	4.1795
J_DE6_1	3:02:30	4.0755
J_DE6_1	3:03:00	3.9715
J_DE6_1	3:03:30	3.8675
J_DE6_1	3:04:00	3.77
J_DE6_1	3:04:30	3.666
J_DE6_1	3:05:00	3.562
J_DE6_1	3:05:30	3.484
J_DE6_1	3:06:00	3.406
J_DE6_1	3:06:30	3.3215
J_DE6_1	3:07:00	3.2435
J_DE6_1	3:07:30	3.1655
J_DE6_1	3:08:00	3.0875
J_DE6_1	3:08:30	3.0095
J_DE6_1	3:09:00	2.9315
J_DE6_1	3:09:30	2.847
J_DE6_1	3:10:00	2.769
J_DE6_1	3:10:30	2.7105
J_DE6_1	3:11:00	2.6455
J_DE6_1	3:11:30	2.587
J_DE6_1	3:12:00	2.5285
J_DE6_1	3:12:30	2.4635
J_DE6_1	3:13:00	2.405
J_DE6_1	3:13:30	2.3465
J_DE6_1	3:14:00	2.2815
J_DE6_1	3:14:30	2.223
J_DE6_1	3:15:00	2.158
J_DE6_1	3:15:30	2.1125
J_DE6_1	3:16:00	2.067
J_DE6_1	3:16:30	2.0215
J_DE6_1	3:17:00	1.976
J_DE6_1	3:17:30	1.9305
J_DE6_1	3:18:00	1.885
J_DE6_1	3:18:30	1.8395
J_DE6_1	3:19:00	1.7875
J_DE6_1	3:19:30	1.742
J_DE6_1	3:20:00	1.6965
J_DE6_1	3:20:30	1.6575
J_DE6_1	3:21:00	1.625
J_DE6_1	3:21:30	1.586

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	3:22:00	1.547
J_DE6_1	3:22:30	1.508
J_DE6_1	3:23:00	1.4755
J_DE6_1	3:23:30	1.4365
J_DE6_1	3:24:00	1.3975
J_DE6_1	3:24:30	1.3585
J_DE6_1	3:25:00	1.326
J_DE6_1	3:25:30	1.2935
J_DE6_1	3:26:00	1.2675
J_DE6_1	3:26:30	1.235
J_DE6_1	3:27:00	1.209
J_DE6_1	3:27:30	1.1765
J_DE6_1	3:28:00	1.1505
J_DE6_1	3:28:30	1.1245
J_DE6_1	3:29:00	1.092
J_DE6_1	3:29:30	1.066
J_DE6_1	3:30:00	1.0335
J_DE6_1	3:30:30	1.014
J_DE6_1	3:31:00	0.9945
J_DE6_1	3:31:30	0.975
J_DE6_1	3:32:00	0.9555
J_DE6_1	3:32:30	0.936
J_DE6_1	3:33:00	0.9165
J_DE6_1	3:33:30	0.897
J_DE6_1	3:34:00	0.8775
J_DE6_1	3:34:30	0.858
J_DE6_1	3:35:00	0.832
J_DE6_1	3:35:30	0.819
J_DE6_1	3:36:00	0.7995
J_DE6_1	3:36:30	0.7865
J_DE6_1	3:37:00	0.767
J_DE6_1	3:37:30	0.754
J_DE6_1	3:38:00	0.7345
J_DE6_1	3:38:30	0.7215
J_DE6_1	3:39:00	0.702
J_DE6_1	3:39:30	0.689
J_DE6_1	3:40:00	0.6695
J_DE6_1	3:40:30	0.6565
J_DE6_1	3:41:00	0.6435
J_DE6_1	3:41:30	0.6305
J_DE6_1	3:42:00	0.6175
J_DE6_1	3:42:30	0.6045
J_DE6_1	3:43:00	0.5915
J_DE6_1	3:43:30	0.5785
J_DE6_1	3:44:00	0.5655
J_DE6_1	3:44:30	0.5525
J_DE6_1	3:45:00	0.533
J_DE6_1	3:45:30	0.5265
J_DE6_1	3:46:00	0.5135
J_DE6_1	3:46:30	0.5005
J_DE6_1	3:47:00	0.4875
J_DE6_1	3:47:30	0.4745
J_DE6_1	3:48:00	0.468

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	3:48:30	0.455
J_DE6_1	3:49:00	0.442
J_DE6_1	3:49:30	0.429
J_DE6_1	3:50:00	0.416
J_DE6_1	3:50:30	0.4095
J_DE6_1	3:51:00	0.3965
J_DE6_1	3:51:30	0.39
J_DE6_1	3:52:00	0.377
J_DE6_1	3:52:30	0.364
J_DE6_1	3:53:00	0.3575
J_DE6_1	3:53:30	0.3445
J_DE6_1	3:54:00	0.338
J_DE6_1	3:54:30	0.325
J_DE6_1	3:55:00	0.312
J_DE6_1	3:55:30	0.3055
J_DE6_1	3:56:00	0.299
J_DE6_1	3:56:30	0.286
J_DE6_1	3:57:00	0.2795
J_DE6_1	3:57:30	0.273
J_DE6_1	3:58:00	0.26
J_DE6_1	3:58:30	0.2535
J_DE6_1	3:59:00	0.247
J_DE6_1	3:59:30	0.234
J_DE6_1	4:00:00	0.2275
J_DE6_1	4:00:30	0.221
J_DE6_1	4:01:00	0.2145
J_DE6_1	4:01:30	0.2015
J_DE6_1	4:02:00	0.195
J_DE6_1	4:02:30	0.1885
J_DE6_1	4:03:00	0.182
J_DE6_1	4:03:30	0.1755
J_DE6_1	4:04:00	0.169
J_DE6_1	4:04:30	0.1625
J_DE6_1	4:05:00	0.1495
J_DE6_1	4:05:30	0.1495
J_DE6_1	4:06:00	0.143
J_DE6_1	4:06:30	0.1365
J_DE6_1	4:07:00	0.13
J_DE6_1	4:07:30	0.1235
J_DE6_1	4:08:00	0.117
J_DE6_1	4:08:30	0.1105
J_DE6_1	4:09:00	0.104
J_DE6_1	4:09:30	0.0975
J_DE6_1	4:10:00	0.091
J_DE6_1	4:10:30	0.091
J_DE6_1	4:11:00	0.0845
J_DE6_1	4:11:30	0.078
J_DE6_1	4:12:00	0.078
J_DE6_1	4:12:30	0.0715
J_DE6_1	4:13:00	0.065
J_DE6_1	4:13:30	0.0585
J_DE6_1	4:14:00	0.0585
J_DE6_1	4:14:30	0.052

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	4:15:00	0.0455
J_DE6_1	4:15:30	0.0455
J_DE6_1	4:16:00	0.039
J_DE6_1	4:16:30	0.039
J_DE6_1	4:17:00	0.0325
J_DE6_1	4:17:30	0.0325
J_DE6_1	4:18:00	0.0325
J_DE6_1	4:18:30	0.026
J_DE6_1	4:19:00	0.026
J_DE6_1	4:19:30	0.0195
J_DE6_1	4:20:00	0.0195
J_DE6_1	4:20:30	0.013
J_DE6_1	4:21:00	0.013
J_DE6_1	4:21:30	0.013
J_DE6_1	4:22:00	0.013
J_DE6_1	4:22:30	0.0065
J_DE6_1	4:23:00	0.0065
J_DE6_1	4:23:30	0.0065
J_DE6_1	4:24:00	0.0065
J_DE6_1	4:24:30	0
J_DE6_1	4:25:00	0
J_DE6_1	4:25:30	0
J_DE6_1	4:26:00	0
J_DE6_1	4:26:30	0
J_DE6_1	4:27:00	0
J_DE6_1	4:27:30	0
J_DE6_1	4:28:00	0
J_DE6_1	4:28:30	0
J_DE6_1	4:29:00	0
J_DE6_1	4:29:30	0
J_DE6_1	4:30:00	0
J_DE6_1	4:30:30	0
J_DE6_1	4:31:00	0
J_DE6_1	4:31:30	0
J_DE6_1	4:32:00	0
J_DE6_1	4:32:30	0
J_DE6_1	4:33:00	0
J_DE6_1	4:33:30	0
J_DE6_1	4:34:00	0
J_DE6_1	4:34:30	0
J_DE6_1	4:35:00	0
J_DE6_1	4:35:30	0
J_DE6_1	4:36:00	0
J_DE6_1	4:36:30	0
J_DE6_1	4:37:00	0
J_DE6_1	4:37:30	0
J_DE6_1	4:38:00	0
J_DE6_1	4:38:30	0
J_DE6_1	4:39:00	0
J_DE6_1	4:39:30	0
J_DE6_1	4:40:00	0
J_DE6_1	4:40:30	0
J_DE6_1	4:41:00	0

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	4:41:30	0
J_DE6_1	4:42:00	0
J_DE6_1	4:42:30	0
J_DE6_1	4:43:00	0
J_DE6_1	4:43:30	0
J_DE6_1	4:44:00	0
J_DE6_1	4:44:30	0
J_DE6_1	4:45:00	0
J_DE6_1	4:45:30	0
J_DE6_1	4:46:00	0
J_DE6_1	4:46:30	0
J_DE6_1	4:47:00	0
J_DE6_1	4:47:30	0
J_DE6_1	4:48:00	0
J_DE6_1	4:48:30	0
J_DE6_1	4:49:00	0
J_DE6_1	4:49:30	0
J_DE6_1	4:50:00	0
J_DE6_1	4:50:30	0
J_DE6_1	4:51:00	0
J_DE6_1	4:51:30	0
J_DE6_1	4:52:00	0
J_DE6_1	4:52:30	0
J_DE6_1	4:53:00	0
J_DE6_1	4:53:30	0
J_DE6_1	4:54:00	0
J_DE6_1	4:54:30	0
J_DE6_1	4:55:00	0
J_DE6_1	4:55:30	0
J_DE6_1	4:56:00	0
J_DE6_1	4:56:30	0
J_DE6_1	4:57:00	0
J_DE6_1	4:57:30	0
J_DE6_1	4:58:00	0
J_DE6_1	4:58:30	0
J_DE6_1	4:59:00	0
J_DE6_1	4:59:30	0
J_DE6_1	5:00:00	0
J_DE6_1	5:00:30	0
J_DE6_1	5:01:00	0
J_DE6_1	5:01:30	0
J_DE6_1	5:02:00	0
J_DE6_1	5:02:30	0
J_DE6_1	5:03:00	0
J_DE6_1	5:03:30	0
J_DE6_1	5:04:00	0
J_DE6_1	5:04:30	0
J_DE6_1	5:05:00	0
J_DE6_1	5:05:30	0
J_DE6_1	5:06:00	0
J_DE6_1	5:06:30	0
J_DE6_1	5:07:00	0
J_DE6_1	5:07:30	0

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_1                  5:08:00    0
J_DE6_1                  5:08:30    0
J_DE6_1                  5:09:00    0
J_DE6_1                  5:09:30    0
J_DE6_1                  5:10:00    0
J_DE6_1                  5:10:30    0
J_DE6_1                  5:11:00    0
J_DE6_1                  5:11:30    0
J_DE6_1                  5:12:00    0
J_DE6_1                  5:12:30    0
J_DE6_1                  5:13:00    0
J_DE6_1                  5:13:30    0
J_DE6_1                  5:14:00    0
J_DE6_1                  5:14:30    0
J_DE6_1                  5:15:00    0
J_DE6_1                  5:15:30    0
J_DE6_1                  5:16:00    0
J_DE6_1                  5:16:30    0
J_DE6_1                  5:17:00    0
J_DE6_1                  5:17:30    0
J_DE6_1                  5:18:00    0
J_DE6_1                  5:18:30    0
J_DE6_1                  5:19:00    0
J_DE6_1                  5:19:30    0
J_DE6_1                  5:20:00    0
J_DE6_1                  5:20:30    0
J_DE6_1                  5:21:00    0
J_DE6_1                  5:21:30    0
J_DE6_1                  5:22:00    0
J_DE6_1                  5:22:30    0
J_DE6_1                  5:23:00    0
J_DE6_1                  5:23:30    0
J_DE6_1                  5:24:00    0
J_DE6_1                  5:24:30    0
J_DE6_1                  5:25:00    0
J_DE6_1                  5:25:30    0
J_DE6_1                  5:26:00    0
J_DE6_1                  5:26:30    0
J_DE6_1                  5:27:00    0
J_DE6_1                  5:27:30    0
J_DE6_1                  5:28:00    0
J_DE6_1                  5:28:30    0
J_DE6_1                  5:29:00    0
J_DE6_1                  5:29:30    0
J_DE6_1                  5:30:00    0
J_DE6_1                  5:30:30    0
J_DE6_1                  5:31:00    0
J_DE6_1                  5:31:30    0
J_DE6_1                  5:32:00    0
J_DE6_1                  5:32:30    0
J_DE6_1                  5:33:00    0
J_DE6_1                  5:33:30    0
J_DE6_1                  5:34:00    0
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_1                  5:34:30    0
J_DE6_1                  5:35:00    0
J_DE6_1                  5:35:30    0
J_DE6_1                  5:36:00    0
J_DE6_1                  5:36:30    0
J_DE6_1                  5:37:00    0
J_DE6_1                  5:37:30    0
J_DE6_1                  5:38:00    0
J_DE6_1                  5:38:30    0
J_DE6_1                  5:39:00    0
J_DE6_1                  5:39:30    0
J_DE6_1                  5:40:00    0
J_DE6_1                  5:40:30    0
J_DE6_1                  5:41:00    0
J_DE6_1                  5:41:30    0
J_DE6_1                  5:42:00    0
J_DE6_1                  5:42:30    0
J_DE6_1                  5:43:00    0
J_DE6_1                  5:43:30    0
J_DE6_1                  5:44:00    0
J_DE6_1                  5:44:30    0
J_DE6_1                  5:45:00    0
J_DE6_1                  5:45:30    0
J_DE6_1                  5:46:00    0
J_DE6_1                  5:46:30    0
J_DE6_1                  5:47:00    0
J_DE6_1                  5:47:30    0
J_DE6_1                  5:48:00    0
J_DE6_1                  5:48:30    0
J_DE6_1                  5:49:00    0
J_DE6_1                  5:49:30    0
J_DE6_1                  5:50:00    0
J_DE6_1                  5:50:30    0
J_DE6_1                  5:51:00    0
J_DE6_1                  5:51:30    0
J_DE6_1                  5:52:00    0
J_DE6_1                  5:52:30    0
J_DE6_1                  5:53:00    0
J_DE6_1                  5:53:30    0
J_DE6_1                  5:54:00    0
J_DE6_1                  5:54:30    0
J_DE6_1                  5:55:00    0
J_DE6_1                  5:55:30    0
J_DE6_1                  5:56:00    0
J_DE6_1                  5:56:30    0
J_DE6_1                  5:57:00    0
J_DE6_1                  5:57:30    0
J_DE6_1                  5:58:00    0
J_DE6_1                  5:58:30    0
J_DE6_1                  5:59:00    0
J_DE6_1                  5:59:30    0
J_DE6_1                  6:00:00    0
;
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	0:00:30	0
J_DE6_2	0:01:00	0
J_DE6_2	0:01:30	0
J_DE6_2	0:02:00	0
J_DE6_2	0:02:30	0
J_DE6_2	0:03:00	0
J_DE6_2	0:03:30	0
J_DE6_2	0:04:00	0
J_DE6_2	0:04:30	0
J_DE6_2	0:05:00	0
J_DE6_2	0:05:30	0
J_DE6_2	0:06:00	0
J_DE6_2	0:06:30	0
J_DE6_2	0:07:00	0
J_DE6_2	0:07:30	0
J_DE6_2	0:08:00	0
J_DE6_2	0:08:30	0
J_DE6_2	0:09:00	0
J_DE6_2	0:09:30	0
J_DE6_2	0:10:00	0
J_DE6_2	0:10:30	0.077
J_DE6_2	0:11:00	0.168
J_DE6_2	0:11:30	0.2625
J_DE6_2	0:12:00	0.3605
J_DE6_2	0:12:30	0.448
J_DE6_2	0:13:00	0.539
J_DE6_2	0:13:30	0.644
J_DE6_2	0:14:00	0.7385
J_DE6_2	0:14:30	0.8295
J_DE6_2	0:15:00	0.924
J_DE6_2	0:15:30	1.176
J_DE6_2	0:16:00	1.428
J_DE6_2	0:16:30	1.6835
J_DE6_2	0:17:00	1.939
J_DE6_2	0:17:30	2.1945
J_DE6_2	0:18:00	2.4465
J_DE6_2	0:18:30	2.702
J_DE6_2	0:19:00	2.9575
J_DE6_2	0:19:30	3.2095
J_DE6_2	0:20:00	3.465
J_DE6_2	0:20:30	4.081
J_DE6_2	0:21:00	4.7005
J_DE6_2	0:21:30	5.32
J_DE6_2	0:22:00	5.943
J_DE6_2	0:22:30	6.5625
J_DE6_2	0:23:00	7.182
J_DE6_2	0:23:30	7.805
J_DE6_2	0:24:00	8.4245
J_DE6_2	0:24:30	9.044
J_DE6_2	0:25:00	9.667
J_DE6_2	0:25:30	11.291
J_DE6_2	0:26:00	12.9325
J_DE6_2	0:26:30	14.574

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	0:27:00	16.219
J_DE6_2	0:27:30	17.8605
J_DE6_2	0:28:00	19.502
J_DE6_2	0:28:30	21.1435
J_DE6_2	0:29:00	22.7885
J_DE6_2	0:29:30	24.43
J_DE6_2	0:30:00	26.0715
J_DE6_2	0:30:30	27.888
J_DE6_2	0:31:00	29.708
J_DE6_2	0:31:30	31.5245
J_DE6_2	0:32:00	33.3445
J_DE6_2	0:32:30	35.161
J_DE6_2	0:33:00	36.981
J_DE6_2	0:33:30	38.801
J_DE6_2	0:34:00	40.6175
J_DE6_2	0:34:30	42.4375
J_DE6_2	0:35:00	44.254
J_DE6_2	0:35:30	45.3075
J_DE6_2	0:36:00	46.3435
J_DE6_2	0:36:30	47.383
J_DE6_2	0:37:00	48.419
J_DE6_2	0:37:30	49.455
J_DE6_2	0:38:00	50.4945
J_DE6_2	0:38:30	51.5305
J_DE6_2	0:39:00	52.57
J_DE6_2	0:39:30	53.606
J_DE6_2	0:40:00	54.6455
J_DE6_2	0:40:30	55.069
J_DE6_2	0:41:00	55.482
J_DE6_2	0:41:30	55.8985
J_DE6_2	0:42:00	56.3115
J_DE6_2	0:42:30	56.7245
J_DE6_2	0:43:00	57.1375
J_DE6_2	0:43:30	57.554
J_DE6_2	0:44:00	57.967
J_DE6_2	0:44:30	58.38
J_DE6_2	0:45:00	58.7965
J_DE6_2	0:45:30	58.8245
J_DE6_2	0:46:00	58.849
J_DE6_2	0:46:30	58.87
J_DE6_2	0:47:00	58.8945
J_DE6_2	0:47:30	58.919
J_DE6_2	0:48:00	58.94
J_DE6_2	0:48:30	58.9645
J_DE6_2	0:49:00	58.9855
J_DE6_2	0:49:30	59.01
J_DE6_2	0:50:00	59.0345
J_DE6_2	0:50:30	58.8315
J_DE6_2	0:51:00	58.6285
J_DE6_2	0:51:30	58.422
J_DE6_2	0:52:00	58.2155
J_DE6_2	0:52:30	58.0125
J_DE6_2	0:53:00	57.806

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	0:53:30	57.603
J_DE6_2	0:54:00	57.3965
J_DE6_2	0:54:30	57.1935
J_DE6_2	0:55:00	56.987
J_DE6_2	0:55:30	56.7595
J_DE6_2	0:56:00	56.5285
J_DE6_2	0:56:30	56.301
J_DE6_2	0:57:00	56.07
J_DE6_2	0:57:30	55.8425
J_DE6_2	0:58:00	55.615
J_DE6_2	0:58:30	55.384
J_DE6_2	0:59:00	55.1565
J_DE6_2	0:59:30	54.9255
J_DE6_2	1:00:00	54.698
J_DE6_2	1:00:30	54.474
J_DE6_2	1:01:00	54.2465
J_DE6_2	1:01:30	54.0225
J_DE6_2	1:02:00	53.7985
J_DE6_2	1:02:30	53.571
J_DE6_2	1:03:00	53.347
J_DE6_2	1:03:30	53.123
J_DE6_2	1:04:00	52.899
J_DE6_2	1:04:30	52.6715
J_DE6_2	1:05:00	52.4475
J_DE6_2	1:05:30	52.1395
J_DE6_2	1:06:00	51.8315
J_DE6_2	1:06:30	51.52
J_DE6_2	1:07:00	51.212
J_DE6_2	1:07:30	50.904
J_DE6_2	1:08:00	50.5925
J_DE6_2	1:08:30	50.2845
J_DE6_2	1:09:00	49.9765
J_DE6_2	1:09:30	49.6685
J_DE6_2	1:10:00	49.357
J_DE6_2	1:10:30	49.0175
J_DE6_2	1:11:00	48.678
J_DE6_2	1:11:30	48.3385
J_DE6_2	1:12:00	47.999
J_DE6_2	1:12:30	47.656
J_DE6_2	1:13:00	47.3165
J_DE6_2	1:13:30	46.977
J_DE6_2	1:14:00	46.6375
J_DE6_2	1:14:30	46.2945
J_DE6_2	1:15:00	45.955
J_DE6_2	1:15:30	45.5945
J_DE6_2	1:16:00	45.234
J_DE6_2	1:16:30	44.8735
J_DE6_2	1:17:00	44.513
J_DE6_2	1:17:30	44.1525
J_DE6_2	1:18:00	43.792
J_DE6_2	1:18:30	43.4315
J_DE6_2	1:19:00	43.071
J_DE6_2	1:19:30	42.7105

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	1:20:00	42.35
J_DE6_2	1:20:30	41.972
J_DE6_2	1:21:00	41.594
J_DE6_2	1:21:30	41.216
J_DE6_2	1:22:00	40.8345
J_DE6_2	1:22:30	40.4565
J_DE6_2	1:23:00	40.0785
J_DE6_2	1:23:30	39.7005
J_DE6_2	1:24:00	39.319
J_DE6_2	1:24:30	38.941
J_DE6_2	1:25:00	38.563
J_DE6_2	1:25:30	38.1955
J_DE6_2	1:26:00	37.828
J_DE6_2	1:26:30	37.457
J_DE6_2	1:27:00	37.0895
J_DE6_2	1:27:30	36.722
J_DE6_2	1:28:00	36.3545
J_DE6_2	1:28:30	35.987
J_DE6_2	1:29:00	35.6195
J_DE6_2	1:29:30	35.252
J_DE6_2	1:30:00	34.881
J_DE6_2	1:30:30	34.538
J_DE6_2	1:31:00	34.1915
J_DE6_2	1:31:30	33.8485
J_DE6_2	1:32:00	33.502
J_DE6_2	1:32:30	33.159
J_DE6_2	1:33:00	32.8125
J_DE6_2	1:33:30	32.466
J_DE6_2	1:34:00	32.123
J_DE6_2	1:34:30	31.7765
J_DE6_2	1:35:00	31.4335
J_DE6_2	1:35:30	31.1045
J_DE6_2	1:36:00	30.779
J_DE6_2	1:36:30	30.4535
J_DE6_2	1:37:00	30.1245
J_DE6_2	1:37:30	29.799
J_DE6_2	1:38:00	29.47
J_DE6_2	1:38:30	29.1445
J_DE6_2	1:39:00	28.819
J_DE6_2	1:39:30	28.49
J_DE6_2	1:40:00	28.1645
J_DE6_2	1:40:30	27.8705
J_DE6_2	1:41:00	27.58
J_DE6_2	1:41:30	27.2895
J_DE6_2	1:42:00	26.999
J_DE6_2	1:42:30	26.7085
J_DE6_2	1:43:00	26.4145
J_DE6_2	1:43:30	26.124
J_DE6_2	1:44:00	25.8335
J_DE6_2	1:44:30	25.543
J_DE6_2	1:45:00	25.2525
J_DE6_2	1:45:30	25.0355
J_DE6_2	1:46:00	24.822

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	1:46:30	24.6085
J_DE6_2	1:47:00	24.395
J_DE6_2	1:47:30	24.178
J_DE6_2	1:48:00	23.9645
J_DE6_2	1:48:30	23.751
J_DE6_2	1:49:00	23.5375
J_DE6_2	1:49:30	23.324
J_DE6_2	1:50:00	23.1105
J_DE6_2	1:50:30	22.932
J_DE6_2	1:51:00	22.757
J_DE6_2	1:51:30	22.582
J_DE6_2	1:52:00	22.407
J_DE6_2	1:52:30	22.2355
J_DE6_2	1:53:00	22.0605
J_DE6_2	1:53:30	21.8855
J_DE6_2	1:54:00	21.7105
J_DE6_2	1:54:30	21.5355
J_DE6_2	1:55:00	21.3605
J_DE6_2	1:55:30	21.2065
J_DE6_2	1:56:00	21.0525
J_DE6_2	1:56:30	20.8985
J_DE6_2	1:57:00	20.7445
J_DE6_2	1:57:30	20.5905
J_DE6_2	1:58:00	20.4365
J_DE6_2	1:58:30	20.2825
J_DE6_2	1:59:00	20.1285
J_DE6_2	1:59:30	19.9745
J_DE6_2	2:00:00	19.8205
J_DE6_2	2:00:30	19.6525
J_DE6_2	2:01:00	19.488
J_DE6_2	2:01:30	19.32
J_DE6_2	2:02:00	19.1555
J_DE6_2	2:02:30	18.9875
J_DE6_2	2:03:00	18.8195
J_DE6_2	2:03:30	18.655
J_DE6_2	2:04:00	18.487
J_DE6_2	2:04:30	18.3225
J_DE6_2	2:05:00	18.1545
J_DE6_2	2:05:30	17.9725
J_DE6_2	2:06:00	17.7905
J_DE6_2	2:06:30	17.6085
J_DE6_2	2:07:00	17.43
J_DE6_2	2:07:30	17.248
J_DE6_2	2:08:00	17.066
J_DE6_2	2:08:30	16.884
J_DE6_2	2:09:00	16.702
J_DE6_2	2:09:30	16.52
J_DE6_2	2:10:00	16.338
J_DE6_2	2:10:30	16.163
J_DE6_2	2:11:00	15.9845
J_DE6_2	2:11:30	15.806
J_DE6_2	2:12:00	15.6275
J_DE6_2	2:12:30	15.449

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	2:13:00	15.2705
J_DE6_2	2:13:30	15.092
J_DE6_2	2:14:00	14.9135
J_DE6_2	2:14:30	14.735
J_DE6_2	2:15:00	14.5565
J_DE6_2	2:15:30	14.3885
J_DE6_2	2:16:00	14.2205
J_DE6_2	2:16:30	14.0525
J_DE6_2	2:17:00	13.8845
J_DE6_2	2:17:30	13.713
J_DE6_2	2:18:00	13.545
J_DE6_2	2:18:30	13.377
J_DE6_2	2:19:00	13.209
J_DE6_2	2:19:30	13.041
J_DE6_2	2:20:00	12.873
J_DE6_2	2:20:30	12.7155
J_DE6_2	2:21:00	12.5615
J_DE6_2	2:21:30	12.404
J_DE6_2	2:22:00	12.2465
J_DE6_2	2:22:30	12.0925
J_DE6_2	2:23:00	11.935
J_DE6_2	2:23:30	11.781
J_DE6_2	2:24:00	11.6235
J_DE6_2	2:24:30	11.4695
J_DE6_2	2:25:00	11.312
J_DE6_2	2:25:30	11.165
J_DE6_2	2:26:00	11.018
J_DE6_2	2:26:30	10.8675
J_DE6_2	2:27:00	10.7205
J_DE6_2	2:27:30	10.5735
J_DE6_2	2:28:00	10.423
J_DE6_2	2:28:30	10.276
J_DE6_2	2:29:00	10.129
J_DE6_2	2:29:30	9.9785
J_DE6_2	2:30:00	9.8315
J_DE6_2	2:30:30	9.688
J_DE6_2	2:31:00	9.5445
J_DE6_2	2:31:30	9.401
J_DE6_2	2:32:00	9.261
J_DE6_2	2:32:30	9.1175
J_DE6_2	2:33:00	8.974
J_DE6_2	2:33:30	8.8305
J_DE6_2	2:34:00	8.687
J_DE6_2	2:34:30	8.5435
J_DE6_2	2:35:00	8.4
J_DE6_2	2:35:30	8.26
J_DE6_2	2:36:00	8.1235
J_DE6_2	2:36:30	7.9835
J_DE6_2	2:37:00	7.8435
J_DE6_2	2:37:30	7.7035
J_DE6_2	2:38:00	7.5635
J_DE6_2	2:38:30	7.4235
J_DE6_2	2:39:00	7.2835

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	2:39:30	7.1435
J_DE6_2	2:40:00	7.0035
J_DE6_2	2:40:30	6.8705
J_DE6_2	2:41:00	6.7375
J_DE6_2	2:41:30	6.601
J_DE6_2	2:42:00	6.468
J_DE6_2	2:42:30	6.335
J_DE6_2	2:43:00	6.202
J_DE6_2	2:43:30	6.0655
J_DE6_2	2:44:00	5.9325
J_DE6_2	2:44:30	5.7995
J_DE6_2	2:45:00	5.6665
J_DE6_2	2:45:30	5.537
J_DE6_2	2:46:00	5.411
J_DE6_2	2:46:30	5.2815
J_DE6_2	2:47:00	5.1555
J_DE6_2	2:47:30	5.026
J_DE6_2	2:48:00	4.9
J_DE6_2	2:48:30	4.7705
J_DE6_2	2:49:00	4.6445
J_DE6_2	2:49:30	4.5185
J_DE6_2	2:50:00	4.389
J_DE6_2	2:50:30	4.277
J_DE6_2	2:51:00	4.1615
J_DE6_2	2:51:30	4.0495
J_DE6_2	2:52:00	3.934
J_DE6_2	2:52:30	3.822
J_DE6_2	2:53:00	3.71
J_DE6_2	2:53:30	3.5945
J_DE6_2	2:54:00	3.4825
J_DE6_2	2:54:30	3.367
J_DE6_2	2:55:00	3.255
J_DE6_2	2:55:30	3.1745
J_DE6_2	2:56:00	3.0975
J_DE6_2	2:56:30	3.0205
J_DE6_2	2:57:00	2.9435
J_DE6_2	2:57:30	2.863
J_DE6_2	2:58:00	2.786
J_DE6_2	2:58:30	2.709
J_DE6_2	2:59:00	2.6285
J_DE6_2	2:59:30	2.5515
J_DE6_2	3:00:00	2.4745
J_DE6_2	3:00:30	2.4185
J_DE6_2	3:01:00	2.3625
J_DE6_2	3:01:30	2.3065
J_DE6_2	3:02:00	2.2505
J_DE6_2	3:02:30	2.1945
J_DE6_2	3:03:00	2.1385
J_DE6_2	3:03:30	2.0825
J_DE6_2	3:04:00	2.03
J_DE6_2	3:04:30	1.974
J_DE6_2	3:05:00	1.918
J_DE6_2	3:05:30	1.876

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	3:06:00	1.834
J_DE6_2	3:06:30	1.7885
J_DE6_2	3:07:00	1.7465
J_DE6_2	3:07:30	1.7045
J_DE6_2	3:08:00	1.6625
J_DE6_2	3:08:30	1.6205
J_DE6_2	3:09:00	1.5785
J_DE6_2	3:09:30	1.533
J_DE6_2	3:10:00	1.491
J_DE6_2	3:10:30	1.4595
J_DE6_2	3:11:00	1.4245
J_DE6_2	3:11:30	1.393
J_DE6_2	3:12:00	1.3615
J_DE6_2	3:12:30	1.3265
J_DE6_2	3:13:00	1.295
J_DE6_2	3:13:30	1.2635
J_DE6_2	3:14:00	1.2285
J_DE6_2	3:14:30	1.197
J_DE6_2	3:15:00	1.162
J_DE6_2	3:15:30	1.1375
J_DE6_2	3:16:00	1.113
J_DE6_2	3:16:30	1.0885
J_DE6_2	3:17:00	1.064
J_DE6_2	3:17:30	1.0395
J_DE6_2	3:18:00	1.015
J_DE6_2	3:18:30	0.9905
J_DE6_2	3:19:00	0.9625
J_DE6_2	3:19:30	0.938
J_DE6_2	3:20:00	0.9135
J_DE6_2	3:20:30	0.8925
J_DE6_2	3:21:00	0.875
J_DE6_2	3:21:30	0.854
J_DE6_2	3:22:00	0.833
J_DE6_2	3:22:30	0.812
J_DE6_2	3:23:00	0.7945
J_DE6_2	3:23:30	0.7735
J_DE6_2	3:24:00	0.7525
J_DE6_2	3:24:30	0.7315
J_DE6_2	3:25:00	0.714
J_DE6_2	3:25:30	0.6965
J_DE6_2	3:26:00	0.6825
J_DE6_2	3:26:30	0.665
J_DE6_2	3:27:00	0.651
J_DE6_2	3:27:30	0.6335
J_DE6_2	3:28:00	0.6195
J_DE6_2	3:28:30	0.6055
J_DE6_2	3:29:00	0.588
J_DE6_2	3:29:30	0.574
J_DE6_2	3:30:00	0.5565
J_DE6_2	3:30:30	0.546
J_DE6_2	3:31:00	0.5355
J_DE6_2	3:31:30	0.525
J_DE6_2	3:32:00	0.5145

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	3:32:30	0.504
J_DE6_2	3:33:00	0.4935
J_DE6_2	3:33:30	0.483
J_DE6_2	3:34:00	0.4725
J_DE6_2	3:34:30	0.462
J_DE6_2	3:35:00	0.448
J_DE6_2	3:35:30	0.441
J_DE6_2	3:36:00	0.4305
J_DE6_2	3:36:30	0.4235
J_DE6_2	3:37:00	0.413
J_DE6_2	3:37:30	0.406
J_DE6_2	3:38:00	0.3955
J_DE6_2	3:38:30	0.3885
J_DE6_2	3:39:00	0.378
J_DE6_2	3:39:30	0.371
J_DE6_2	3:40:00	0.3605
J_DE6_2	3:40:30	0.3535
J_DE6_2	3:41:00	0.3465
J_DE6_2	3:41:30	0.3395
J_DE6_2	3:42:00	0.3325
J_DE6_2	3:42:30	0.3255
J_DE6_2	3:43:00	0.3185
J_DE6_2	3:43:30	0.3115
J_DE6_2	3:44:00	0.3045
J_DE6_2	3:44:30	0.2975
J_DE6_2	3:45:00	0.287
J_DE6_2	3:45:30	0.2835
J_DE6_2	3:46:00	0.2765
J_DE6_2	3:46:30	0.2695
J_DE6_2	3:47:00	0.2625
J_DE6_2	3:47:30	0.2555
J_DE6_2	3:48:00	0.252
J_DE6_2	3:48:30	0.245
J_DE6_2	3:49:00	0.238
J_DE6_2	3:49:30	0.231
J_DE6_2	3:50:00	0.224
J_DE6_2	3:50:30	0.2205
J_DE6_2	3:51:00	0.2135
J_DE6_2	3:51:30	0.21
J_DE6_2	3:52:00	0.203
J_DE6_2	3:52:30	0.196
J_DE6_2	3:53:00	0.1925
J_DE6_2	3:53:30	0.1855
J_DE6_2	3:54:00	0.182
J_DE6_2	3:54:30	0.175
J_DE6_2	3:55:00	0.168
J_DE6_2	3:55:30	0.1645
J_DE6_2	3:56:00	0.161
J_DE6_2	3:56:30	0.154
J_DE6_2	3:57:00	0.1505
J_DE6_2	3:57:30	0.147
J_DE6_2	3:58:00	0.14
J_DE6_2	3:58:30	0.1365

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	3:59:00	0.133
J_DE6_2	3:59:30	0.126
J_DE6_2	4:00:00	0.1225
J_DE6_2	4:00:30	0.119
J_DE6_2	4:01:00	0.1155
J_DE6_2	4:01:30	0.1085
J_DE6_2	4:02:00	0.105
J_DE6_2	4:02:30	0.1015
J_DE6_2	4:03:00	0.098
J_DE6_2	4:03:30	0.0945
J_DE6_2	4:04:00	0.091
J_DE6_2	4:04:30	0.0875
J_DE6_2	4:05:00	0.0805
J_DE6_2	4:05:30	0.0805
J_DE6_2	4:06:00	0.077
J_DE6_2	4:06:30	0.0735
J_DE6_2	4:07:00	0.07
J_DE6_2	4:07:30	0.0665
J_DE6_2	4:08:00	0.063
J_DE6_2	4:08:30	0.0595
J_DE6_2	4:09:00	0.056
J_DE6_2	4:09:30	0.0525
J_DE6_2	4:10:00	0.049
J_DE6_2	4:10:30	0.049
J_DE6_2	4:11:00	0.0455
J_DE6_2	4:11:30	0.042
J_DE6_2	4:12:00	0.042
J_DE6_2	4:12:30	0.0385
J_DE6_2	4:13:00	0.035
J_DE6_2	4:13:30	0.0315
J_DE6_2	4:14:00	0.0315
J_DE6_2	4:14:30	0.028
J_DE6_2	4:15:00	0.0245
J_DE6_2	4:15:30	0.0245
J_DE6_2	4:16:00	0.021
J_DE6_2	4:16:30	0.021
J_DE6_2	4:17:00	0.0175
J_DE6_2	4:17:30	0.0175
J_DE6_2	4:18:00	0.0175
J_DE6_2	4:18:30	0.014
J_DE6_2	4:19:00	0.014
J_DE6_2	4:19:30	0.0105
J_DE6_2	4:20:00	0.0105
J_DE6_2	4:20:30	0.007
J_DE6_2	4:21:00	0.007
J_DE6_2	4:21:30	0.007
J_DE6_2	4:22:00	0.007
J_DE6_2	4:22:30	0.0035
J_DE6_2	4:23:00	0.0035
J_DE6_2	4:23:30	0.0035
J_DE6_2	4:24:00	0.0035
J_DE6_2	4:24:30	0
J_DE6_2	4:25:00	0

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	4:25:30	0
J_DE6_2	4:26:00	0
J_DE6_2	4:26:30	0
J_DE6_2	4:27:00	0
J_DE6_2	4:27:30	0
J_DE6_2	4:28:00	0
J_DE6_2	4:28:30	0
J_DE6_2	4:29:00	0
J_DE6_2	4:29:30	0
J_DE6_2	4:30:00	0
J_DE6_2	4:30:30	0
J_DE6_2	4:31:00	0
J_DE6_2	4:31:30	0
J_DE6_2	4:32:00	0
J_DE6_2	4:32:30	0
J_DE6_2	4:33:00	0
J_DE6_2	4:33:30	0
J_DE6_2	4:34:00	0
J_DE6_2	4:34:30	0
J_DE6_2	4:35:00	0
J_DE6_2	4:35:30	0
J_DE6_2	4:36:00	0
J_DE6_2	4:36:30	0
J_DE6_2	4:37:00	0
J_DE6_2	4:37:30	0
J_DE6_2	4:38:00	0
J_DE6_2	4:38:30	0
J_DE6_2	4:39:00	0
J_DE6_2	4:39:30	0
J_DE6_2	4:40:00	0
J_DE6_2	4:40:30	0
J_DE6_2	4:41:00	0
J_DE6_2	4:41:30	0
J_DE6_2	4:42:00	0
J_DE6_2	4:42:30	0
J_DE6_2	4:43:00	0
J_DE6_2	4:43:30	0
J_DE6_2	4:44:00	0
J_DE6_2	4:44:30	0
J_DE6_2	4:45:00	0
J_DE6_2	4:45:30	0
J_DE6_2	4:46:00	0
J_DE6_2	4:46:30	0
J_DE6_2	4:47:00	0
J_DE6_2	4:47:30	0
J_DE6_2	4:48:00	0
J_DE6_2	4:48:30	0
J_DE6_2	4:49:00	0
J_DE6_2	4:49:30	0
J_DE6_2	4:50:00	0
J_DE6_2	4:50:30	0
J_DE6_2	4:51:00	0
J_DE6_2	4:51:30	0

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	4:52:00	0
J_DE6_2	4:52:30	0
J_DE6_2	4:53:00	0
J_DE6_2	4:53:30	0
J_DE6_2	4:54:00	0
J_DE6_2	4:54:30	0
J_DE6_2	4:55:00	0
J_DE6_2	4:55:30	0
J_DE6_2	4:56:00	0
J_DE6_2	4:56:30	0
J_DE6_2	4:57:00	0
J_DE6_2	4:57:30	0
J_DE6_2	4:58:00	0
J_DE6_2	4:58:30	0
J_DE6_2	4:59:00	0
J_DE6_2	4:59:30	0
J_DE6_2	5:00:00	0
J_DE6_2	5:00:30	0
J_DE6_2	5:01:00	0
J_DE6_2	5:01:30	0
J_DE6_2	5:02:00	0
J_DE6_2	5:02:30	0
J_DE6_2	5:03:00	0
J_DE6_2	5:03:30	0
J_DE6_2	5:04:00	0
J_DE6_2	5:04:30	0
J_DE6_2	5:05:00	0
J_DE6_2	5:05:30	0
J_DE6_2	5:06:00	0
J_DE6_2	5:06:30	0
J_DE6_2	5:07:00	0
J_DE6_2	5:07:30	0
J_DE6_2	5:08:00	0
J_DE6_2	5:08:30	0
J_DE6_2	5:09:00	0
J_DE6_2	5:09:30	0
J_DE6_2	5:10:00	0
J_DE6_2	5:10:30	0
J_DE6_2	5:11:00	0
J_DE6_2	5:11:30	0
J_DE6_2	5:12:00	0
J_DE6_2	5:12:30	0
J_DE6_2	5:13:00	0
J_DE6_2	5:13:30	0
J_DE6_2	5:14:00	0
J_DE6_2	5:14:30	0
J_DE6_2	5:15:00	0
J_DE6_2	5:15:30	0
J_DE6_2	5:16:00	0
J_DE6_2	5:16:30	0
J_DE6_2	5:17:00	0
J_DE6_2	5:17:30	0
J_DE6_2	5:18:00	0

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	5:18:30	0
J_DE6_2	5:19:00	0
J_DE6_2	5:19:30	0
J_DE6_2	5:20:00	0
J_DE6_2	5:20:30	0
J_DE6_2	5:21:00	0
J_DE6_2	5:21:30	0
J_DE6_2	5:22:00	0
J_DE6_2	5:22:30	0
J_DE6_2	5:23:00	0
J_DE6_2	5:23:30	0
J_DE6_2	5:24:00	0
J_DE6_2	5:24:30	0
J_DE6_2	5:25:00	0
J_DE6_2	5:25:30	0
J_DE6_2	5:26:00	0
J_DE6_2	5:26:30	0
J_DE6_2	5:27:00	0
J_DE6_2	5:27:30	0
J_DE6_2	5:28:00	0
J_DE6_2	5:28:30	0
J_DE6_2	5:29:00	0
J_DE6_2	5:29:30	0
J_DE6_2	5:30:00	0
J_DE6_2	5:30:30	0
J_DE6_2	5:31:00	0
J_DE6_2	5:31:30	0
J_DE6_2	5:32:00	0
J_DE6_2	5:32:30	0
J_DE6_2	5:33:00	0
J_DE6_2	5:33:30	0
J_DE6_2	5:34:00	0
J_DE6_2	5:34:30	0
J_DE6_2	5:35:00	0
J_DE6_2	5:35:30	0
J_DE6_2	5:36:00	0
J_DE6_2	5:36:30	0
J_DE6_2	5:37:00	0
J_DE6_2	5:37:30	0
J_DE6_2	5:38:00	0
J_DE6_2	5:38:30	0
J_DE6_2	5:39:00	0
J_DE6_2	5:39:30	0
J_DE6_2	5:40:00	0
J_DE6_2	5:40:30	0
J_DE6_2	5:41:00	0
J_DE6_2	5:41:30	0
J_DE6_2	5:42:00	0
J_DE6_2	5:42:30	0
J_DE6_2	5:43:00	0
J_DE6_2	5:43:30	0
J_DE6_2	5:44:00	0
J_DE6_2	5:44:30	0

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_2                  5:45:00    0
J_DE6_2                  5:45:30    0
J_DE6_2                  5:46:00    0
J_DE6_2                  5:46:30    0
J_DE6_2                  5:47:00    0
J_DE6_2                  5:47:30    0
J_DE6_2                  5:48:00    0
J_DE6_2                  5:48:30    0
J_DE6_2                  5:49:00    0
J_DE6_2                  5:49:30    0
J_DE6_2                  5:50:00    0
J_DE6_2                  5:50:30    0
J_DE6_2                  5:51:00    0
J_DE6_2                  5:51:30    0
J_DE6_2                  5:52:00    0
J_DE6_2                  5:52:30    0
J_DE6_2                  5:53:00    0
J_DE6_2                  5:53:30    0
J_DE6_2                  5:54:00    0
J_DE6_2                  5:54:30    0
J_DE6_2                  5:55:00    0
J_DE6_2                  5:55:30    0
J_DE6_2                  5:56:00    0
J_DE6_2                  5:56:30    0
J_DE6_2                  5:57:00    0
J_DE6_2                  5:57:30    0
J_DE6_2                  5:58:00    0
J_DE6_2                  5:58:30    0
J_DE6_2                  5:59:00    0
J_DE6_2                  5:59:30    0
J_DE6_2                  6:00:00    0

[REPORT]
;;Reporting Options
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       19071STMH       EX
Node       19079STMH       EX
Node       19097STMH       EX
Node       19111STMH       EX
Node       19132STMH       EX
Node       19134STMH       EX
Node       19139STMH       EX
Node       19143STMH       EX
Node       19150STMH       EX
Node       19154STMH       EX
Node       19162STMH       EX
Node       19171STMH       EX
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

Node	19179STMH	EX
Node	19214STMH	EX
Node	20135STMH	EX
Node	20209STFT	EX
Node	20818STMH	EX
Node	20841STMH	EX
Node	23839STMH	EX
Node	23840STMH	EX
Node	23841STMH	EX
Node	23843STMH	EX
Node	23845STMH	EX
Node	23849STMH	EX
Node	23852STMH	EX
Node	23855STMH	EX
Node	23856STMH	EX
Node	23861STMH	EX
Node	23862STMH	EX
Node	23868STMH	EX
Node	24788STMH	EX
Node	24791STMH	EX
Node	24796STMH	EX
Node	24797STIL	EX
Node	24800STMH	EX
Node	405658STFT	EX
Node	405659STFT	EX
Node	407540STMH	EX
Node	407541STMH	EX
Node	407542STMH	EX
Node	407543STMH	EX
Node	407544STMH	EX
Node	407546STMH	EX
Node	J_DE6_2	BASIN
Node	J_DE5	BASIN
Node	J_DE3	BASIN
Node	J_DE2	BASIN
Node	J_AD4	BASIN
Node	J_AD1	BASIN
Node	J_DE1	BASIN
Node	773032STMH	EX
Node	773050STMH	EX
Node	773052STMH	EX
Node	773389STMH	EX
Node	773392STMH	EX
Node	773410STMH	EX
Node	773412STMH	EX
Node	18979STOF	OUT
Node	18979STOF2	OUT
Node	23842STFT	OUT
Node	24773STOF	OUT
Node	24773STOF2	OUT
Node	407544STMH-OF	OUT
Node	407550STMH	OUT
Node	4401-02-250-OF	OUT

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
Node       773412STMH-OF    OUT
Link       19071STMH        EX
Link       19071STMH-OF     OF
Link       35191STGM        EX
Link       35191STGM-OF     OF
Link       35325STGM        EX
Link       35325STGM-OF     OF
Link       35326STGM        EX
Link       35326STGM-OF     OF
Link       35328STGM        EX
Link       35328STGM-OF     OF
Link       35329STGM        EX
Link       35329STGM-OF     OF
Link       35355STGM        EX
Link       35355STGM-OF     OF
Link       35357STGM        EX
Link       35357STGM-OF     OF
Link       35358STGM        EX
Link       35358STGM-OF     OF
Link       35362STGM        EX
Link       35362STGM-OF     OF
Link       35363STGM        EX
Link       35363STGM-OF     OF
Link       35365STGM        EX
Link       35365STGM-OF     OF
Link       35367STGM        EX
Link       35367STGM-OF     OF
Link       35368STGM        EX
Link       35368STGM-OF     OF
Link       35369STGM        EX
Link       35369STGM-OF     OF
Link       35370STGM        EX
Link       35370STGM-OF     OF
Link       35371STGM        EX
Link       35372STGM        EX
Link       35372STGM-OF     OF
Link       36715STGM        EX
Link       36715STGM-OF     OF
Link       36716STGM        EX
Link       36716STGM-OF     OF
Link       36717STGM        EX
Link       36717STGM-OF     OF
Link       36718STGM        EX
Link       36718STGM-OF     OF
Link       36939STGM        EX
Link       36939STGM-OF     OF
Link       37665STGM        EX
Link       37665STGM-OF     OF
Link       37666STGM        EX
Link       37666STGM-OF     OF
Link       37673STGM        EX
Link       37673STGMF-OFE   OF
Link       37750STGM        EX
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
Link       37750STGM-OF     OF
Link       37757STGM        EX
Link       37757STGM-OF     OF
Link       37758STGM        EX
Link       37758STGM-OF     OF
Link       37759STGM        EX
Link       37759STGM-OF     OF
Link       37760STGM        EX
Link       37760STGM-OF     OF
Link       37761STGM        EX
Link       37762STGM        EX
Link       37762STGM-OF     OF
Link       37763STGM        EX
Link       37763STGM-OF     OF
Link       37764STGM        EX
Link       37764STGM-OF     OF
Link       406193STGM       EX
Link       406193STGM-OF    OF
Link       406197STGM       EX
Link       406197STGM-OF    OF
Link       406199STGM       EX
Link       406199STGM-OF    OF
Link       406200STGM       EX
Link       406200STGM-OF    OF
Link       406201STGM       EX
Link       406201STGM-OF    OF
Link       406205STGM       EX
Link       406205STGM-OF    OF
Link       406206STGM       EX
Link       407544STMH       EX
Link       407544STMH-OF    OF
Link       4401-02-210      DUMMY
Link       4401-02-220      DUMMY
Link       4401-02-230      DUMMY
Link       4401-02-240      DUMMY
Link       4401-02-250      DUMMY
Link       4401-02-260      DUMMY
Link       4401-02-261      DUMMY
Link       773049STMN       EX
Link       773049STMN-OF    OF
Link       773051STMN       EX
Link       773051STMN-OF    OF
Link       773387STMN       EX
Link       773387STMN-OF    OF
Link       773391STMN       EX
Link       773391STMN-OF    OF
Link       773393STMN       EX
Link       773393STMN-OF    OF
Link       773411STMN       EX
Link       773411STMN-OF    OF
Link       773413STMN       EX

[MAP]
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
DIMENSIONS 3169619.582 1692524.283 3174539.017 1698161.313
Units      Feet

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
19071STMH        3174275.326        1697808.991
19079STMH        3174259.103        1697799.410
19097STMH        3173673.769        1697766.020
19111STMH        3173113.219        1697766.164
19132STMH        3172874.500        1697723.000
19134STMH        3172690.000        1697722.500
19139STMH        3173036.500        1697721.000
19143STMH        3172362.000        1697720.000
19150STMH        3172033.000        1697716.000
19154STMH        3171740.000        1697714.500
19162STMH        3171399.500        1697711.500
19171STMH        3171082.500        1697708.500
19179STMH        3170766.500        1697702.000
19214STMH        3170739.000        1697672.500
20135STMH        3170740.000        1697044.000
20209STFT        3170741.550        1696985.941
20818STMH        3170739.147        1696419.176
20841STMH        3170713.500        1696393.000
23839STMH        3172049.741        1694009.382
23840STMH        3172428.574        1694009.045
23841STMH        3172382.210        1694008.356
23843STMH        3172564.139        1694008.173
23845STMH        3171762.665        1694007.832
23849STMH        3171381.366        1693999.131
23852STMH        3171708.290        1693998.947
23855STMH        3171059.463        1693997.389
23856STMH        3171089.463        1693997.389
23861STMH        3170703.457        1693996.561
23862STMH        3170740.976        1693996.561
23868STMH        3170427.244        1693995.170
24788STMH        3172025.537        1692879.130
24791STMH        3172411.991        1692878.221
24796STMH        3171681.927        1692876.845
24797STIL        3171356.308        1692876.784
24800STMH        3172064.124        1692875.955
405658STFT       3172348.757        1694535.966
405659STFT       3172015.067        1694534.757
407540STMH       3172373.070        1694536.985
407541STMH       3172409.669        1694536.765
407542STMH       3172583.271        1694534.507
407543STMH       3172047.369        1694534.122
407544STMH       3172718.243        1694533.695
407546STMH       3171729.887        1694533.257
J_DE6_2          3171168.070        1693014.184
J_DE5            3170142.651        1694302.763
J_DE3            3171486.934        1694912.855
J_DE2            3172338.749        1696058.653
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
J_AD4              3173355.797        1696939.911
J_AD1              3172990.092        1697273.960
J_DE1              3169843.193        1697179.382
773032STMH         3172368.712        1695733.037
773050STMH         3172406.225        1695736.788
773052STMH         3172697.475        1695736.788
773389STMH         3173026.215        1695742.040
773392STMH         3173046.739        1695740.051
773410STMH         3173331.889        1695740.051
773412STMH         3173381.359        1695740.069
J_DE4              3170977.372        1694422.402
J_12th             3171407.900        1693412.098
J_DE6_1            3171237.494        1693188.866
18979STOF          3174295.025        1697869.942
18979STOF2         3174314.795        1697905.084
23842STFT          3172709.496        1694008.428
24773STOF          3172450.008        1692925.330
24773STOF2         3172466.514        1693054.486
407544STMH-OF      3172752.219        1694500.022
407550STMH         3172753.190        1694524.102
4401-02-250-OF     3174308.834        1697053.510
773412STMH-OF      3173385.488        1695655.425
12th_Out           3172529.171        1693412.098

[VERTICES]
;;Link            X-Coord            Y-Coord
;;--------------- ------------------ ------------------
19071STMH-OF       3174315.407        1697815.426
35191STGM-OF       3172395.271        1692922.437
35325STGM-OF       3172041.936        1692780.512
35325STGM-OF       3172084.482        1692791.149
35326STGM          3172343.096        1692877.971
35326STGM-OF       3172371.666        1692793.808
35326STGM-OF       3172145.642        1692799.126
35328STGM-OF       3171659.024        1692807.104
35328STGM-OF       3171425.022        1692809.763
35329STGM-OF       3171991.413        1692801.785
35329STGM-OF       3171752.093        1692807.104
35355STGM-OF       3170456.560        1694022.183
35355STGM-OF       3170663.572        1694022.183
35357STGM-OF       3170720.495        1693963.780
35357STGM-OF       3170739.417        1693962.519
35358STGM          3171043.138        1693997.346
35358STGM-OF       3171013.171        1694022.496
35358STGM-OF       3170767.513        1694013.762
35362STGM-OF       3171072.597        1694024.699
35362STGM-OF       3171083.998        1694021.442
35363STGM          3171360.815        1693999.008
35363STGM-OF       3171165.792        1694039.468
35363STGM-OF       3171298.246        1694040.730
35365STGM          3171685.358        1693998.960
35365STGM-OF       3171434.484        1694034.422
35365STGM-OF       3171662.810        1694034.422
```

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

35367STGM-OF	3171719.953	1694500.250
35367STGM-OF	3171712.020	1694042.359
35368STGM-OF	3171792.484	1694029.585
35368STGM-OF	3172017.245	1694030.400
35369STGM-OF	3172097.377	1694039.469
35369STGM-OF	3172323.817	1694038.545
35370STGM-OF	3172398.853	1694027.595
35370STGM-OF	3172424.728	1694031.515
35372STGM-OF	3172545.751	1694030.528
35372STGM-OF	3172461.597	1694030.528
36715STGM-OF	3173040.031	1697758.886
36715STGM-OF	3173075.780	1697781.635
36716STGM-OF	3174155.324	1697856.533
36716STGM-OF	3173797.284	1697847.871
36717STGM-OF	3174273.903	1697791.091
36717STGM-OF	3174285.448	1697796.863
36718STGM-OF	3173210.922	1697812.474
36718STGM-OF	3173589.557	1697808.762
36939STGM-OF	3170696.116	1696477.494
36939STGM-OF	3170695.974	1696911.488
37665STGM	3170739.935	1697004.180
37665STGM	3170739.974	1697024.998
37665STGM-OF	3170712.581	1697009.638
37665STGM-OF	3170713.380	1697039.235
37666STGM-OF	3170754.735	1696397.913
37666STGM-OF	3170745.841	1696383.937
37673STGM	3170739.974	1697060.336
37673STGMF-OFE	3171391.697	1697050.552
37750STGM-OF	3170708.951	1697704.293
37750STGM-OF	3170728.411	1697729.841
37757STGM	3171396.997	1697711.476
37757STGM	3171365.498	1697711.178
37757STGM-OF	3171361.399	1697753.985
37757STGM-OF	3171166.750	1697753.985
37758STGM	3171035.932	1697707.542
37758STGM	3171068.921	1697708.221
37758STGM-OF	3170818.525	1697746.842
37758STGM-OF	3171020.317	1697750.414
37759STGM	3171696.500	1697714.000
37759STGM	3171730.070	1697714.413
37759STGM-OF	3171457.831	1697752.200
37759STGM-OF	3171691.767	1697752.200
37760STGM-OF	3171784.627	1697753.985
37760STGM-OF	3172007.848	1697750.414
37761STGM	3172352.404	1697719.883
37762STGM	3172663.471	1697722.298
37762STGM	3172388.661	1697720.203
37762STGM-OF	3172668.460	1697761.052
37762STGM-OF	3172416.052	1697757.802
37763STGM-OF	3172728.615	1697747.041
37763STGM-OF	3172855.010	1697747.041
37764STGM	3173010.017	1697721.327
37764STGM	3172990.612	1697721.566

Table E.3 – Existing SWMM Input for 100-year (Future) Event in Denver

```
37764STGM-OF     3173008.515        1697760.856
37764STGM-OF     3172911.229        1697760.856
406193STGM-OF    3172602.876        1694554.214
406193STGM-OF    3172694.073        1694551.976
406197STGM-OF    3172426.075        1694557.011
406197STGM-OF    3172560.913        1694554.773
406199STGM-OF    3172379.637        1694558.130
406199STGM-OF    3172405.374        1694558.690
406200STGM-OF    3172352.344        1694556.622
406200STGM-OF    3172367.325        1694556.057
406201STGM-OF    3172321.592        1694575.406
406201STGM-OF    3172091.218        1694575.406
406205STGM-OF    3172018.867        1694570.038
406205STGM-OF    3172049.518        1694571.517
407544STMH-OF    3172724.837        1694517.710
773049STMN-OF    3172381.934        1695766.829
773049STMN-OF    3172407.675        1695767.948
773051STMN-OF    3172463.313        1695760.040
773051STMN-OF    3172661.146        1695760.939
773387STMN-OF    3172796.280        1695628.067
773387STMN-OF    3173006.406        1695632.737
773391STMN-OF    3173025.070        1695787.090
773391STMN-OF    3173045.824        1695791.240
773393STMN-OF    3173310.609        1695770.201
773393STMN-OF    3173089.567        1695766.126
773411STMN-OF    3173349.316        1695766.126
773411STMN-OF    3173370.708        1695766.126
37761STGM-OF_BHI 3172075.685        1697752.014
37761STGM-OF_BHI 3172319.107        1697757.193


[BACKDROP]
FILE       "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\Background\Westerly_Creek_SWMM_Background.jpg"
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
```

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.011)
--------------------------------------------------------------

Lower Westerly Creek
Baseline Hydrology - with 1st and Havana Pond (100-year)
Bohannan Huston

WARNING 08: elevation drop exceeds length for Conduit C_JL2
WARNING 04: minimum elevation drop used for Conduit C1
WARNING 04: minimum elevation drop used for Conduit C101
WARNING 04: minimum elevation drop used for Conduit C102
WARNING 04: minimum elevation drop used for Conduit C104
WARNING 04: minimum elevation drop used for Conduit C106
WARNING 04: minimum elevation drop used for Conduit C107
WARNING 04: minimum elevation drop used for Conduit C111
WARNING 04: minimum elevation drop used for Conduit C113
WARNING 04: minimum elevation drop used for Conduit C121
WARNING 04: minimum elevation drop used for Conduit C122
WARNING 04: minimum elevation drop used for Conduit C124
WARNING 04: minimum elevation drop used for Conduit C126
WARNING 04: minimum elevation drop used for Conduit C128
WARNING 04: minimum elevation drop used for Conduit C131
WARNING 04: minimum elevation drop used for Conduit C132
WARNING 04: minimum elevation drop used for Conduit C133
WARNING 04: minimum elevation drop used for Conduit C134
WARNING 04: minimum elevation drop used for Conduit C14
WARNING 04: minimum elevation drop used for Conduit C140
WARNING 04: minimum elevation drop used for Conduit C150
WARNING 04: minimum elevation drop used for Conduit C151
WARNING 04: minimum elevation drop used for Conduit C154
WARNING 04: minimum elevation drop used for Conduit C155
WARNING 04: minimum elevation drop used for Conduit C159
WARNING 04: minimum elevation drop used for Conduit C160
WARNING 04: minimum elevation drop used for Conduit C161
WARNING 04: minimum elevation drop used for Conduit C163
WARNING 04: minimum elevation drop used for Conduit C16th2
WARNING 04: minimum elevation drop used for Conduit C19th2
WARNING 08: elevation drop exceeds length for Conduit C20
WARNING 04: minimum elevation drop used for Conduit C200
WARNING 04: minimum elevation drop used for Conduit C203
WARNING 04: minimum elevation drop used for Conduit C230
WARNING 04: minimum elevation drop used for Conduit C231
WARNING 04: minimum elevation drop used for Conduit C232
WARNING 04: minimum elevation drop used for Conduit C233
WARNING 04: minimum elevation drop used for Conduit C234
WARNING 04: minimum elevation drop used for Conduit C235
WARNING 04: minimum elevation drop used for Conduit C24
WARNING 04: minimum elevation drop used for Conduit C242
WARNING 04: minimum elevation drop used for Conduit C245
WARNING 04: minimum elevation drop used for Conduit C247
WARNING 04: minimum elevation drop used for Conduit C25
WARNING 04: minimum elevation drop used for Conduit C251
```

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
WARNING 04: minimum elevation drop used for Conduit C252
WARNING 04: minimum elevation drop used for Conduit C253
WARNING 04: minimum elevation drop used for Conduit C31
WARNING 04: minimum elevation drop used for Conduit C311
WARNING 04: minimum elevation drop used for Conduit C32
WARNING 04: minimum elevation drop used for Conduit C33
WARNING 04: minimum elevation drop used for Conduit C34
WARNING 04: minimum elevation drop used for Conduit C341
WARNING 04: minimum elevation drop used for Conduit C343
WARNING 04: minimum elevation drop used for Conduit C345
WARNING 04: minimum elevation drop used for Conduit C347
WARNING 04: minimum elevation drop used for Conduit C35
WARNING 04: minimum elevation drop used for Conduit C350
WARNING 04: minimum elevation drop used for Conduit C351
WARNING 04: minimum elevation drop used for Conduit C352
WARNING 04: minimum elevation drop used for Conduit C355
WARNING 04: minimum elevation drop used for Conduit C36
WARNING 04: minimum elevation drop used for Conduit C361
WARNING 04: minimum elevation drop used for Conduit C362
WARNING 04: minimum elevation drop used for Conduit C37
WARNING 04: minimum elevation drop used for Conduit C371
WARNING 04: minimum elevation drop used for Conduit C372
WARNING 04: minimum elevation drop used for Conduit C374
WARNING 04: minimum elevation drop used for Conduit C38
WARNING 04: minimum elevation drop used for Conduit C389
WARNING 04: minimum elevation drop used for Conduit C390
WARNING 04: minimum elevation drop used for Conduit C391
WARNING 04: minimum elevation drop used for Conduit C392
WARNING 04: minimum elevation drop used for Conduit C393
WARNING 04: minimum elevation drop used for Conduit C395
WARNING 04: minimum elevation drop used for Conduit C395-DIV
WARNING 04: minimum elevation drop used for Conduit C396
WARNING 08: elevation drop exceeds length for Conduit C396-DIV
WARNING 04: minimum elevation drop used for Conduit C397
WARNING 08: elevation drop exceeds length for Conduit C397-DIV
WARNING 04: minimum elevation drop used for Conduit C41
WARNING 04: minimum elevation drop used for Conduit C42
WARNING 04: minimum elevation drop used for Conduit C43
WARNING 04: minimum elevation drop used for Conduit C44
WARNING 04: minimum elevation drop used for Conduit C51
WARNING 04: minimum elevation drop used for Conduit C52
WARNING 04: minimum elevation drop used for Conduit C53
WARNING 04: minimum elevation drop used for Conduit C54
WARNING 04: minimum elevation drop used for Conduit C61
WARNING 04: minimum elevation drop used for Conduit C62
WARNING 04: minimum elevation drop used for Conduit C64
WARNING 04: minimum elevation drop used for Conduit C65
WARNING 04: minimum elevation drop used for Conduit C67
WARNING 04: minimum elevation drop used for Conduit C68
WARNING 04: minimum elevation drop used for Conduit CAD1
WARNING 04: minimum elevation drop used for Conduit CAD3
WARNING 04: minimum elevation drop used for Conduit CAD4
WARNING 04: minimum elevation drop used for Conduit CAD7
```

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
WARNING 04: minimum elevation drop used for Conduit CAR1
WARNING 08: elevation drop exceeds length for Conduit CAR2
WARNING 04: minimum elevation drop used for Conduit CDE1
WARNING 04: minimum elevation drop used for Conduit CDE2
WARNING 04: minimum elevation drop used for Conduit CDE3
WARNING 04: minimum elevation drop used for Conduit CDE4
WARNING 04: minimum elevation drop used for Conduit CDE5
WARNING 04: minimum elevation drop used for Conduit CDE6
WARNING 04: minimum elevation drop used for Conduit CJL2
WARNING 04: minimum elevation drop used for Conduit CMontview2
WARNING 04: minimum elevation drop used for Conduit CST1
WARNING 04: minimum elevation drop used for Conduit CST2
WARNING 04: minimum elevation drop used for Conduit CST3
WARNING 04: minimum elevation drop used for Conduit CST4
WARNING 04: minimum elevation drop used for Conduit CST5
WARNING 04: minimum elevation drop used for Conduit CST6
WARNING 04: minimum elevation drop used for Conduit CST8
WARNING 04: minimum elevation drop used for Conduit CST9
WARNING 04: minimum elevation drop used for Conduit d_03c
WARNING 08: elevation drop exceeds length for Conduit d_04d
WARNING 04: minimum elevation drop used for Conduit d_05a
WARNING 04: minimum elevation drop used for Conduit d_05b
WARNING 04: minimum elevation drop used for Conduit d_05c
WARNING 04: minimum elevation drop used for Conduit d_06a
WARNING 04: minimum elevation drop used for Conduit d_06b
WARNING 04: minimum elevation drop used for Conduit d_06c
WARNING 04: minimum elevation drop used for Conduit d_07b
WARNING 04: minimum elevation drop used for Conduit d_08a
WARNING 04: minimum elevation drop used for Conduit d_08b
WARNING 04: minimum elevation drop used for Conduit d_09a
WARNING 04: minimum elevation drop used for Conduit d_09b
WARNING 04: minimum elevation drop used for Conduit d_10a
WARNING 04: minimum elevation drop used for Conduit d_10a2
WARNING 04: minimum elevation drop used for Conduit d_11a
WARNING 04: minimum elevation drop used for Conduit d_12a
WARNING 04: minimum elevation drop used for Conduit d_14a
WARNING 04: minimum elevation drop used for Conduit d_14b
WARNING 04: minimum elevation drop used for Conduit d_15a
WARNING 08: elevation drop exceeds length for Conduit d_17thAv
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_23rd
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_19thAv
WARNING 08: elevation drop exceeds length for Conduit d_16thAve_E
WARNING 10: crest elevation raised to downstream invert for regulator Link OUT04
WARNING 02: maximum depth increased for Node EC_Out_23rd
WARNING 02: maximum depth increased for Node E-J-16
WARNING 02: maximum depth increased for Node J_01a
WARNING 02: maximum depth increased for Node J_02a
WARNING 02: maximum depth increased for Node J_04a
WARNING 02: maximum depth increased for Node J_05a
WARNING 02: maximum depth increased for Node J_06a
WARNING 02: maximum depth increased for Node J_07a
WARNING 02: maximum depth increased for Node J_07b
WARNING 02: maximum depth increased for Node J_07c
```

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
  WARNING 02: maximum depth increased for Node J_08a
  WARNING 02: maximum depth increased for Node J_08b
  WARNING 02: maximum depth increased for Node J_09a
  WARNING 02: maximum depth increased for Node J_10a
  WARNING 02: maximum depth increased for Node J_10b
  WARNING 02: maximum depth increased for Node J_14a
  WARNING 02: maximum depth increased for Node J_15a
  WARNING 02: maximum depth increased for Node J_EC_Colfax_Out
  WARNING 02: maximum depth increased for Node J-10a1
  WARNING 02: maximum depth increased for Node D_02a
  WARNING 02: maximum depth increased for Node D_03b
  WARNING 02: maximum depth increased for Node D_05a
  WARNING 02: maximum depth increased for Node D_05b
  WARNING 02: maximum depth increased for Node D_05c
  WARNING 02: maximum depth increased for Node D_05d
  WARNING 02: maximum depth increased for Node D_06a
  WARNING 02: maximum depth increased for Node D_06b
  WARNING 02: maximum depth increased for Node D_07a
  WARNING 02: maximum depth increased for Node D_08a
  WARNING 02: maximum depth increased for Node D_08b
  WARNING 02: maximum depth increased for Node D_10a
  WARNING 02: maximum depth increased for Node D_10a1
  WARNING 02: maximum depth increased for Node D_10b
  WARNING 02: maximum depth increased for Node D_10c
  WARNING 02: maximum depth increased for Node D_10d
  WARNING 02: maximum depth increased for Node D_11a
  WARNING 02: maximum depth increased for Node D_12a
  WARNING 02: maximum depth increased for Node D_13a
  WARNING 02: maximum depth increased for Node D_14a
  WARNING 02: maximum depth increased for Node D_15a
  WARNING 02: maximum depth increased for Node D_03a
  WARNING 02: maximum depth increased for Node D_04a

  ********************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  ********************************************************

  ***************
  Analysis Options
  ***************
  Flow Units ............... CFS
  Process Models:
    Rainfall/Runoff ........ NO
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Flow Routing Method ...... KINWAVE
  Starting Date ............ 01/01/2005 00:00:00
```

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
  Ending Date ..... 01/25/2005 23:00:00
  Antecedent Dry Days ..... 0.0
  Report Time Step ..... 00:05:00
  Routing Time Step ..... 300.00 sec


  *************************        Volume        Volume
  Flow Routing Continuity        acre-feet      10^6 gal
  *************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.000         0.000
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........      1545.381       503.585
  External Outflow .........      1557.890       507.662
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.033         0.011
  Continuity Error (%) .....        -0.812


  ******************************
  Highest Flow Instability Indexes
  ******************************
  All links are stable.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :   300.00 sec
  Average Time Step           :   300.00 sec
  Maximum Time Step           :   300.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     1.00
  Percent Not Converging      :     0.00


  ******************
  Node Depth Summary
  ******************

  ---------------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type         Feet     Feet     Feet  days hr:min        Feet
  ---------------------------------------------------------------------------------
  EC_Out_23rd          JUNCTION     0.01     1.55  5296.55     0  01:35        1.55
  EC_Out_19thAv        JUNCTION     0.03     3.89  5313.89     0  03:00        3.89
  E-J-01               JUNCTION     0.00     0.00  5467.00     0  00:00        0.00
  E-J-02               JUNCTION     0.00     0.00  5463.00     0  00:00        0.00
```

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

E-J-03	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-04	JUNCTION	0.00	0.00	5449.20	0	00:00	0.00
E-J-05	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-06	JUNCTION	0.00	0.00	5421.20	0	00:00	0.00
E-J-07	JUNCTION	0.00	0.00	5387.00	0	00:00	0.00
E-J-08	JUNCTION	0.00	0.00	5389.00	0	00:00	0.00
E-J-09	JUNCTION	0.00	0.00	5409.00	0	00:00	0.00
E-J-10	JUNCTION	0.00	0.00	5344.00	0	00:00	0.00
E-J-11	JUNCTION	0.00	0.00	5371.00	0	00:00	0.00
E-J-12	JUNCTION	0.00	0.00	5357.00	0	00:00	0.00
E-J-13	JUNCTION	0.00	0.00	5315.00	0	00:00	0.00
E-J-14	JUNCTION	0.00	0.00	5336.00	0	00:00	0.00
E-J-15	JUNCTION	0.00	0.00	5303.00	0	00:00	0.00
E-J-16	JUNCTION	0.00	0.94	5302.94	0	00:50	0.94
J_01a	JUNCTION	5.00	5.00	5463.00	0	00:05	5.00
J_02a	JUNCTION	0.00	1.09	5461.09	0	00:45	1.09
J_03a	JUNCTION	0.00	0.00	5411.00	0	00:00	0.00
J_04a	JUNCTION	0.01	2.99	5439.99	0	00:40	2.99
J_05_07	JUNCTION	0.00	1.52	5397.52	0	01:05	1.52
J_05a	JUNCTION	0.00	0.38	5415.38	0	01:00	0.38
J_06a	JUNCTION	0.00	1.06	5422.26	0	00:55	1.06
J_07a	JUNCTION	0.00	0.54	5401.54	0	00:50	0.54
J_07b	JUNCTION	0.00	1.19	5394.19	0	01:10	1.19
J_07c	JUNCTION	0.00	1.25	5388.25	0	01:10	1.25
J_08a	JUNCTION	0.01	3.34	5392.34	0	01:30	3.34
J_08b	JUNCTION	0.02	4.00	5392.90	0	00:40	4.00
J_09a	JUNCTION	0.00	0.74	5409.74	0	00:55	0.74
J_10a	JUNCTION	0.00	1.50	5382.50	0	01:15	1.50
J_10b	JUNCTION	0.00	1.50	5384.00	0	01:15	1.50
J_10c	JUNCTION	0.02	1.78	5377.78	0	01:15	1.78
J_14a	JUNCTION	0.02	4.50	5340.50	0	00:50	4.50
J_15	JUNCTION	0.00	1.56	5324.56	0	01:30	1.56
J_15a	JUNCTION	0.01	2.18	5305.18	0	00:50	2.18
J_17thAv_Out	JUNCTION	0.00	0.62	5322.62	0	01:35	0.62
J_7b	JUNCTION	0.00	0.00	5384.00	0	00:00	0.00
J_AD1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_AD3	JUNCTION	0.00	0.00	969.20	0	00:00	0.00
J_AD4	JUNCTION	0.00	0.00	966.60	0	00:00	0.00
J_AD7	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_AR1	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_AR2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_EC_Colfax_Out	JUNCTION	0.00	1.32	5344.32	0	01:20	1.32
J_DE1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_DE2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_DE3	JUNCTION	0.00	0.00	980.90	0	00:00	0.00
J_DE4	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_DE5	JUNCTION	0.00	0.00	988.00	0	00:00	0.00
J_DE6	JUNCTION	0.00	0.00	992.00	0	00:00	0.00
J_L1	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J_L2	JUNCTION	0.00	0.00	5374.00	0	00:00	0.00
J_ST1	JUNCTION	0.00	0.00	928.00	0	00:00	0.00
J_ST2	JUNCTION	0.00	0.00	915.00	0	00:00	0.00
J_ST3	JUNCTION	0.00	0.00	931.00	0	00:00	0.00

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

J_ST4	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST5	JUNCTION	0.00	0.00	933.00	0	00:00	0.00
J_ST6	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST7	JUNCTION	0.00	1.51	973.51	0	00:50	1.51
J_ST8	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST9	JUNCTION	0.00	0.00	951.00	0	00:00	0.00
J100	JUNCTION	0.00	0.00	1010.51	0	00:00	0.00
J101	JUNCTION	0.41	5.46	1010.47	0	01:00	5.46
J102	JUNCTION	0.41	5.73	1005.74	0	01:00	5.73
J104	JUNCTION	0.01	1.31	1001.31	0	01:15	1.31
J106	JUNCTION	0.01	4.44	1011.95	0	00:50	4.44
J107	JUNCTION	0.01	4.00	1006.51	0	00:50	4.00
J-10a1	JUNCTION	0.00	0.49	5388.99	0	00:40	0.49
J111	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J113	JUNCTION	0.00	2.18	1010.79	0	00:45	2.18
J11th	JUNCTION	0.30	1.99	1001.99	0	01:05	1.99
J121	JUNCTION	0.00	0.00	1013.87	0	00:00	0.00
J122	JUNCTION	0.00	0.00	1005.87	0	00:00	0.00
J124	JUNCTION	0.00	1.91	1007.78	0	00:45	1.91
J126	JUNCTION	0.01	3.50	1008.09	0	00:40	3.50
J128	JUNCTION	0.01	2.99	1006.65	0	00:50	2.99
J12th	JUNCTION	0.37	3.07	995.07	0	01:05	3.07
J131	JUNCTION	0.00	0.00	1015.92	0	00:00	0.00
J132	JUNCTION	0.00	0.00	1016.26	0	00:00	0.00
J133	JUNCTION	0.00	0.00	1013.76	0	00:00	0.00
J134	JUNCTION	0.00	0.00	1009.26	0	00:00	0.00
J14	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J140	JUNCTION	0.00	0.00	1005.21	0	00:00	0.00
J141	JUNCTION	0.00	1.49	1006.70	0	00:40	1.49
J150	JUNCTION	0.37	4.75	1017.76	0	00:50	4.75
J151	JUNCTION	0.94	4.00	1012.01	0	00:35	4.00
J154	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J155	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J157	JUNCTION	0.01	1.31	1002.46	0	01:15	1.31
J159	JUNCTION	0.00	0.38	1000.38	0	01:40	0.38
J160	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J161	JUNCTION	0.01	2.66	1016.42	0	00:50	2.66
J163	JUNCTION	0.01	4.00	1013.26	0	00:40	4.00
J165	JUNCTION	0.41	5.46	1013.47	0	01:05	5.46
J166	JUNCTION	0.00	0.25	1003.91	0	00:55	0.25
J167	JUNCTION	0.00	0.05	1007.13	0	00:45	0.05
J168	JUNCTION	0.00	0.12	1003.78	0	00:50	0.12
J169	JUNCTION	0.00	0.69	1008.20	0	00:55	0.69
J16th-us	JUNCTION	0.49	5.70	981.70	0	01:00	5.70
J170	JUNCTION	0.00	0.65	1003.16	0	01:05	0.65
J171	JUNCTION	0.41	5.74	1010.75	0	01:00	5.74
J17th	JUNCTION	0.52	7.44	976.64	0	01:30	7.44
J19th-ds	JUNCTION	0.56	8.27	974.87	0	01:10	8.27
J19th-us	JUNCTION	0.52	7.42	974.02	0	01:30	7.42
J200	JUNCTION	0.00	0.00	1031.15	0	00:00	0.00
J202	JUNCTION	0.72	2.03	1033.17	0	11:30	2.03
J203	JUNCTION	0.72	2.03	1027.77	0	11:30	2.03
J204	JUNCTION	0.27	0.81	1026.54	0	11:30	0.81

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

J230	JUNCTION	0.03	3.49	1026.69	0	00:45	3.49
J231	JUNCTION	0.00	0.00	1023.20	0	00:00	0.00
J232	JUNCTION	0.00	0.00	1024.21	0	00:00	0.00
J233	JUNCTION	0.00	0.00	1025.58	0	00:00	0.00
J234	JUNCTION	0.00	0.00	1022.41	0	00:00	0.00
J235	JUNCTION	0.03	4.08	1023.70	0	00:50	4.08
J23rd	JUNCTION	0.40	5.71	956.71	0	01:30	5.71
J24	JUNCTION	0.00	0.00	1022.33	0	00:00	0.00
J242	JUNCTION	0.01	3.42	1025.75	0	00:50	3.42
J245	JUNCTION	0.01	4.55	1020.74	0	00:45	4.55
J247	JUNCTION	0.01	5.05	1020.33	0	00:45	5.05
J248	JUNCTION	0.01	2.73	1018.01	0	00:45	2.73
J25	JUNCTION	0.01	4.17	1021.10	0	00:45	4.17
J251	JUNCTION	0.00	0.00	1011.21	0	00:00	0.00
J252	JUNCTION	0.00	0.00	1016.93	0	00:00	0.00
J253	JUNCTION	0.01	2.73	1013.77	0	00:45	2.73
J254	JUNCTION	0.01	3.12	1014.16	0	00:45	3.12
J26th	JUNCTION	0.40	5.71	951.71	0	01:35	5.71
J29th	JUNCTION	0.50	8.93	941.93	0	01:35	8.93
J31	JUNCTION	0.00	0.00	1039.11	0	00:00	0.00
J311	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J314	JUNCTION	0.01	2.32	1041.42	0	00:45	2.32
J315	JUNCTION	0.03	1.54	1038.24	0	02:10	1.54
J32	JUNCTION	0.00	0.00	1037.25	0	00:00	0.00
J33	JUNCTION	0.00	0.00	1036.79	0	00:00	0.00
J33rd	JUNCTION	0.55	9.62	937.62	0	01:25	9.62
J34	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J341	JUNCTION	0.01	3.67	1038.66	0	00:55	3.67
J343	JUNCTION	0.02	5.00	1029.23	0	00:45	5.00
J345	JUNCTION	0.29	6.00	1024.24	0	00:50	6.00
J346	JUNCTION	0.49	4.15	1022.39	0	01:10	4.15
J347	JUNCTION	0.49	4.15	1020.29	0	01:15	4.15
J348	JUNCTION	0.36	3.56	1019.69	0	01:15	3.56
J35	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J350	JUNCTION	0.03	1.54	1033.88	0	02:15	1.54
J351	JUNCTION	0.00	0.00	1036.69	0	00:00	0.00
J352	JUNCTION	0.02	1.41	1031.87	0	02:15	1.41
J353	JUNCTION	0.01	1.85	1024.58	0	00:50	1.85
J354	JUNCTION	0.01	1.15	1014.26	0	01:05	1.15
J355	JUNCTION	0.01	2.30	1039.01	0	00:45	2.30
J36	JUNCTION	0.02	2.50	1026.30	0	00:45	2.50
J361	JUNCTION	0.00	0.00	1030.45	0	00:00	0.00
J362	JUNCTION	0.00	0.00	1027.23	0	00:00	0.00
J37	JUNCTION	0.00	0.00	1016.81	0	00:00	0.00
J371	JUNCTION	0.00	0.00	1019.61	0	00:00	0.00
J372	JUNCTION	0.03	4.40	1021.21	0	00:50	4.40
J374	JUNCTION	0.03	4.22	1019.03	0	00:50	4.22
J38	JUNCTION	0.00	0.00	1024.23	0	00:00	0.00
J390	JUNCTION	0.00	2.18	1018.39	0	00:45	2.18
J391	JUNCTION	0.00	0.00	1016.21	0	00:00	0.00
J392	JUNCTION	0.00	0.00	1013.01	0	00:00	0.00
J393	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J394	JUNCTION	0.00	1.87	1018.08	0	00:45	1.87

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

J41	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J42	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J43	JUNCTION	0.00	0.00	1022.74	0	00:00	0.00
J44	JUNCTION	0.00	0.00	1013.11	0	00:00	0.00
J51	JUNCTION	0.00	0.00	1013.61	0	00:00	0.00
J52	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J53	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J54	JUNCTION	0.00	0.00	1011.61	0	00:00	0.00
J56	JUNCTION	0.00	1.82	1015.43	0	00:45	1.82
J61	JUNCTION	0.00	0.00	1013.85	0	00:00	0.00
J62	JUNCTION	0.00	0.00	1009.85	0	00:00	0.00
J63	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J64	JUNCTION	0.00	0.00	1000.00	0	00:00	0.00
J65	JUNCTION	0.02	4.00	1004.00	0	00:35	4.00
J67	JUNCTION	0.01	2.50	1012.35	0	00:25	2.50
J68	JUNCTION	0.01	3.50	1006.90	0	00:35	3.50
J6th_Pipe	JUNCTION	0.08	6.00	5378.45	0	00:40	6.00
J74	JUNCTION	0.01	3.00	1009.60	0	00:30	3.00
J7b	JUNCTION	0.07	4.72	5389.72	0	01:15	4.72
JL2	JUNCTION	0.00	1.29	5375.29	0	01:00	1.29
JMLK	JUNCTION	0.55	9.62	940.62	0	01:25	9.62
JMontview-ds	JUNCTION	0.37	5.18	969.78	0	01:10	5.18
JMontview-us	JUNCTION	0.56	8.26	972.86	0	01:10	8.26
J_16thAve_E	JUNCTION	0.02	6.26	5340.90	0	01:30	6.26
JSandCreek	OUTFALL	0.40	9.12	924.12	0	01:30	9.12
DIV344	DIVIDER	0.02	6.00	1030.23	0	00:45	6.00
DIV342	DIVIDER	0.02	5.00	1039.98	0	00:40	5.00
DIV135	DIVIDER	0.01	2.00	1017.92	0	00:45	2.00
DIV389	DIVIDER	0.00	0.00	1001.15	0	00:00	0.00
DIV397	DIVIDER	0.00	0.00	1009.26	0	00:00	0.00
DIV105	DIVIDER	0.03	2.16	1012.67	0	02:05	2.16
DIV376	DIVIDER	0.94	4.00	1017.01	0	00:35	4.00
DIV70	DIVIDER	0.01	3.00	1012.85	0	00:25	3.00
DIV395	DIVIDER	0.00	0.00	1003.66	0	00:00	0.00
DIV1	DIVIDER	4.60	4.60	1012.61	0	00:05	4.60
DIV164	DIVIDER	0.01	4.50	1013.76	0	00:45	4.50
DIV125	DIVIDER	0.01	3.50	1009.37	0	00:40	3.50
DIV316	DIVIDER	0.02	1.41	1033.75	0	02:15	1.41
DIV396	DIVIDER	2.88	2.88	1008.09	0	00:05	2.88
DIV71	DIVIDER	0.01	2.50	1016.35	0	00:25	2.50
DIV399	DIVIDER	0.08	6.00	5390.00	0	00:35	6.00
DIV162	DIVIDER	0.01	4.00	1017.76	0	00:40	4.00
DIV136	DIVIDER	0.01	2.67	1018.93	0	00:45	2.67
DIV123	DIVIDER	0.00	1.91	1010.53	0	00:45	1.91
J13th-DIV	DIVIDER	0.37	3.31	991.31	0	01:05	3.31
J14th-DIV	DIVIDER	0.28	6.00	990.30	0	00:50	6.00
JColfax-DIV	DIVIDER	0.49	6.00	986.90	0	01:05	6.00
J16th-DIV	DIVIDER	0.28	6.00	982.00	0	00:45	6.00
D_02a	DIVIDER	0.00	1.65	5461.85	0	00:45	1.65
D_03b	DIVIDER	0.00	0.41	5409.41	0	00:50	0.41
D_05-07	DIVIDER	0.00	1.54	5405.54	0	01:00	1.54
D_05a	DIVIDER	0.06	2.54	5451.54	0	00:40	2.54
D_05b	DIVIDER	0.08	4.50	5419.50	0	00:40	4.50

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

D_05c	DIVIDER	0.00	1.55	5415.55	0	00:55	1.55
D_05d	DIVIDER	0.09	4.50	5418.50	0	00:35	4.50
D_06a	DIVIDER	0.02	4.00	5425.20	0	00:35	4.00
D_06b	DIVIDER	0.00	1.10	5422.30	0	00:55	1.10
D_07a	DIVIDER	0.01	2.25	5396.25	0	00:50	2.25
D_08a	DIVIDER	0.01	4.00	5413.00	0	00:40	4.00
D_08b	DIVIDER	0.02	4.00	5393.00	0	00:35	4.00
D_10a	DIVIDER	0.03	2.40	5373.40	0	00:45	2.40
D_10a1	DIVIDER	0.00	1.03	5389.53	0	01:05	1.03
D_10b	DIVIDER	0.03	4.00	5369.00	0	00:50	4.00
D_10c	DIVIDER	0.00	0.84	5352.84	0	01:05	0.84
D_10d	DIVIDER	0.01	1.93	5345.93	0	01:20	1.93
D_11a	DIVIDER	0.02	4.00	5375.00	0	00:45	4.00
D_12a	DIVIDER	0.02	4.50	5361.50	0	00:40	4.50
D_13a	DIVIDER	0.03	4.50	5345.50	0	00:45	4.50
D_14a	DIVIDER	0.02	5.50	5341.50	0	00:40	5.50
D_15a	DIVIDER	0.02	5.50	5319.50	0	00:50	5.50
D_03a	DIVIDER	0.09	5.50	5414.50	0	00:40	5.50
D_12_14	DIVIDER	0.00	0.63	5349.63	0	01:05	0.63
D_10_13	DIVIDER	0.00	1.45	5332.45	0	01:25	1.45
J72	DIVIDER	0.01	3.50	1010.00	0	00:30	3.50
J120	DIVIDER	0.00	2.17	1016.04	0	00:45	2.17
J127	DIVIDER	0.01	2.99	1007.57	0	00:50	2.99
J129	DIVIDER	0.01	4.00	1007.66	0	00:45	4.00
J158	DIVIDER	0.00	0.38	1000.80	0	01:40	0.38
J73	DIVIDER	0.02	4.00	1007.40	0	00:30	4.00
J236	DIVIDER	0.00	2.17	1024.58	0	00:40	2.17
J244	DIVIDER	0.01	4.55	1021.48	0	00:45	4.55
J241	DIVIDER	0.01	3.41	1027.62	0	00:50	3.41
J243	DIVIDER	0.01	4.18	1026.52	0	00:45	4.18
J246	DIVIDER	0.01	5.07	1021.27	0	00:45	5.07
J375	DIVIDER	0.03	4.74	1019.55	0	00:50	4.74
J330	DIVIDER	0.01	3.60	1040.39	0	00:55	3.60
J320	DIVIDER	0.03	4.38	1024.00	0	00:45	4.38
J319	DIVIDER	0.03	4.10	1027.30	0	00:45	4.10
J321	DIVIDER	0.01	3.67	1040.92	0	00:50	3.67
J373	DIVIDER	0.03	4.20	1021.01	0	00:50	4.20
J57	DIVIDER	0.01	3.41	1015.02	0	00:40	3.41
J250	DIVIDER	0.01	2.08	1013.29	0	00:50	2.08
J317	DIVIDER	0.02	2.50	1032.96	0	00:45	2.50
J318	DIVIDER	0.03	3.48	1027.28	0	00:45	3.48
J322	DIVIDER	0.01	2.17	1027.76	0	00:45	2.17
J363	DIVIDER	0.01	2.38	1029.61	0	00:45	2.38
D_AR2	DIVIDER	0.02	6.26	5344.26	0	01:25	6.26
DIV72	DIVIDER	0.00	1.65	1008.10	0	01:00	1.65
D_04a	DIVIDER	0.01	3.26	5460.29	0	00:40	3.26
D_04b	DIVIDER	0.01	3.33	5443.43	0	00:45	3.33
RES30	STORAGE	0.08	8.93	1045.63	0	02:10	8.93
RES201	STORAGE	101.71	597.62	1628.77	0	11:30	597.62
RES130	STORAGE	13.89	187.16	1187.17	0	04:45	187.16
RES156	STORAGE	0.01	2.14	1003.30	0	01:40	2.14
HavanaPnd	STORAGE	0.07	8.23	5384.23	0	01:15	8.23
1st/HavanaPnd	STORAGE	1.86	11.29	5447.35	0	02:45	11.29

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

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Node Inflow Summary
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-------------------------------------------------------------------------------------------------
                                 Maximum  Maximum                  Lateral       Total        Flow
                                 Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                  Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type           CFS      CFS  days hr:min    10^6 gal    10^6 gal     Percent
-------------------------------------------------------------------------------------------------
EC_Out_23rd          JUNCTION      0.00   984.07     0  01:35           0          38       0.000
EC_Out_19thAv        JUNCTION      0.00   223.39     0  01:00           0          16       0.000
E-J-01               JUNCTION    174.54   174.54     0  00:40        3.35        3.35       0.000
E-J-02               JUNCTION    282.37   282.37     0  00:45        6.72        6.72       0.000
E-J-03               JUNCTION    174.21   174.21     0  00:45        4.51        4.51       0.000
E-J-04               JUNCTION     94.44    94.44     0  00:55        3.45        3.45       0.000
E-J-05               JUNCTION    166.92   166.92     0  00:55        5.74        5.74       0.000
E-J-06               JUNCTION    177.77   177.77     0  00:50        5.91        5.91       0.000
E-J-07               JUNCTION     79.51    79.51     0  01:00        3.62        3.62       0.000
E-J-08               JUNCTION    121.05   121.05     0  00:55        4.29        4.29       0.000
E-J-09               JUNCTION    144.35   144.35     0  00:50        4.43        4.43       0.000
E-J-10               JUNCTION    159.62   159.62     0  00:55        5.49        5.49       0.000
E-J-11               JUNCTION    126.91   126.91     0  01:00        5.75        5.75       0.000
E-J-12               JUNCTION    138.47   138.47     0  00:45        3.96        3.96       0.000
E-J-13               JUNCTION     90.47    90.47     0  00:55        3.49        3.49       0.000
E-J-14               JUNCTION    135.66   135.66     0  00:55        4.88        4.88       0.000
E-J-15               JUNCTION    152.49   152.49     0  00:50        4.89        4.89       0.000
E-J-16               JUNCTION    167.14   167.14     0  00:50        4.91        4.91       0.000
J_01a                JUNCTION      0.00   176.73     0  00:40           0        4.05       0.000
J_02a                JUNCTION      0.00   254.13     0  00:45           0        6.05       0.000
J_03a                JUNCTION      0.00   174.21     0  00:45           0        4.51       0.000
J_04a                JUNCTION      0.00   101.23     0  00:50           0        7.49       0.000
J_05_07              JUNCTION      0.00   271.57     0  01:05           0        6.72       0.000
J_05a                JUNCTION      0.00   187.41     0  00:55           0        5.95       0.000
J_06a                JUNCTION      0.00   415.89     0  00:55           0          12       0.000
J_07a                JUNCTION      0.00    38.67     0  00:50           0       0.403       0.000
J_07b                JUNCTION      0.00   251.25     0  01:10           0        5.75       0.000
J_07c                JUNCTION      0.00   328.37     0  01:10           0        9.38       0.000
J_08a                JUNCTION      0.00   548.04     0  01:05           0        16.4       0.000
J_08b                JUNCTION      0.00   105.05     0  02:25           0        5.95       0.000
J_09a                JUNCTION      0.00   247.41     0  00:55           0        6.32       0.000
J_10a                JUNCTION      0.00   490.39     0  01:15           0        13.1       0.000
J_10b                JUNCTION      0.00   416.54     0  01:15           0        9.78       0.000
J_10c                JUNCTION      0.00    25.21     0  01:15           0        4.31       0.000
J_14a                JUNCTION      0.00   264.01     0  01:05           0        12.4       0.000
J_15                 JUNCTION      0.00   649.93     0  01:30           0          17       0.000
J_15a                JUNCTION      0.00   357.66     0  00:50           0          16       0.000
J_17thAv_Out         JUNCTION      0.00    50.81     0  01:35           0        1.38       0.000
J_7b                 JUNCTION    273.66   273.66     0  00:50        8.45        8.45       0.000
J_AD1                JUNCTION     37.54    37.54     0  00:50        1.27        1.27       0.000
J_AD3                JUNCTION     26.69    26.69     0  00:45       0.793       0.793       0.000
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Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

J_AD4	JUNCTION	31.70	31.70	0	00:45	0.818	0.818	0.000
J_AD7	JUNCTION	53.99	53.99	0	00:45	1.33	1.33	0.000
J_AR1	JUNCTION	266.32	266.32	0	00:45	6.05	6.05	0.000
J_AR2	JUNCTION	266.74	266.74	0	01:05	12.6	12.6	0.000
J_EC_Colfax_Out	JUNCTION	0.00	243.95	0	01:20	0	5.71	-0.000
J_DE1	JUNCTION	402.94	402.94	0	00:55	14.8	14.8	0.000
J_DE2	JUNCTION	104.26	104.26	0	00:50	3.19	3.19	0.000
J_DE3	JUNCTION	50.78	50.78	0	01:00	2.22	2.22	0.000
J_DE4	JUNCTION	54.00	54.00	0	01:00	2.5	2.5	0.000
J_DE5	JUNCTION	96.31	96.31	0	01:00	4.09	4.09	0.000
J_DE6	JUNCTION	168.67	168.67	0	00:55	5.8	5.8	0.000
J_L1	JUNCTION	48.73	48.73	0	00:40	1.04	1.04	0.000
J_L2	JUNCTION	19.46	19.46	0	00:55	0.756	0.756	0.000
J_ST1	JUNCTION	46.16	46.16	0	01:15	3.5	3.5	0.000
J_ST2	JUNCTION	133.26	133.26	0	00:55	5.3	5.3	0.000
J_ST3	JUNCTION	106.52	106.52	0	01:05	5.07	5.07	0.000
J_ST4	JUNCTION	376.84	376.84	0	00:50	10.9	10.9	0.000
J_ST5	JUNCTION	339.33	339.33	0	01:05	15	15	0.000
J_ST6	JUNCTION	100.24	100.24	0	01:00	4.59	4.59	0.000
J_ST7	JUNCTION	346.72	346.72	0	00:50	10.7	10.7	0.000
J_ST8	JUNCTION	69.95	69.95	0	00:55	2.52	2.52	0.000
J_ST9	JUNCTION	131.69	131.69	0	00:50	3.99	3.99	0.000
J100	JUNCTION	653.61	653.61	0	01:00	26	26	0.000
J101	JUNCTION	0.00	1413.61	0	01:00	0	276	0.000
J102	JUNCTION	0.00	1507.08	0	01:00	0	279	0.000
J104	JUNCTION	0.00	257.43	0	01:05	0	290	0.000
J106	JUNCTION	0.00	103.63	0	00:55	0	3.49	0.000
J107	JUNCTION	0.00	94.72	0	01:05	0	3.01	0.000
J-10a1	JUNCTION	0.00	75.00	0	00:40	0	3.34	-0.000
J111	JUNCTION	26.68	26.68	0	00:50	0.871	0.871	0.000
J113	JUNCTION	0.00	28.25	0	00:45	0	0.672	0.000
J11th	JUNCTION	0.00	257.43	0	01:05	0	290	0.000
J121	JUNCTION	28.20	28.20	0	00:45	0.672	0.672	0.000
J122	JUNCTION	44.97	44.97	0	00:50	1.48	1.48	0.000
J124	JUNCTION	0.00	72.89	0	00:50	0	2.16	0.000
J126	JUNCTION	0.00	74.08	0	00:50	0	2.17	0.000
J128	JUNCTION	0.00	83.53	0	00:50	0	2.52	0.000
J12th	JUNCTION	0.00	412.33	0	01:05	0	296	0.000
J131	JUNCTION	11.83	11.83	0	01:00	0.567	0.567	0.000
J132	JUNCTION	54.51	54.51	0	00:45	1.55	1.55	0.000
J133	JUNCTION	42.82	42.82	0	00:45	1.03	1.03	0.000
J134	JUNCTION	15.37	15.37	0	00:45	0.44	0.44	0.000
J14	JUNCTION	92.70	92.70	0	00:45	2.64	2.64	0.000
J140	JUNCTION	17.33	17.33	0	00:45	0.509	0.509	0.000
J141	JUNCTION	0.00	16.00	0	00:40	0	0.502	0.000
J150	JUNCTION	0.00	707.56	0	01:10	0	241	0.000
J151	JUNCTION	0.00	1264.19	0	01:05	0	271	0.000
J154	JUNCTION	9.24	9.24	0	00:50	0.351	0.351	0.000
J155	JUNCTION	10.51	10.51	0	00:45	0.318	0.318	0.000
J157	JUNCTION	0.00	16.00	0	01:15	0	1.32	0.000
J159	JUNCTION	0.00	257.43	0	01:05	0	290	0.000
J160	JUNCTION	0.00	1507.08	0	01:00	0	279	0.000
J161	JUNCTION	0.00	106.28	0	00:45	0	3.15	0.000

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

J163	JUNCTION	0.00	118.30	0	00:55	0	3.6	0.000
J165	JUNCTION	0.00	1264.19	0	01:05	0	271	0.000
J166	JUNCTION	0.00	18.30	0	00:55	0	0.147	0.000
J167	JUNCTION	0.00	1.33	0	00:45	0	0.00698	0.000
J168	JUNCTION	0.00	5.53	0	00:50	0	0.0217	0.000
J169	JUNCTION	0.00	103.63	0	00:55	0	3.49	0.000
J16th-us	JUNCTION	0.00	1481.02	0	01:00	0	328	0.000
J170	JUNCTION	0.00	94.72	0	01:05	0	3.01	0.000
J171	JUNCTION	0.00	1413.61	0	01:00	0	276	0.000
J17th	JUNCTION	0.00	1773.48	0	01:30	0	349	0.000
J19th-ds	JUNCTION	0.00	1997.21	0	01:10	0	366	0.000
J19th-us	JUNCTION	0.00	1778.56	0	01:10	0	350	0.000
J200	JUNCTION	3280.00	3280.00	0	01:05	208	208	0.000
J202	JUNCTION	0.00	49.50	0	11:30	0	208	0.000
J203	JUNCTION	0.00	49.50	0	11:30	0	208	0.000
J204	JUNCTION	0.00	49.50	0	11:30	0	208	0.000
J230	JUNCTION	0.00	162.68	0	00:45	0	7.85	0.000
J231	JUNCTION	45.00	45.00	0	00:45	1.18	1.18	0.000
J232	JUNCTION	81.20	81.20	0	00:50	2.63	2.63	0.000
J233	JUNCTION	34.75	34.75	0	00:45	1.12	1.12	0.000
J234	JUNCTION	33.30	33.30	0	00:40	0.839	0.839	0.000
J235	JUNCTION	0.00	201.35	0	00:45	0	8.99	0.000
J23rd	JUNCTION	0.00	3348.20	0	01:30	0	424	0.000
J24	JUNCTION	112.76	112.76	0	00:40	2.35	2.35	0.000
J242	JUNCTION	0.00	186.10	0	00:45	0	4.98	0.000
J245	JUNCTION	0.00	223.04	0	00:45	0	5.94	0.000
J247	JUNCTION	0.00	221.70	0	00:45	0	5.94	0.000
J248	JUNCTION	0.00	221.70	0	00:45	0	5.94	0.000
J25	JUNCTION	0.00	223.30	0	00:45	0	5.94	0.000
J251	JUNCTION	33.29	33.29	0	00:50	1.17	1.17	0.000
J252	JUNCTION	38.36	38.36	0	00:45	0.964	0.964	0.000
J253	JUNCTION	0.00	221.61	0	00:45	0	5.94	0.000
J254	JUNCTION	0.00	221.61	0	00:45	0	5.94	0.000
J26th	JUNCTION	0.00	3696.98	0	01:30	0	442	0.000
J29th	JUNCTION	0.00	3951.95	0	01:35	0	457	0.000
J31	JUNCTION	95.10	95.10	0	00:45	2.3	2.3	0.000
J311	JUNCTION	15.90	15.90	0	00:50	0.568	0.568	0.000
J314	JUNCTION	0.00	95.10	0	00:45	0	2.3	0.000
J315	JUNCTION	0.00	19.63	0	02:10	0	3.85	0.000
J32	JUNCTION	137.69	137.69	0	00:50	4.71	4.71	0.000
J33	JUNCTION	96.15	96.15	0	00:55	3.72	3.72	0.000
J33rd	JUNCTION	0.00	4305.99	0	01:25	0	476	0.000
J34	JUNCTION	40.61	40.61	0	01:10	2.22	2.22	0.000
J341	JUNCTION	0.00	233.67	0	00:55	0	8.43	0.000
J343	JUNCTION	0.00	310.93	0	01:05	0	12.4	0.000
J345	JUNCTION	0.00	473.13	0	01:10	0	228	0.000
J346	JUNCTION	0.00	473.13	0	01:10	0	228	0.000
J347	JUNCTION	0.00	472.69	0	01:15	0	228	0.000
J348	JUNCTION	0.00	472.69	0	01:15	0	228	0.000
J35	JUNCTION	47.49	47.49	0	00:40	0.981	0.981	0.000
J350	JUNCTION	0.00	19.63	0	02:15	0	3.85	0.000
J351	JUNCTION	0.00	19.63	0	02:10	0	3.85	0.000
J352	JUNCTION	0.00	83.16	0	00:45	0	5.55	0.000

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

J353	JUNCTION	0.00	75.49	0	00:50	0	2.56	0.000
J354	JUNCTION	0.00	9.65	0	01:05	0	0.511	0.000
J355	JUNCTION	0.00	153.37	0	00:45	0	3.86	0.000
J36	JUNCTION	0.00	117.46	0	00:45	0	6.67	0.000
J361	JUNCTION	79.36	79.36	0	00:40	1.71	1.71	0.000
J362	JUNCTION	40.40	40.40	0	00:45	1.14	1.14	0.000
J37	JUNCTION	21.75	21.75	0	00:40	0.529	0.529	0.000
J371	JUNCTION	40.41	40.41	0	00:45	1.15	1.15	0.000
J372	JUNCTION	0.00	222.45	0	00:50	0	9.51	0.000
J374	JUNCTION	0.00	270.86	0	00:50	0	10.8	0.000
J38	JUNCTION	51.66	51.66	0	01:05	2.68	2.68	0.000
J390	JUNCTION	0.00	48.42	0	00:45	0	1.34	0.000
J391	JUNCTION	15.28	15.28	0	00:50	0.497	0.497	0.000
J392	JUNCTION	53.38	53.38	0	00:45	1.32	1.32	0.000
J393	JUNCTION	32.74	32.74	0	00:40	0.712	0.712	0.000
J394	JUNCTION	0.00	48.42	0	00:45	0	1.34	0.000
J41	JUNCTION	39.63	39.63	0	00:55	1.74	1.74	0.000
J42	JUNCTION	48.44	48.44	0	01:15	3.59	3.59	0.000
J43	JUNCTION	75.49	75.49	0	00:50	2.56	2.56	0.000
J44	JUNCTION	9.65	9.65	0	01:05	0.511	0.511	0.000
J51	JUNCTION	32.01	32.01	0	00:45	0.871	0.871	0.000
J52	JUNCTION	29.96	29.96	0	00:40	0.655	0.655	0.000
J53	JUNCTION	41.33	41.33	0	00:40	0.794	0.794	0.000
J54	JUNCTION	91.20	91.20	0	00:40	1.57	1.57	0.000
J56	JUNCTION	0.00	32.01	0	00:45	0	0.871	0.000
J61	JUNCTION	186.58	427.57	0	00:55	3.63	10.4	0.000
J62	JUNCTION	101.83	101.83	0	00:40	1.97	1.97	0.000
J63	JUNCTION	88.36	88.36	0	00:45	2.63	2.63	0.000
J64	JUNCTION	87.65	87.65	0	00:40	1.77	1.77	0.000
J65	JUNCTION	0.00	176.98	0	01:00	0	6.61	0.000
J67	JUNCTION	0.00	500.80	0	00:55	0	12.4	0.000
J68	JUNCTION	0.00	124.63	0	01:00	0	4.8	0.000
J6th_Pipe	JUNCTION	0.00	244.25	0	02:05	0	18.2	0.000
J74	JUNCTION	0.00	496.20	0	01:00	0	12.4	0.000
J7b	JUNCTION	0.00	508.77	0	00:50	0	24.1	0.000
JL2	JUNCTION	0.00	290.78	0	01:00	0	6.81	0.000
JMLK	JUNCTION	0.00	4265.52	0	01:25	0	473	0.000
JMontview-ds	JUNCTION	0.00	2402.67	0	01:10	0	382	0.000
JMontview-us	JUNCTION	0.00	2028.97	0	01:10	0	367	0.000
J_16thAve_E	JUNCTION	0.00	463.67	0	01:30	0	18.3	0.000
JSandCreek	OUTFALL	0.00	4399.43	0	01:30	0	482	0.000
DIV344	DIVIDER	0.00	310.93	0	01:05	0	12.4	0.000
DIV342	DIVIDER	0.00	233.67	0	00:55	0	8.43	0.000
DIV135	DIVIDER	0.00	11.83	0	01:00	0	0.567	0.000
DIV389	DIVIDER	0.00	17.61	0	01:40	0	1.36	0.000
DIV397	DIVIDER	0.00	118.30	0	00:55	0	3.6	0.000
DIV105	DIVIDER	0.00	244.25	0	02:05	0	18.2	0.000
DIV376	DIVIDER	0.00	707.56	0	01:10	0	241	0.000
DIV70	DIVIDER	0.00	500.80	0	00:55	0	12.4	0.000
DIV395	DIVIDER	0.00	83.53	0	00:50	0	2.52	0.000
DIV1	DIVIDER	0.00	31.66	0	00:50	0	0.871	0.000
DIV164	DIVIDER	0.00	100.00	0	00:45	0	3.45	0.000
DIV125	DIVIDER	0.00	72.89	0	00:50	0	2.16	0.000

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

DIV316	DIVIDER	0.00	19.63	0	02:15	0	3.85	0.000
DIV396	DIVIDER	0.00	17.33	0	00:45	0	0.509	0.000
DIV71	DIVIDER	0.00	427.57	0	00:55	0	10.4	0.000
DIV399	DIVIDER	0.00	508.77	0	00:50	0	24.1	0.000
DIV162	DIVIDER	0.00	106.28	0	00:45	0	3.15	0.000
DIV136	DIVIDER	0.00	54.51	0	00:45	0	1.55	0.000
DIV123	DIVIDER	0.00	28.25	0	00:45	0	0.672	0.000
J13th-DIV	DIVIDER	0.00	507.09	0	01:05	0	300	0.000
J14th-DIV	DIVIDER	0.00	1199.06	0	01:05	0	320	0.000
JColfax-DIV	DIVIDER	0.00	1344.65	0	01:00	0	323	0.000
J16th-DIV	DIVIDER	0.00	1771.57	0	01:00	0	346	0.000
D_02a	DIVIDER	0.00	282.37	0	00:45	0	6.72	0.000
D_03b	DIVIDER	0.00	49.61	0	00:50	0	0.516	0.000
D_05-07	DIVIDER	0.00	441.99	0	01:00	0	12	0.000
D_05a	DIVIDER	0.00	101.23	0	00:50	0	7.49	0.000
D_05b	DIVIDER	0.00	258.41	0	00:55	0	13.2	0.000
D_05c	DIVIDER	0.00	471.35	0	00:55	0	13	0.000
D_05d	DIVIDER	0.00	560.81	0	00:55	0	23.4	-0.000
D_06a	DIVIDER	0.00	415.89	0	00:55	0	12	0.000
D_06b	DIVIDER	0.00	349.61	0	00:55	0	7.93	0.000
D_07a	DIVIDER	0.00	267.61	0	01:10	0	6.73	0.000
D_08a	DIVIDER	0.00	247.41	0	00:55	0	6.32	0.000
D_08b	DIVIDER	0.00	564.63	0	01:05	0	17.4	0.000
D_10a	DIVIDER	0.00	840.86	0	01:15	0	26.8	0.000
D_10a1	DIVIDER	0.00	471.64	0	01:05	0	11.5	0.000
D_10b	DIVIDER	0.00	833.80	0	01:15	0	26.8	0.000
D_10c	DIVIDER	0.00	128.31	0	01:05	0	2.91	0.000
D_10d	DIVIDER	0.00	933.16	0	01:20	0	25.1	0.000
D_11a	DIVIDER	0.00	126.91	0	01:00	0	5.75	0.000
D_12a	DIVIDER	0.00	242.56	0	01:00	0	9.76	0.000
D_13a	DIVIDER	0.00	793.80	0	01:25	0	29.2	0.000
D_14a	DIVIDER	0.00	264.01	0	01:05	0	12.4	0.000
D_15a	DIVIDER	0.00	200.00	0	01:55	0	11.1	0.000
D_03a	DIVIDER	0.00	277.54	0	00:50	0	16	0.000
D_12_14	DIVIDER	0.00	45.62	0	01:05	0	0.9	0.000
D_10_13	DIVIDER	0.00	669.55	0	01:25	0	17	0.000
J72	DIVIDER	0.00	611.29	0	01:00	0	16.1	0.000
J120	DIVIDER	0.00	28.20	0	00:45	0	0.672	0.000
J127	DIVIDER	0.00	74.08	0	00:50	0	2.17	0.000
J129	DIVIDER	0.00	78.00	0	00:50	0	2.5	0.000
J158	DIVIDER	0.00	1.61	0	01:40	0	0.0328	0.000
J73	DIVIDER	0.00	124.63	0	01:00	0	4.8	0.000
J236	DIVIDER	0.00	33.30	0	00:40	0	0.839	0.000
J244	DIVIDER	0.00	223.30	0	00:45	0	5.94	0.000
J241	DIVIDER	0.00	81.20	0	00:50	0	2.63	0.000
J243	DIVIDER	0.00	186.10	0	00:45	0	4.98	0.000
J246	DIVIDER	0.00	223.04	0	00:45	0	5.94	-0.000
J375	DIVIDER	0.00	270.86	0	00:50	0	10.8	0.000
J330	DIVIDER	0.00	96.15	0	00:55	0	3.72	0.000
J320	DIVIDER	0.00	201.35	0	00:45	0	8.99	0.000
J319	DIVIDER	0.00	162.68	0	00:45	0	7.85	0.000
J321	DIVIDER	0.00	137.69	0	00:50	0	4.71	0.000
J373	DIVIDER	0.00	222.45	0	00:50	0	9.51	0.000

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

J57	DIVIDER	0.00	91.20	0	00:40	0	1.57	0.000
J250	DIVIDER	0.00	33.29	0	00:50	0	1.17	0.000
J317	DIVIDER	0.00	83.16	0	00:45	0	5.55	0.000
J318	DIVIDER	0.00	117.46	0	00:45	0	6.67	0.000
J322	DIVIDER	0.00	34.75	0	00:45	0	1.12	0.000
J363	DIVIDER	0.00	40.40	0	00:45	0	1.14	0.000
D_AR2	DIVIDER	0.00	463.56	0	01:25	0	18.3	0.000
DIV72	DIVIDER	0.00	547.66	0	01:00	0	12.5	0.000
D_04a	DIVIDER	0.00	171.65	0	00:45	0	4.05	0.000
D_04b	DIVIDER	0.00	225.87	0	00:55	0	7.21	0.000
RES30	STORAGE	0.00	153.37	0	00:45	0	3.86	0.064
RES201	STORAGE	0.00	3280.00	0	01:05	0	208	0.001
RES130	STORAGE	0.00	1589.96	0	01:00	0	282	0.013
RES156	STORAGE	0.00	59.89	0	00:55	0	1.36	0.164
HavanaPnd	STORAGE	0.00	490.12	0	01:05	0	14.1	0.101
1st/HavanaPnd	STORAGE	0.00	165.87	0	00:55	0	4.65	0.077

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
RES30	3.270	0	0	0	388.954	1	0 02:10	19.63
RES201	4430.467	0	0	0	26032.459	0	0 11:30	49.50
RES130	604.792	0	0	0	8152.773	0	0 04:45	95.48
RES156	0.395	0	0	0	93.165	0	0 01:40	17.61
HavanaPnd	3.231	0	0	0	514.915	61	0 01:15	441.75
1st/HavanaPnd	25.918	1	0	0	555.730	29	0 02:45	11.86

****
Outfall Loading Summary
****

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
JSandCreek	74.22	40.23	4399.43	481.616
System	74.22	40.23	4399.43	481.616

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
C_03a	CONDUIT	236.42	0	01:15	11.17	1.04	0.92
C_05a	CONDUIT	71.00	0	01:00	10.72	0.88	0.73
C_05b	CONDUIT	96.68	0	00:40	7.01	1.00	1.00
C_05c	CONDUIT	94.53	0	02:40	6.70	1.06	1.00
C_06a	CONDUIT	66.73	0	02:25	6.48	1.01	1.00
C_07a	CONDUIT	16.80	0	02:45	5.16	1.01	1.00
C_08a	CONDUIT	99.89	0	01:30	9.48	1.02	0.92
C_08b	CONDUIT	105.05	0	02:25	6.83	1.12	1.00
C_10a	CONDUIT	25.19	0	01:15	5.12	0.51	0.51
C_10b	CONDUIT	46.30	0	00:50	6.60	0.82	0.69
C_10c	CONDUIT	97.90	0	02:55	8.91	1.05	0.94
C_11a	CONDUIT	93.09	0	00:50	8.39	1.04	1.00
C_13a	CONDUIT	135.46	0	03:00	10.05	1.04	0.93
C_14a	CONDUIT	120.52	0	02:00	8.61	1.06	1.00
C_15a	CONDUIT	200.00	0	01:55	9.58	1.04	1.00
C_15b	CONDUIT	205.17	0	00:50	9.63	0.28	0.33
C_16a	CONDUIT	167.21	0	00:50	16.34	0.01	0.09
C_16thAv	CONDUIT	463.67	0	01:30	9.87	0.83	0.69
C_JL2	DUMMY	290.78	0	01:00			
C1	DUMMY	31.66	0	00:50			
C101	DUMMY	1413.61	0	01:00			
C102	DUMMY	1507.08	0	01:00			
C104	DUMMY	257.43	0	01:05			
C105	CONDUIT	247.37	0	00:45	5.22	0.13	0.36
C105-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C106	DUMMY	103.63	0	00:55			
C107	DUMMY	94.72	0	01:05			
C111	DUMMY	26.68	0	00:50			
C113	DUMMY	28.25	0	00:45			
C120	CONDUIT	28.25	0	00:45	5.19	0.88	0.72
C120_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C121	DUMMY	28.20	0	00:45			
C122	DUMMY	44.97	0	00:50			
C123	CONDUIT	28.18	0	00:45	5.25	0.58	0.55

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

C123-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C124	DUMMY	72.89	0	00:50			
C125	CONDUIT	44.13	0	01:25	5.30	1.01	1.00
C125-OVER	CONDUIT	29.79	0	00:50	2.26	0.00	0.07
C126	DUMMY	74.08	0	00:50			
C127	CONDUIT	74.29	0	00:50	6.62	0.78	0.66
C127_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C128	DUMMY	83.53	0	00:50			
C129	CONDUIT	73.77	0	01:05	6.39	1.06	1.00
C129_Overflow	CONDUIT	8.59	0	00:55	3.04	0.00	0.05
C12th	CONDUIT	256.71	0	01:10	4.12	0.04	0.20
C131	DUMMY	11.83	0	01:00			
C132	DUMMY	54.51	0	00:45			
C133	DUMMY	42.82	0	00:45			
C134	DUMMY	15.37	0	00:45			
C135	CONDUIT	10.22	0	01:30	3.68	1.04	1.00
C135-OVER	CONDUIT	1.94	0	01:10	2.25	0.00	0.05
C136	CONDUIT	54.26	0	00:50	6.14	0.78	0.66
C136-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C13th	CONDUIT	412.68	0	01:05	4.60	0.09	0.31
C14	DUMMY	92.70	0	00:45			
C140	DUMMY	17.33	0	00:45			
C141	CONDUIT	16.22	0	00:45	4.59	0.50	0.50
C14th	CONDUIT	507.61	0	01:05	8.52	0.57	0.55
C14th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C150	DUMMY	707.56	0	01:10			
C151	DUMMY	1264.19	0	01:05			
C154	DUMMY	9.24	0	00:50			
C155	DUMMY	10.51	0	00:45			
C157	CONDUIT	16.01	0	01:15	4.49	0.23	0.33
C158	CONDUIT	1.61	0	01:40	2.61	0.02	0.10
C158_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C159	DUMMY	257.43	0	01:05			
C160	DUMMY	1507.08	0	01:00			
C161	DUMMY	106.28	0	00:45			
C162	CONDUIT	72.18	0	01:20	6.52	1.04	1.00
C162-OVER	CONDUIT	34.36	0	00:55	5.27	0.00	0.10
C163	DUMMY	118.30	0	00:55			
C164	CONDUIT	98.76	0	00:55	6.87	1.04	0.99
C164-OVER	CONDUIT	4.86	0	00:55	2.33	0.00	0.04
C165	CONDUIT	1263.06	0	01:00	7.27	0.24	0.55
C166	CONDUIT	19.38	0	00:55	1.34	0.00	0.03
C167	CONDUIT	1.00	0	00:55	0.81	0.00	0.00
C168	CONDUIT	4.37	0	00:55	1.02	0.00	0.01
C169	CONDUIT	103.22	0	00:55	2.44	0.01	0.07
C16th	CONDUIT	1340.74	0	01:00	7.63	0.89	0.95
C16th2	DUMMY	1481.02	0	01:00			
C16th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C170	CONDUIT	94.33	0	01:05	2.37	0.01	0.06
C171	CONDUIT	1413.13	0	01:00	7.48	0.27	0.57
C17th	CONDUIT	1057.69	0	01:50	10.15	1.20	1.00
C17th-OVER	CONDUIT	839.51	0	01:05	5.62	0.05	0.30
C19th	CONDUIT	1763.34	0	01:30	5.59	0.33	0.62

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

C19th2	DUMMY	1778.56	0	01:10			
C1-DIV	DUMMY	0.00	0	00:00			
C20	DUMMY	244.25	0	02:05			
C200	DUMMY	3280.00	0	01:05			
C202	CONDUIT	49.50	0	11:30	7.72	0.51	0.51
C203	DUMMY	49.50	0	11:30			
C204	CONDUIT	49.50	0	11:35	2.56	0.01	0.08
C230	DUMMY	162.68	0	00:45			
C231	DUMMY	45.00	0	00:45			
C232	DUMMY	81.20	0	00:50			
C233	DUMMY	34.75	0	00:45			
C234	DUMMY	33.30	0	00:40			
C235	DUMMY	201.35	0	00:45			
C236	CONDUIT	33.42	0	00:45	6.12	0.88	0.72
C236_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C23rd	CONDUIT	2389.57	0	01:15	6.10	0.19	0.52
C24	DUMMY	112.76	0	00:40			
C241	CONDUIT	81.30	0	00:50	5.25	0.71	0.62
C241_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C242	DUMMY	186.10	0	00:45			
C243	CONDUIT	184.95	0	00:45	8.06	0.71	0.62
C243_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C244	CONDUIT	223.04	0	00:45	8.75	0.80	0.68
C244_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C245	DUMMY	223.04	0	00:45			
C246	CONDUIT	221.70	0	00:45	6.64	0.73	0.63
C246_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C247	DUMMY	221.70	0	00:45			
C248	CONDUIT	221.61	0	00:45	14.61	0.25	0.34
C25	DUMMY	223.30	0	00:45			
C250	CONDUIT	33.16	0	00:55	5.04	0.53	0.52
C250_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C251	DUMMY	33.29	0	00:50			
C252	DUMMY	38.36	0	00:45			
C253	DUMMY	221.61	0	00:45			
C254	CONDUIT	223.69	0	00:50	4.12	0.37	0.63
C26th	CONDUIT	3336.19	0	01:35	4.94	0.24	0.57
C29th	CONDUIT	3689.97	0	01:35	5.55	0.22	0.54
C31	DUMMY	95.10	0	00:45			
C311	DUMMY	15.90	0	00:50			
C314	CONDUIT	93.61	0	00:45	2.90	0.28	0.58
C315	CONDUIT	19.63	0	02:15	4.38	0.32	0.39
C316	CONDUIT	19.63	0	02:15	4.31	0.17	0.28
C316-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C317	CONDUIT	83.29	0	00:45	8.47	0.50	0.50
C318	CONDUIT	117.69	0	00:45	6.35	0.53	0.52
C319	CONDUIT	161.35	0	00:50	6.87	0.63	0.58
C319_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C32	DUMMY	137.69	0	00:50			
C320	CONDUIT	202.39	0	00:50	7.88	0.70	0.62
C320_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C321	CONDUIT	137.95	0	00:55	6.69	0.53	0.52
C321_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

C322	CONDUIT	34.85	0	00:50	4.58	0.47	0.48
C33	DUMMY	96.15	0	00:55			
C330	CONDUIT	95.72	0	00:55	5.84	0.76	0.65
C330_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C34	DUMMY	40.61	0	01:10			
C341	DUMMY	233.67	0	00:55			
C342	CONDUIT	129.50	0	01:50	7.79	1.03	1.00
C342-OVER	CONDUIT	98.96	0	01:05	5.84	0.01	0.15
C343	DUMMY	310.93	0	01:05			
C344	CONDUIT	213.26	0	01:50	8.61	1.04	1.00
C344-OVER	CONDUIT	103.46	0	01:10	4.10	0.01	0.13
C345	DUMMY	473.13	0	01:10			
C346	CONDUIT	472.69	0	01:15	4.29	0.22	0.52
C347	DUMMY	472.69	0	01:15			
C348	CONDUIT	470.58	0	01:20	3.89	0.19	0.44
C35	DUMMY	47.49	0	00:40			
C350	DUMMY	19.63	0	02:15			
C351	DUMMY	19.63	0	02:10			
C352	DUMMY	83.16	0	00:45			
C353	CONDUIT	73.78	0	01:00	2.67	0.11	0.36
C354	CONDUIT	9.61	0	01:10	3.27	0.18	0.29
C355	DUMMY	153.37	0	00:45			
C36	DUMMY	117.46	0	00:45			
C361	DUMMY	79.36	0	00:40			
C362	DUMMY	40.40	0	00:45			
C363	CONDUIT	40.14	0	00:50	4.76	0.54	0.52
C37	DUMMY	21.75	0	00:40			
C371	DUMMY	40.41	0	00:45			
C372	DUMMY	222.45	0	00:50			
C373	CONDUIT	223.64	0	00:50	8.12	0.51	0.51
C373_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C374	DUMMY	270.86	0	00:50			
C375	CONDUIT	271.35	0	00:50	8.49	0.62	0.57
C375_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C376	CONDUIT	66.84	0	06:50	5.73	1.08	1.00
C376-OVER	CONDUIT	642.91	0	01:15	4.20	0.14	0.39
C38	DUMMY	51.66	0	01:05			
C389	DUMMY	16.00	0	01:15			
C389-DIV	DUMMY	1.61	0	01:40			
C390	DUMMY	48.42	0	00:45			
C391	DUMMY	15.28	0	00:50			
C392	DUMMY	53.38	0	00:45			
C393	DUMMY	32.74	0	00:40			
C394	CONDUIT	48.42	0	00:45	5.31	0.11	0.23
C395	DUMMY	78.00	0	00:50			
C395-DIV	DUMMY	5.53	0	00:50			
C396	DUMMY	16.00	0	00:40			
C396-DIV	DUMMY	1.33	0	00:45			
C397	DUMMY	100.00	0	00:45			
C397-DIV	DUMMY	18.30	0	00:55			
C399	CONDUIT	244.25	0	02:05	9.93	1.05	1.00
C399-DIV	CHANNEL	271.83	0	01:00	8.66	0.02	0.13
C41	DUMMY	39.63	0	00:55			

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

C42	DUMMY	48.44	0	01:15			
C43	DUMMY	75.49	0	00:50			
C44	DUMMY	9.65	0	01:05			
C51	DUMMY	32.01	0	00:45			
C52	DUMMY	29.96	0	00:40			
C53	DUMMY	41.33	0	00:40			
C54	DUMMY	91.20	0	00:40			
C56	CONDUIT	31.66	0	00:50	4.97	0.28	0.36
C57	CONDUIT	91.78	0	00:40	6.45	0.81	0.68
C57_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C61	DUMMY	427.57	0	00:55			
C62	DUMMY	101.83	0	00:40			
C63	DUMMY	88.36	0	00:45			
C64	DUMMY	87.65	0	00:40			
C65	DUMMY	176.98	0	01:00			
C67	DUMMY	500.80	0	00:55			
C68	DUMMY	124.63	0	01:00			
C70	CONDUIT	28.15	0	02:15	5.17	1.00	1.00
C70-OVER	CHANNEL	468.14	0	01:00	5.68	0.03	0.18
C71	CONDUIT	20.10	0	02:15	5.01	1.01	1.00
C71-OVER	CHANNEL	404.25	0	00:55	6.54	0.03	0.16
C72	CONDUIT	66.40	0	02:10	7.85	1.04	1.00
C73	CONDUIT	35.15	0	00:35	3.72	1.00	1.00
C73_Overlfow	CHANNEL	89.05	0	01:05	8.52	0.01	0.08
C74	DUMMY	496.20	0	01:00			
CAD1	DUMMY	37.54	0	00:50			
CAD3	DUMMY	26.69	0	00:45			
CAD4	DUMMY	31.70	0	00:45			
CAD7	DUMMY	53.99	0	00:45			
CAR1	DUMMY	266.32	0	00:45			
CAR2	DUMMY	266.74	0	01:05			
CColfax	CONDUIT	1054.42	0	01:00	9.92	1.20	1.00
CColf-OVER	CONDUIT	314.93	0	01:10	4.29	0.02	0.19
CCPark	CONDUIT	4260.83	0	01:25	5.15	0.39	0.69
CDE1	DUMMY	402.94	0	00:55			
CDE2	DUMMY	104.26	0	00:50			
CDE3	DUMMY	50.78	0	01:00			
CDE4	DUMMY	54.00	0	01:00			
CDE5	DUMMY	96.31	0	01:00			
CDE6	DUMMY	168.67	0	00:55			
CDIV7b	DUMMY	508.77	0	00:50			
CJ_L1	DUMMY	48.73	0	00:40			
CJ7b	DUMMY	273.66	0	00:50			
CJL2	DUMMY	19.46	0	00:55			
CMLK	CONDUIT	3950.91	0	01:35	5.71	0.33	0.64
CMontview	CONDUIT	1996.34	0	01:10	5.25	0.12	0.41
CMontview2	DUMMY	2028.97	0	01:10			
CSandCreek	CONDUIT	4301.63	0	01:30	7.87	0.37	0.65
CST1	DUMMY	46.16	0	01:15			
CST2	DUMMY	133.26	0	00:55			
CST3	DUMMY	106.52	0	01:05			
CST4	DUMMY	376.84	0	00:50			
CST5	DUMMY	339.33	0	01:05			

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

CST6	DUMMY	100.24	0	01:00			
CST7	CONDUIT	326.41	0	01:05	3.18	0.01	0.15
CST8	DUMMY	69.95	0	00:55			
CST9	DUMMY	131.69	0	00:50			
d_01a	DUMMY	174.54	0	00:40			
d_02a	DUMMY	282.37	0	00:45			
d_02b	DUMMY	254.13	0	00:45			
d_03a	DUMMY	174.21	0	00:45			
d_03b	DUMMY	174.21	0	00:45			
d_03c	DUMMY	49.61	0	00:50			
d_04b	DUMMY	94.44	0	00:55			
d_04d	DUMMY	101.23	0	00:50			
d_05a	DUMMY	166.92	0	00:55			
d_05b	DUMMY	187.41	0	00:55			
d_05c	DUMMY	471.35	0	00:55			
d_06a	DUMMY	177.77	0	00:50			
d_06b	DUMMY	415.89	0	00:55			
d_06c	DUMMY	349.61	0	00:55			
d_07b	DUMMY	79.51	0	01:00			
d_08a	DUMMY	121.05	0	00:55			
d_08b	DUMMY	548.04	0	01:05			
d_08c	DUMMY	105.05	0	02:25			
d_09a	DUMMY	144.35	0	00:50			
d_09b	DUMMY	247.41	0	00:55			
d_10a	DUMMY	159.62	0	00:55			
d_10a1	DUMMY	396.64	0	01:05			
d_10a2	DUMMY	75.00	0	00:40			
d_11a	DUMMY	126.91	0	01:00			
d_12a	DUMMY	138.47	0	00:45			
d_13a	DUMMY	90.47	0	00:55			
d_14a	DUMMY	135.66	0	00:55			
d_14b	DUMMY	264.01	0	01:05			
d_15a	DUMMY	152.49	0	00:50			
d_17thAv	DUMMY	50.81	0	01:35			
d_EC_Out_23rd	DUMMY	984.07	0	01:35			
d_EC_Out_19thAv	DUMMY	223.39	0	01:00			
S_02a	CONDUIT	23.03	0	01:05	0.81	0.26	0.48
S_03a	CHANNEL	8.43	0	01:05	8.01	0.00	0.05
S_05_07a	CHANNEL	247.57	0	01:05	5.77	0.01	0.11
S_05_07b	CHANNEL	195.71	0	01:05	9.97	0.01	0.10
S_05a	CHANNEL	21.73	0	01:00	11.62	0.00	0.04
S_05b	CHANNEL	162.03	0	00:55	4.61	0.01	0.10
S_05c	CHANNEL	441.99	0	01:00	8.96	0.02	0.15
S_05d	CHANNEL	25.23	0	01:10	5.31	0.00	0.08
S_06a	CHANNEL	239.08	0	00:55	10.07	0.01	0.11
S_06b	CHANNEL	238.98	0	01:00	7.41	0.03	0.18
S_07a	CHANNEL	38.67	0	00:50	13.70	0.00	0.04
S_07b	CHANNEL	37.26	0	00:55	10.58	0.00	0.05
S_07b2	CHANNEL	267.61	0	01:10	5.98	0.03	0.15
S_07d	CHANNEL	251.25	0	01:10	8.18	0.01	0.11
S_07e	CHANNEL	251.04	0	01:10	8.15	0.01	0.12
S_08a	CHANNEL	143.07	0	01:00	10.83	0.01	0.08
S_08b	CHANNEL	471.64	0	01:05	10.11	0.02	0.13

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

S_09a	CHANNEL	106.97	0	00:55	12.83	0.01	0.07
S_10_13	CHANNEL	50.81	0	01:35	9.91	0.00	0.06
S_10a	CHANNEL	415.39	0	01:15	7.98	0.02	0.15
S_10a1	CHANNEL	81.95	0	00:45	10.57	0.00	0.06
S_10b	CHANNEL	490.65	0	01:15	11.31	0.02	0.14
S_10c	CHANNEL	325.02	0	01:15	9.58	0.01	0.12
S_10d	CHANNEL	787.80	0	01:15	9.15	0.05	0.20
S_10e	CHANNEL	735.25	0	01:20	10.81	0.04	0.17
S_10f	CHANNEL	128.31	0	01:05	11.32	0.01	0.08
S_10g	CHANNEL	82.32	0	01:05	14.75	0.00	0.07
S_10i	DUMMY	243.95	0	01:20			
S_11a	CHANNEL	36.27	0	01:10	8.44	0.00	0.05
S_12_14	CHANNEL	18.11	0	01:10	4.93	0.00	0.03
S_13a	CHANNEL	683.53	0	01:25	8.94	0.05	0.19
S_13b1	CHANNEL	669.55	0	01:25	10.53	0.03	0.17
S_13b2	CHANNEL	607.16	0	01:30	8.44	0.04	0.18
S_14a1	CHANNEL	45.62	0	01:05	6.20	0.00	0.06
S_14a2	CHANNEL	26.56	0	01:15	8.18	0.00	0.05
S_15	CHANNEL	635.88	0	01:35	13.59	0.03	0.15
S_15a	CHANNEL	70.60	0	01:10	8.23	0.00	0.07
S_15b	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
S_15c	CONDUIT	357.52	0	00:50	11.74	0.00	0.05
S_Beeler	CHANNEL	460.13	0	01:10	9.27	0.03	0.16
C317_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C318_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C363_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C_EC_Colfax_Out	CHANNEL	231.96	0	01:30	7.48	0.02	0.13
S_AR2	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
d_16thAve_E	DUMMY	463.67	0	01:30			
d_72	DUMMY	547.66	0	01:00			
C72_Overflow	CHANNEL	60.99	0	01:00	8.43	0.00	0.07
C_04b	CONDUIT	133.84	0	00:45	12.22	1.01	0.82
S_04a	CHANNEL	171.65	0	00:45	2.35	0.02	0.14
d_04c	DUMMY	165.87	0	00:55			
S_04b	CHANNEL	40.02	0	00:50	15.22	0.00	0.04
C_04c	CONDUIT	62.17	0	00:40	9.98	1.00	0.90
O_10a	ORIFICE	25.21	0	01:15			0.00
W_10a	WEIR	416.54	0	01:15			0.00
OUT30	DUMMY	19.63	0	02:10			
OUT201	DUMMY	49.50	0	11:30			
OUT130	DUMMY	95.48	0	04:45			
OUT156	DUMMY	17.61	0	01:40			
OUT04	DUMMY	11.86	0	02:45			

****
Conduit Surcharge Summary
****

	Hours Full		Hours Above Full	Hours Capacity
	---	---		

Table E.4 – Existing Kinematic SWMM Output for 100-year (Future) Event in Aurora

Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
C_03a	0.58	0.58	0.58	0.58	0.58
C_05b	1.25	1.25	1.25	1.25	1.25
C_05c	2.08	2.08	2.08	2.17	2.08
C_06a	1.75	1.75	1.75	0.08	1.75
C_07a	1.92	1.92	1.92	1.92	1.92
C_08a	1.00	1.00	1.00	0.92	1.00
C_08b	1.92	1.92	1.92	1.92	1.92
C_10c	2.08	2.08	2.08	2.00	2.08
C_11a	1.00	1.00	1.00	1.00	1.00
C_13a	2.25	2.25	2.25	2.17	2.25
C_14a	1.33	1.33	1.33	1.42	1.33
C_15a	1.17	1.17	1.17	1.25	1.17
C125	0.83	0.83	0.83	0.83	0.83
C129	0.50	0.50	0.50	0.17	0.50
C135	0.75	0.75	0.75	0.75	0.75
C14th	0.01	0.01	0.01	0.67	0.01
C162	0.67	0.67	0.67	0.08	0.67
C164	0.58	0.58	0.58	0.58	0.58
C17th	1.25	1.25	1.25	1.92	1.25
C342	1.08	1.08	1.08	1.17	1.08
C344	1.08	1.08	1.08	1.08	1.08
C376	6.75	6.75	6.75	6.92	6.75
C399	1.42	1.42	1.42	0.08	1.42
C70	1.92	1.92	1.92	0.08	1.92
C71	1.83	1.83	1.83	1.92	1.83
C72	1.75	1.75	1.75	1.67	1.75
C73	1.92	1.92	1.92	1.92	1.92
CColfax	0.75	0.75	0.75	1.42	0.75
C_04b	0.01	0.01	0.01	0.08	0.01
C_04c	0.01	0.01	0.01	0.08	0.01

Analysis begun on: Thu Mar 17 09:47:17 2022
Analysis ended on: Thu Mar 17 09:47:18 2022
Total elapsed time: 00:00:01

Table E.5 – Existing Dynamic SWMM Output for 100-year (Future) Event in Aurora

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.011)
--------------------------------------------------------------

Basis of model: Westerly Creek FHAD 100-year SWMM
Alternative Plan 6:
-48" SD in E 23rd Ave

WARNING 02: maximum depth increased for Node D_10b

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/15/2021 00:00:00
Ending Date .............. 04/15/2021 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Routing Time Step ........ 30.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.005000 ft


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........       189.382        61.713
External Outflow .........       199.585        65.038
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
```

Table E.5 – Existing Dynamic SWMM Output for 100-year (Future) Event in Aurora

```
  Final Stored Volume ......          0.014         0.004
  Continuity Error (%) .....         -5.394


  ************************
  Highest Continuity Errors
  ************************
  Node J_15 (-20.89%)
  Node D_10_13_b (1.57%)
  Node J_AR1_b (1.02%)


  ***************************
  Time-Step Critical Elements
  ***************************
  Link C_10c_2 (3.01%)


  *******************************
  Highest Flow Instability Indexes
  *******************************
  All links are stable.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     1.66 sec
  Average Time Step           :    29.68 sec
  Maximum Time Step           :    30.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.15
  Percent Not Converging      :     0.86


  ******************
  Node Depth Summary
  ******************

  ---------------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type        Feet     Feet     Feet  days hr:min        Feet
  ---------------------------------------------------------------------------------
  D_10d                JUNCTION    1.71    10.60  5348.52     0  01:24       10.60
  D_10b                JUNCTION    2.05    14.74  5367.04     0  01:21       14.74
  E-J-10               JUNCTION    0.00     0.00  5344.00     0  00:00        0.00
  D_10c                JUNCTION    0.07     0.83  5352.83     0  01:07        0.83
  D_13a                JUNCTION    3.82    14.30  5341.66     0  01:26       14.30
  D_10_13_a            JUNCTION    3.42    11.24  5332.75     0  01:29       11.24
  D_16a                JUNCTION    1.63     7.91  5310.09     0  01:46        7.91
  D_16b                JUNCTION    3.25     9.16  5314.06     0  01:02        9.16
  J_15                 JUNCTION    5.86     7.88  5321.84     0  01:01        7.86
```

Table E.5 – Existing Dynamic SWMM Output for 100-year (Future) Event in Aurora

D_14a	JUNCTION	1.04	14.86	5337.20	0	01:13	14.86
D_12_14	JUNCTION	0.03	0.33	5349.33	0	01:10	0.33
J_AR1_b	JUNCTION	0.14	1.55	5340.37	0	01:19	1.55
DIV72	JUNCTION	0.12	1.53	5361.90	0	01:11	1.53
D_10_13_b	JUNCTION	0.05	0.47	5331.67	0	01:33	0.47
D_AR2_b	JUNCTION	0.06	0.85	5347.65	0	01:25	0.85
E-J-16_b	JUNCTION	0.00	0.00	5312.27	0	00:00	0.00
E-J-16_a	JUNCTION	0.00	0.00	5308.09	0	00:00	0.00
D_AR2_a	OUTFALL	0.00	0.00	5338.20	0	00:00	0.00
EC_Out_19thAv	OUTFALL	0.78	3.23	5314.70	0	01:29	3.23
EC_Out_23rd	OUTFALL	0.65	4.00	5302.80	0	00:40	4.00
EC_Out_23rd_OF	OUTFALL	0.13	1.96	5307.76	0	01:46	1.96
J_17thAve_Out_OF	OUTFALL	0.04	0.47	5323.31	0	01:33	0.47
J14th-DIV	OUTFALL	0.12	1.55	5334.83	0	01:19	1.55
D_15a	OUTFALL	0.50	4.38	5318.78	0	01:13	4.38

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
D_10d	JUNCTION	0.00	1022.25	0	01:20	0	34.6	0.067
D_10b	JUNCTION	834.57	834.57	0	01:15	27.1	27.1	-0.054
E-J-10	JUNCTION	159.58	159.58	0	00:55	5.49	5.49	0.000
D_10c	JUNCTION	82.30	82.30	0	01:05	2.02	2.02	0.079
D_13a	JUNCTION	0.00	763.33	0	01:24	0	29.1	0.805
D_10_13_a	JUNCTION	0.00	759.13	0	01:27	0	28.9	-0.626
D_16a	JUNCTION	0.00	611.54	0	01:03	0	21.8	-0.605
D_16b	JUNCTION	0.00	3029.49	0	01:01	0	20	-0.208
J_15	JUNCTION	0.00	586.69	0	01:28	0	15.5	-17.283
D_14a	JUNCTION	263.98	263.98	0	01:05	12.4	12.4	-0.146
D_12_14	JUNCTION	18.11	18.11	0	01:10	0.361	0.361	0.512
J_AR1_b	JUNCTION	0.00	459.42	0	01:13	0	11.5	1.034
DIV72	JUNCTION	459.93	459.93	0	01:10	11.4	11.4	-0.759
D_10_13_b	JUNCTION	0.00	49.82	0	01:30	0	1.13	1.595
D_AR2_b	JUNCTION	0.00	255.39	0	01:24	0	5.87	0.089
E-J-16_b	JUNCTION	40.12	40.12	0	00:50	1.18	1.18	0.000
E-J-16_a	JUNCTION	60.17	60.17	0	00:50	1.77	1.77	0.000
D_AR2_a	OUTFALL	0.00	255.29	0	01:25	0	5.86	0.000
EC_Out_19thAv	OUTFALL	0.00	120.57	0	01:29	0	12.5	0.000
EC_Out_23rd	OUTFALL	0.00	93.10	0	01:46	0	6.86	0.000
EC_Out_23rd_OF	OUTFALL	0.00	469.53	0	01:46	0	15.1	0.000
J_17thAve_Out_OF	OUTFALL	0.00	49.08	0	01:33	0	1.11	0.000
J14th-DIV	OUTFALL	0.00	446.25	0	01:19	0	11.4	0.000
D_15a	OUTFALL	0.00	246.21	0	01:13	0	12.3	0.000

Table E.5 – Existing Dynamic SWMM Output for 100-year (Future) Event in Aurora

```
**********************
Node Surcharge Summary
**********************

Surcharging occurs when water rises above the top of the highest conduit.
------------------------------------------------------------------------
                                          Max. Height   Min. Depth
                                Hours     Above Crown    Below Rim
Node                 Type     Surcharged       Feet         Feet
------------------------------------------------------------------------
E-J-10               JUNCTION      23.00       0.000        0.000
E-J-16_b             JUNCTION      23.00       0.000        0.000
E-J-16_a             JUNCTION      23.00       0.000        0.000


*********************
Node Flooding Summary
*********************

No nodes were flooded.


**********************
Outfall Loading Summary
**********************

-----------------------------------------------------------
                        Flow      Avg       Max       Total
                        Freq     Flow      Flow      Volume
Outfall Node            Pcnt      CFS       CFS    10^6 gal
-----------------------------------------------------------
D_AR2_a                65.73    14.25    255.29       5.860
EC_Out_19thAv          98.49    21.32    120.57      12.474
EC_Out_23rd            98.78    11.62     93.10       6.861
EC_Out_23rd_OF         10.68   225.32    469.53      15.052
J_17thAve_Out_OF       94.98     1.87     49.08       1.111
J14th-DIV              96.99    19.01    446.25      11.401
D_15a                  40.11    51.32    246.21      12.274
-----------------------------------------------------------
System                 72.25   344.71   1523.15      65.033


*********************
Link Flow Summary
*********************

-------------------------------------------------------------------------------
                             Maximum  Time of Max   Maximum    Max/    Max/
                              |Flow|   Occurrence   |Veloc|    Full    Full
Link                 Type       CFS  days hr:min    ft/sec    Flow   Depth
-------------------------------------------------------------------------------
S_10e                CHANNEL  743.04     0  01:21      5.63    0.05    0.19
C_10c                CONDUIT   81.89     0  01:11      6.52    1.18    1.00
```

Table E.5 – Existing Dynamic SWMM Output for 100-year (Future) Event in Aurora

C_10c_2	CONDUIT	120.26	0	00:52	10.00	1.73	1.00
d_10a	DUMMY	159.58	0	00:55			
J_EC_Colfax_Out	CHANNEL	255.29	0	01:25	8.05	0.01	0.08
S_13a	CHANNEL	650.63	0	01:24	6.37	0.03	0.16
S_10g	CHANNEL	81.92	0	01:08	2.74	0.00	0.08
S_13_b1	CHANNEL	630.32	0	01:27	5.98	0.03	0.17
C_13a	CONDUIT	140.72	0	00:54	8.85	1.48	1.00
C_13a_2	CONDUIT	120.57	0	01:29	8.29	1.24	0.86
S_13b2	CHANNEL	585.71	0	01:29	4.61	0.03	0.52
S_15_a	CHANNEL	469.53	0	01:46	3.29	0.04	0.20
C_15_a	CONDUIT	93.10	0	01:46	7.41	1.33	1.00
C_15_b	CONDUIT	29.64	0	03:11	6.43	1.51	1.00
S_15_b	CHANNEL	536.21	0	01:03	4.79	0.03	0.18
S_15_c	CHANNEL	2993.65	0	01:01	12.50	0.20	0.55
S_15a	CHANNEL	11.83	0	01:13	1.64	0.00	0.51
S_10_13_b	CHANNEL	49.08	0	01:33	4.33	0.00	0.05
S_12_14	CHANNEL	18.08	0	01:10	2.89	0.00	0.08
S_AR1_a	CHANNEL	446.25	0	01:19	5.04	0.02	0.16
S_AR1_c	CHANNEL	459.42	0	01:13	6.50	0.02	0.15
S_10_13_a	CHANNEL	49.82	0	01:30	1.44	0.02	0.09
S_10i	CHANNEL	255.39	0	01:24	3.92	0.07	0.12
C_16a_1	DUMMY	40.12	0	00:50			
C_16a_2	DUMMY	60.17	0	00:50			
C_15a	CONDUIT	246.21	0	01:13	10.95	1.56	0.90

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
S_10e	1.00	0.88	0.02	0.00	0.10	0.00	0.00	0.00	0.96	0.00
C_10c	1.00	0.02	0.00	0.00	0.15	0.00	0.00	0.84	0.02	0.00
C_10c_2	1.00	0.01	0.00	0.00	0.12	0.00	0.00	0.87	0.00	0.00
J_EC_Colfax_Out	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
S_13a	1.00	0.88	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00
S_10g	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
S_13_b1	1.00	0.88	0.02	0.00	0.03	0.03	0.00	0.04	0.92	0.00
C_13a	1.00	0.01	0.00	0.00	0.13	0.00	0.00	0.85	0.00	0.00
C_13a_2	1.00	0.01	0.00	0.00	0.94	0.05	0.00	0.00	0.00	0.00
S_13b2	1.00	0.04	0.84	0.00	0.12	0.00	0.00	0.00	0.96	0.00
S_15_a	1.00	0.89	0.00	0.00	0.11	0.00	0.00	0.00	0.07	0.00
C_15_a	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.62	0.00
C_15_b	1.00	0.01	0.00	0.00	0.12	0.00	0.00	0.87	0.00	0.00
S_15_b	1.00	0.87	0.00	0.00	0.08	0.00	0.00	0.05	0.07	0.00
S_15_c	1.00	0.03	0.02	0.00	0.05	0.00	0.00	0.90	0.01	0.00
S_15a	1.00	0.04	0.93	0.00	0.02	0.00	0.00	0.00	0.96	0.00
S_10_13_b	1.00	0.04	0.00	0.00	0.00	0.95	0.00	0.00	0.14	0.00
S_12_14	1.00	0.03	0.00	0.00	0.09	0.00	0.00	0.87	0.10	0.00

Table E.5 – Existing Dynamic SWMM Output for 100-year (Future) Event in Aurora

S_AR1_a	1.00	0.03	0.00	0.00	0.08	0.89	0.00	0.00	0.04	0.00
S_AR1_c	1.00	0.03	0.00	0.00	0.91	0.07	0.00	0.00	0.95	0.00
S_10_13_a	1.00	0.04	0.84	0.00	0.12	0.00	0.00	0.00	0.85	0.00
S_10i	1.00	0.03	0.85	0.00	0.12	0.00	0.00	0.00	0.85	0.00
C_15a	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
C_10c	2.66	2.66	2.79	2.64	2.62
C_10c_2	2.43	2.87	2.43	2.94	2.43
C_13a	2.70	2.79	2.74	2.74	2.60
C_13a_2	0.01	2.81	0.01	2.87	0.01
S_13b2	0.01	0.01	0.01	0.01	0.01
C_15_a	2.48	2.48	2.51	2.51	2.48
C_15_b	2.50	2.97	2.50	2.99	2.50
S_15_c	0.01	0.01	0.01	0.01	0.01
S_15a	0.01	0.01	0.01	0.01	0.01
C_15a	0.01	1.43	0.01	1.51	0.01

Analysis begun on: Thu Mar 17 09:50:17 2022
Analysis ended on: Thu Mar 17 09:50:17 2022
Total elapsed time: < 1 sec

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
  EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.011)
  --------------------------------------------------------------

  Denver SDMP - Basin 4401-02 - Updated by Enginuity 2018
  100-Year Existing Conditions

  WARNING 03: negative offset ignored for Link 35357STGM
  WARNING 03: negative offset ignored for Link 35358STGM
  WARNING 03: negative offset ignored for Link 4401-02-210
  WARNING 03: negative offset ignored for Link 4401-02-220
  WARNING 03: negative offset ignored for Link 4401-02-240
  WARNING 08: elevation drop exceeds length for Conduit CDE4
  WARNING 08: elevation drop exceeds length for Conduit D_12th
  WARNING 02: maximum depth increased for Node 19071STMH
  WARNING 02: maximum depth increased for Node 19079STMH
  WARNING 02: maximum depth increased for Node 19097STMH
  WARNING 02: maximum depth increased for Node 19111STMH
  WARNING 02: maximum depth increased for Node 19132STMH
  WARNING 02: maximum depth increased for Node 19134STMH
  WARNING 02: maximum depth increased for Node 19139STMH
  WARNING 02: maximum depth increased for Node 19143STMH
  WARNING 02: maximum depth increased for Node 19150STMH
  WARNING 02: maximum depth increased for Node 19154STMH
  WARNING 02: maximum depth increased for Node 19162STMH
  WARNING 02: maximum depth increased for Node 19171STMH
  WARNING 02: maximum depth increased for Node 19179STMH
  WARNING 02: maximum depth increased for Node 19214STMH
  WARNING 02: maximum depth increased for Node 20135STMH
  WARNING 02: maximum depth increased for Node 20209STFT
  WARNING 02: maximum depth increased for Node 20818STMH
  WARNING 02: maximum depth increased for Node 20841STMH
  WARNING 02: maximum depth increased for Node 23839STMH
  WARNING 02: maximum depth increased for Node 23840STMH
  WARNING 02: maximum depth increased for Node 23841STMH
  WARNING 02: maximum depth increased for Node 23843STMH
  WARNING 02: maximum depth increased for Node 23845STMH
  WARNING 02: maximum depth increased for Node 23849STMH
  WARNING 02: maximum depth increased for Node 23852STMH
  WARNING 02: maximum depth increased for Node 23855STMH
  WARNING 02: maximum depth increased for Node 23856STMH
  WARNING 02: maximum depth increased for Node 23861STMH
  WARNING 02: maximum depth increased for Node 23862STMH
  WARNING 02: maximum depth increased for Node 23868STMH
  WARNING 02: maximum depth increased for Node 24788STMH
  WARNING 02: maximum depth increased for Node 24791STMH
  WARNING 02: maximum depth increased for Node 24796STMH
  WARNING 02: maximum depth increased for Node 24797STIL
  WARNING 02: maximum depth increased for Node 24800STMH
  WARNING 02: maximum depth increased for Node 405658STFT
  WARNING 02: maximum depth increased for Node 405659STFT
  WARNING 02: maximum depth increased for Node 407540STMH
  WARNING 02: maximum depth increased for Node 407541STMH
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
WARNING 02: maximum depth increased for Node 407542STMH
WARNING 02: maximum depth increased for Node 407543STMH
WARNING 02: maximum depth increased for Node 407544STMH
WARNING 02: maximum depth increased for Node 407546STMH
WARNING 02: maximum depth increased for Node 773032STMH
WARNING 02: maximum depth increased for Node 773050STMH
WARNING 02: maximum depth increased for Node 773052STMH
WARNING 02: maximum depth increased for Node 773389STMH
WARNING 02: maximum depth increased for Node 773392STMH
WARNING 02: maximum depth increased for Node 773410STMH
WARNING 02: maximum depth increased for Node 773412STMH

*************
Element Count
*************
Number of rain gages ...... 0
Number of subcatchments ... 0
Number of nodes ........... 70
Number of links ........... 107
Number of pollutants ...... 0
Number of land uses ....... 0


************
Node Summary
************
                                 Invert      Max.    Ponded    External
Name                 Type         Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------
19071STMH            JUNCTION      5304.43     25.58       0.0
19079STMH            JUNCTION      5304.61     13.04       0.0
19097STMH            JUNCTION      5306.42     16.76       0.0
19111STMH            JUNCTION      5308.24     16.49       0.0
19132STMH            JUNCTION      5313.44     12.16       0.0
19134STMH            JUNCTION      5315.66     10.91       0.0
19139STMH            JUNCTION      5309.07     16.50       0.0
19143STMH            JUNCTION      5317.36     10.61       0.0
19150STMH            JUNCTION      5318.95     10.87       0.0
19154STMH            JUNCTION      5320.49     10.84       0.0
19162STMH            JUNCTION      5321.94     17.53       0.0
19171STMH            JUNCTION      5323.10     10.41       0.0
19179STMH            JUNCTION      5324.36     17.04       0.0
19214STMH            JUNCTION      5324.57     16.81       0.0
20135STMH            JUNCTION      5328.82     20.18       0.0
20209STFT            JUNCTION      5329.74     18.66       0.0
20818STMH            JUNCTION      5332.32     18.64       0.0
20841STMH            JUNCTION      5332.52     18.73       0.0
23839STMH            JUNCTION      5333.38     17.56       0.0
23840STMH            JUNCTION      5330.19     18.22       0.0
23841STMH            JUNCTION      5330.48     18.31       0.0
23843STMH            JUNCTION      5328.82     18.69       0.0
23845STMH            JUNCTION      5335.33     17.13       0.0
23849STMH            JUNCTION      5337.72     16.71       0.0
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

23852STMH	JUNCTION	5335.67	17.19	0.0	
23855STMH	JUNCTION	5339.55	16.36	0.0	
23856STMH	JUNCTION	5339.16	16.55	0.0	
23861STMH	JUNCTION	5341.79	16.54	0.0	
23862STMH	JUNCTION	5341.65	16.45	0.0	
23868STMH	JUNCTION	5343.15	17.45	0.0	
24788STMH	JUNCTION	5341.35	14.77	0.0	
24791STMH	JUNCTION	5337.70	13.86	0.0	
24796STMH	JUNCTION	5342.67	14.90	0.0	
24797STIL	JUNCTION	5343.91	15.21	0.0	
24800STMH	JUNCTION	5341.13	14.65	0.0	
405658STFT	JUNCTION	5324.68	22.61	0.0	
405659STFT	JUNCTION	5326.98	21.73	0.0	
407540STMH	JUNCTION	5324.28	22.86	0.0	
407541STMH	JUNCTION	5323.97	22.81	0.0	
407542STMH	JUNCTION	5323.54	21.94	0.0	
407543STMH	JUNCTION	5326.58	22.10	0.0	
407544STMH	JUNCTION	5323.33	21.65	0.0	
407546STMH	JUNCTION	5328.26	21.77	0.0	
J_DE6_2	JUNCTION	5348.42	0.00	0.0	Yes
J_DE5	JUNCTION	5354.48	0.00	0.0	
J_DE3	JUNCTION	5341.25	0.00	0.0	
J_DE2	JUNCTION	5327.53	0.00	0.0	
J_AD4	JUNCTION	5315.00	0.00	0.0	
J_AD1	JUNCTION	5336.76	0.00	0.0	
J_DE1	JUNCTION	5348.23	0.00	0.0	
773032STMH	JUNCTION	5322.91	19.17	0.0	
773050STMH	JUNCTION	5322.77	18.55	0.0	
773052STMH	JUNCTION	5321.85	15.75	0.0	
773389STMH	JUNCTION	5320.69	15.04	0.0	
773392STMH	JUNCTION	5320.51	15.35	0.0	
773410STMH	JUNCTION	5319.46	14.81	0.0	
773412STMH	JUNCTION	5318.49	16.96	0.0	
J_DE4	JUNCTION	984.30	0.00	0.0	
J_12th	JUNCTION	5344.00	10.00	0.0	
J_DE6_1	JUNCTION	0.00	0.00	0.0	Yes
18979STOF	OUTFALL	5304.32	5.00	0.0	
18979STOF2	OUTFALL	5304.32	16.21	0.0	
23842STFT	OUTFALL	5325.94	4.00	0.0	
24773STOF	OUTFALL	5335.30	1.25	0.0	
24773STOF2	OUTFALL	5335.30	10.00	0.0	
407544STMH-OF	OUTFALL	5322.61	10.00	0.0	
407550STMH	OUTFALL	5322.61	3.00	0.0	
4401-02-250-OF	OUTFALL	5309.40	0.00	0.0	
773412STMH-OF	OUTFALL	5318.00	2.83	0.0	
12th_Out	OUTFALL	5336.20	10.00	0.0	

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

19071STMH	19071STMH	18979STOF	CONDUIT	64.1	0.1717	0.0190
19071STMH-OF	19071STMH	18979STOF2	CONDUIT	64.1	14.9630	0.0210
35191STGM	24791STMH	24773STOF	CONDUIT	4.8	58.3847	0.0190
35191STGM-OF	24791STMH	24773STOF2	CONDUIT	4.8	58.3847	0.0200
35325STGM	24788STMH	24800STMH	CONDUIT	35.0	0.3429	0.0190
35325STGM-OF	24788STMH	24800STMH	CONDUIT	35.0	0.9829	0.0200
35326STGM	24800STMH	24791STMH	CONDUIT	343.0	1.0001	0.0190
35326STGM-OF	24800STMH	24791STMH	CONDUIT	343.0	1.2287	0.0200
35328STGM	24797STIL	24796STMH	CONDUIT	322.7	0.3471	0.0190
35328STGM-OF	24797STIL	24796STMH	CONDUIT	322.7	0.4810	0.0200
35329STGM	24796STMH	24788STMH	CONDUIT	346.4	0.3493	0.0190
35329STGM-OF	24796STMH	24788STMH	CONDUIT	346.4	0.4171	0.0200
35355STGM	23868STMH	23861STMH	CONDUIT	276.2	0.4489	0.0190
35355STGM-OF	23868STMH	23861STMH	CONDUIT	276.2	0.8236	0.0200
35357STGM	23861STMH	23862STMH	CONDUIT	37.5	0.3731	0.0190
35357STGM-OF	23861STMH	23862STMH	CONDUIT	37.5	0.6077	0.0200
35358STGM	23862STMH	23855STMH	CONDUIT	318.8	0.6116	0.0190
35358STGM-OF	23862STMH	23855STMH	CONDUIT	318.8	0.6866	0.0200
35362STGM	23855STMH	23856STMH	CONDUIT	30.0	0.4333	0.0190
35362STGM-OF	23855STMH	23856STMH	CONDUIT	30.0	0.6700	0.0200
35363STGM	23856STMH	23849STMH	CONDUIT	291.1	0.4465	0.0190
35363STGM-OF	23856STMH	23849STMH	CONDUIT	291.1	0.4397	0.0200
35365STGM	23849STMH	23852STMH	CONDUIT	326.6	0.6276	0.0190
35365STGM-OF	23849STMH	23852STMH	CONDUIT	326.6	0.4800	0.0200
35367STGM	23852STMH	23845STMH	CONDUIT	56.7	0.5997	0.0190
35367STGM-OF	23852STMH	407546STMH	CONDUIT	536.0	0.5280	0.0200
35368STGM	23845STMH	23839STMH	CONDUIT	287.1	0.6409	0.0190
35368STGM-OF	23845STMH	23839STMH	CONDUIT	287.1	0.5298	0.0200
35369STGM	23839STMH	23841STMH	CONDUIT	325.9	0.8900	0.0190
35369STGM-OF	23839STMH	23841STMH	CONDUIT	325.9	0.6610	0.0200
35370STGM	23841STMH	23840STMH	CONDUIT	53.5	0.8228	0.0190
35370STGM-OF	23841STMH	23840STMH	CONDUIT	53.5	0.6956	0.0200
35371STGM	23843STMH	23842STFT	CONDUIT	143.8	2.0037	0.0190
35372STGM	23840STMH	23843STMH	CONDUIT	136.6	1.0029	0.0190
35372STGM-OF	23840STMH	23843STMH	CONDUIT	136.6	0.6581	0.0200
36715STGM	19139STMH	19111STMH	CONDUIT	92.0	0.4130	0.0190
36715STGM-OF	19139STMH	19111STMH	CONDUIT	92.0	0.9087	0.0200
36716STGM	19097STMH	19079STMH	CONDUIT	581.0	0.2806	0.0190
36716STGM-OF	19097STMH	19079STMH	CONDUIT	581.0	0.9513	0.0200
36717STGM	19079STMH	19071STMH	CONDUIT	18.5	0.3784	0.0190
36717STGM-OF	19079STMH	19071STMH	CONDUIT	18.5	4.5995	0.0200
36718STGM	19111STMH	19097STMH	CONDUIT	552.7	0.3058	0.0190
36718STGM-OF	19111STMH	19097STMH	CONDUIT	552.7	0.2817	0.0200
36939STGM	20818STMH	20209STFT	CONDUIT	572.0	0.4511	0.0190
36939STGM-OF	20818STMH	20209STFT	CONDUIT	572.0	0.4465	0.0200
37665STGM	20209STFT	20135STMH	CONDUIT	46.0	1.9569	0.0190
37665STGM-OF	20209STFT	20135STMH	CONDUIT	46.0	-1.3045	0.0200
37666STGM	20841STMH	20818STMH	CONDUIT	44.0	0.3636	0.0190
37666STGM-OF	20841STMH	20818STMH	CONDUIT	44.0	0.6637	0.0200
37673STGM	20135STMH	19214STMH	CONDUIT	630.0	0.6746	0.0190
37673STGMF-OFE	20135STMH	19162STMH	CONDUIT	1312.7	0.7265	0.0200
37750STGM	19214STMH	19179STMH	CONDUIT	39.2	0.1020	0.0190
37750STGM-OF	19214STMH	19179STMH	CONDUIT	39.2	-0.0510	0.0200

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

37757STGM	19171STMH	19162STMH	CONDUIT	317.3	0.3750	0.0190
37757STGM-OF	19171STMH	19162STMH	CONDUIT	317.3	0.3290	0.0200
37758STGM	19179STMH	19171STMH	CONDUIT	316.5	0.3981	0.0190
37758STGM-OF	19179STMH	19171STMH	CONDUIT	316.5	0.2793	0.0200
37759STGM	19162STMH	19154STMH	CONDUIT	340.5	0.4112	0.0190
37759STGM-OF	19162STMH	19154STMH	CONDUIT	340.5	0.3354	0.0200
37760STGM	19154STMH	19150STMH	CONDUIT	293.2	0.4127	0.0190
37760STGM-OF	19154STMH	19150STMH	CONDUIT	293.2	0.5147	0.0200
37761STGM	19150STMH	19143STMH	CONDUIT	329.2	0.4496	0.0190
37762STGM	19143STMH	19134STMH	CONDUIT	328.5	0.4779	0.0190
37762STGM-OF	19143STMH	19134STMH	CONDUIT	328.5	0.4256	0.0200
37763STGM	19134STMH	19132STMH	CONDUIT	185.0	1.2001	0.0190
37763STGM-OF	19134STMH	19132STMH	CONDUIT	185.0	0.5254	0.0200
37764STGM	19132STMH	19139STMH	CONDUIT	161.5	2.7069	0.0190
37764STGM-OF	19132STMH	19139STMH	CONDUIT	161.5	0.0211	0.0200
406193STGM	407542STMH	407544STMH	CONDUIT	130.0	0.0846	0.0190
406193STGM-OF	407542STMH	407544STMH	CONDUIT	135.0	0.3659	0.0200
406197STGM	407541STMH	407542STMH	CONDUIT	164.3	0.1948	0.0190
406197STGM-OF	407541STMH	407542STMH	CONDUIT	164.3	0.7967	0.0200
406199STGM	407540STMH	407541STMH	CONDUIT	36.6	0.8197	0.0190
406199STGM-OF	407540STMH	407541STMH	CONDUIT	36.6	0.9673	0.0200
406200STGM	405658STFT	407540STMH	CONDUIT	20.1	1.9904	0.0190
406200STGM-OF	405658STFT	407540STMH	CONDUIT	20.1	0.7562	0.0200
406201STGM	407543STMH	405658STFT	CONDUIT	304.7	0.6236	0.0190
406201STGM-OF	407543STMH	405658STFT	CONDUIT	304.7	0.4562	0.0200
406205STGM	405659STFT	407543STMH	CONDUIT	20.1	1.4912	0.0190
406205STGM-OF	405659STFT	407543STMH	CONDUIT	20.1	0.1640	0.0200
406206STGM	407546STMH	405659STFT	CONDUIT	307.6	0.4162	0.0190
407544STMH	407544STMH	407550STMH	CONDUIT	35.0	2.0576	0.0190
407544STMH-OF	407544STMH	407544STMH-OF	CONDUIT	36.2	36.3179	0.0200
4401-02-210	J_DE6_2	24797STIL	CONDUIT	233.1	1.9360	0.0100
4401-02-220	J_DE5	23868STMH	CONDUIT	419.1	2.7037	0.0100
4401-02-230	J_DE3	773032STMH	CONDUIT	1661.1	0.8832	0.0100
4401-02-240	J_DE2	773032STMH	CONDUIT	327.0	1.4139	0.0100
4401-02-250	J_AD4	4401-02-250-OF	CONDUIT	959.8	0.5835	0.0100
4401-02-260	J_AD1	19111STMH	CONDUIT	507.4	5.6300	0.0100
4401-02-261	J_DE1	20841STMH	CONDUIT	1173.0	1.3398	0.0100
773049STMN	773032STMH	773050STMH	CONDUIT	37.7	0.3714	0.0190
773049STMN-OF	773032STMH	773050STMH	CONDUIT	37.7	2.0216	0.0200
773051STMN	773050STMH	773052STMH	CONDUIT	291.3	0.3159	0.0190
773051STMN-OF	773050STMH	773052STMH	CONDUIT	291.3	1.2784	0.0200
773387STMN	773052STMH	773389STMH	CONDUIT	329.4	0.3521	0.0190
773387STMN-OF	773052STMH	773389STMH	CONDUIT	329.4	0.5668	0.0200
773391STMN	773389STMH	773392STMH	CONDUIT	20.6	0.2910	0.0190
773391STMN-OF	773389STMH	773392STMH	CONDUIT	20.6	-0.6450	0.0200
773393STMN	773392STMH	773410STMH	CONDUIT	285.2	0.3226	0.0190
773393STMN-OF	773392STMH	773410STMH	CONDUIT	285.1	0.5604	0.0200
773411STMN	773410STMH	773412STMH	CONDUIT	49.5	1.9612	0.0190
773411STMN-OF	773410STMH	773412STMH	CONDUIT	49.5	-2.3900	0.0200
773413STMN	773412STMH	773412STMH-OF	CONDUIT	15.7	3.1206	0.0190
CDE4	J_DE4	23862STMH	CONDUIT	1.0	-435735.0000	0.0100
C_12th	J_12th	12th_Out	CONDUIT	1200.0	0.6500	0.0200
D_12th	J_DE6_1	J_12th	CONDUIT	400.0	-1336.0000	0.0100

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
37761STGM-OF_BHI 19150STMH        19143STMH        CONDUIT          329.2    0.5599    0.0200


**********
Cross Section Summary
**********
                                    Full     Full     Hyd.     Max.   No. of     Full
Conduit          Shape             Depth     Area     Rad.    Width  Barrels     Flow
---------------------------------------------------------------------------------------
19071STMH        CIRCULAR           5.00    19.63     1.25     5.00        1    73.85
19071STMH-OF     19071STMH-OF      16.21  2577.38    15.03   167.00        1 429659.59
35191STGM        CIRCULAR           1.25     1.23     0.31     1.25        1    33.77
35191STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 169535.96
35325STGM        CIRCULAR           1.25     1.23     0.31     1.25        1     2.59
35325STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 21997.24
35326STGM        CIRCULAR           1.25     1.23     0.31     1.25        1     4.42
35326STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 24593.99
35328STGM        CIRCULAR           1.25     1.23     0.31     1.25        1     2.60
35328STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 15387.98
35329STGM        CIRCULAR           1.25     1.23     0.31     1.25        1     2.61
35329STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 14330.02
35355STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    46.12
35355STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 20136.45
35357STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    42.05
35357STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 17296.27
35358STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    53.84
35358STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 18384.59
35362STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    45.32
35362STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 18161.63
35363STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    46.00
35363STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 14712.15
35365STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    54.53
35365STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 15372.58
35367STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    53.31
35367STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 16122.18
35368STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    55.11
35368STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 16150.23
35369STGM        CIRCULAR           3.50     9.62     0.88     3.50        1    64.94
35369STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 18039.22
35370STGM        HORIZ_ELLIPSE      2.83    10.19     0.87     4.42        1    65.72
35370STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 18505.19
35371STGM        CIRCULAR           4.00    12.57     1.00     4.00        1   139.12
35372STGM        CIRCULAR           4.00    12.57     1.00     4.00        1    98.42
35372STGM-OF     36ftStreet        10.00  1253.52     3.68   136.00        1 17999.31
36715STGM        CIRCULAR           5.00    19.63     1.25     5.00        1   114.53
36715STGM-OF     Montview           3.00   532.32     0.89   408.00        1  3496.68
36716STGM        CIRCULAR           5.00    19.63     1.25     5.00        1    94.39
36716STGM-OF     Montview           3.00   532.32     0.89   408.00        1  3577.70
36717STGM        CIRCULAR           5.00    19.63     1.25     5.00        1   109.61
36717STGM-OF     Montview           3.00   532.32     0.89   408.00        1  7866.67
36718STGM        CIRCULAR           5.00    19.63     1.25     5.00        1    98.54
36718STGM-OF     Montview           3.00   532.32     0.89   408.00        1  1946.88
36939STGM        CIRCULAR           4.00    12.57     1.00     4.00        1    66.01
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

36939STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	14826.10
37665STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	137.49
37665STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	25341.23
37666STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	59.27
37666STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	18075.17
37673STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	80.72
37673STGMF-OFE	36ftStreet	10.00	1253.52	3.68	136.00	1	18911.94
37750STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	42.98
37750STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	5011.69
37757STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	82.40
37757STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2104.04
37758STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	84.89
37758STGM-OF	Montview	3.00	532.32	0.89	408.00	1	1938.55
37759STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	86.28
37759STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2124.29
37760STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	86.44
37760STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2631.50
37761STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	90.22
37762STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	93.02
37762STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2392.91
37763STGM	CIRCULAR	5.00	19.63	1.25	5.00	1	195.21
37763STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2658.82
37764STGM	CIRCULAR	5.00	19.63	1.25	5.00	1	293.18
37764STGM-OF	Montview	3.00	532.32	0.89	408.00	1	532.22
406193STGM	CIRCULAR	3.00	7.07	0.75	3.00	1	13.27
406193STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	13421.79
406197STGM	CIRCULAR	3.00	7.07	0.75	3.00	1	20.14
406197STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	19804.80
406199STGM	CIRCULAR	2.00	3.14	0.50	2.00	1	14.01
406199STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	21821.46
406200STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	39.59
406200STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	19294.90
406201STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	22.16
406201STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	14986.01
406205STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	34.27
406205STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	8985.78
406206STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	18.10
407544STMH	CIRCULAR	3.00	7.07	0.75	3.00	1	65.46
407544STMH-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	133712.70
4401-02-210	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-220	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-230	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-240	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-250	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-260	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-261	DUMMY	0.00	0.00	0.00	0.00	1	0.00
773049STMN	HORIZ_ELLIPSE	2.42	7.41	0.74	3.75	1	28.91
773049STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	31547.40
773051STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	40.72
773051STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	25086.71
773387STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	42.99
773387STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	16703.97
773391STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	39.08

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
773391STMN-OF    36ftStreet          10.00  1253.52     3.68   136.00        1 17819.62
773393STMN       HORIZ_ELLIPSE        2.83    10.19     0.87     4.42        1    41.15
773393STMN-OF    36ftStreet          10.00  1253.52     3.68   136.00        1 16609.92
773411STMN       HORIZ_ELLIPSE        2.83    10.19     0.87     4.42        1   101.46
773411STMN-OF    36ftStreet          10.00  1253.52     3.68   136.00        1 34301.43
773413STMN       HORIZ_ELLIPSE        2.83    10.16     0.87     4.42        1   127.62
CDE4             DUMMY                0.00     0.00     0.00     0.00        1     0.00
C_12th           36ftStreet          10.00  1253.52     3.68   136.00        1 17888.49
D_12th           DUMMY                0.00     0.00     0.00     0.00        1     0.00
37761STGM-OF_BHI Montview             3.00   532.32     0.89   408.00        1  2744.57


***************
Transect Summary
***************

Transect 19071STMH-OF
Area:
           0.0026     0.0130     0.0275     0.0439     0.0625
           0.0825     0.1029     0.1234     0.1439     0.1644
           0.1850     0.2056     0.2263     0.2469     0.2677
           0.2884     0.3092     0.3300     0.3509     0.3717
           0.3926     0.4135     0.4344     0.4553     0.4762
           0.4971     0.5180     0.5389     0.5598     0.5807
           0.6016     0.6226     0.6435     0.6644     0.6854
           0.7063     0.7273     0.7482     0.7692     0.7901
           0.8111     0.8321     0.8531     0.8740     0.8950
           0.9160     0.9370     0.9580     0.9790     1.0000
Hrad:
           0.0097     0.0216     0.0393     0.0519     0.0714
           0.0865     0.1076     0.1287     0.1496     0.1705
           0.1914     0.2121     0.2328     0.2534     0.2739
           0.2943     0.3147     0.3349     0.3552     0.3760
           0.3969     0.4178     0.4387     0.4595     0.4804
           0.5013     0.5221     0.5430     0.5638     0.5847
           0.6055     0.6263     0.6471     0.6679     0.6887
           0.7095     0.7303     0.7511     0.7719     0.7926
           0.8134     0.8342     0.8549     0.8757     0.8964
           0.9171     0.9379     0.9586     0.9793     1.0000
Width:
           0.2982     0.6497     0.7135     0.8635     0.9004
           0.9723     0.9739     0.9755     0.9772     0.9788
           0.9804     0.9820     0.9836     0.9853     0.9869
           0.9885     0.9901     0.9917     0.9933     0.9938
           0.9940     0.9942     0.9944     0.9946     0.9948
           0.9950     0.9952     0.9954     0.9956     0.9958
           0.9961     0.9963     0.9965     0.9967     0.9969
           0.9971     0.9973     0.9975     0.9977     0.9979
           0.9981     0.9983     0.9985     0.9988     0.9990
           0.9992     0.9994     0.9996     0.9998     1.0000

Transect 50ftStreet
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
Area:
            0.0019     0.0077     0.0173     0.0300     0.0457
            0.0644     0.0855     0.1067     0.1280     0.1493
            0.1705     0.1918     0.2131     0.2343     0.2556
            0.2769     0.2981     0.3194     0.3407     0.3619
            0.3832     0.4045     0.4258     0.4470     0.4683
            0.4896     0.5108     0.5321     0.5534     0.5746
            0.5959     0.6172     0.6384     0.6597     0.6810
            0.7022     0.7235     0.7448     0.7660     0.7873
            0.8086     0.8299     0.8511     0.8724     0.8937
            0.9149     0.9362     0.9575     0.9787     1.0000
Hrad:
            0.0198     0.0397     0.0674     0.0941     0.1133
            0.1281     0.1432     0.1615     0.1810     0.2010
            0.2214     0.2420     0.2627     0.2834     0.3042
            0.3249     0.3456     0.3663     0.3870     0.4076
            0.4282     0.4487     0.4691     0.4895     0.5099
            0.5301     0.5504     0.5705     0.5906     0.6107
            0.6307     0.6506     0.6705     0.6903     0.7100
            0.7297     0.7494     0.7690     0.7885     0.8080
            0.8274     0.8468     0.8661     0.8854     0.9046
            0.9238     0.9429     0.9620     0.9810     1.0000
Width:
            0.1818     0.3636     0.5254     0.6671     0.8087
            0.9504     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000

Transect 36ftStreet
Area:
            0.0016     0.0063     0.0125     0.0214     0.0335
            0.0488     0.0673     0.0886     0.1103     0.1320
            0.1537     0.1754     0.1971     0.2188     0.2405
            0.2622     0.2839     0.3056     0.3273     0.3490
            0.3707     0.3924     0.4141     0.4358     0.4575
            0.4792     0.5009     0.5226     0.5443     0.5660
            0.5877     0.6094     0.6311     0.6528     0.6745
            0.6962     0.7179     0.7396     0.7613     0.7830
            0.8047     0.8264     0.8481     0.8698     0.8915
            0.9132     0.9349     0.9566     0.9783     1.0000
Hrad:
            0.0266     0.0583     0.1059     0.1300     0.1424
            0.1506     0.1572     0.1669     0.1829     0.2009
            0.2200     0.2398     0.2600     0.2804     0.3009
            0.3216     0.3423     0.3630     0.3837     0.4044
            0.4251     0.4457     0.4663     0.4868     0.5073
            0.5278     0.5482     0.5685     0.5888     0.6090
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
             0.6291     0.6492     0.6692     0.6892     0.7091
             0.7289     0.7487     0.7684     0.7880     0.8076
             0.8271     0.8466     0.8660     0.8853     0.9046
             0.9238     0.9429     0.9620     0.9810     1.0000
  Width:
             0.1471     0.2647     0.3382     0.4853     0.6324
             0.7794     0.9265     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000
             1.0000     1.0000     1.0000     1.0000     1.0000

  Transect Montview
  Area:
             0.0049     0.0100     0.0152     0.0205     0.0258
             0.0313     0.0368     0.0423     0.0480     0.0537
             0.0594     0.0653     0.0712     0.0772     0.0833
             0.0895     0.0975     0.1082     0.1189     0.1296
             0.1404     0.1513     0.1621     0.1730     0.1840
             0.1950     0.2060     0.2171     0.2282     0.2393
             0.2505     0.2618     0.2732     0.3059     0.3491
             0.3923     0.4355     0.4787     0.5220     0.5653
             0.6086     0.6519     0.6953     0.7387     0.7821
             0.8256     0.8691     0.9126     0.9563     1.0000
  Hrad:
             0.0650     0.1298     0.1941     0.2575     0.3200
             0.3817     0.4424     0.5024     0.5616     0.6201
             0.6778     0.7349     0.7913     0.8470     0.8943
             0.9242     0.8616     0.8888     0.9204     0.9548
             0.9913     1.0292     1.0682     1.1080     1.1484
             1.1892     1.2304     1.2719     1.3136     1.3554
             1.3959     1.4359     1.4720     1.3051     1.1914
             1.1142     1.0608     1.0237     0.9984     0.9818
             0.9717     0.9667     0.9656     0.9678     0.9726
             0.9795     0.9877     0.9974     1.0084     1.0000
  Width:
             0.1098     0.1123     0.1139     0.1154     0.1170
             0.1186     0.1202     0.1217     0.1233     0.1249
             0.1264     0.1280     0.1296     0.1312     0.1340
             0.1394     0.2317     0.2326     0.2334     0.2342
             0.2351     0.2359     0.2367     0.2376     0.2384
             0.2393     0.2401     0.2409     0.2418     0.2426
             0.2447     0.2470     0.2526     0.9384     0.9389
             0.9395     0.9400     0.9406     0.9411     0.9417
             0.9422     0.9428     0.9433     0.9439     0.9445
             0.9452     0.9467     0.9482     0.9498     1.0000


  ***********************************************************
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  *****************************************************

  ***************
  Analysis Options
  ***************
  Flow Units ............... CFS
  Process Models:
    Rainfall/Runoff ........ NO
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Flow Routing Method ...... DYNWAVE
  Starting Date ............ 01/01/2005 00:00:00
  Ending Date .............. 01/01/2005 06:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:00:30
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 4
  Head Tolerance ........... 0.005000 ft

  *************************        Volume        Volume
  Flow Routing Continuity        acre-feet      10^6 gal
  *************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.000         0.000
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........       106.499        34.704
  External Outflow .........       106.253        34.624
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.008         0.003
  Continuity Error (%) .....         0.223

  ************************
  Highest Continuity Errors
  ************************
  Node 20135STMH (1.81%)
  Node 19162STMH (-1.52%)
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
**************************
Time-Step Critical Elements
**************************
Link 35191STGM (44.47%)
Link 36717STGM (31.18%)
Link 773413STMN (13.44%)
Link 35362STGM (1.98%)
Link 773391STMN (1.23%)


*******************************
Highest Flow Instability Indexes
*******************************
Link 35372STGM (19)
Link 35370STGM (11)
Link 35371STGM (9)
Link 773411STMN (2)
Link 773393STMN (2)


************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.01 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.02
Percent Not Converging      :     0.07


******************
Node Depth Summary
******************

-------------------------------------------------------------------------------
                            Average  Maximum  Maximum  Time of Max    Reported
                              Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type      Feet     Feet     Feet  days hr:min        Feet
-------------------------------------------------------------------------------
19071STMH            JUNCTION  4.37     8.33  5312.76     0  01:13        8.33
19079STMH            JUNCTION  4.54     9.15  5313.76     0  01:13        9.15
19097STMH            JUNCTION  8.17    14.53  5320.95     0  01:13       14.53
19111STMH            JUNCTION  9.20    14.85  5323.09     0  01:11       14.85
19132STMH            JUNCTION  6.17    10.69  5324.13     0  01:09       10.69
19134STMH            JUNCTION  5.37     9.03  5324.69     0  01:08        9.03
19139STMH            JUNCTION  8.89    14.43  5323.50     0  01:09       14.43
19143STMH            JUNCTION  5.71     8.81  5326.17     0  01:07        8.81
19150STMH            JUNCTION  6.00     8.97  5327.92     0  01:06        8.97
19154STMH            JUNCTION  6.11     8.96  5329.45     0  01:05        8.96
19162STMH            JUNCTION  6.15     8.81  5330.75     0  01:04        8.81
19171STMH            JUNCTION  5.88     7.96  5331.06     0  01:06        7.96
19179STMH            JUNCTION  5.64     7.48  5331.84     0  01:05        7.48
```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

19214STMH	JUNCTION	5.62	7.43	5332.00	0	01:04	7.43
20135STMH	JUNCTION	8.05	11.42	5340.24	0	00:59	11.42
20209STFT	JUNCTION	7.55	10.80	5340.54	0	00:57	10.80
20818STMH	JUNCTION	7.33	10.14	5342.46	0	00:54	10.14
20841STMH	JUNCTION	7.34	10.14	5342.66	0	00:52	10.14
23839STMH	JUNCTION	3.23	5.02	5338.40	0	01:04	5.02
23840STMH	JUNCTION	2.13	2.85	5333.04	0	01:04	2.85
23841STMH	JUNCTION	2.38	3.31	5333.79	0	01:04	3.31
23843STMH	JUNCTION	1.72	2.28	5331.10	0	01:04	2.28
23845STMH	JUNCTION	4.51	7.34	5342.67	0	01:03	7.34
23849STMH	JUNCTION	4.88	7.58	5345.30	0	00:59	7.58
23852STMH	JUNCTION	4.79	7.88	5343.55	0	01:01	7.88
23855STMH	JUNCTION	4.82	7.20	5346.75	0	00:56	7.20
23856STMH	JUNCTION	5.01	7.45	5346.61	0	00:57	7.45
23861STMH	JUNCTION	4.81	7.20	5348.99	0	00:55	7.20
23862STMH	JUNCTION	4.85	7.22	5348.87	0	00:56	7.22
23868STMH	JUNCTION	4.96	7.96	5351.11	0	00:55	7.96
24788STMH	JUNCTION	4.22	5.34	5346.69	0	00:51	5.34
24791STMH	JUNCTION	0.17	0.28	5337.98	0	00:52	0.28
24796STMH	JUNCTION	4.52	5.60	5348.27	0	00:51	5.60
24797STIL	JUNCTION	4.74	5.88	5349.79	0	00:50	5.88
24800STMH	JUNCTION	4.09	5.19	5346.32	0	00:52	5.19
405658STFT	JUNCTION	2.17	5.65	5330.33	0	01:31	5.65
405659STFT	JUNCTION	3.52	9.37	5336.35	0	01:30	9.37
407540STMH	JUNCTION	2.20	5.68	5329.96	0	01:31	5.68
407541STMH	JUNCTION	1.50	3.76	5327.73	0	01:31	3.76
407542STMH	JUNCTION	1.29	3.07	5326.61	0	01:31	3.07
407543STMH	JUNCTION	3.55	9.40	5335.98	0	01:30	9.40
407544STMH	JUNCTION	0.69	1.65	5324.98	0	01:31	1.65
407546STMH	JUNCTION	5.20	13.79	5342.05	0	01:29	13.79
J_DE6_2	JUNCTION	0.00	0.00	5348.42	0	00:00	0.00
J_DE5	JUNCTION	0.00	0.00	5354.48	0	00:00	0.00
J_DE3	JUNCTION	0.00	0.00	5341.25	0	00:00	0.00
J_DE2	JUNCTION	0.00	0.00	5327.53	0	00:00	0.00
J_AD4	JUNCTION	0.00	0.00	5315.00	0	00:00	0.00
J_AD1	JUNCTION	0.00	0.00	5336.76	0	00:00	0.00
J_DE1	JUNCTION	0.00	0.00	5348.23	0	00:00	0.00
773032STMH	JUNCTION	5.21	9.77	5332.68	0	00:45	9.77
773050STMH	JUNCTION	4.88	9.16	5331.93	0	00:46	9.16
773052STMH	JUNCTION	3.70	6.58	5328.43	0	00:48	6.58
773389STMH	JUNCTION	3.25	6.06	5326.75	0	00:51	6.06
773392STMH	JUNCTION	3.28	6.07	5326.58	0	00:52	6.07
773410STMH	JUNCTION	1.63	3.61	5323.07	0	00:52	3.61
773412STMH	JUNCTION	1.30	2.34	5320.83	0	00:52	2.34
J_DE4	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_12th	JUNCTION	0.51	0.84	5344.84	0	00:50	0.84
J_DE6_1	JUNCTION	0.00	0.00	0.00	0	00:00	0.00
18979STOF	OUTFALL	3.30	5.00	5309.32	0	01:05	5.00
18979STOF2	OUTFALL	0.00	0.00	5304.32	0	00:00	0.00
23842STFT	OUTFALL	1.72	2.28	5328.22	0	01:04	2.28
24773STOF	OUTFALL	0.17	0.27	5335.57	0	00:52	0.27
24773STOF2	OUTFALL	0.15	0.26	5335.56	0	00:52	0.26
407544STMH-OF	OUTFALL	0.00	0.00	5322.61	0	00:00	0.00

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

407550STMH	OUTFALL	0.68	1.65	5324.26	0	01:31	1.65
4401-02-250-OF	OUTFALL	0.00	0.00	5309.40	0	00:00	0.00
773412STMH-OF	OUTFALL	1.28	2.19	5320.19	0	00:41	2.19
12th_Out	OUTFALL	0.49	0.84	5337.04	0	00:50	0.84

****
Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
19071STMH	JUNCTION	0.00	413.18	0	01:13	0	16	0.000
19079STMH	JUNCTION	0.00	413.19	0	01:13	0	16	-0.051
19097STMH	JUNCTION	0.00	414.09	0	01:11	0	16	-0.069
19111STMH	JUNCTION	0.00	416.49	0	01:08	0	16	0.065
19132STMH	JUNCTION	0.00	385.78	0	01:08	0	14.7	-0.106
19134STMH	JUNCTION	0.00	385.84	0	01:08	0	14.7	-0.076
19139STMH	JUNCTION	0.00	385.60	0	01:09	0	14.7	0.056
19143STMH	JUNCTION	0.00	386.37	0	01:06	0	14.7	-0.042
19150STMH	JUNCTION	0.00	386.46	0	01:05	0	14.8	0.262
19154STMH	JUNCTION	0.00	386.58	0	01:04	0	14.8	0.087
19162STMH	JUNCTION	0.00	392.69	0	00:59	0	14.5	-1.497
19171STMH	JUNCTION	0.00	112.31	0	01:02	0	7.58	-0.198
19179STMH	JUNCTION	0.00	112.38	0	00:59	0	7.58	0.043
19214STMH	JUNCTION	0.00	114.59	0	00:35	0	7.58	0.011
20135STMH	JUNCTION	0.00	397.23	0	00:56	0	14.8	1.846
20209STFT	JUNCTION	0.00	401.62	0	00:53	0	14.8	-0.188
20818STMH	JUNCTION	0.00	402.94	0	00:50	0	14.8	0.180
20841STMH	JUNCTION	0.00	402.94	0	00:50	0	14.8	0.050
23839STMH	JUNCTION	0.00	85.98	0	01:02	0	5.35	-0.008
23840STMH	JUNCTION	0.00	86.00	0	01:04	0	5.35	0.006
23841STMH	JUNCTION	0.00	85.98	0	01:04	0	5.35	0.006
23843STMH	JUNCTION	0.00	87.71	0	01:04	0	5.35	-0.004
23845STMH	JUNCTION	0.00	87.99	0	00:44	0	5.35	0.022
23849STMH	JUNCTION	0.00	149.95	0	00:57	0	6.58	-0.049
23852STMH	JUNCTION	0.00	149.60	0	00:59	0	6.58	0.107
23855STMH	JUNCTION	0.00	150.02	0	00:56	0	6.57	-0.353
23856STMH	JUNCTION	0.00	149.94	0	00:56	0	6.6	0.290
23861STMH	JUNCTION	0.00	96.24	0	00:55	0	4.09	-0.046
23862STMH	JUNCTION	0.00	150.11	0	00:55	0	6.6	0.377
23868STMH	JUNCTION	0.00	96.31	0	00:55	0	4.09	-0.002
24788STMH	JUNCTION	0.00	58.73	0	00:51	0	2.03	0.043
24791STMH	JUNCTION	0.00	58.67	0	00:52	0	2.03	0.000
24796STMH	JUNCTION	0.00	59.00	0	00:50	0	2.01	-0.814
24797STIL	JUNCTION	0.00	59.03	0	00:50	0	2.03	0.895
24800STMH	JUNCTION	0.00	58.73	0	00:51	0	2.03	-0.037
405658STFT	JUNCTION	0.00	38.20	0	01:29	0	1.23	-0.023
405659STFT	JUNCTION	0.00	42.83	0	00:54	0	1.23	-0.029

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

407540STMH	JUNCTION	0.00	38.20	0	01:30	0	1.23	0.033	
407541STMH	JUNCTION	0.00	38.20	0	01:30	0	1.23	0.171	
407542STMH	JUNCTION	0.00	38.20	0	01:31	0	1.23	-0.076	
407543STMH	JUNCTION	0.00	38.35	0	00:54	0	1.23	0.012	
407544STMH	JUNCTION	0.00	38.20	0	01:31	0	1.23	0.001	
407546STMH	JUNCTION	0.00	63.14	0	01:01	0	1.22	-0.569	
J_DE6_2	JUNCTION	59.03	59.03	0	00:50	2.03	2.03	0.000	
J_DE5	JUNCTION	96.31	96.31	0	00:55	4.09	4.09	0.000	
J_DE3	JUNCTION	50.78	50.78	0	00:55	2.22	2.22	0.000	
J_DE2	JUNCTION	104.26	104.26	0	00:45	3.19	3.19	0.000	
J_AD4	JUNCTION	31.70	31.70	0	00:40	0.818	0.818	0.000	
J_AD1	JUNCTION	37.54	37.54	0	00:45	1.27	1.27	0.000	
J_DE1	JUNCTION	402.94	402.94	0	00:50	14.8	14.8	0.000	
773032STMH	JUNCTION	0.00	152.69	0	00:45	0	5.41	0.006	
773050STMH	JUNCTION	0.00	152.71	0	00:45	0	5.41	0.161	
773052STMH	JUNCTION	0.00	152.46	0	00:45	0	5.4	-0.031	
773389STMH	JUNCTION	0.00	151.92	0	00:48	0	5.41	-0.192	
773392STMH	JUNCTION	0.00	151.25	0	00:50	0	5.42	-0.004	
773410STMH	JUNCTION	0.00	150.94	0	00:52	0	5.42	0.002	
773412STMH	JUNCTION	0.00	150.94	0	00:52	0	5.42	-0.000	
J_DE4	JUNCTION	54.00	54.00	0	00:55	2.5	2.5	0.000	
J_12th	JUNCTION	0.00	109.64	0	00:50	0	3.77	0.093	
J_DE6_1	JUNCTION	109.64	109.64	0	00:50	3.77	3.77	0.000	
18979STOF	OUTFALL	0.00	413.18	0	01:13	0	16	0.000	
18979STOF2	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	gal
23842STFT	OUTFALL	0.00	86.00	0	01:04	0	5.35	0.000	
24773STOF	OUTFALL	0.00	3.34	0	00:52	0	0.139	0.000	
24773STOF2	OUTFALL	0.00	55.34	0	00:52	0	1.89	0.000	
407544STMH-OF	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	gal
407550STMH	OUTFALL	0.00	38.20	0	01:31	0	1.23	0.000	
4401-02-250-OF	OUTFALL	0.00	31.70	0	00:40	0	0.818	0.000	
773412STMH-OF	OUTFALL	0.00	150.94	0	00:52	0	5.42	0.000	
12th_Out	OUTFALL	0.00	109.23	0	00:50	0	3.76	0.000	

****
Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
J_DE6_2	JUNCTION	6.00	0.000	0.000
J_DE5	JUNCTION	6.00	0.000	0.000
J_DE3	JUNCTION	6.00	0.000	0.000
J_DE2	JUNCTION	6.00	0.000	0.000
J_AD4	JUNCTION	6.00	0.000	0.000
J_AD1	JUNCTION	6.00	0.000	0.000
J_DE1	JUNCTION	6.00	0.000	0.000
J_DE4	JUNCTION	6.00	0.000	0.000

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

J_DE6_1 JUNCTION 6.00 0.000 0.000

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Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
18979STOF	99.00	185.88	413.18	16.018
18979STOF2	0.00	0.00	0.00	0.000
23842STFT	98.17	59.67	86.00	5.351
24773STOF	96.90	1.64	3.34	0.139
24773STOF2	97.93	22.89	55.34	1.888
407544STMH-OF	0.00	0.00	0.00	0.000
407550STMH	74.58	20.16	38.20	1.228
4401-02-250-OF	88.00	11.01	31.70	0.818
773412STMH-OF	99.13	64.23	150.94	5.417
12th_Out	99.23	45.16	109.23	3.764
System	75.29	410.63	830.13	34.622

****
Link Flow Summary
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Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
19071STMH	CONDUIT	413.18	0	01:13	21.04	5.60	1.00
19071STMH-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
35191STGM	CONDUIT	3.34	0	00:52	17.01	0.10	0.22
35191STGM-OF	CHANNEL	55.34	0	00:52	14.34	0.00	0.03
35325STGM	CONDUIT	8.75	0	00:32	7.13	3.38	1.00
35325STGM-OF	CHANNEL	54.17	0	00:51	3.75	0.00	0.06
35326STGM	CONDUIT	5.51	0	00:52	7.36	1.25	0.61
35326STGM-OF	CHANNEL	53.16	0	00:52	3.99	0.00	0.05
35328STGM	CONDUIT	5.23	0	00:23	4.26	2.01	1.00
35328STGM-OF	CHANNEL	55.97	0	00:50	2.80	0.00	0.07
35329STGM	CONDUIT	5.08	0	00:28	4.14	1.94	1.00

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

35329STGM-OF	CHANNEL	55.75	0	00:51	2.92	0.00	0.07
35355STGM	CONDUIT	61.26	0	00:35	6.37	1.33	1.00
35355STGM-OF	CHANNEL	36.02	0	00:55	2.41	0.00	0.06
35357STGM	CONDUIT	53.07	0	00:35	5.52	1.26	1.00
35357STGM-OF	CHANNEL	57.61	0	00:55	2.59	0.00	0.07
35358STGM	CONDUIT	74.46	0	00:34	7.74	1.38	1.00
35358STGM-OF	CHANNEL	93.79	0	00:56	3.47	0.01	0.08
35362STGM	CONDUIT	79.12	0	00:38	8.22	1.75	1.00
35362STGM-OF	CHANNEL	102.54	0	00:56	3.35	0.01	0.09
35363STGM	CONDUIT	70.77	0	00:37	7.36	1.54	1.00
35363STGM-OF	CHANNEL	103.76	0	00:57	3.26	0.01	0.09
35365STGM	CONDUIT	77.40	0	00:41	8.04	1.42	1.00
35365STGM-OF	CHANNEL	99.25	0	00:59	3.36	0.01	0.08
35367STGM	CONDUIT	87.99	0	00:44	9.15	1.65	1.00
35367STGM-OF	CHANNEL	63.14	0	01:01	3.06	0.00	0.13
35368STGM	CONDUIT	84.66	0	00:52	8.80	1.54	1.00
35368STGM-OF	CHANNEL	2.02	0	01:03	1.19	0.00	0.02
35369STGM	CONDUIT	85.98	0	01:04	9.01	1.32	0.97
35369STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
35370STGM	CONDUIT	86.00	0	01:04	8.44	1.31	1.00
35370STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
35371STGM	CONDUIT	86.00	0	01:04	11.65	0.62	0.57
35372STGM	CONDUIT	87.71	0	01:04	10.32	0.89	0.64
35372STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36715STGM	CONDUIT	190.65	0	00:56	9.71	1.66	1.00
36715STGM-OF	CHANNEL	266.14	0	01:10	4.88	0.08	0.38
36716STGM	CONDUIT	234.13	0	01:00	11.92	2.48	1.00
36716STGM-OF	CHANNEL	214.92	0	01:13	5.72	0.06	0.26
36717STGM	CONDUIT	413.18	0	01:13	21.04	3.77	1.00
36717STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36718STGM	CONDUIT	194.86	0	00:55	9.92	1.98	1.00
36718STGM-OF	CHANNEL	303.05	0	01:11	4.26	0.16	0.42
36939STGM	CONDUIT	117.48	0	00:30	9.40	1.78	1.00
36939STGM-OF	CHANNEL	344.32	0	00:54	3.26	0.02	0.18
37665STGM	CONDUIT	127.21	0	00:34	10.12	0.93	1.00
37665STGM-OF	CHANNEL	317.02	0	00:57	2.73	0.01	0.17
37666STGM	CONDUIT	131.92	0	00:30	10.50	2.23	1.00
37666STGM-OF	CHANNEL	335.85	0	00:51	3.93	0.02	0.15
37673STGM	CONDUIT	114.59	0	00:35	9.12	1.42	1.00
37673STGMF-OFE	CHANNEL	281.21	0	00:59	4.28	0.01	0.13
37750STGM	CONDUIT	110.53	0	00:36	6.95	2.57	1.00
37750STGM-OF	CHANNEL	25.22	0	01:04	1.92	0.01	0.05
37757STGM	CONDUIT	111.30	0	02:48	7.00	1.35	1.00
37757STGM-OF	CHANNEL	70.23	0	01:06	1.92	0.03	0.30
37758STGM	CONDUIT	108.90	0	00:38	6.85	1.28	1.00
37758STGM-OF	CHANNEL	45.45	0	01:05	2.07	0.02	0.17
37759STGM	CONDUIT	128.15	0	00:42	8.06	1.49	1.00
37759STGM-OF	CHANNEL	303.56	0	01:04	4.43	0.14	0.41
37760STGM	CONDUIT	135.67	0	00:46	8.53	1.57	1.00
37760STGM-OF	CHANNEL	289.17	0	01:05	4.84	0.11	0.38
37761STGM	CONDUIT	145.90	0	00:48	9.17	1.62	1.00
37762STGM	CONDUIT	148.72	0	00:50	9.35	1.60	1.00
37762STGM-OF	CHANNEL	295.75	0	01:08	4.62	0.12	0.39

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

37763STGM	CONDUIT	170.65	0	00:52	12.06	0.87	1.00
37763STGM-OF	CHANNEL	287.24	0	01:08	4.01	0.11	0.44
37764STGM	CONDUIT	169.92	0	02:23	8.65	0.58	1.00
37764STGM-OF	CHANNEL	274.37	0	01:09	3.77	0.52	0.44
406193STGM	CONDUIT	38.20	0	01:31	6.06	2.88	0.84
406193STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406197STGM	CONDUIT	38.20	0	01:31	5.41	1.90	0.99
406197STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406199STGM	CONDUIT	38.20	0	01:30	12.16	2.73	1.00
406199STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406200STGM	CONDUIT	38.20	0	01:30	7.78	0.96	1.00
406200STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406201STGM	CONDUIT	38.20	0	01:29	7.78	1.72	1.00
406201STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406205STGM	CONDUIT	38.35	0	00:54	7.81	1.12	1.00
406205STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406206STGM	CONDUIT	42.83	0	00:54	8.73	2.37	1.00
407544STMH	CONDUIT	38.20	0	01:31	9.61	0.58	0.55
407544STMH-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
4401-02-210	DUMMY	59.03	0	00:50			
4401-02-220	DUMMY	96.31	0	00:55			
4401-02-230	DUMMY	50.78	0	00:55			
4401-02-240	DUMMY	104.26	0	00:45			
4401-02-250	DUMMY	31.70	0	00:40			
4401-02-260	DUMMY	37.54	0	00:45			
4401-02-261	DUMMY	402.94	0	00:50			
773049STMN	CONDUIT	89.68	0	00:31	12.10	3.10	1.00
773049STMN-OF	CHANNEL	85.90	0	00:45	5.47	0.00	0.06
773051STMN	CONDUIT	82.97	0	00:33	8.15	2.04	1.00
773051STMN-OF	CHANNEL	72.95	0	00:46	3.60	0.00	0.07
773387STMN	CONDUIT	73.21	0	00:32	7.19	1.70	1.00
773387STMN-OF	CHANNEL	100.16	0	00:48	3.22	0.01	0.09
773391STMN	CONDUIT	92.67	0	00:37	9.10	2.37	1.00
773391STMN-OF	CHANNEL	84.88	0	00:51	2.55	0.00	0.09
773393STMN	CONDUIT	93.26	0	00:42	9.41	2.27	1.00
773393STMN-OF	CHANNEL	70.58	0	00:52	3.32	0.00	0.07
773411STMN	CONDUIT	150.94	0	00:52	15.51	1.49	0.91
773411STMN-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
773413STMN	CONDUIT	150.94	0	00:52	17.06	1.18	0.80
CDE4	DUMMY	54.00	0	00:55			
C_12th	CHANNEL	109.23	0	00:50	3.70	0.01	0.08
D_12th	DUMMY	109.64	0	00:50			
37761STGM-OF_BHI	CHANNEL	288.11	0	01:06	4.78	0.10	0.38

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class							
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

19071STMH	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
19071STMH-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35191STGM	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
35191STGM-OF	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.27	0.00
35325STGM	1.00	0.01	0.00	0.00	0.87	0.00	0.00	0.13	0.00	0.00
35325STGM-OF	1.00	0.23	0.01	0.00	0.16	0.00	0.00	0.60	0.52	0.00
35326STGM	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
35326STGM-OF	1.00	0.23	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00
35328STGM	1.00	0.01	0.00	0.00	0.92	0.00	0.00	0.08	0.02	0.00
35328STGM-OF	1.00	0.17	0.03	0.00	0.76	0.00	0.00	0.04	0.89	0.00
35329STGM	1.00	0.01	0.00	0.00	0.87	0.00	0.00	0.12	0.00	0.00
35329STGM-OF	1.00	0.19	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00
35355STGM	1.00	0.01	0.00	0.00	0.93	0.00	0.00	0.06	0.26	0.00
35355STGM-OF	1.00	0.42	0.17	0.00	0.41	0.00	0.00	0.00	0.90	0.00
35357STGM	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.23	0.00
35357STGM-OF	1.00	0.41	0.01	0.00	0.58	0.00	0.00	0.00	0.75	0.00
35358STGM	1.00	0.01	0.00	0.00	0.78	0.00	0.00	0.22	0.00	0.00
35358STGM-OF	1.00	0.41	0.00	0.00	0.55	0.00	0.00	0.04	0.88	0.00
35362STGM	1.00	0.01	0.00	0.00	0.82	0.00	0.00	0.17	0.00	0.00
35362STGM-OF	1.00	0.42	0.00	0.00	0.54	0.00	0.00	0.03	0.04	0.00
35363STGM	1.00	0.01	0.00	0.00	0.79	0.00	0.00	0.20	0.00	0.00
35363STGM-OF	1.00	0.43	0.00	0.00	0.44	0.00	0.00	0.14	0.00	0.00
35365STGM	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.58	0.00
35365STGM-OF	1.00	0.48	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00
35367STGM	1.00	0.01	0.00	0.00	0.98	0.02	0.00	0.00	0.38	0.00
35367STGM-OF	1.00	0.56	0.00	0.00	0.37	0.00	0.00	0.07	0.18	0.00
35368STGM	1.00	0.01	0.00	0.00	0.64	0.00	0.00	0.35	0.00	0.00
35368STGM-OF	1.00	0.69	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00
35369STGM	1.00	0.01	0.00	0.00	0.72	0.27	0.00	0.00	0.48	0.00
35369STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35370STGM	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.30	0.00
35370STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35371STGM	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	0.48	0.00
35372STGM	1.00	0.02	0.00	0.00	0.02	0.96	0.00	0.00	0.33	0.00
35372STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36715STGM	1.00	0.01	0.01	0.00	0.81	0.00	0.00	0.16	0.00	0.00
36715STGM-OF	1.00	0.54	0.01	0.00	0.43	0.00	0.00	0.02	0.74	0.00
36716STGM	1.00	0.01	0.00	0.00	0.80	0.00	0.00	0.20	0.00	0.00
36716STGM-OF	1.00	0.66	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00
36717STGM	1.00	0.01	0.00	0.00	0.89	0.00	0.00	0.10	0.00	0.00
36717STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36718STGM	1.00	0.01	0.00	0.00	0.95	0.00	0.00	0.05	0.21	0.00
36718STGM-OF	1.00	0.54	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00
36939STGM	1.00	0.01	0.00	0.00	0.92	0.07	0.00	0.00	0.11	0.00
36939STGM-OF	1.00	0.29	0.00	0.00	0.67	0.00	0.00	0.03	0.35	0.00
37665STGM	1.00	0.01	0.00	0.00	0.78	0.19	0.00	0.03	0.28	0.00
37665STGM-OF	1.00	0.32	0.01	0.00	0.36	0.00	0.30	0.00	0.00	0.00
37666STGM	1.00	0.01	0.00	0.00	0.95	0.00	0.00	0.04	0.08	0.00
37666STGM-OF	1.00	0.29	0.00	0.00	0.68	0.00	0.00	0.03	0.61	0.00
37673STGM	1.00	0.01	0.00	0.00	0.99	0.01	0.00	0.00	0.52	0.00
37673STGMF-OFE	1.00	0.32	0.04	0.00	0.54	0.00	0.00	0.10	0.84	0.00
37750STGM	1.00	0.01	0.00	0.00	0.85	0.00	0.00	0.14	0.00	0.00

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

37750STGM-OF	1.00	0.32	0.00	0.00	0.63	0.00	0.04	0.00	0.00	0.00
37757STGM	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.44	0.00
37757STGM-OF	1.00	0.34	0.00	0.00	0.62	0.00	0.00	0.03	0.32	0.00
37758STGM	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.51	0.00
37758STGM-OF	1.00	0.33	0.00	0.00	0.64	0.00	0.00	0.04	0.22	0.00
37759STGM	1.00	0.01	0.00	0.00	0.97	0.00	0.00	0.02	0.02	0.00
37759STGM-OF	1.00	0.36	0.00	0.00	0.27	0.01	0.00	0.37	0.00	0.00
37760STGM	1.00	0.01	0.00	0.00	0.77	0.00	0.00	0.22	0.00	0.00
37760STGM-OF	1.00	0.42	0.00	0.00	0.34	0.01	0.00	0.24	0.00	0.00
37761STGM	1.00	0.02	0.00	0.00	0.85	0.00	0.00	0.13	0.00	0.00
37762STGM	1.00	0.02	0.00	0.00	0.57	0.00	0.00	0.42	0.00	0.00
37762STGM-OF	1.00	0.46	0.00	0.00	0.23	0.01	0.00	0.30	0.00	0.00
37763STGM	1.00	0.02	0.00	0.00	0.63	0.35	0.00	0.00	0.10	0.00
37763STGM-OF	1.00	0.50	0.00	0.00	0.48	0.00	0.00	0.02	0.24	0.00
37764STGM	1.00	0.02	0.00	0.00	0.80	0.18	0.00	0.00	0.58	0.00
37764STGM-OF	1.00	0.51	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00
406193STGM	1.00	0.14	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00
406193STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406197STGM	1.00	0.14	0.00	0.00	0.57	0.00	0.00	0.29	0.05	0.00
406197STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406199STGM	1.00	0.25	0.02	0.00	0.71	0.00	0.00	0.02	0.65	0.00
406199STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406200STGM	1.00	0.27	0.03	0.00	0.69	0.01	0.00	0.00	0.65	0.00
406200STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406201STGM	1.00	0.13	0.00	0.00	0.86	0.01	0.00	0.00	0.50	0.00
406201STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406205STGM	1.00	0.12	0.00	0.00	0.43	0.01	0.00	0.44	0.01	0.00
406205STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406206STGM	1.00	0.12	0.20	0.00	0.67	0.01	0.00	0.00	0.66	0.00
407544STMH	1.00	0.14	0.00	0.00	0.12	0.74	0.00	0.00	0.07	0.00
407544STMH-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
773049STMN	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.33	0.00
773049STMN-OF	1.00	0.61	0.00	0.00	0.00	0.20	0.00	0.19	0.07	0.00
773051STMN	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.42	0.00
773051STMN-OF	1.00	0.55	0.07	0.00	0.35	0.02	0.00	0.02	0.90	0.00
773387STMN	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.35	0.00
773387STMN-OF	1.00	0.55	0.00	0.00	0.35	0.00	0.00	0.11	0.16	0.00
773391STMN	1.00	0.01	0.00	0.00	0.95	0.00	0.00	0.05	0.00	0.00
773391STMN-OF	1.00	0.63	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00
773393STMN	1.00	0.01	0.00	0.00	0.25	0.00	0.00	0.74	0.00	0.00
773393STMN-OF	1.00	0.64	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00
773411STMN	1.00	0.01	0.00	0.00	0.04	0.95	0.00	0.00	0.39	0.00
773411STMN-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
773413STMN	1.00	0.01	0.00	0.00	0.02	0.98	0.00	0.00	0.50	0.00
C_12th	1.00	0.01	0.00	0.00	0.69	0.30	0.00	0.00	0.07	0.00
37761STGM-OF_BHI	1.00	0.44	0.00	0.00	0.46	0.05	0.00	0.05	0.24	0.00

```
*************************
Conduit Surcharge Summary
*************************

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```

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

Conduit	Hours Full (Both Ends)	Hours Full (Upstream)	Hours Full (Dnstream)	Hours Above Full Normal Flow	Hours Capacity Limited
19071STMH	0.53	1.23	0.53	2.44	0.53
35325STGM	2.94	2.97	2.94	3.05	2.94
35326STGM	0.01	2.96	0.01	2.78	0.01
35328STGM	2.99	3.03	3.03	2.76	2.72
35329STGM	2.95	3.04	2.95	3.05	2.95
35355STGM	1.89	1.89	1.91	1.45	1.45
35357STGM	1.92	1.92	1.92	0.13	0.13
35358STGM	1.91	1.92	1.91	1.96	1.91
35362STGM	1.91	1.92	1.91	2.03	1.91
35363STGM	1.87	1.94	1.87	1.45	1.29
35365STGM	1.82	1.88	1.82	0.66	0.51
35367STGM	1.79	1.82	1.79	1.97	1.79
35368STGM	1.53	1.79	1.53	1.95	1.53
35369STGM	0.01	1.58	0.01	1.81	0.01
35370STGM	0.42	1.41	0.42	1.79	0.42
36715STGM	2.17	2.17	2.17	2.09	2.06
36716STGM	1.17	2.13	1.17	2.37	1.17
36717STGM	1.13	1.23	1.13	2.30	1.13
36718STGM	2.09	2.23	2.09	2.36	2.09
36939STGM	2.33	2.38	2.35	0.25	0.18
37665STGM	2.35	2.35	2.37	0.01	0.01
37666STGM	2.38	2.38	2.38	2.35	2.31
37673STGM	2.34	2.37	2.35	2.30	2.25
37750STGM	2.30	2.31	2.30	2.54	2.29
37757STGM	2.25	2.29	2.25	0.40	0.26
37758STGM	2.29	2.31	2.29	0.28	0.17
37759STGM	2.19	2.25	2.19	0.66	0.48
37760STGM	2.11	2.19	2.11	2.37	2.11
37761STGM	1.95	2.16	1.95	2.34	1.95
37762STGM	1.69	2.05	1.69	0.92	0.28
37763STGM	1.67	1.67	1.78	0.01	0.01
37764STGM	1.78	1.78	2.17	0.01	0.01
406193STGM	0.01	0.95	0.01	1.24	0.01
406197STGM	0.01	1.13	0.01	1.21	0.01
406199STGM	1.22	1.23	1.22	1.24	1.22
406200STGM	1.20	1.20	1.21	0.01	0.01
406201STGM	1.19	1.20	1.20	1.20	1.18
406205STGM	1.19	1.19	1.20	1.13	1.13
406206STGM	1.19	1.21	1.19	1.20	1.16
773049STMN	1.68	1.72	1.68	1.97	1.68
773051STMN	1.57	1.62	1.57	1.75	1.57
773387STMN	1.49	1.57	1.49	1.72	1.49
773391STMN	1.47	1.49	1.47	1.78	1.47
773393STMN	0.48	1.50	0.48	1.75	0.48
773411STMN	0.01	0.55	0.01	0.80	0.01
773413STMN	0.01	0.01	0.01	0.56	0.01

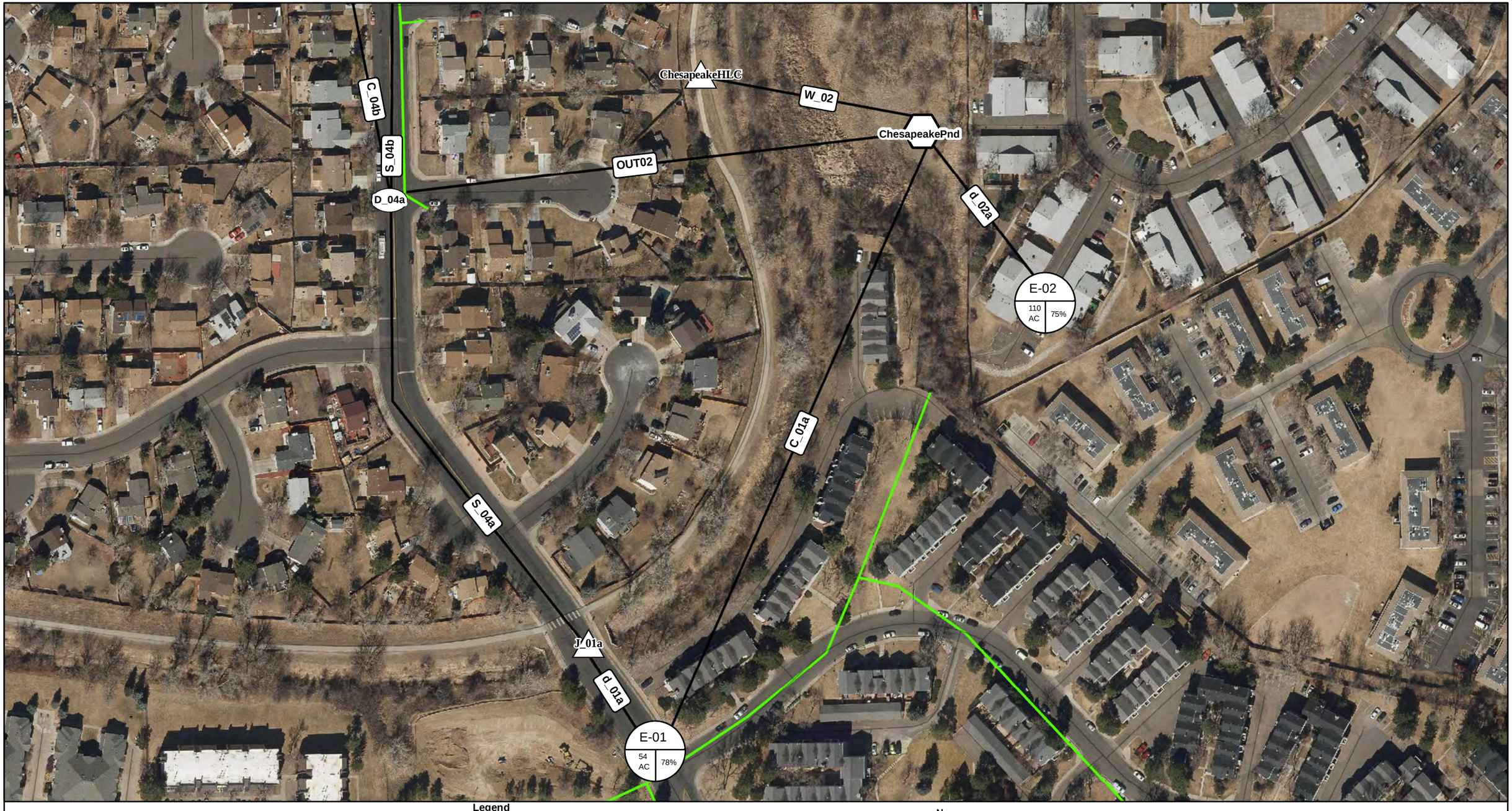
Analysis begun on: Thu Mar 17 09:52:18 2022

Table E.6 – Existing SWMM Output for 100-year (Future) Event in Denver

```
  Analysis ended on:  Thu Mar 17 09:52:21 2022
  Total elapsed time: 00:00:03
```

APPENDIX F – CONCEPTUAL DESIGN INFORMATION

Bohannan Huston



MILE HIGH FLOOD DISTRICT

DENVER THE MILE HIGH CITY

Bohannan Huston
www.bhinc.com 800.877.5332

Legend

- Detention
- Split Flow
- Design Point
- Basin ID, Area, %Imp
- Conveyance
- Existing Storm

N
W E
S

0 125 250 Feet

1 " = 125 feet

Westerly Creek OSP

Figure F.1 - Revised SWMM Routing Map
ChesapeakeTownhomes Pond

P:\20210239\WR\Calculations\Programs\ArcGIS\Maps\FigureF.1_SWMM Routing Map.mxd
Author: cbangs

September 2021

Table F.1 – Proposed Detention Rating Curve or Chesapeake Townhomes Pond

Depth (ft)	Area (sqft)
0	2917
1	23196
2	51339
3	71578
4	76085
5	80703
6	85432
7	90272
8	95222
9	100284
10	106519
11	112551

Table F.2 – Proposed Detention Rating Curve for Havana Park Pond

Depth (ft)	Area (sqft)
0	0
0.58	0
1.58	4112
2.58	15442
3.58	34210
4.58	59156
5.58	79264
6.58	89088
7.58	95006
8.58	100654
9.58	109000
10.58	109001

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
[TITLE]
;;Project Title/Notes
Basis of model: Westerly Creek FHAD 100-year SWMM
Alternative Plan 3:
-48" SD in E 23rd Ave
-48" x 76" Elliptical SD in E 23rd Ave
-66" SD in E 22nd Ave
-66" SD in E 17th Ave
-78-84" SD in Alton St/E 14th Ave/ Akron St
-Havana Park Pond
-Chesapeake Townhomes Pond
Pipe sizes increased to meet criteria for street flooding (<1') within Aurora for Westerly Creek OSP Conceptual Design
Model inflows are from Lower Westerly_ConceptualDesign_Kimenatic_100yr
All alternatives recommended by the Denver SDMP are excluded from this model.
Models updated to include topographic data obtained from MHFD.
09/2021 BHI Job # 20210239

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           04/15/2021
START_TIME           00:00:00
REPORT_START_DATE    04/15/2021
REPORT_START_TIME    00:00:00
END_DATE             04/15/2021
END_TIME             06:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:05:00
DRY_STEP             01:00:00
ROUTING_STEP         0:00:30

INERTIAL_DAMPING     FULL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.566
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              4
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
D_10d            5337.92    0          0          0          0
D_10b            5352.3     1          0          0          0
E-J-10           5344       0          0          0          0
D_10c            5352       0          0          0          0
D_13a            5327.36    0          0          0          0
D_10_13_a        5321.13    0          0          0          0
D_16a            5302.18    0          0          0          0
D_16b            5304.9     0          0          0          0
J_15             5313.96    0          0          0          0
D_14a            5322.34    0          0          0          0
D_12_14          5349       0          0          0          0
J_AR1_d          5327.76    0          0          0          0
DIV72            5348.69    0          0          0          0
D_10_13_b        5320.83    0          0          0          0
D_AR2_b          5346.8     0          0          0          0
E-J-16_b         5312.265   0          0          0          0
E-J-16_a         5308.09    0          0          0          0
D_16c            5299.13    0          0          0          0
D_10_13_c        5317.52    0          0          0          0
D_10_13_d        5314.2     0          0          0          0
J_AR1_a          5344.56    0          0          0          0
J_AR1_b          5334.19    0          0          0          0
DIV72_DUMMY      5460       0          0          0          0
J_AR1_c          5329.523   0          0          0          0
J_Beeler         5358.38    0          0          0          0
J_13th           5347.34    0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
D_AR2_a          5338.2     FREE                        NO
EC_Out_19thAv    5310.87    FREE                        NO
EC_Out_23rd      5298.8     NORMAL                      NO
EC_Out_23rd_OF   5305.8     NORMAL                      NO
J_15b            5302.24    FREE                        NO
J_17thAve_Out_OF 5322.44    FREE                        NO
JColfax_Alton    5323       FREE                        NO
J14th-DIV        5328       FREE                        NO
EC_Out_23rd_New  5289.23    FREE                        NO
D_15a            5314.14    FREE                        NO
J_17thAv_Out     5313       FREE                        NO

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
S_10e            D_10b            D_10d            2675.35    0.01       13.2       9.02       0          0
C_10c            D_10b            D_10d            2675.35    0.019      0          1          0          0
C_10c_2          D_10d            D_13a            671.79     0.019      0          7.2        0          0
d_10a            E-J-10           D_10d            48.16      0.01       0          0          0          0
J_EC_Colfax_Out  D_AR2_b          D_AR2_a          300        0.01       0          0          0          0
S_13a            D_10d            D_13a            671.79     0.01       9.03       12.96      0          0
S_10g            D_10c            D_10d            653.48     0.01       0          11.2       0          0
S_13_b1          D_13a            D_10_13_a        972        0.01       12.96      10.32      0          0
C_13a            D_13a            D_10_13_a        972        0.019      2          2          0          0
C_10_13_b        D_10_13_b        D_10_13_c        663.15     0.019      0          0          0          0
C_13a_2          D_10_13_a        EC_Out_19thAv    2300       0.019      1.62       0          0          0
S_13b2           D_10_13_a        J_15             1310       0.01       10.32      5.92       0          0
S_15_a           D_16a            EC_Out_23rd_OF   812        0.01       5.95       0          0          0
C_15_a           D_16a            EC_Out_23rd      812        0.019      0.72       0          0          0
C_15_b           D_16b            D_16a            670        0.019      2.275      1.72       0          0
S_15_b           D_16b            D_16a            670        0.01       7.36       5.95       0          0
C_16b            D_16b            J_15b            807        0.019      0          0          0          0
S_15_c           J_15             D_16b            1674       0.01       5.92       7.375      0          0
S_15a            D_14a            J_15             1640       0.01       14.53      5.92       0          0
S_10_13_b        D_10_13_b        D_10_13_c        663.15     0.01       10.5       10.67      0          0
S_12_14          D_12_14          D_13a            400        0.01       0          12.96      0          0
C_AR2_e          J_AR1_d          JColfax_Alton    1108.07    0.019      0          0          0          0
S_AR1_e          J_AR1_d          J14th-DIV        720        0.01       11.52      0          0          0
S_AR1_a          DIV72            J_Beeler         828.29     0.01       11.31      0          0          0
C_10_13_a        D_10_13_a        D_10_13_b        360.07     0.019      1.56       0          0          0
S_10_13_a        D_10_13_a        D_10_13_b        360.07     0.01       10.32      10.5       0          0
S_10i            D_10d            D_AR2_b          340        0.01       8.98       0          0          0
C_16a_1          E-J-16_b         D_16b            400        0.01       0          0          0          0
C_16a_2          E-J-16_a         D_16a            400        0.01       0          0          0          0
C_15d            D_16c            EC_Out_23rd_New  420.9      0.019      0          0          0          0
C_15c            D_16a            D_16c            273.9      0.019      0          0          0          0
C_15a            D_14a            D_15a            1675       0.019      0          0          0          0
C_10_13_c        D_10_13_c        D_10_13_d        663.87     0.019      0          0          0          0
C_10_13_d        D_10_13_d        J_17thAv_Out     239.4      0.019      0          0          0          0
S_10_13_c        D_10_13_c        D_10_13_d        663.87     0.01       10.67      8.89       0          0
S_10_13_d        D_10_13_d        J_17thAve_Out_OF 400        0.01       8.89       0          0          0
C_AR1_a          DIV72            J_AR1_a          828.29     0.019      0          0          0          0
C_AR1_b          J_AR1_a          J_AR1_b          518.3      0.019      0          0          0          0
C_AR1_c          J_AR1_b          J_AR1_c          600        0.01       0          0          0          0
S_AR1_b          J_AR1_a          J_AR1_b          518.3      0.01       20.4       19.025     0          0
S_AR1_c          J_AR1_b          J_AR1_c          1122.34    0.01       19.025     11.52      0          0
18               DIV72_DUMMY      DIV72            400        0.01       0          0          0          0
C_AR1_d          J_AR1_c          J_AR1_d          522.6      0.019      0          0          0          0
S_AR1_d          J_AR1_c          J_AR1_d          522.6      0.01       11.52      11.52      0          0
S_Beeler         J_Beeler         J_13th           1600       0.01       0          0          0          0
S_13th           J_13th           J_AR1_c          360        0.01       0          11.52      0          0

[XSECTIONS]
;;Link            Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
S_10e            IRREGULAR    DelMarPkwy       0          0          0          1
C_10c            CIRCULAR     4                0          0          0          1
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
C_10c_2          CIRCULAR     4               0          0          0          1
d_10a            DUMMY        0               0          0          0          1
J_EC_Colfax_Out  IRREGULAR    50ftStreet      0          0          0          1
S_13a            IRREGULAR    50ftStreet      0          0          0          1
S_10g            IRREGULAR    Colfax          0          0          0          1
S_13_b1          IRREGULAR    DelMarPkwy      0          0          0          1
C_13a            CIRCULAR     4.5             0          0          0          1
C_10_13_b        CIRCULAR     5.5             0          0          0          1
C_13a_2          CIRCULAR     4.5             0          0          0          1
S_13b2           IRREGULAR    DelMarPkwy      0          0          0          1
S_15_a           IRREGULAR    36ftStreet      0          0          0          1
C_15_a           CIRCULAR     5               0          0          0          1
C_15_b           CIRCULAR     2.5             0          0          0          1
S_15_b           IRREGULAR    36ftStreet      0          0          0          1
C_16b            CIRCULAR     5.5             0          0          0          1
S_15_c           IRREGULAR    36ftStreet      0          0          0          1
S_15a            IRREGULAR    50ftStreet      0          0          0          1
S_10_13_b        IRREGULAR    50ftStreet      0          0          0          1
S_12_14          IRREGULAR    50ftStreet      0          0          0          1
C_AR2_e          CIRCULAR     7               0          0          0          1
S_AR1_e          IRREGULAR    36ftStreet      0          0          0          1
S_AR1_a          IRREGULAR    36ftStreet      0          0          0          1
C_10_13_a        CIRCULAR     5               0          0          0          1
S_10_13_a        IRREGULAR    50ftStreet      0          0          0          1
S_10i            IRREGULAR    Colfax          0          0          0          1
C_16a_1          DUMMY        0               0          0          0          1
C_16a_2          DUMMY        0               0          0          0          1
C_15d            HORIZ_ELLIPSE 4               6.33       0          0          1
C_15c            CIRCULAR     4               0          0          0          1
C_15a            CIRCULAR     5.5             0          0          0          1
C_10_13_c        CIRCULAR     5.5             0          0          0          1
C_10_13_d        CIRCULAR     5.5             0          0          0          1
S_10_13_c        IRREGULAR    50ftStreet      0          0          0          1
S_10_13_d        IRREGULAR    50ftStreet      0          0          0          1
C_AR1_a          CIRCULAR     6.5             0          0          0          1
C_AR1_b          CIRCULAR     6.5             0          0          0          1
C_AR1_c          CIRCULAR     6.5             0          0          0          1
S_AR1_b          IRREGULAR    36ftStreet      0          0          0          1
S_AR1_c          IRREGULAR    36ftStreet      0          0          0          1
18               DUMMY        0               0          0          0          1
C_AR1_d          CIRCULAR     7               0          0          0          1
S_AR1_d          IRREGULAR    36ftStreet      0          0          0          1
S_Beeler         IRREGULAR    36ftStreet      0          0          0          1
S_13th           IRREGULAR    36ftStreet      0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.1      0.1      0.02
X1 DelMarPkwy        15       4        88       0.0      0.0      0.0      0.0      0.0
GR 8         -16      1.07     -16      0.67     4        0        4        0.32     20
GR 0         36       0.67     36       0.87     46       0.67     56       0        56
GR 0.32      72       0        88       0.67     88       1.07     108      8        108
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
;
NC 0.05     0.05     0.02
X1 50ftStreet        9        30       80       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.27     0        0.67     30       0        30       0.5      55
GR 0        80       0.67     80       1.27     110      10       110
;
NC 0.01     0.01     0.02
X1 Colfax            12       5        87       0.0      0.0      0.0      0.0      0.0
GR 10       0        0.77     0        0.67     5        0        5        0.8      45
GR 3.3      45       3.3      47       0.8      47       0        87       0.67     87
GR 0.77     92       10       92
;
NC 0.05     0.05     0.02
X1 36ftStreet        9        50       86       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.67     0        0.67     50       0        50       0.36     68
GR 0        86       0.67     86       1.67     136      10       136

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
D_10b            FLOW             D_10b            FLOW     1.0      1.0
E-J-10           FLOW             E-J-10           FLOW     1.0      1.0
D_10c            FLOW             D_10c            FLOW     1.0      1.0
D_14a            FLOW             D_14a            FLOW     1.0      1.0
D_12_14          FLOW             D_12_14          FLOW     1.0      1.0
E-J-16_b         FLOW             E-J-16_b         FLOW     1.0      1.0
E-J-16_a         FLOW             E-J-16_a         FLOW     1.0      1.0
DIV72_DUMMY      FLOW             DIV72            FLOW     1.0      1.0

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
D_10b                       0:05:00    0
D_10b                       0:10:00    0
D_10b                       0:15:00    0
D_10b                       0:20:00    0
D_10b                       0:25:00    0.1
D_10b                       0:30:00    3.19
D_10b                       0:35:00    13.6
D_10b                       0:40:00    32.36
D_10b                       0:45:00    46.09
D_10b                       0:50:00    91.43
D_10b                       0:55:00    181.04
D_10b                       1:00:00    327.29
D_10b                       1:05:00    428.25
D_10b                       1:10:00    477.65
D_10b                       1:15:00    479.83
D_10b                       1:20:00    462.7
D_10b                       1:25:00    433.64
D_10b                       1:30:00    401.41
D_10b                       1:35:00    380.32
D_10b                       1:40:00    378.03
D_10b                       1:45:00    370.04
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_10b	1:50:00	339.57
D_10b	1:55:00	306.79
D_10b	2:00:00	276.6
D_10b	2:05:00	248.53
D_10b	2:10:00	223.26
D_10b	2:15:00	200.33
D_10b	2:20:00	179.83
D_10b	2:25:00	160.68
D_10b	2:30:00	143
D_10b	2:35:00	126.88
D_10b	2:40:00	112.2
D_10b	2:45:00	98.64
D_10b	2:50:00	86.7
D_10b	2:55:00	78.17
D_10b	3:00:00	71.77
D_10b	3:05:00	67.37
D_10b	3:10:00	64.97
D_10b	3:15:00	62.96
D_10b	3:20:00	61.45
D_10b	3:25:00	60.09
D_10b	3:30:00	58.64
D_10b	3:35:00	57.39
D_10b	3:40:00	55.95
D_10b	3:45:00	54.69
D_10b	3:50:00	53.44
D_10b	3:55:00	52.15
D_10b	4:00:00	50.88
D_10b	4:05:00	49.6
D_10b	4:10:00	48.28
D_10b	4:15:00	47.13
D_10b	4:20:00	45.85
D_10b	4:25:00	44.59
D_10b	4:30:00	43.14
D_10b	4:35:00	42.08
D_10b	4:40:00	41.11
D_10b	4:45:00	40.34
D_10b	4:50:00	39.54
D_10b	4:55:00	38.98
D_10b	5:00:00	38.28
D_10b	5:05:00	37.78
D_10b	5:10:00	37.24
D_10b	5:15:00	36.66
D_10b	5:20:00	36.13
D_10b	5:25:00	35.7
D_10b	5:30:00	35.25
D_10b	5:35:00	36.89
D_10b	5:40:00	35.5
D_10b	5:45:00	34.02
D_10b	5:50:00	34.49
D_10b	5:55:00	32.11
D_10b	6:00:00	30.83
D_10b	6:05:00	29.83
D_10b	6:10:00	28.74

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_10b	6:15:00	27.66
D_10b	6:20:00	26.51
D_10b	6:25:00	25.14
D_10b	6:30:00	23.62
D_10b	6:35:00	21.63
D_10b	6:40:00	18.82
D_10b	6:45:00	14.19
D_10b	6:50:00	8.06
D_10b	6:55:00	3.24
D_10b	7:00:00	0.96
D_10b	7:05:00	0.4
D_10b	7:10:00	0.21
D_10b	7:15:00	0.13
D_10b	7:20:00	0.08
D_10b	7:25:00	0.06
D_10b	7:30:00	0.05
D_10b	7:35:00	0.04
D_10b	7:40:00	0.03
D_10b	7:45:00	0.03
D_10b	7:50:00	0.02
D_10b	7:55:00	0.02
D_10b	8:00:00	0.02
D_10b	8:05:00	0.01
D_10b	8:10:00	0.01
D_10b	8:15:00	0.01
D_10b	8:20:00	0
D_10b	8:25:00	0
D_10b	8:30:00	0
D_10b	8:35:00	0
D_10b	8:40:00	0
D_10b	8:45:00	0
D_10b	8:50:00	0
D_10b	8:55:00	0
D_10b	9:00:00	0
D_10b	9:05:00	0
D_10b	9:10:00	0
D_10b	9:15:00	0
D_10b	9:20:00	0
D_10b	9:25:00	0
D_10b	9:30:00	0
D_10b	9:35:00	0
D_10b	9:40:00	0
D_10b	9:45:00	0
D_10b	9:50:00	0
D_10b	9:55:00	0
D_10b	10:00:00	0
D_10b	10:05:00	0
D_10b	10:10:00	0
D_10b	10:15:00	0
D_10b	10:20:00	0
D_10b	10:25:00	0
D_10b	10:30:00	0
D_10b	10:35:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10b                    10:40:00   0
D_10b                    10:45:00   0
D_10b                    10:50:00   0
D_10b                    10:55:00   0
D_10b                    11:00:00   0
D_10b                    11:05:00   0
D_10b                    11:10:00   0
D_10b                    11:15:00   0
D_10b                    11:20:00   0
D_10b                    11:25:00   0
D_10b                    11:30:00   0
D_10b                    11:35:00   0
D_10b                    11:40:00   0
D_10b                    11:45:00   0
D_10b                    11:50:00   0
D_10b                    11:55:00   0
D_10b                    12:00:00   0
D_10b                    12:05:00   0
D_10b                    12:10:00   0
D_10b                    12:15:00   0
D_10b                    12:20:00   0
D_10b                    12:25:00   0
D_10b                    12:30:00   0
D_10b                    12:35:00   0
D_10b                    12:40:00   0
D_10b                    12:45:00   0
D_10b                    12:50:00   0
D_10b                    12:55:00   0
D_10b                    13:00:00   0
D_10b                    13:05:00   0
D_10b                    13:10:00   0
D_10b                    13:15:00   0
D_10b                    13:20:00   0
D_10b                    13:25:00   0
D_10b                    13:30:00   0
D_10b                    13:35:00   0
D_10b                    13:40:00   0
D_10b                    13:45:00   0
D_10b                    13:50:00   0
D_10b                    13:55:00   0
D_10b                    14:00:00   0
D_10b                    14:05:00   0
D_10b                    14:10:00   0
D_10b                    14:15:00   0
D_10b                    14:20:00   0
D_10b                    14:25:00   0
D_10b                    14:30:00   0
D_10b                    14:35:00   0
D_10b                    14:40:00   0
D_10b                    14:45:00   0
D_10b                    14:50:00   0
D_10b                    14:55:00   0
D_10b                    15:00:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10b                    15:05:00   0
D_10b                    15:10:00   0
D_10b                    15:15:00   0
D_10b                    15:20:00   0
D_10b                    15:25:00   0
D_10b                    15:30:00   0
D_10b                    15:35:00   0
D_10b                    15:40:00   0
D_10b                    15:45:00   0
D_10b                    15:50:00   0
D_10b                    15:55:00   0
D_10b                    16:00:00   0
D_10b                    16:05:00   0
D_10b                    16:10:00   0
D_10b                    16:15:00   0
D_10b                    16:20:00   0
D_10b                    16:25:00   0
D_10b                    16:30:00   0
D_10b                    16:35:00   0
D_10b                    16:40:00   0
D_10b                    16:45:00   0
D_10b                    16:50:00   0
D_10b                    16:55:00   0
D_10b                    17:00:00   0
D_10b                    17:05:00   0
D_10b                    17:10:00   0
D_10b                    17:15:00   0
D_10b                    17:20:00   0
D_10b                    17:25:00   0
D_10b                    17:30:00   0
D_10b                    17:35:00   0
D_10b                    17:40:00   0
D_10b                    17:45:00   0
D_10b                    17:50:00   0
D_10b                    17:55:00   0
D_10b                    18:00:00   0
D_10b                    18:05:00   0
D_10b                    18:10:00   0
D_10b                    18:15:00   0
D_10b                    18:20:00   0
D_10b                    18:25:00   0
D_10b                    18:30:00   0
D_10b                    18:35:00   0
D_10b                    18:40:00   0
D_10b                    18:45:00   0
D_10b                    18:50:00   0
D_10b                    18:55:00   0
D_10b                    19:00:00   0
D_10b                    19:05:00   0
D_10b                    19:10:00   0
D_10b                    19:15:00   0
D_10b                    19:20:00   0
D_10b                    19:25:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10b                    19:30:00   0
D_10b                    19:35:00   0
D_10b                    19:40:00   0
D_10b                    19:45:00   0
D_10b                    19:50:00   0
D_10b                    19:55:00   0
D_10b                    20:00:00   0
D_10b                    20:05:00   0
D_10b                    20:10:00   0
D_10b                    20:15:00   0
D_10b                    20:20:00   0
D_10b                    20:25:00   0
D_10b                    20:30:00   0
D_10b                    20:35:00   0
D_10b                    20:40:00   0
D_10b                    20:45:00   0
D_10b                    20:50:00   0
D_10b                    20:55:00   0
D_10b                    21:00:00   0
D_10b                    21:05:00   0
D_10b                    21:10:00   0
D_10b                    21:15:00   0
D_10b                    21:20:00   0
D_10b                    21:25:00   0
D_10b                    21:30:00   0
D_10b                    21:35:00   0
D_10b                    21:40:00   0
D_10b                    21:45:00   0
D_10b                    21:50:00   0
D_10b                    21:55:00   0
D_10b                    22:00:00   0
D_10b                    22:05:00   0
D_10b                    22:10:00   0
D_10b                    22:15:00   0
D_10b                    22:20:00   0
D_10b                    22:25:00   0
D_10b                    22:30:00   0
D_10b                    22:35:00   0
D_10b                    22:40:00   0
D_10b                    22:45:00   0
D_10b                    22:50:00   0
D_10b                    22:55:00   0
D_10b                    23:00:00   0
D_10b                    23:05:00   0
D_10b                    23:10:00   0
D_10b                    23:15:00   0
D_10b                    23:20:00   0
D_10b                    23:25:00   0
D_10b                    23:30:00   0
D_10b                    23:35:00   0
D_10b                    23:40:00   0
D_10b                    23:45:00   0
D_10b                    23:50:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10b                    23:55:00   0
;
D_10c                    0:05:00    0
D_10c                    0:10:00    0
D_10c                    0:15:00    0
D_10c                    0:20:00    0
D_10c                    0:25:00    0
D_10c                    0:30:00    0
D_10c                    0:35:00    0
D_10c                    0:40:00    1.66
D_10c                    0:45:00    29.79
D_10c                    0:50:00    71.06
D_10c                    0:55:00    79.94
D_10c                    1:00:00    81.24
D_10c                    1:05:00    82.32
D_10c                    1:10:00    81.48
D_10c                    1:15:00    78.35
D_10c                    1:20:00    73.74
D_10c                    1:25:00    67.34
D_10c                    1:30:00    58.46
D_10c                    1:35:00    49.94
D_10c                    1:40:00    42.35
D_10c                    1:45:00    34.99
D_10c                    1:50:00    27.5
D_10c                    1:55:00    18.93
D_10c                    2:00:00    10.26
D_10c                    2:05:00    4.29
D_10c                    2:10:00    1.44
D_10c                    2:15:00    0.71
D_10c                    2:20:00    0.41
D_10c                    2:25:00    0.26
D_10c                    2:30:00    0.18
D_10c                    2:35:00    0.13
D_10c                    2:40:00    0.1
D_10c                    2:45:00    0.08
D_10c                    2:50:00    0.06
D_10c                    2:55:00    0.05
D_10c                    3:00:00    0.08
D_10c                    3:05:00    0.06
D_10c                    3:10:00    0.04
D_10c                    3:15:00    0.03
D_10c                    3:20:00    0.03
D_10c                    3:25:00    0
D_10c                    3:30:00    0
D_10c                    3:35:00    0
D_10c                    3:40:00    0
D_10c                    3:45:00    0
D_10c                    3:50:00    0
D_10c                    3:55:00    0
D_10c                    4:00:00    0
D_10c                    4:05:00    0
D_10c                    4:10:00    0
D_10c                    4:15:00    0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    4:20:00    0
D_10c                    4:25:00    0
D_10c                    4:30:00    0
D_10c                    4:35:00    0
D_10c                    4:40:00    0
D_10c                    4:45:00    0
D_10c                    4:50:00    0
D_10c                    4:55:00    0
D_10c                    5:00:00    0
D_10c                    5:05:00    0
D_10c                    5:10:00    0
D_10c                    5:15:00    0
D_10c                    5:20:00    0
D_10c                    5:25:00    0
D_10c                    5:30:00    0
D_10c                    5:35:00    0
D_10c                    5:40:00    0
D_10c                    5:45:00    0
D_10c                    5:50:00    0
D_10c                    5:55:00    0
D_10c                    6:00:00    0
D_10c                    6:05:00    0
D_10c                    6:10:00    0
D_10c                    6:15:00    0
D_10c                    6:20:00    0
D_10c                    6:25:00    0
D_10c                    6:30:00    0
D_10c                    6:35:00    0
D_10c                    6:40:00    0
D_10c                    6:45:00    0
D_10c                    6:50:00    0
D_10c                    6:55:00    0
D_10c                    7:00:00    0
D_10c                    7:05:00    0
D_10c                    7:10:00    0
D_10c                    7:15:00    0
D_10c                    7:20:00    0
D_10c                    7:25:00    0
D_10c                    7:30:00    0
D_10c                    7:35:00    0
D_10c                    7:40:00    0
D_10c                    7:45:00    0
D_10c                    7:50:00    0
D_10c                    7:55:00    0
D_10c                    8:00:00    0
D_10c                    8:05:00    0
D_10c                    8:10:00    0
D_10c                    8:15:00    0
D_10c                    8:20:00    0
D_10c                    8:25:00    0
D_10c                    8:30:00    0
D_10c                    8:35:00    0
D_10c                    8:40:00    0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    8:45:00    0
D_10c                    8:50:00    0
D_10c                    8:55:00    0
D_10c                    9:00:00    0
D_10c                    9:05:00    0
D_10c                    9:10:00    0
D_10c                    9:15:00    0
D_10c                    9:20:00    0
D_10c                    9:25:00    0
D_10c                    9:30:00    0
D_10c                    9:35:00    0
D_10c                    9:40:00    0
D_10c                    9:45:00    0
D_10c                    9:50:00    0
D_10c                    9:55:00    0
D_10c                    10:00:00   0
D_10c                    10:05:00   0
D_10c                    10:10:00   0
D_10c                    10:15:00   0
D_10c                    10:20:00   0
D_10c                    10:25:00   0
D_10c                    10:30:00   0
D_10c                    10:35:00   0
D_10c                    10:40:00   0
D_10c                    10:45:00   0
D_10c                    10:50:00   0
D_10c                    10:55:00   0
D_10c                    11:00:00   0
D_10c                    11:05:00   0
D_10c                    11:10:00   0
D_10c                    11:15:00   0
D_10c                    11:20:00   0
D_10c                    11:25:00   0
D_10c                    11:30:00   0
D_10c                    11:35:00   0
D_10c                    11:40:00   0
D_10c                    11:45:00   0
D_10c                    11:50:00   0
D_10c                    11:55:00   0
D_10c                    12:00:00   0
D_10c                    12:05:00   0
D_10c                    12:10:00   0
D_10c                    12:15:00   0
D_10c                    12:20:00   0
D_10c                    12:25:00   0
D_10c                    12:30:00   0
D_10c                    12:35:00   0
D_10c                    12:40:00   0
D_10c                    12:45:00   0
D_10c                    12:50:00   0
D_10c                    12:55:00   0
D_10c                    13:00:00   0
D_10c                    13:05:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    13:10:00   0
D_10c                    13:15:00   0
D_10c                    13:20:00   0
D_10c                    13:25:00   0
D_10c                    13:30:00   0
D_10c                    13:35:00   0
D_10c                    13:40:00   0
D_10c                    13:45:00   0
D_10c                    13:50:00   0
D_10c                    13:55:00   0
D_10c                    14:00:00   0
D_10c                    14:05:00   0
D_10c                    14:10:00   0
D_10c                    14:15:00   0
D_10c                    14:20:00   0
D_10c                    14:25:00   0
D_10c                    14:30:00   0
D_10c                    14:35:00   0
D_10c                    14:40:00   0
D_10c                    14:45:00   0
D_10c                    14:50:00   0
D_10c                    14:55:00   0
D_10c                    15:00:00   0
D_10c                    15:05:00   0
D_10c                    15:10:00   0
D_10c                    15:15:00   0
D_10c                    15:20:00   0
D_10c                    15:25:00   0
D_10c                    15:30:00   0
D_10c                    15:35:00   0
D_10c                    15:40:00   0
D_10c                    15:45:00   0
D_10c                    15:50:00   0
D_10c                    15:55:00   0
D_10c                    16:00:00   0
D_10c                    16:05:00   0
D_10c                    16:10:00   0
D_10c                    16:15:00   0
D_10c                    16:20:00   0
D_10c                    16:25:00   0
D_10c                    16:30:00   0
D_10c                    16:35:00   0
D_10c                    16:40:00   0
D_10c                    16:45:00   0
D_10c                    16:50:00   0
D_10c                    16:55:00   0
D_10c                    17:00:00   0
D_10c                    17:05:00   0
D_10c                    17:10:00   0
D_10c                    17:15:00   0
D_10c                    17:20:00   0
D_10c                    17:25:00   0
D_10c                    17:30:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    17:35:00   0
D_10c                    17:40:00   0
D_10c                    17:45:00   0
D_10c                    17:50:00   0
D_10c                    17:55:00   0
D_10c                    18:00:00   0
D_10c                    18:05:00   0
D_10c                    18:10:00   0
D_10c                    18:15:00   0
D_10c                    18:20:00   0
D_10c                    18:25:00   0
D_10c                    18:30:00   0
D_10c                    18:35:00   0
D_10c                    18:40:00   0
D_10c                    18:45:00   0
D_10c                    18:50:00   0
D_10c                    18:55:00   0
D_10c                    19:00:00   0
D_10c                    19:05:00   0
D_10c                    19:10:00   0
D_10c                    19:15:00   0
D_10c                    19:20:00   0
D_10c                    19:25:00   0
D_10c                    19:30:00   0
D_10c                    19:35:00   0
D_10c                    19:40:00   0
D_10c                    19:45:00   0
D_10c                    19:50:00   0
D_10c                    19:55:00   0
D_10c                    20:00:00   0
D_10c                    20:05:00   0
D_10c                    20:10:00   0
D_10c                    20:15:00   0
D_10c                    20:20:00   0
D_10c                    20:25:00   0
D_10c                    20:30:00   0
D_10c                    20:35:00   0
D_10c                    20:40:00   0
D_10c                    20:45:00   0
D_10c                    20:50:00   0
D_10c                    20:55:00   0
D_10c                    21:00:00   0
D_10c                    21:05:00   0
D_10c                    21:10:00   0
D_10c                    21:15:00   0
D_10c                    21:20:00   0
D_10c                    21:25:00   0
D_10c                    21:30:00   0
D_10c                    21:35:00   0
D_10c                    21:40:00   0
D_10c                    21:45:00   0
D_10c                    21:50:00   0
D_10c                    21:55:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_10c                    22:00:00   0
D_10c                    22:05:00   0
D_10c                    22:10:00   0
D_10c                    22:15:00   0
D_10c                    22:20:00   0
D_10c                    22:25:00   0
D_10c                    22:30:00   0
D_10c                    22:35:00   0
D_10c                    22:40:00   0
D_10c                    22:45:00   0
D_10c                    22:50:00   0
D_10c                    22:55:00   0
D_10c                    23:00:00   0
D_10c                    23:05:00   0
D_10c                    23:10:00   0
D_10c                    23:15:00   0
D_10c                    23:20:00   0
D_10c                    23:25:00   0
D_10c                    23:30:00   0
D_10c                    23:35:00   0
D_10c                    23:40:00   0
D_10c                    23:45:00   0
D_10c                    23:50:00   0
D_10c                    23:55:00   0
;
E-J-10                   0:05       0
E-J-10                   0:10       0
E-J-10                   0:15       0
E-J-10                   0:20       2.4
E-J-10                   0:25       8.84
E-J-10                   0:30       25.28
E-J-10                   0:35       71.04
E-J-10                   0:40       120.81
E-J-10                   0:45       148.23
E-J-10                   0:50       159.09
E-J-10                   0:55       159.62
E-J-10                   1:00       154.12
E-J-10                   1:05       148.01
E-J-10                   1:10       142.02
E-J-10                   1:15       133.51
E-J-10                   1:20       124.17
E-J-10                   1:25       114.38
E-J-10                   1:30       104.14
E-J-10                   1:35       94.26
E-J-10                   1:40       84.97
E-J-10                   1:45       76.14
E-J-10                   1:50       68.19
E-J-10                   1:55       62.2
E-J-10                   2:00       57.38
E-J-10                   2:05       53.18
E-J-10                   2:10       48.68
E-J-10                   2:15       43.85
E-J-10                   2:20       39.15
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-10	2:25	34.71
E-J-10	2:30	30.6
E-J-10	2:35	26.7
E-J-10	2:40	22.93
E-J-10	2:45	19.25
E-J-10	2:50	15.69
E-J-10	2:55	12.28
E-J-10	3:00	9.17
E-J-10	3:05	6.85
E-J-10	3:10	5.25
E-J-10	3:15	4.06
E-J-10	3:20	3.15
E-J-10	3:25	2.45
E-J-10	3:30	1.9
E-J-10	3:35	1.48
E-J-10	3:40	1.18
E-J-10	3:45	0.94
E-J-10	3:50	0.76
E-J-10	3:55	0.59
E-J-10	4:00	0.45
E-J-10	4:05	0.33
E-J-10	4:10	0.23
E-J-10	4:15	0.14
E-J-10	4:20	0.08
E-J-10	4:25	0.03
E-J-10	4:30	0.01
E-J-10	4:35	0
E-J-10	4:40	0
E-J-10	4:45	0
E-J-10	4:50	0
E-J-10	4:55	0
E-J-10	5:00	0
E-J-10	5:05	0
E-J-10	5:10	0
E-J-10	5:15	0
E-J-10	5:20	0
E-J-10	5:25	0
E-J-10	5:30	0
E-J-10	5:35	0
E-J-10	5:40	0
E-J-10	5:45	0
E-J-10	5:50	0
E-J-10	5:55	0
E-J-10	6:00	0
E-J-10	6:05	0
E-J-10	6:10	0
E-J-10	6:15	0
E-J-10	6:20	0
E-J-10	6:25	0
E-J-10	6:30	0
E-J-10	6:35	0
E-J-10	6:40	0
E-J-10	6:45	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-10	6:50	0
E-J-10	6:55	0
E-J-10	7:00	0
E-J-10	7:05	0
E-J-10	7:10	0
E-J-10	7:15	0
E-J-10	7:20	0
E-J-10	7:25	0
E-J-10	7:30	0
E-J-10	7:35	0
E-J-10	7:40	0
E-J-10	7:45	0
E-J-10	7:50	0
E-J-10	7:55	0
E-J-10	8:00	0
E-J-10	8:05	0
E-J-10	8:10	0
E-J-10	8:15	0
E-J-10	8:20	0
E-J-10	8:25	0
E-J-10	8:30	0
E-J-10	8:35	0
E-J-10	8:40	0
E-J-10	8:45	0
E-J-10	8:50	0
E-J-10	8:55	0
E-J-10	9:00	0
E-J-10	9:05	0
E-J-10	9:10	0
E-J-10	9:15	0
E-J-10	9:20	0
E-J-10	9:25	0
E-J-10	9:30	0
E-J-10	9:35	0
E-J-10	9:40	0
E-J-10	9:45	0
E-J-10	9:50	0
E-J-10	9:55	0
E-J-10	10:00	0
E-J-10	10:05	0
E-J-10	10:10	0
E-J-10	10:15	0
E-J-10	10:20	0
E-J-10	10:25	0
E-J-10	10:30	0
E-J-10	10:35	0
E-J-10	10:40	0
E-J-10	10:45	0
E-J-10	10:50	0
E-J-10	10:55	0
E-J-10	11:00	0
E-J-10	11:05	0
E-J-10	11:10	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-10                  11:15      0
E-J-10                  11:20      0
E-J-10                  11:25      0
E-J-10                  11:30      0
E-J-10                  11:35      0
E-J-10                  11:40      0
E-J-10                  11:45      0
E-J-10                  11:50      0
E-J-10                  11:55      0
E-J-10                  12:00      0
E-J-10                  12:05      0
E-J-10                  12:10      0
E-J-10                  12:15      0
E-J-10                  12:20      0
E-J-10                  12:25      0
E-J-10                  12:30      0
E-J-10                  12:35      0
E-J-10                  12:40      0
E-J-10                  12:45      0
E-J-10                  12:50      0
E-J-10                  12:55      0
E-J-10                  13:00      0
E-J-10                  13:05      0
E-J-10                  13:10      0
E-J-10                  13:15      0
E-J-10                  13:20      0
E-J-10                  13:25      0
E-J-10                  13:30      0
E-J-10                  13:35      0
E-J-10                  13:40      0
E-J-10                  13:45      0
E-J-10                  13:50      0
E-J-10                  13:55      0
E-J-10                  14:00      0
E-J-10                  14:05      0
E-J-10                  14:10      0
E-J-10                  14:15      0
E-J-10                  14:20      0
E-J-10                  14:25      0
E-J-10                  14:30      0
E-J-10                  14:35      0
E-J-10                  14:40      0
E-J-10                  14:45      0
E-J-10                  14:50      0
E-J-10                  14:55      0
E-J-10                  15:00      0
E-J-10                  15:05      0
E-J-10                  15:10      0
E-J-10                  15:15      0
E-J-10                  15:20      0
E-J-10                  15:25      0
E-J-10                  15:30      0
E-J-10                  15:35      0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-10	15:40	0
E-J-10	15:45	0
E-J-10	15:50	0
E-J-10	15:55	0
E-J-10	16:00	0
E-J-10	16:05	0
E-J-10	16:10	0
E-J-10	16:15	0
E-J-10	16:20	0
E-J-10	16:25	0
E-J-10	16:30	0
E-J-10	16:35	0
E-J-10	16:40	0
E-J-10	16:45	0
E-J-10	16:50	0
E-J-10	16:55	0
E-J-10	17:00	0
E-J-10	17:05	0
E-J-10	17:10	0
E-J-10	17:15	0
E-J-10	17:20	0
E-J-10	17:25	0
E-J-10	17:30	0
E-J-10	17:35	0
E-J-10	17:40	0
E-J-10	17:45	0
E-J-10	17:50	0
E-J-10	17:55	0
E-J-10	18:00	0
E-J-10	18:05	0
E-J-10	18:10	0
E-J-10	18:15	0
E-J-10	18:20	0
E-J-10	18:25	0
E-J-10	18:30	0
E-J-10	18:35	0
E-J-10	18:40	0
E-J-10	18:45	0
E-J-10	18:50	0
E-J-10	18:55	0
E-J-10	19:00	0
E-J-10	19:05	0
E-J-10	19:10	0
E-J-10	19:15	0
E-J-10	19:20	0
E-J-10	19:25	0
E-J-10	19:30	0
E-J-10	19:35	0
E-J-10	19:40	0
E-J-10	19:45	0
E-J-10	19:50	0
E-J-10	19:55	0
E-J-10	20:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-10                  20:05      0
E-J-10                  20:10      0
E-J-10                  20:15      0
E-J-10                  20:20      0
E-J-10                  20:25      0
E-J-10                  20:30      0
E-J-10                  20:35      0
E-J-10                  20:40      0
E-J-10                  20:45      0
E-J-10                  20:50      0
E-J-10                  20:55      0
E-J-10                  21:00      0
E-J-10                  21:05      0
E-J-10                  21:10      0
E-J-10                  21:15      0
E-J-10                  21:20      0
E-J-10                  21:25      0
E-J-10                  21:30      0
E-J-10                  21:35      0
E-J-10                  21:40      0
E-J-10                  21:45      0
E-J-10                  21:50      0
E-J-10                  21:55      0
E-J-10                  22:00      0
E-J-10                  22:05      0
E-J-10                  22:10      0
E-J-10                  22:15      0
E-J-10                  22:20      0
E-J-10                  22:25      0
E-J-10                  22:30      0
E-J-10                  22:35      0
E-J-10                  22:40      0
E-J-10                  22:45      0
E-J-10                  22:50      0
E-J-10                  22:55      0
E-J-10                  23:00      0
E-J-10                  23:05      0
E-J-10                  23:10      0
E-J-10                  23:15      0
E-J-10                  23:20      0
E-J-10                  23:25      0
E-J-10                  23:30      0
E-J-10                  23:35      0
E-J-10                  23:40      0
E-J-10                  23:45      0
E-J-10                  23:50      0
E-J-10                  23:55      0
;
D_12_14                 0:05:00    0
D_12_14                 0:10:00    0
D_12_14                 0:15:00    0
D_12_14                 0:20:00    0
D_12_14                 0:25:00    0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_12_14	0:30:00	0
D_12_14	0:35:00	0
D_12_14	0:40:00	0
D_12_14	0:45:00	0.18
D_12_14	0:50:00	6.42
D_12_14	0:55:00	15.37
D_12_14	1:00:00	17.95
D_12_14	1:05:00	17.94
D_12_14	1:10:00	18.11
D_12_14	1:15:00	16.9
D_12_14	1:20:00	14.83
D_12_14	1:25:00	12.43
D_12_14	1:30:00	10.19
D_12_14	1:35:00	8.08
D_12_14	1:40:00	6.14
D_12_14	1:45:00	4.59
D_12_14	1:50:00	3.21
D_12_14	1:55:00	2.74
D_12_14	2:00:00	2
D_12_14	2:05:00	1.32
D_12_14	2:10:00	0.79
D_12_14	2:15:00	0.42
D_12_14	2:20:00	0.26
D_12_14	2:25:00	0.17
D_12_14	2:30:00	0.12
D_12_14	2:35:00	0.09
D_12_14	2:40:00	0.07
D_12_14	2:45:00	0.05
D_12_14	2:50:00	0.05
D_12_14	2:55:00	0.04
D_12_14	3:00:00	0.03
D_12_14	3:05:00	0
D_12_14	3:10:00	0
D_12_14	3:15:00	0
D_12_14	3:20:00	0
D_12_14	3:25:00	0
D_12_14	3:30:00	0
D_12_14	3:35:00	0
D_12_14	3:40:00	0
D_12_14	3:45:00	0
D_12_14	3:50:00	0
D_12_14	3:55:00	0
D_12_14	4:00:00	0
D_12_14	4:05:00	0
D_12_14	4:10:00	0
D_12_14	4:15:00	0
D_12_14	4:20:00	0
D_12_14	4:25:00	0
D_12_14	4:30:00	0
D_12_14	4:35:00	0
D_12_14	4:40:00	0
D_12_14	4:45:00	0
D_12_14	4:50:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 4:55:00    0
D_12_14                 5:00:00    0
D_12_14                 5:05:00    0
D_12_14                 5:10:00    0
D_12_14                 5:15:00    0
D_12_14                 5:20:00    0
D_12_14                 5:25:00    0
D_12_14                 5:30:00    0
D_12_14                 5:35:00    0
D_12_14                 5:40:00    0
D_12_14                 5:45:00    0
D_12_14                 5:50:00    0
D_12_14                 5:55:00    0
D_12_14                 6:00:00    0
D_12_14                 6:05:00    0
D_12_14                 6:10:00    0
D_12_14                 6:15:00    0
D_12_14                 6:20:00    0
D_12_14                 6:25:00    0
D_12_14                 6:30:00    0
D_12_14                 6:35:00    0
D_12_14                 6:40:00    0
D_12_14                 6:45:00    0
D_12_14                 6:50:00    0
D_12_14                 6:55:00    0
D_12_14                 7:00:00    0
D_12_14                 7:05:00    0
D_12_14                 7:10:00    0
D_12_14                 7:15:00    0
D_12_14                 7:20:00    0
D_12_14                 7:25:00    0
D_12_14                 7:30:00    0
D_12_14                 7:35:00    0
D_12_14                 7:40:00    0
D_12_14                 7:45:00    0
D_12_14                 7:50:00    0
D_12_14                 7:55:00    0
D_12_14                 8:00:00    0
D_12_14                 8:05:00    0
D_12_14                 8:10:00    0
D_12_14                 8:15:00    0
D_12_14                 8:20:00    0
D_12_14                 8:25:00    0
D_12_14                 8:30:00    0
D_12_14                 8:35:00    0
D_12_14                 8:40:00    0
D_12_14                 8:45:00    0
D_12_14                 8:50:00    0
D_12_14                 8:55:00    0
D_12_14                 9:00:00    0
D_12_14                 9:05:00    0
D_12_14                 9:10:00    0
D_12_14                 9:15:00    0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 9:20:00    0
D_12_14                 9:25:00    0
D_12_14                 9:30:00    0
D_12_14                 9:35:00    0
D_12_14                 9:40:00    0
D_12_14                 9:45:00    0
D_12_14                 9:50:00    0
D_12_14                 9:55:00    0
D_12_14                 10:00:00   0
D_12_14                 10:05:00   0
D_12_14                 10:10:00   0
D_12_14                 10:15:00   0
D_12_14                 10:20:00   0
D_12_14                 10:25:00   0
D_12_14                 10:30:00   0
D_12_14                 10:35:00   0
D_12_14                 10:40:00   0
D_12_14                 10:45:00   0
D_12_14                 10:50:00   0
D_12_14                 10:55:00   0
D_12_14                 11:00:00   0
D_12_14                 11:05:00   0
D_12_14                 11:10:00   0
D_12_14                 11:15:00   0
D_12_14                 11:20:00   0
D_12_14                 11:25:00   0
D_12_14                 11:30:00   0
D_12_14                 11:35:00   0
D_12_14                 11:40:00   0
D_12_14                 11:45:00   0
D_12_14                 11:50:00   0
D_12_14                 11:55:00   0
D_12_14                 12:00:00   0
D_12_14                 12:05:00   0
D_12_14                 12:10:00   0
D_12_14                 12:15:00   0
D_12_14                 12:20:00   0
D_12_14                 12:25:00   0
D_12_14                 12:30:00   0
D_12_14                 12:35:00   0
D_12_14                 12:40:00   0
D_12_14                 12:45:00   0
D_12_14                 12:50:00   0
D_12_14                 12:55:00   0
D_12_14                 13:00:00   0
D_12_14                 13:05:00   0
D_12_14                 13:10:00   0
D_12_14                 13:15:00   0
D_12_14                 13:20:00   0
D_12_14                 13:25:00   0
D_12_14                 13:30:00   0
D_12_14                 13:35:00   0
D_12_14                 13:40:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 13:45:00   0
D_12_14                 13:50:00   0
D_12_14                 13:55:00   0
D_12_14                 14:00:00   0
D_12_14                 14:05:00   0
D_12_14                 14:10:00   0
D_12_14                 14:15:00   0
D_12_14                 14:20:00   0
D_12_14                 14:25:00   0
D_12_14                 14:30:00   0
D_12_14                 14:35:00   0
D_12_14                 14:40:00   0
D_12_14                 14:45:00   0
D_12_14                 14:50:00   0
D_12_14                 14:55:00   0
D_12_14                 15:00:00   0
D_12_14                 15:05:00   0
D_12_14                 15:10:00   0
D_12_14                 15:15:00   0
D_12_14                 15:20:00   0
D_12_14                 15:25:00   0
D_12_14                 15:30:00   0
D_12_14                 15:35:00   0
D_12_14                 15:40:00   0
D_12_14                 15:45:00   0
D_12_14                 15:50:00   0
D_12_14                 15:55:00   0
D_12_14                 16:00:00   0
D_12_14                 16:05:00   0
D_12_14                 16:10:00   0
D_12_14                 16:15:00   0
D_12_14                 16:20:00   0
D_12_14                 16:25:00   0
D_12_14                 16:30:00   0
D_12_14                 16:35:00   0
D_12_14                 16:40:00   0
D_12_14                 16:45:00   0
D_12_14                 16:50:00   0
D_12_14                 16:55:00   0
D_12_14                 17:00:00   0
D_12_14                 17:05:00   0
D_12_14                 17:10:00   0
D_12_14                 17:15:00   0
D_12_14                 17:20:00   0
D_12_14                 17:25:00   0
D_12_14                 17:30:00   0
D_12_14                 17:35:00   0
D_12_14                 17:40:00   0
D_12_14                 17:45:00   0
D_12_14                 17:50:00   0
D_12_14                 17:55:00   0
D_12_14                 18:00:00   0
D_12_14                 18:05:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 18:10:00   0
D_12_14                 18:15:00   0
D_12_14                 18:20:00   0
D_12_14                 18:25:00   0
D_12_14                 18:30:00   0
D_12_14                 18:35:00   0
D_12_14                 18:40:00   0
D_12_14                 18:45:00   0
D_12_14                 18:50:00   0
D_12_14                 18:55:00   0
D_12_14                 19:00:00   0
D_12_14                 19:05:00   0
D_12_14                 19:10:00   0
D_12_14                 19:15:00   0
D_12_14                 19:20:00   0
D_12_14                 19:25:00   0
D_12_14                 19:30:00   0
D_12_14                 19:35:00   0
D_12_14                 19:40:00   0
D_12_14                 19:45:00   0
D_12_14                 19:50:00   0
D_12_14                 19:55:00   0
D_12_14                 20:00:00   0
D_12_14                 20:05:00   0
D_12_14                 20:10:00   0
D_12_14                 20:15:00   0
D_12_14                 20:20:00   0
D_12_14                 20:25:00   0
D_12_14                 20:30:00   0
D_12_14                 20:35:00   0
D_12_14                 20:40:00   0
D_12_14                 20:45:00   0
D_12_14                 20:50:00   0
D_12_14                 20:55:00   0
D_12_14                 21:00:00   0
D_12_14                 21:05:00   0
D_12_14                 21:10:00   0
D_12_14                 21:15:00   0
D_12_14                 21:20:00   0
D_12_14                 21:25:00   0
D_12_14                 21:30:00   0
D_12_14                 21:35:00   0
D_12_14                 21:40:00   0
D_12_14                 21:45:00   0
D_12_14                 21:50:00   0
D_12_14                 21:55:00   0
D_12_14                 22:00:00   0
D_12_14                 22:05:00   0
D_12_14                 22:10:00   0
D_12_14                 22:15:00   0
D_12_14                 22:20:00   0
D_12_14                 22:25:00   0
D_12_14                 22:30:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_12_14                 22:35:00   0
D_12_14                 22:40:00   0
D_12_14                 22:45:00   0
D_12_14                 22:50:00   0
D_12_14                 22:55:00   0
D_12_14                 23:00:00   0
D_12_14                 23:05:00   0
D_12_14                 23:10:00   0
D_12_14                 23:15:00   0
D_12_14                 23:20:00   0
D_12_14                 23:25:00   0
D_12_14                 23:30:00   0
D_12_14                 23:35:00   0
D_12_14                 23:40:00   0
D_12_14                 23:45:00   0
D_12_14                 23:50:00   0
D_12_14                 23:55:00   0
;
DIV72                   0:05:00    0
DIV72                   0:10:00    0
DIV72                   0:15:00    0
DIV72                   0:20:00    0
DIV72                   0:25:00    0
DIV72                   0:30:00    11.48
DIV72                   0:35:00    130.22
DIV72                   0:40:00    256.54
DIV72                   0:45:00    337.12
DIV72                   0:50:00    407.17
DIV72                   0:55:00    474.76
DIV72                   1:00:00    485.12
DIV72                   1:05:00    461.65
DIV72                   1:10:00    432.23
DIV72                   1:15:00    398.46
DIV72                   1:20:00    360.05
DIV72                   1:25:00    317.37
DIV72                   1:30:00    268.8
DIV72                   1:35:00    215.34
DIV72                   1:40:00    164.7
DIV72                   1:45:00    120.36
DIV72                   1:50:00    82.26
DIV72                   1:55:00    51.29
DIV72                   2:00:00    30.84
DIV72                   2:05:00    15.31
DIV72                   2:10:00    2.41
DIV72                   2:15:00    0
DIV72                   2:20:00    0
DIV72                   2:25:00    0
DIV72                   2:30:00    0
DIV72                   2:35:00    0
DIV72                   2:40:00    0
DIV72                   2:45:00    0
DIV72                   2:50:00    0
DIV72                   2:55:00    0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
DIV72                    3:00:00    0
DIV72                    3:05:00    0
DIV72                    3:10:00    0
DIV72                    3:15:00    0
DIV72                    3:20:00    0
DIV72                    3:25:00    0
DIV72                    3:30:00    0
DIV72                    3:35:00    0
DIV72                    3:40:00    0
DIV72                    3:45:00    0
DIV72                    3:50:00    0
DIV72                    3:55:00    0
DIV72                    4:00:00    0
DIV72                    4:05:00    0
DIV72                    4:10:00    0
DIV72                    4:15:00    0
DIV72                    4:20:00    0
DIV72                    4:25:00    0
DIV72                    4:30:00    0
DIV72                    4:35:00    0
DIV72                    4:40:00    0
DIV72                    4:45:00    0
DIV72                    4:50:00    0
DIV72                    4:55:00    0
DIV72                    5:00:00    0
DIV72                    5:05:00    0
DIV72                    5:10:00    0
DIV72                    5:15:00    0
DIV72                    5:20:00    0
DIV72                    5:25:00    0
DIV72                    5:30:00    0
DIV72                    5:35:00    0
DIV72                    5:40:00    0
DIV72                    5:45:00    0
DIV72                    5:50:00    0
DIV72                    5:55:00    0
DIV72                    6:00:00    0
DIV72                    6:05:00    0
DIV72                    6:10:00    0
DIV72                    6:15:00    0
DIV72                    6:20:00    0
DIV72                    6:25:00    0
DIV72                    6:30:00    0
DIV72                    6:35:00    0
DIV72                    6:40:00    0
DIV72                    6:45:00    0
DIV72                    6:50:00    0
DIV72                    6:55:00    0
DIV72                    7:00:00    0
DIV72                    7:05:00    0
DIV72                    7:10:00    0
DIV72                    7:15:00    0
DIV72                    7:20:00    0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

DIV72	7:25:00	0
DIV72	7:30:00	0
DIV72	7:35:00	0
DIV72	7:40:00	0
DIV72	7:45:00	0
DIV72	7:50:00	0
DIV72	7:55:00	0
DIV72	8:00:00	0
DIV72	8:05:00	0
DIV72	8:10:00	0
DIV72	8:15:00	0
DIV72	8:20:00	0
DIV72	8:25:00	0
DIV72	8:30:00	0
DIV72	8:35:00	0
DIV72	8:40:00	0
DIV72	8:45:00	0
DIV72	8:50:00	0
DIV72	8:55:00	0
DIV72	9:00:00	0
DIV72	9:05:00	0
DIV72	9:10:00	0
DIV72	9:15:00	0
DIV72	9:20:00	0
DIV72	9:25:00	0
DIV72	9:30:00	0
DIV72	9:35:00	0
DIV72	9:40:00	0
DIV72	9:45:00	0
DIV72	9:50:00	0
DIV72	9:55:00	0
DIV72	10:00:00	0
DIV72	10:05:00	0
DIV72	10:10:00	0
DIV72	10:15:00	0
DIV72	10:20:00	0
DIV72	10:25:00	0
DIV72	10:30:00	0
DIV72	10:35:00	0
DIV72	10:40:00	0
DIV72	10:45:00	0
DIV72	10:50:00	0
DIV72	10:55:00	0
DIV72	11:00:00	0
DIV72	11:05:00	0
DIV72	11:10:00	0
DIV72	11:15:00	0
DIV72	11:20:00	0
DIV72	11:25:00	0
DIV72	11:30:00	0
DIV72	11:35:00	0
DIV72	11:40:00	0
DIV72	11:45:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
DIV72                    11:50:00   0
DIV72                    11:55:00   0
DIV72                    12:00:00   0
DIV72                    12:05:00   0
DIV72                    12:10:00   0
DIV72                    12:15:00   0
DIV72                    12:20:00   0
DIV72                    12:25:00   0
DIV72                    12:30:00   0
DIV72                    12:35:00   0
DIV72                    12:40:00   0
DIV72                    12:45:00   0
DIV72                    12:50:00   0
DIV72                    12:55:00   0
DIV72                    13:00:00   0
DIV72                    13:05:00   0
DIV72                    13:10:00   0
DIV72                    13:15:00   0
DIV72                    13:20:00   0
DIV72                    13:25:00   0
DIV72                    13:30:00   0
DIV72                    13:35:00   0
DIV72                    13:40:00   0
DIV72                    13:45:00   0
DIV72                    13:50:00   0
DIV72                    13:55:00   0
DIV72                    14:00:00   0
DIV72                    14:05:00   0
DIV72                    14:10:00   0
DIV72                    14:15:00   0
DIV72                    14:20:00   0
DIV72                    14:25:00   0
DIV72                    14:30:00   0
DIV72                    14:35:00   0
DIV72                    14:40:00   0
DIV72                    14:45:00   0
DIV72                    14:50:00   0
DIV72                    14:55:00   0
DIV72                    15:00:00   0
DIV72                    15:05:00   0
DIV72                    15:10:00   0
DIV72                    15:15:00   0
DIV72                    15:20:00   0
DIV72                    15:25:00   0
DIV72                    15:30:00   0
DIV72                    15:35:00   0
DIV72                    15:40:00   0
DIV72                    15:45:00   0
DIV72                    15:50:00   0
DIV72                    15:55:00   0
DIV72                    16:00:00   0
DIV72                    16:05:00   0
DIV72                    16:10:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
DIV72                    16:15:00   0
DIV72                    16:20:00   0
DIV72                    16:25:00   0
DIV72                    16:30:00   0
DIV72                    16:35:00   0
DIV72                    16:40:00   0
DIV72                    16:45:00   0
DIV72                    16:50:00   0
DIV72                    16:55:00   0
DIV72                    17:00:00   0
DIV72                    17:05:00   0
DIV72                    17:10:00   0
DIV72                    17:15:00   0
DIV72                    17:20:00   0
DIV72                    17:25:00   0
DIV72                    17:30:00   0
DIV72                    17:35:00   0
DIV72                    17:40:00   0
DIV72                    17:45:00   0
DIV72                    17:50:00   0
DIV72                    17:55:00   0
DIV72                    18:00:00   0
DIV72                    18:05:00   0
DIV72                    18:10:00   0
DIV72                    18:15:00   0
DIV72                    18:20:00   0
DIV72                    18:25:00   0
DIV72                    18:30:00   0
DIV72                    18:35:00   0
DIV72                    18:40:00   0
DIV72                    18:45:00   0
DIV72                    18:50:00   0
DIV72                    18:55:00   0
DIV72                    19:00:00   0
DIV72                    19:05:00   0
DIV72                    19:10:00   0
DIV72                    19:15:00   0
DIV72                    19:20:00   0
DIV72                    19:25:00   0
DIV72                    19:30:00   0
DIV72                    19:35:00   0
DIV72                    19:40:00   0
DIV72                    19:45:00   0
DIV72                    19:50:00   0
DIV72                    19:55:00   0
DIV72                    20:00:00   0
DIV72                    20:05:00   0
DIV72                    20:10:00   0
DIV72                    20:15:00   0
DIV72                    20:20:00   0
DIV72                    20:25:00   0
DIV72                    20:30:00   0
DIV72                    20:35:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
DIV72                    20:40:00   0
DIV72                    20:45:00   0
DIV72                    20:50:00   0
DIV72                    20:55:00   0
DIV72                    21:00:00   0
DIV72                    21:05:00   0
DIV72                    21:10:00   0
DIV72                    21:15:00   0
DIV72                    21:20:00   0
DIV72                    21:25:00   0
DIV72                    21:30:00   0
DIV72                    21:35:00   0
DIV72                    21:40:00   0
DIV72                    21:45:00   0
DIV72                    21:50:00   0
DIV72                    21:55:00   0
DIV72                    22:00:00   0
DIV72                    22:05:00   0
DIV72                    22:10:00   0
DIV72                    22:15:00   0
DIV72                    22:20:00   0
DIV72                    22:25:00   0
DIV72                    22:30:00   0
DIV72                    22:35:00   0
DIV72                    22:40:00   0
DIV72                    22:45:00   0
DIV72                    22:50:00   0
DIV72                    22:55:00   0
DIV72                    23:00:00   0
DIV72                    23:05:00   0
DIV72                    23:10:00   0
DIV72                    23:15:00   0
DIV72                    23:20:00   0
DIV72                    23:25:00   0
DIV72                    23:30:00   0
DIV72                    23:35:00   0
DIV72                    23:40:00   0
DIV72                    23:45:00   0
DIV72                    23:50:00   0
DIV72                    23:55:00   0
;
E-J-16_a                 0:05:00    0
E-J-16_a                 0:10:00    0
E-J-16_a                 0:15:00    0
E-J-16_a                 0:20:00    1.422
E-J-16_a                 0:25:00    5.4612
E-J-16_a                 0:30:00    13.2588
E-J-16_a                 0:35:00    32.94
E-J-16_a                 0:40:00    51.4656
E-J-16_a                 0:45:00    59.2956
E-J-16_a                 0:50:00    60.1956
E-J-16_a                 0:55:00    57.8772
E-J-16_a                 1:00:00    54.5688
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_a	1:05:00	51.0768
E-J-16_a	1:10:00	48.3696
E-J-16_a	1:15:00	44.7084
E-J-16_a	1:20:00	40.2732
E-J-16_a	1:25:00	35.5428
E-J-16_a	1:30:00	30.978
E-J-16_a	1:35:00	27.2088
E-J-16_a	1:40:00	24.3252
E-J-16_a	1:45:00	22.0068
E-J-16_a	1:50:00	19.89
E-J-16_a	1:55:00	17.9928
E-J-16_a	2:00:00	16.1928
E-J-16_a	2:05:00	14.4972
E-J-16_a	2:10:00	12.4848
E-J-16_a	2:15:00	10.1916
E-J-16_a	2:20:00	8.082
E-J-16_a	2:25:00	6.1488
E-J-16_a	2:30:00	4.7484
E-J-16_a	2:35:00	3.6504
E-J-16_a	2:40:00	2.8872
E-J-16_a	2:45:00	2.25
E-J-16_a	2:50:00	1.7532
E-J-16_a	2:55:00	1.35
E-J-16_a	3:00:00	1.044
E-J-16_a	3:05:00	0.8244
E-J-16_a	3:10:00	0.6696
E-J-16_a	3:15:00	0.5364
E-J-16_a	3:20:00	0.4248
E-J-16_a	3:25:00	0.3276
E-J-16_a	3:30:00	0.2412
E-J-16_a	3:35:00	0.1692
E-J-16_a	3:40:00	0.1116
E-J-16_a	3:45:00	0.0648
E-J-16_a	3:50:00	0.0324
E-J-16_a	3:55:00	0.0108
E-J-16_a	4:00:00	0.0036
E-J-16_a	4:05:00	0
E-J-16_a	4:10:00	0
E-J-16_a	4:15:00	0
E-J-16_a	4:20:00	0
E-J-16_a	4:25:00	0
E-J-16_a	4:30:00	0
E-J-16_a	4:35:00	0
E-J-16_a	4:40:00	0
E-J-16_a	4:45:00	0
E-J-16_a	4:50:00	0
E-J-16_a	4:55:00	0
E-J-16_a	5:00:00	0
E-J-16_a	5:05:00	0
E-J-16_a	5:10:00	0
E-J-16_a	5:15:00	0
E-J-16_a	5:20:00	0
E-J-16_a	5:25:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_a	5:30:00	0
E-J-16_a	5:35:00	0
E-J-16_a	5:40:00	0
E-J-16_a	5:45:00	0
E-J-16_a	5:50:00	0
E-J-16_a	5:55:00	0
E-J-16_a	6:00:00	0
E-J-16_a	6:05:00	0
E-J-16_a	6:10:00	0
E-J-16_a	6:15:00	0
E-J-16_a	6:20:00	0
E-J-16_a	6:25:00	0
E-J-16_a	6:30:00	0
E-J-16_a	6:35:00	0
E-J-16_a	6:40:00	0
E-J-16_a	6:45:00	0
E-J-16_a	6:50:00	0
E-J-16_a	6:55:00	0
E-J-16_a	7:00:00	0
E-J-16_a	7:05:00	0
E-J-16_a	7:10:00	0
E-J-16_a	7:15:00	0
E-J-16_a	7:20:00	0
E-J-16_a	7:25:00	0
E-J-16_a	7:30:00	0
E-J-16_a	7:35:00	0
E-J-16_a	7:40:00	0
E-J-16_a	7:45:00	0
E-J-16_a	7:50:00	0
E-J-16_a	7:55:00	0
E-J-16_a	8:00:00	0
E-J-16_a	8:05:00	0
E-J-16_a	8:10:00	0
E-J-16_a	8:15:00	0
E-J-16_a	8:20:00	0
E-J-16_a	8:25:00	0
E-J-16_a	8:30:00	0
E-J-16_a	8:35:00	0
E-J-16_a	8:40:00	0
E-J-16_a	8:45:00	0
E-J-16_a	8:50:00	0
E-J-16_a	8:55:00	0
E-J-16_a	9:00:00	0
E-J-16_a	9:05:00	0
E-J-16_a	9:10:00	0
E-J-16_a	9:15:00	0
E-J-16_a	9:20:00	0
E-J-16_a	9:25:00	0
E-J-16_a	9:30:00	0
E-J-16_a	9:35:00	0
E-J-16_a	9:40:00	0
E-J-16_a	9:45:00	0
E-J-16_a	9:50:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_a                 9:55:00    0
E-J-16_a                 10:00:00   0
E-J-16_a                 10:05:00   0
E-J-16_a                 10:10:00   0
E-J-16_a                 10:15:00   0
E-J-16_a                 10:20:00   0
E-J-16_a                 10:25:00   0
E-J-16_a                 10:30:00   0
E-J-16_a                 10:35:00   0
E-J-16_a                 10:40:00   0
E-J-16_a                 10:45:00   0
E-J-16_a                 10:50:00   0
E-J-16_a                 10:55:00   0
E-J-16_a                 11:00:00   0
E-J-16_a                 11:05:00   0
E-J-16_a                 11:10:00   0
E-J-16_a                 11:15:00   0
E-J-16_a                 11:20:00   0
E-J-16_a                 11:25:00   0
E-J-16_a                 11:30:00   0
E-J-16_a                 11:35:00   0
E-J-16_a                 11:40:00   0
E-J-16_a                 11:45:00   0
E-J-16_a                 11:50:00   0
E-J-16_a                 11:55:00   0
E-J-16_a                 12:00:00   0
E-J-16_a                 12:05:00   0
E-J-16_a                 12:10:00   0
E-J-16_a                 12:15:00   0
E-J-16_a                 12:20:00   0
E-J-16_a                 12:25:00   0
E-J-16_a                 12:30:00   0
E-J-16_a                 12:35:00   0
E-J-16_a                 12:40:00   0
E-J-16_a                 12:45:00   0
E-J-16_a                 12:50:00   0
E-J-16_a                 12:55:00   0
E-J-16_a                 13:00:00   0
E-J-16_a                 13:05:00   0
E-J-16_a                 13:10:00   0
E-J-16_a                 13:15:00   0
E-J-16_a                 13:20:00   0
E-J-16_a                 13:25:00   0
E-J-16_a                 13:30:00   0
E-J-16_a                 13:35:00   0
E-J-16_a                 13:40:00   0
E-J-16_a                 13:45:00   0
E-J-16_a                 13:50:00   0
E-J-16_a                 13:55:00   0
E-J-16_a                 14:00:00   0
E-J-16_a                 14:05:00   0
E-J-16_a                 14:10:00   0
E-J-16_a                 14:15:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_a                 14:20:00   0
E-J-16_a                 14:25:00   0
E-J-16_a                 14:30:00   0
E-J-16_a                 14:35:00   0
E-J-16_a                 14:40:00   0
E-J-16_a                 14:45:00   0
E-J-16_a                 14:50:00   0
E-J-16_a                 14:55:00   0
E-J-16_a                 15:00:00   0
E-J-16_a                 15:05:00   0
E-J-16_a                 15:10:00   0
E-J-16_a                 15:15:00   0
E-J-16_a                 15:20:00   0
E-J-16_a                 15:25:00   0
E-J-16_a                 15:30:00   0
E-J-16_a                 15:35:00   0
E-J-16_a                 15:40:00   0
E-J-16_a                 15:45:00   0
E-J-16_a                 15:50:00   0
E-J-16_a                 15:55:00   0
E-J-16_a                 16:00:00   0
E-J-16_a                 16:05:00   0
E-J-16_a                 16:10:00   0
E-J-16_a                 16:15:00   0
E-J-16_a                 16:20:00   0
E-J-16_a                 16:25:00   0
E-J-16_a                 16:30:00   0
E-J-16_a                 16:35:00   0
E-J-16_a                 16:40:00   0
E-J-16_a                 16:45:00   0
E-J-16_a                 16:50:00   0
E-J-16_a                 16:55:00   0
E-J-16_a                 17:00:00   0
E-J-16_a                 17:05:00   0
E-J-16_a                 17:10:00   0
E-J-16_a                 17:15:00   0
E-J-16_a                 17:20:00   0
E-J-16_a                 17:25:00   0
E-J-16_a                 17:30:00   0
E-J-16_a                 17:35:00   0
E-J-16_a                 17:40:00   0
E-J-16_a                 17:45:00   0
E-J-16_a                 17:50:00   0
E-J-16_a                 17:55:00   0
E-J-16_a                 18:00:00   0
E-J-16_a                 18:05:00   0
E-J-16_a                 18:10:00   0
E-J-16_a                 18:15:00   0
E-J-16_a                 18:20:00   0
E-J-16_a                 18:25:00   0
E-J-16_a                 18:30:00   0
E-J-16_a                 18:35:00   0
E-J-16_a                 18:40:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_a	18:45:00	0
E-J-16_a	18:50:00	0
E-J-16_a	18:55:00	0
E-J-16_a	19:00:00	0
E-J-16_a	19:05:00	0
E-J-16_a	19:10:00	0
E-J-16_a	19:15:00	0
E-J-16_a	19:20:00	0
E-J-16_a	19:25:00	0
E-J-16_a	19:30:00	0
E-J-16_a	19:35:00	0
E-J-16_a	19:40:00	0
E-J-16_a	19:45:00	0
E-J-16_a	19:50:00	0
E-J-16_a	19:55:00	0
E-J-16_a	20:00:00	0
E-J-16_a	20:05:00	0
E-J-16_a	20:10:00	0
E-J-16_a	20:15:00	0
E-J-16_a	20:20:00	0
E-J-16_a	20:25:00	0
E-J-16_a	20:30:00	0
E-J-16_a	20:35:00	0
E-J-16_a	20:40:00	0
E-J-16_a	20:45:00	0
E-J-16_a	20:50:00	0
E-J-16_a	20:55:00	0
E-J-16_a	21:00:00	0
E-J-16_a	21:05:00	0
E-J-16_a	21:10:00	0
E-J-16_a	21:15:00	0
E-J-16_a	21:20:00	0
E-J-16_a	21:25:00	0
E-J-16_a	21:30:00	0
E-J-16_a	21:35:00	0
E-J-16_a	21:40:00	0
E-J-16_a	21:45:00	0
E-J-16_a	21:50:00	0
E-J-16_a	21:55:00	0
E-J-16_a	22:00:00	0
E-J-16_a	22:05:00	0
E-J-16_a	22:10:00	0
E-J-16_a	22:15:00	0
E-J-16_a	22:20:00	0
E-J-16_a	22:25:00	0
E-J-16_a	22:30:00	0
E-J-16_a	22:35:00	0
E-J-16_a	22:40:00	0
E-J-16_a	22:45:00	0
E-J-16_a	22:50:00	0
E-J-16_a	22:55:00	0
E-J-16_a	23:00:00	0
E-J-16_a	23:05:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_a                23:10:00   0
E-J-16_a                23:15:00   0
E-J-16_a                23:20:00   0
E-J-16_a                23:25:00   0
E-J-16_a                23:30:00   0
E-J-16_a                23:35:00   0
E-J-16_a                23:40:00   0
E-J-16_a                23:45:00   0
E-J-16_a                23:50:00   0
E-J-16_a                23:55:00   0
;
E-J-16_b                0:05:00    0
E-J-16_b                0:10:00    0
E-J-16_b                0:15:00    0
E-J-16_b                0:20:00    0.948
E-J-16_b                0:25:00    3.6408
E-J-16_b                0:30:00    8.8392
E-J-16_b                0:35:00    21.96
E-J-16_b                0:40:00    34.3104
E-J-16_b                0:45:00    39.5304
E-J-16_b                0:50:00    40.1304
E-J-16_b                0:55:00    38.5848
E-J-16_b                1:00:00    36.3792
E-J-16_b                1:05:00    34.0512
E-J-16_b                1:10:00    32.2464
E-J-16_b                1:15:00    29.8056
E-J-16_b                1:20:00    26.8488
E-J-16_b                1:25:00    23.6952
E-J-16_b                1:30:00    20.652
E-J-16_b                1:35:00    18.1392
E-J-16_b                1:40:00    16.2168
E-J-16_b                1:45:00    14.6712
E-J-16_b                1:50:00    13.26
E-J-16_b                1:55:00    11.9952
E-J-16_b                2:00:00    10.7952
E-J-16_b                2:05:00    9.6648
E-J-16_b                2:10:00    8.3232
E-J-16_b                2:15:00    6.7944
E-J-16_b                2:20:00    5.388
E-J-16_b                2:25:00    4.0992
E-J-16_b                2:30:00    3.1656
E-J-16_b                2:35:00    2.4336
E-J-16_b                2:40:00    1.9248
E-J-16_b                2:45:00    1.5
E-J-16_b                2:50:00    1.1688
E-J-16_b                2:55:00    0.9
E-J-16_b                3:00:00    0.696
E-J-16_b                3:05:00    0.5496
E-J-16_b                3:10:00    0.4464
E-J-16_b                3:15:00    0.3576
E-J-16_b                3:20:00    0.2832
E-J-16_b                3:25:00    0.2184
E-J-16_b                3:30:00    0.1608
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_b	3:35:00	0.1128
E-J-16_b	3:40:00	0.0744
E-J-16_b	3:45:00	0.0432
E-J-16_b	3:50:00	0.0216
E-J-16_b	3:55:00	0.0072
E-J-16_b	4:00:00	0.0024
E-J-16_b	4:05:00	0
E-J-16_b	4:10:00	0
E-J-16_b	4:15:00	0
E-J-16_b	4:20:00	0
E-J-16_b	4:25:00	0
E-J-16_b	4:30:00	0
E-J-16_b	4:35:00	0
E-J-16_b	4:40:00	0
E-J-16_b	4:45:00	0
E-J-16_b	4:50:00	0
E-J-16_b	4:55:00	0
E-J-16_b	5:00:00	0
E-J-16_b	5:05:00	0
E-J-16_b	5:10:00	0
E-J-16_b	5:15:00	0
E-J-16_b	5:20:00	0
E-J-16_b	5:25:00	0
E-J-16_b	5:30:00	0
E-J-16_b	5:35:00	0
E-J-16_b	5:40:00	0
E-J-16_b	5:45:00	0
E-J-16_b	5:50:00	0
E-J-16_b	5:55:00	0
E-J-16_b	6:00:00	0
E-J-16_b	6:05:00	0
E-J-16_b	6:10:00	0
E-J-16_b	6:15:00	0
E-J-16_b	6:20:00	0
E-J-16_b	6:25:00	0
E-J-16_b	6:30:00	0
E-J-16_b	6:35:00	0
E-J-16_b	6:40:00	0
E-J-16_b	6:45:00	0
E-J-16_b	6:50:00	0
E-J-16_b	6:55:00	0
E-J-16_b	7:00:00	0
E-J-16_b	7:05:00	0
E-J-16_b	7:10:00	0
E-J-16_b	7:15:00	0
E-J-16_b	7:20:00	0
E-J-16_b	7:25:00	0
E-J-16_b	7:30:00	0
E-J-16_b	7:35:00	0
E-J-16_b	7:40:00	0
E-J-16_b	7:45:00	0
E-J-16_b	7:50:00	0
E-J-16_b	7:55:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_b                 8:00:00    0
E-J-16_b                 8:05:00    0
E-J-16_b                 8:10:00    0
E-J-16_b                 8:15:00    0
E-J-16_b                 8:20:00    0
E-J-16_b                 8:25:00    0
E-J-16_b                 8:30:00    0
E-J-16_b                 8:35:00    0
E-J-16_b                 8:40:00    0
E-J-16_b                 8:45:00    0
E-J-16_b                 8:50:00    0
E-J-16_b                 8:55:00    0
E-J-16_b                 9:00:00    0
E-J-16_b                 9:05:00    0
E-J-16_b                 9:10:00    0
E-J-16_b                 9:15:00    0
E-J-16_b                 9:20:00    0
E-J-16_b                 9:25:00    0
E-J-16_b                 9:30:00    0
E-J-16_b                 9:35:00    0
E-J-16_b                 9:40:00    0
E-J-16_b                 9:45:00    0
E-J-16_b                 9:50:00    0
E-J-16_b                 9:55:00    0
E-J-16_b                 10:00:00   0
E-J-16_b                 10:05:00   0
E-J-16_b                 10:10:00   0
E-J-16_b                 10:15:00   0
E-J-16_b                 10:20:00   0
E-J-16_b                 10:25:00   0
E-J-16_b                 10:30:00   0
E-J-16_b                 10:35:00   0
E-J-16_b                 10:40:00   0
E-J-16_b                 10:45:00   0
E-J-16_b                 10:50:00   0
E-J-16_b                 10:55:00   0
E-J-16_b                 11:00:00   0
E-J-16_b                 11:05:00   0
E-J-16_b                 11:10:00   0
E-J-16_b                 11:15:00   0
E-J-16_b                 11:20:00   0
E-J-16_b                 11:25:00   0
E-J-16_b                 11:30:00   0
E-J-16_b                 11:35:00   0
E-J-16_b                 11:40:00   0
E-J-16_b                 11:45:00   0
E-J-16_b                 11:50:00   0
E-J-16_b                 11:55:00   0
E-J-16_b                 12:00:00   0
E-J-16_b                 12:05:00   0
E-J-16_b                 12:10:00   0
E-J-16_b                 12:15:00   0
E-J-16_b                 12:20:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_b                 12:25:00   0
E-J-16_b                 12:30:00   0
E-J-16_b                 12:35:00   0
E-J-16_b                 12:40:00   0
E-J-16_b                 12:45:00   0
E-J-16_b                 12:50:00   0
E-J-16_b                 12:55:00   0
E-J-16_b                 13:00:00   0
E-J-16_b                 13:05:00   0
E-J-16_b                 13:10:00   0
E-J-16_b                 13:15:00   0
E-J-16_b                 13:20:00   0
E-J-16_b                 13:25:00   0
E-J-16_b                 13:30:00   0
E-J-16_b                 13:35:00   0
E-J-16_b                 13:40:00   0
E-J-16_b                 13:45:00   0
E-J-16_b                 13:50:00   0
E-J-16_b                 13:55:00   0
E-J-16_b                 14:00:00   0
E-J-16_b                 14:05:00   0
E-J-16_b                 14:10:00   0
E-J-16_b                 14:15:00   0
E-J-16_b                 14:20:00   0
E-J-16_b                 14:25:00   0
E-J-16_b                 14:30:00   0
E-J-16_b                 14:35:00   0
E-J-16_b                 14:40:00   0
E-J-16_b                 14:45:00   0
E-J-16_b                 14:50:00   0
E-J-16_b                 14:55:00   0
E-J-16_b                 15:00:00   0
E-J-16_b                 15:05:00   0
E-J-16_b                 15:10:00   0
E-J-16_b                 15:15:00   0
E-J-16_b                 15:20:00   0
E-J-16_b                 15:25:00   0
E-J-16_b                 15:30:00   0
E-J-16_b                 15:35:00   0
E-J-16_b                 15:40:00   0
E-J-16_b                 15:45:00   0
E-J-16_b                 15:50:00   0
E-J-16_b                 15:55:00   0
E-J-16_b                 16:00:00   0
E-J-16_b                 16:05:00   0
E-J-16_b                 16:10:00   0
E-J-16_b                 16:15:00   0
E-J-16_b                 16:20:00   0
E-J-16_b                 16:25:00   0
E-J-16_b                 16:30:00   0
E-J-16_b                 16:35:00   0
E-J-16_b                 16:40:00   0
E-J-16_b                 16:45:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

E-J-16_b	16:50:00	0
E-J-16_b	16:55:00	0
E-J-16_b	17:00:00	0
E-J-16_b	17:05:00	0
E-J-16_b	17:10:00	0
E-J-16_b	17:15:00	0
E-J-16_b	17:20:00	0
E-J-16_b	17:25:00	0
E-J-16_b	17:30:00	0
E-J-16_b	17:35:00	0
E-J-16_b	17:40:00	0
E-J-16_b	17:45:00	0
E-J-16_b	17:50:00	0
E-J-16_b	17:55:00	0
E-J-16_b	18:00:00	0
E-J-16_b	18:05:00	0
E-J-16_b	18:10:00	0
E-J-16_b	18:15:00	0
E-J-16_b	18:20:00	0
E-J-16_b	18:25:00	0
E-J-16_b	18:30:00	0
E-J-16_b	18:35:00	0
E-J-16_b	18:40:00	0
E-J-16_b	18:45:00	0
E-J-16_b	18:50:00	0
E-J-16_b	18:55:00	0
E-J-16_b	19:00:00	0
E-J-16_b	19:05:00	0
E-J-16_b	19:10:00	0
E-J-16_b	19:15:00	0
E-J-16_b	19:20:00	0
E-J-16_b	19:25:00	0
E-J-16_b	19:30:00	0
E-J-16_b	19:35:00	0
E-J-16_b	19:40:00	0
E-J-16_b	19:45:00	0
E-J-16_b	19:50:00	0
E-J-16_b	19:55:00	0
E-J-16_b	20:00:00	0
E-J-16_b	20:05:00	0
E-J-16_b	20:10:00	0
E-J-16_b	20:15:00	0
E-J-16_b	20:20:00	0
E-J-16_b	20:25:00	0
E-J-16_b	20:30:00	0
E-J-16_b	20:35:00	0
E-J-16_b	20:40:00	0
E-J-16_b	20:45:00	0
E-J-16_b	20:50:00	0
E-J-16_b	20:55:00	0
E-J-16_b	21:00:00	0
E-J-16_b	21:05:00	0
E-J-16_b	21:10:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
E-J-16_b                 21:15:00   0
E-J-16_b                 21:20:00   0
E-J-16_b                 21:25:00   0
E-J-16_b                 21:30:00   0
E-J-16_b                 21:35:00   0
E-J-16_b                 21:40:00   0
E-J-16_b                 21:45:00   0
E-J-16_b                 21:50:00   0
E-J-16_b                 21:55:00   0
E-J-16_b                 22:00:00   0
E-J-16_b                 22:05:00   0
E-J-16_b                 22:10:00   0
E-J-16_b                 22:15:00   0
E-J-16_b                 22:20:00   0
E-J-16_b                 22:25:00   0
E-J-16_b                 22:30:00   0
E-J-16_b                 22:35:00   0
E-J-16_b                 22:40:00   0
E-J-16_b                 22:45:00   0
E-J-16_b                 22:50:00   0
E-J-16_b                 22:55:00   0
E-J-16_b                 23:00:00   0
E-J-16_b                 23:05:00   0
E-J-16_b                 23:10:00   0
E-J-16_b                 23:15:00   0
E-J-16_b                 23:20:00   0
E-J-16_b                 23:25:00   0
E-J-16_b                 23:30:00   0
E-J-16_b                 23:35:00   0
E-J-16_b                 23:40:00   0
E-J-16_b                 23:45:00   0
E-J-16_b                 23:50:00   0
E-J-16_b                 23:55:00   0
;
D_14a                    0:05:00    0
D_14a                    0:10:00    0
D_14a                    0:15:00    0
D_14a                    0:20:00    2.54
D_14a                    0:25:00    11.02
D_14a                    0:30:00    36.2
D_14a                    0:35:00    102.62
D_14a                    0:40:00    200.98
D_14a                    0:45:00    238.55
D_14a                    0:50:00    247.75
D_14a                    0:55:00    255.66
D_14a                    1:00:00    262.58
D_14a                    1:05:00    264.01
D_14a                    1:10:00    261.79
D_14a                    1:15:00    255.46
D_14a                    1:20:00    246.32
D_14a                    1:25:00    235.63
D_14a                    1:30:00    224.27
D_14a                    1:35:00    213.29
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_14a	1:40:00	202.94
D_14a	1:45:00	193.22
D_14a	1:50:00	184.47
D_14a	1:55:00	184.39
D_14a	2:00:00	179.51
D_14a	2:05:00	168.01
D_14a	2:10:00	150.4
D_14a	2:15:00	134.22
D_14a	2:20:00	118.75
D_14a	2:25:00	104.87
D_14a	2:30:00	92.8
D_14a	2:35:00	82.19
D_14a	2:40:00	72.86
D_14a	2:45:00	64.76
D_14a	2:50:00	57.54
D_14a	2:55:00	51.03
D_14a	3:00:00	45.15
D_14a	3:05:00	40.01
D_14a	3:10:00	35.92
D_14a	3:15:00	32.5
D_14a	3:20:00	29.5
D_14a	3:25:00	26.84
D_14a	3:30:00	24.4
D_14a	3:35:00	22.13
D_14a	3:40:00	20.01
D_14a	3:45:00	18.08
D_14a	3:50:00	16.3
D_14a	3:55:00	14.53
D_14a	4:00:00	12.79
D_14a	4:05:00	11.23
D_14a	4:10:00	9.68
D_14a	4:15:00	8.1
D_14a	4:20:00	6.76
D_14a	4:25:00	5.48
D_14a	4:30:00	4.35
D_14a	4:35:00	3.4
D_14a	4:40:00	2.75
D_14a	4:45:00	2.19
D_14a	4:50:00	1.79
D_14a	4:55:00	1.48
D_14a	5:00:00	1.22
D_14a	5:05:00	1.01
D_14a	5:10:00	0.84
D_14a	5:15:00	0.71
D_14a	5:20:00	0.58
D_14a	5:25:00	0.49
D_14a	5:30:00	0.42
D_14a	5:35:00	0.36
D_14a	5:40:00	0.31
D_14a	5:45:00	0.26
D_14a	5:50:00	0.22
D_14a	5:55:00	0.19
D_14a	6:00:00	0.16

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

D_14a	6:05:00	0.13
D_14a	6:10:00	0.11
D_14a	6:15:00	0.09
D_14a	6:20:00	0.08
D_14a	6:25:00	0.06
D_14a	6:30:00	0.05
D_14a	6:35:00	0.05
D_14a	6:40:00	0.04
D_14a	6:45:00	0.03
D_14a	6:50:00	0.03
D_14a	6:55:00	0.03
D_14a	7:00:00	0.02
D_14a	7:05:00	0.02
D_14a	7:10:00	0.02
D_14a	7:15:00	0.02
D_14a	7:20:00	0.01
D_14a	7:25:00	0.01
D_14a	7:30:00	0.01
D_14a	7:35:00	0.01
D_14a	7:40:00	0.01
D_14a	7:45:00	0.01
D_14a	7:50:00	0.01
D_14a	7:55:00	0.01
D_14a	8:00:00	0.01
D_14a	8:05:00	0.01
D_14a	8:10:00	0.01
D_14a	8:15:00	0
D_14a	8:20:00	0
D_14a	8:25:00	0
D_14a	8:30:00	0
D_14a	8:35:00	0
D_14a	8:40:00	0
D_14a	8:45:00	0
D_14a	8:50:00	0
D_14a	8:55:00	0
D_14a	9:00:00	0
D_14a	9:05:00	0
D_14a	9:10:00	0
D_14a	9:15:00	0
D_14a	9:20:00	0
D_14a	9:25:00	0
D_14a	9:30:00	0
D_14a	9:35:00	0
D_14a	9:40:00	0
D_14a	9:45:00	0
D_14a	9:50:00	0
D_14a	9:55:00	0
D_14a	10:00:00	0
D_14a	10:05:00	0
D_14a	10:10:00	0
D_14a	10:15:00	0
D_14a	10:20:00	0
D_14a	10:25:00	0

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_14a                    10:30:00   0
D_14a                    10:35:00   0
D_14a                    10:40:00   0
D_14a                    10:45:00   0
D_14a                    10:50:00   0
D_14a                    10:55:00   0
D_14a                    11:00:00   0
D_14a                    11:05:00   0
D_14a                    11:10:00   0
D_14a                    11:15:00   0
D_14a                    11:20:00   0
D_14a                    11:25:00   0
D_14a                    11:30:00   0
D_14a                    11:35:00   0
D_14a                    11:40:00   0
D_14a                    11:45:00   0
D_14a                    11:50:00   0
D_14a                    11:55:00   0
D_14a                    12:00:00   0
D_14a                    12:05:00   0
D_14a                    12:10:00   0
D_14a                    12:15:00   0
D_14a                    12:20:00   0
D_14a                    12:25:00   0
D_14a                    12:30:00   0
D_14a                    12:35:00   0
D_14a                    12:40:00   0
D_14a                    12:45:00   0
D_14a                    12:50:00   0
D_14a                    12:55:00   0
D_14a                    13:00:00   0
D_14a                    13:05:00   0
D_14a                    13:10:00   0
D_14a                    13:15:00   0
D_14a                    13:20:00   0
D_14a                    13:25:00   0
D_14a                    13:30:00   0
D_14a                    13:35:00   0
D_14a                    13:40:00   0
D_14a                    13:45:00   0
D_14a                    13:50:00   0
D_14a                    13:55:00   0
D_14a                    14:00:00   0
D_14a                    14:05:00   0
D_14a                    14:10:00   0
D_14a                    14:15:00   0
D_14a                    14:20:00   0
D_14a                    14:25:00   0
D_14a                    14:30:00   0
D_14a                    14:35:00   0
D_14a                    14:40:00   0
D_14a                    14:45:00   0
D_14a                    14:50:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_14a                    14:55:00   0
D_14a                    15:00:00   0
D_14a                    15:05:00   0
D_14a                    15:10:00   0
D_14a                    15:15:00   0
D_14a                    15:20:00   0
D_14a                    15:25:00   0
D_14a                    15:30:00   0
D_14a                    15:35:00   0
D_14a                    15:40:00   0
D_14a                    15:45:00   0
D_14a                    15:50:00   0
D_14a                    15:55:00   0
D_14a                    16:00:00   0
D_14a                    16:05:00   0
D_14a                    16:10:00   0
D_14a                    16:15:00   0
D_14a                    16:20:00   0
D_14a                    16:25:00   0
D_14a                    16:30:00   0
D_14a                    16:35:00   0
D_14a                    16:40:00   0
D_14a                    16:45:00   0
D_14a                    16:50:00   0
D_14a                    16:55:00   0
D_14a                    17:00:00   0
D_14a                    17:05:00   0
D_14a                    17:10:00   0
D_14a                    17:15:00   0
D_14a                    17:20:00   0
D_14a                    17:25:00   0
D_14a                    17:30:00   0
D_14a                    17:35:00   0
D_14a                    17:40:00   0
D_14a                    17:45:00   0
D_14a                    17:50:00   0
D_14a                    17:55:00   0
D_14a                    18:00:00   0
D_14a                    18:05:00   0
D_14a                    18:10:00   0
D_14a                    18:15:00   0
D_14a                    18:20:00   0
D_14a                    18:25:00   0
D_14a                    18:30:00   0
D_14a                    18:35:00   0
D_14a                    18:40:00   0
D_14a                    18:45:00   0
D_14a                    18:50:00   0
D_14a                    18:55:00   0
D_14a                    19:00:00   0
D_14a                    19:05:00   0
D_14a                    19:10:00   0
D_14a                    19:15:00   0
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_14a                    19:20:00   0
D_14a                    19:25:00   0
D_14a                    19:30:00   0
D_14a                    19:35:00   0
D_14a                    19:40:00   0
D_14a                    19:45:00   0
D_14a                    19:50:00   0
D_14a                    19:55:00   0
D_14a                    20:00:00   0
D_14a                    20:05:00   0
D_14a                    20:10:00   0
D_14a                    20:15:00   0
D_14a                    20:20:00   0
D_14a                    20:25:00   0
D_14a                    20:30:00   0
D_14a                    20:35:00   0
D_14a                    20:40:00   0
D_14a                    20:45:00   0
D_14a                    20:50:00   0
D_14a                    20:55:00   0
D_14a                    21:00:00   0
D_14a                    21:05:00   0
D_14a                    21:10:00   0
D_14a                    21:15:00   0
D_14a                    21:20:00   0
D_14a                    21:25:00   0
D_14a                    21:30:00   0
D_14a                    21:35:00   0
D_14a                    21:40:00   0

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
D_10d            3176694.350        1695093.073
D_10b            3177506.439        1693478.148
E-J-10           3176585.491        1695008.163
D_10c            3177299.607        1695096.883
D_13a            3176505.538        1695746.944
D_10_13_a        3176073.115        1696399.900
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
D_16a            3175356.836        1699055.129
D_16b            3175370.188        1698400.874
J_15             3175990.100        1697713.244
D_14a            3177012.220        1697081.768
D_12_14          3177350.643        1695768.074
J_AR1_d          3173703.036        1694541.913
DIV72            3174047.138        1692404.931
D_10_13_b        3175688.427        1696392.662
D_AR2_b          3176305.152        1695088.601
E-J-16_b         3175294.558        1698200.521
E-J-16_a         3175430.773        1699175.999
D_16c            3174896.650        1699150.060
D_10_13_c        3175035.370        1696391.255
D_10_13_d        3174387.244        1696382.366
J_AR1_a          3173713.171        1692897.340
J_AR1_b          3173696.185        1693429.572
DIV72_DUMMY      3174132.131        1692397.854
J_AR1_c          3173738.726        1694019.364
J_Beeler         3174060.999        1692893.555
J_13th           3174047.342        1694026.381
D_AR2_a          3175696.221        1695753.942
EC_Out_19thAv    3174341.381        1697071.869
EC_Out_23rd      3174549.031        1699077.383
EC_Out_23rd_OF   3174593.539        1699012.847
J_15b            3174546.638        1698416.419
J_17thAve_Out_OF 3174143.132        1696363.352
JColfax_Alton    3173385.384        1695020.522
J14th-DIV        3173081.644        1694539.710
EC_Out_23rd_New  3174591.401        1699151.170
D_15a            3174504.030        1697701.133
J_17thAv_Out     3174225.617        1696477.726

[VERTICES]
;;Link            X-Coord            Y-Coord
;;--------------- ------------------ ------------------
S_10e            3177418.632        1693512.349
S_10e            3177361.473        1693604.684
S_10e            3177321.901        1694343.363
S_10e            3177255.947        1694448.888
S_10e            3177093.262        1694528.032
S_10e            3176807.464        1694620.367
S_10e            3176688.747        1694743.480
C_10c            3177418.632        1693609.080
C_10c            3177392.251        1694413.713
C_10c            3177115.246        1694563.207
C_10c            3176803.067        1694708.305
C_10c_2          3176604.559        1695538.220
C_13a            3176361.289        1696184.816
C_13a_2          3175935.730        1697075.882
S_15_b           3175469.956        1698717.574
S_15_c           3175679.436        1697642.979
S_15_c           3175641.605        1698315.037
S_15a            3176361.838        1697079.518
```

Table F.3 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Aurora

```
S_15a            3176348.336        1697720.898
S_10_13_b        3175345.727        1696328.538
C_AR2_e          3173392.340        1694550.727
S_AR1_a          3173917.951        1692645.920
S_10_13_a        3175824.128        1696355.151
C_15a            3176333.503        1697019.565
C_15a            3176243.823        1697663.019
S_10_13_c        3174619.098        1696304.946
C_AR1_a          3173715.059        1692417.953
S_AR1_b          3173862.272        1693214.414
S_AR1_c          3173893.114        1693770.837
18               3174045.439        1692408.968
S_AR1_d          3173835.680        1694366.622
S_Beeler         3174059.478        1694010.199


[BACKDROP]
FILE       "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\Background\Westerly_Creek_SWMM_Background.jpg"
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
[TITLE]
;;Project Title/Notes
Basis of model: Westerly Creek FHAD 100-year SWMM
Alternative Plan 3:
Revised kinematic wave model used for determining inflows to conceptual design dynamic wave model.
HLC assumed to have capacity to convey flows from Chesapeake pond out of Easterly Creek watershed.

[OPTIONS]
;;Option            Value
FLOW_UNITS          CFS
INFILTRATION        HORTON
FLOW_ROUTING        KINWAVE
LINK_OFFSETS        DEPTH
MIN_SLOPE           0
ALLOW_PONDING       NO
SKIP_STEADY_STATE   NO

START_DATE          01/01/2005
START_TIME          00:00:00
REPORT_START_DATE   01/01/2005
REPORT_START_TIME   00:00:00
END_DATE            01/02/2005
END_TIME            12:00:00
SWEEP_START         01/01
SWEEP_END           12/31
DRY_DAYS            0
REPORT_STEP         00:05:00
WET_STEP            00:05:00
DRY_STEP            00:05:00
ROUTING_STEP        0:05:00

INERTIAL_DAMPING    PARTIAL
NORMAL_FLOW_LIMITED SLOPE
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP       0.75
LENGTHENING_STEP    0
MIN_SURFAREA        12.557
MAX_TRIALS          8
HEAD_TOLERANCE      0.005
SYS_FLOW_TOL        5
LAT_FLOW_TOL        5
MINIMUM_STEP        0.5
THREADS             1

[FILES]
;;Interfacing Files
USE INFLOWS "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\CUHP\6_Fut_100yr_0mi^2_WC_FHAD_2017_NOAA14.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT        0.0
DRY_ONLY        NO
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
EC_Out_23rd      5295       1          0          0          0
;CAR4 (Westerly Creek)
EC_Out_19thAv    5310       0          0          0          0
E-J-02           5463       1          0          10         0
E-J-03           5415       1          0          10         0
E-J-04           5449.2     1          0          10         0
E-J-05           5415       1          0          10         0
E-J-06           5421.2     1          0          10         0
E-J-07           5387       1          0          0          0
E-J-08           5389       1          0          0          0
E-J-09           5409       1          0          0          0
E-J-10           5344       1          0          0          0
E-J-11           5371       1          0          0          0
E-J-12           5357       1          0          0          0
E-J-13           5315       1          0          0          0
E-J-14           5336       1          0          0          0
E-J-15           5303       1          0          0          0
;CAD8 (Westerly Creek)
E-J-16           5302       1          0          0          0
J_01a            5458       6          0          2          0
J_02a            5460       1          0          0          0
J_03a            5411       1          0          0          0
J_04a            5437       1          0          0          0
J_05_07          5396       0          0          0          0
J_05a            5415       1          0          0          0
J_06a            5421.2     1          0          0          0
;29 (Westerly Creek)
J_07a            5401       1          0          0          0
;break up flows in street upstream S_07d steeper than D/S
J_07b            5393       1          0          0          0
J_07c            5387       1          0          0          0
J_08a            5389       1          0          0          0
;Flows from 27"RCP & 48" RCP enter Heron Pond in a 4- x 4-ft RCB - since RCB will accomodate U/S flows easily, no need for another RCB element
J_08b            5381.66    1          0          0          0
J_09a            5409       1          0          0          0
;JAR5-DIV (Westerly Creek)
J_10a            5381       1          0          0          0
J_10b            5383.69    2          0          0          0
J_10c            5373.33    7.07       0          0          0
J_14a            5336       1          0          0          0
J_15a            5303       1          0          0          0
J_17thAv_Out     5322       0          0          0          0
J_7b             5384       0          0          0          0
J_AD1            964.6      0          0          0          0
J_AD3            969.2      0          0          0          0
J_AD4            966.6      0          0          0          0
J_AD7            976        0          0          0          0
J_AR1_a          984.3      0          0          0          0
J_AR2            5357       0          0          0          0
J_DE1            964.6      0          0          0          0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
J_DE2            976        0          0          0          0
J_DE3            980.9      0          0          0          0
J_DE4            984.3      0          0          0          0
J_DE5            988        0          0          0          0
J_DE6            992        0          0          0          0
J_L1             1007       0          0          0          0
J_L2             5374       0          0          0          0
J_ST1            928        0          0          0          0
J_ST2            915        0          0          0          0
J_ST3            931        0          0          0          0
J_ST4            931        0          0          0          0
J_ST5            933        0          0          0          0
J_ST6            946        0          0          0          0
J_ST7            972        0          0          0          0
J_ST8            946        0          0          0          0
J_ST9            951        0          0          0          0
23843STMH        5328.82    8.694      0          0          0
773412STMH       5318.49    6.958      0          0          0
;BRW drainage basin 100 into intersection of 6th and Dayton.
;Revised to 7a, 7b, and 5c in '08 Revised model.
;J100 purposely left "disconnected" from model.
J100             1010.51    0          0          0          0
J101             1005.01    0          0          0          0
J102             1000.01    0          0          0          0
J104             1000       0          0          0          0
J106             1007.51    0          0          0          0
J107             1002.51    0          0          0          0
J-10a1           5388.5     1          0          0          0
J111             1001.16    0          0          0          0
J113             1008.615   0          0          0          0
J11th            1000       0          0          0          0
J121             1013.865   0          0          0          0
J122             1005.865   0          0          0          0
J124             1005.865   0          0          0          0
J126             1004.585   0          0          0          0
J128             1003.66    0          0          0          0
J12th            992        0          0          0          0
J131             1015.92    0          0          0          0
J132             1016.26    0          0          0          0
J133             1013.76    0          0          0          0
J134             1009.26    0          0          0          0
J14              1000.01    0          0          0          0
J140             1005.21    0          0          0          0
J141             1005.21    0          0          0          0
J150             1013.01    0          0          0          0
J151             1008.01    0          0          0          0
J154             1003.66    0          0          0          0
J155             1001.16    0          0          0          0
J157             1001.15    0          0          0          0
J159             1000       0          0          0          0
J160             1000.01    0          0          0          0
J161             1013.76    0          0          0          0
J163             1009.26    0          0          0          0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

J165	1008.01	0	0	0	0
J166	1003.66	0	0	0	0
J167	1007.085	0	0	0	0
J168	1003.66	0	0	0	0
J169	1007.51	0	0	0	0
J16th-us	976	0	0	0	0
J170	1002.51	0	0	0	0
J171	1005.01	0	0	0	0
J17th	969.2	0	0	0	0
J19th-ds	966.6	0	0	0	0
J19th-us	966.6	0	0	0	0
J200	1031.145	0	0	0	0
J202	1031.135	0	0	0	0
J203	1025.735	0	0	0	0
J204	1025.735	0	0	0	0
J230	1023.198	0	0	0	0
J231	1023.198	0	0	0	0
J232	1024.206	0	0	0	0
J233	1025.582	0	0	0	0
J234	1022.412	0	0	0	0
J235	1019.614	0	0	0	0
J23rd	951	0	0	0	0
J24	1022.331	0	0	0	0
J242	1022.331	0	0	0	0
J245	1016.197	0	0	0	0
J247	1015.28	0	0	0	0
J248	1015.28	0	0	0	0
J25	1016.931	0	0	0	0
J251	1011.21	0	0	0	0
J252	1016.931	0	0	0	0
J253	1011.04	0	0	0	0
J254	1011.04	0	0	0	0
J26th	946	0	0	0	0
J29th	933	0	0	0	0
J31	1039.105	0	0	0	0
J311	1036.705	0	0	0	0
J314	1039.105	0	0	0	0
J315	1036.695	0	0	0	0
J32	1037.252	0	0	0	0
J33	1036.785	0	0	0	0
J33rd	928	0	0	0	0
J34	1018.235	0	0	0	0
J341	1034.985	0	0	0	0
J343	1024.235	0	0	0	0
J345	1018.235	0	0	0	0
J346	1018.235	0	0	0	0
J347	1016.135	0	0	0	0
J348	1016.135	0	0	0	0
J35	1036.705	0	0	0	0
J350	1032.335	0	0	0	0
J351	1036.695	0	0	0	0
J352	1030.455	0	0	0	0
J353	1022.735	0	0	0	0

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
J354              1013.11    0          0          0          0
J355              1036.705   0          0          0          0
J36               1023.8     0          0          0          0
J361              1030.455   0          0          0          0
J362              1027.235   0          0          0          0
J37               1016.81    0          0          0          0
J371              1019.614   0          0          0          0
J372              1016.81    0          0          0          0
J374              1014.81    0          0          0          0
J38               1024.235   0          0          0          0
J390              1016.21    0          0          0          0
J391              1016.21    0          0          0          0
J392              1013.01    0          0          0          0
J393              1008.01    0          0          0          0
J394              1016.21    0          0          0          0
J41               1008.01    0          0          0          0
J42               1018.235   0          0          0          0
J43               1022.735   0          0          0          0
J44               1013.11    0          0          0          0
J51               1013.61    0          0          0          0
J52               1005.01    0          0          0          0
J53               1005.01    0          0          0          0
J54               1011.61    0          0          0          0
J56               1013.61    0          0          0          0
J61               1013.85    0          0          0          0
J62               1009.85    0          0          0          0
J63               1007       0          0          0          0
J64               1000       0          0          0          0
J65               1000       0          0          0          0
J67               1009.85    0          0          0          0
J68               1003.4     0          0          0          0
J6th_Pipe         5372.45    0          0          0          0
J74               1006.6     0          0          0          0
J7b               5385       0          0          0          0
JL2               5374       0          0          0          0
JMLK              931        0          0          0          0
JMontview-ds      964.6      0          0          0          0
JMontview-us      964.6      0          0          0          0
J_16thAve_E       5334.64    0          0          0          0
J_HP-OUT          5375.42    10.58      0          0          0
J_15b             5300       0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;The names are derived from the swmm element IDs with ROOT_JUNCT_ appended to the front.
JSandCreek        915        NORMAL                      NO
ChesapeakeHLC     5460.2     FREE                        NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
DIV344            1024.235   C344-OVER        OVERFLOW   0          0          0          0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
DIV342          1034.985   C342-OVER       OVERFLOW   0          0         0         0
DIV135          1015.92    C135-OVER       OVERFLOW   0          0         0         0
DIV389          1001.15    C389-DIV        TABULAR    DIVCURVE_389    0         0         0         0
DIV397          1009.26    C397-DIV        TABULAR    DIVCURVE_397    0         0         0         0
DIV105          1010.51    C105-OVER       OVERFLOW   0          0         0         0
DIV376          1013.01    C376-OVER       OVERFLOW   0          0         0         0
DIV70           1009.85    C70-OVER        OVERFLOW   0          0         0         0
DIV395          1003.66    C395-DIV        TABULAR    DIVCURVE_395    0         0         0         0
DIV1            1008.01    C1-DIV          TABULAR    DIVCURVE_1      0         0         0         0
DIV164          1009.26    C164-OVER       OVERFLOW   0          0         0         0
DIV125          1005.865   C125-OVER       OVERFLOW   0          0         0         0
DIV316          1032.335   C316-OVER       OVERFLOW   0          0         0         0
DIV396          1005.21    C396-DIV        TABULAR    DIVCURVE_396    0         0         0         0
DIV71           1013.85    C71-OVER        OVERFLOW   0          0         0         0
DIV399          5384       C399-DIV        OVERFLOW   0          0         0         0
DIV162          1013.76    C162-OVER       OVERFLOW   0          0         0         0
DIV136          1016.26    C136-OVER       OVERFLOW   0          0         0         0
DIV123          1008.615   C123-OVER       OVERFLOW   0          0         0         0
J13th-DIV       988        C14th-OVER      OVERFLOW   0          0         0         0
J14th-DIV       984.3      CColf-OVER      OVERFLOW   0          0         0         0
JColfax-DIV     980.9      C16th-OVER      OVERFLOW   0          0         0         0
J16th-DIV       976        C17th-OVER      OVERFLOW   0          0         0         0
D_02a           5460.2     S_02a           TABULAR    Chspk_Pond_DS   1         0         0         0
;split flow HECRAS
D_03b           5409       S_07a           TABULAR    6thAv&Havana    1         0         0         0
D_05-07         5404       S_05_07b        TABULAR    Jamaica/Lowry   0         0         0         0
D_05a           5449       S_05a           OVERFLOW   1          0         0         0
;increase RCP from 42 to 54
D_05b           5415       S_05b           OVERFLOW   1          0         0         0
;split flow FLO-2D
D_05c           5414       S_05c           TABULAR    6thAv_Kenton    1         0         0         0
;combine flows 6th ave&Kenton SS, divert remainder onto 6th Ave street
D_05d           5414       d_05c           OVERFLOW   1          0         0         0
;discharge to 48" street flows to split flow diversion
D_06a           5421.2     d_06c           OVERFLOW   1          0         0         0
;Flow split HECRAS
D_06b           5421.2     S_09a           TABULAR    6thAv_Moline    1         0         0         0
;divert street flow in Havana to 27" RCP
D_07a           5394       S_07d           OVERFLOW   1          0         0         0
D_08a           5409       S_08a           OVERFLOW   1          0         0         0
;Cresdelmar (Westerly Creek)
D_08b           5389       S_08b           OVERFLOW   1.5        0         0         0
;Add up to 46 cfs to 42"RCP- below capacity of RCP
D_10a           5364.44    S_10d           OVERFLOW   6.15       0         0         0
D_10a1          5388.5     d_10a1          OVERFLOW   1          0         0         0
;D/S RCP 48", flow full
D_10b           5362.6     S_10e           OVERFLOW   1          0         0         0
D_10c           5352       S_10g           TABULAR    Cofax_Galena    1         0         0         0
D_10d           5344       S_10i           TABULAR    Colfax_Florence  1         0         0         0
D_11a           5371       S_11a           OVERFLOW   1          0         0         0
D_12a           5357       S_10f           OVERFLOW   1          0         0         0
D_13a           5341       S_13b1          OVERFLOW   1          0         0         0
D_14a           5336       S_15a           OVERFLOW   1          0         0         0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

D_15a	5314	S_15b	OVERFLOW	1	0	0	0		
D_03a	5409	d_03c	OVERFLOW	1	0	0	0		
D_12_14	5349	S_12_14	TABULAR	Galena/16thAv	0	0	0	0	
D_10_13	5331	d_10_13_2	TABULAR	17thAv/DelMar	0	0	0	0	
J72	1006.5	d_72	OVERFLOW	0	0	0	0		
J120	1013.865	C120_Overflow	OVERFLOW	0	0	0	0		
J127	1004.585	C127_Overflow	OVERFLOW	0	0	0	0		
J129	1003.66	C129_Overflow	OVERFLOW	0	0	0	0		
J158	1000.42	C158_Overflow	OVERFLOW	0	0	0	0		
J73	1003.4	C73_Overlfow	OVERFLOW	0	0	0	0		
J236	1022.412	C236_Overflow	OVERFLOW	0	0	0	0		
J244	1016.931	C244_Overflow	OVERFLOW	0	0	0	0		
J241	1024.206	C241_Overflow	OVERFLOW	0	0	0	0		
J243	1022.331	C243_Overflow	OVERFLOW	0	0	0	0		
J246	1016.197	C246_Overflow	OVERFLOW	0	0	0	0		
J375	1014.81	C375_Overflow	OVERFLOW	0	0	0	0		
J330	1036.785	C330_Overflow	OVERFLOW	0	0	0	0		
J320	1019.614	C320_Overflow	OVERFLOW	0	0	0	0		
J319	1023.198	C319_Overflow	OVERFLOW	0	0	0	0		
J321	1037.252	C321_Overflow	OVERFLOW	0	0	0	0		
J373	1016.81	C373_Overflow	OVERFLOW	0	0	0	0		
J57	1011.61	C57_Overflow	OVERFLOW	0	0	0	0		
J250	1011.21	C250_Overflow	OVERFLOW	0	0	0	0		
J317	1030.455	C317_Overflow	OVERFLOW	0	0	0	0		
J318	1023.8	C318_Overflow	OVERFLOW	0	0	0	0		
J322	1025.582	C322_Overflow	OVERFLOW	0	0	0	0		
J363	1027.235	C363_Overflow	OVERFLOW	0	0	0	0		
D_AR2_a	5338	S_AR2_a	OVERFLOW	0	0	0	0		
DIV72	1006.45	S_Beeler	TABULAR	11thAv_Beeler	0	0	0	0	
D_04a	5457.03	S_04b	OVERFLOW	4	0	0	0		
D_AR2_b	5351.65	S_AR2_b	OVERFLOW	0	0	0	0		
D_AR2_c	5369	S_AR2_c	OVERFLOW	0	0	0	0		
19071STMH	5304.43	19071STMH-OF	OVERFLOW	9.369	0	0	0		
19079STMH	5304.61	36717STGM-OF	OVERFLOW	10.039	0	0	0		
19097STMH	5306.42	36716STGM-OF	OVERFLOW	13.756	0	0	0		
19111STMH	5308.24	36718STGM-OF	OVERFLOW	13.493	0	0	0		
19139STMH	5309.07	36715STGM-OF	OVERFLOW	13.499	0	0	0		
19132STMH	5313.44	37764STGM-OF	OVERFLOW	9.163	0	0	0		
19134STMH	5315.66	37763STGM-OF	OVERFLOW	7.915	0	0	0		
19143STMH	5317.36	37762STGM-OF	OVERFLOW	7.613	0	0	0		
19154STMH	5320.49	37760STGM-OF	OVERFLOW	7.835	0	0	0		
19162STMH	5321.94	37759STGM-OF	OVERFLOW	7.527	0	0	0		
19171STMH	5323.1	37757STGM-OF	OVERFLOW	7.411	0	0	0		
19179STMH	5324.36	37758STGM-OF	OVERFLOW	7.035	0	0	0		
19214STMH	5324.57	37750STGM-OF	OVERFLOW	6.805	0	0	0		
20135STMH	5328.82	37673STGMF-OFE	OVERFLOW	10.184	0	0	0		
20209STFT	5329.74	37665STGM-OF	OVERFLOW	8.664	0	0	0		
20818STMH	5332.32	36939STGM-OF	OVERFLOW	8.638	0	0	0		
20841STMH	5332.52	37666STGM-OF	OVERFLOW	8.73	0	0	0		
773410STMH	5319.46	773411STMN-OF	OVERFLOW	4.806	0	0	0		
773392STMH	5320.51	773393STMN-OF	OVERFLOW	5.354	0	0	0		
773389STMH	5320.69	773391STMN-OF	OVERFLOW	5.041	0	0	0		
773052STMH	5321.85	773387STMN-OF	OVERFLOW	5.748	0	0	0		

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
773050STMH       5322.77    773051STMN-OF    OVERFLOW   8.551      0          0          0
773032STMH       5322.91    773049STMN-OF    OVERFLOW   9.173      0          0          0
407544STMH       5323.33    407544STMH-OF    OVERFLOW   11.651     0          0          0
407542STMH       5323.54    406193STGM-OF    OVERFLOW   11.935     0          0          0
407541STMH       5323.97    406197STGM-OF    OVERFLOW   12.814     0          0          0
407540STMH       5324.28    406199STGM-OF    OVERFLOW   12.858     0          0          0
405658STFT       5324.68    406200STGM-OF    OVERFLOW   12.61      0          0          0
407543STMH       5326.58    406201STGM-OF    OVERFLOW   12.1       0          0          0
405659STFT       5326.98    406205STGM-OF    OVERFLOW   11.733     0          0          0
23840STMH        5330.19    35372STGM-OF     OVERFLOW   8.223      0          0          0
23841STMH        5330.48    35370STGM-OF     OVERFLOW   8.305      0          0          0
23839STMH        5333.38    35369STGM-OF     OVERFLOW   7.559      0          0          0
23845STMH        5335.33    35368STGM-OF     OVERFLOW   6.982      0          0          0
23856STMH        5339.16    35363STGM-OF     OVERFLOW   6.555      0          0          0
23855STMH        5339.55    35362STGM-OF     OVERFLOW   6.367      0          0          0
23862STMH        5341.65    35358STGM-OF     OVERFLOW   6.487      0          0          0
23861STMH        5341.79    35357STGM-OF     OVERFLOW   6.539      0          0          0
23868STMH        5343.15    35355STGM-OF     OVERFLOW   7.42       0          0          0
24791STMH        5337.7     35191STGM-OF     OVERFLOW   3.864      0          0          0
24800STMH        5341.13    35326STGM-OF     OVERFLOW   4.648      0          0          0
24788STMH        5341.35    35325STGM-OF     OVERFLOW   4.772      0          0          0
24796STMH        5342.67    35329STGM-OF     OVERFLOW   4.897      0          0          0
24797STIL        5343.91    35328STGM-OF     OVERFLOW   5.209      0          0          0
23849STMH        5337.72    35365STGM-OF     OVERFLOW   6.657      0          0          0
23852STMH        5335.67    35367STGM-OF     OVERFLOW   7.2        0          0          0
19150STMH        5318.95    37761STGM-OF_BHI OVERFLOW   7.866      0          0          0
407546STMH       5328.26    406206STGM-OF_BHI OVERFLOW   11.773     0          0          0
D_16a            5308       S_15_a           OVERFLOW   1          0          0          0
D_16b            5312       d_15_b           OVERFLOW   1          0          0          0
J_EC_Colfax_Out  5343       C_EC_Colfax_Out  OVERFLOW   1          0          0          0
D_AR1            1008.165   S_AR1_d          OVERFLOW   0          0          0          0
J_AR1_d          1005.4     S_AR1_c          OVERFLOW   0          0          0          0
J_AR1_b          989.8      S_AR1_a          OVERFLOW   0          0          0          0
D_04b            5440.1     C_04c            TABULAR    1st/HavanaPnd    5          0          0          0
D_16b2           5312       S_15_b           OVERFLOW   0          0          0          0
D_10_13_2        5331       S_13b2           OVERFLOW   0          0          0          0
J_15             5323       S_15_c           OVERFLOW   0          0          0          0
D_10_13_3        5331       S_10_13          OVERFLOW   0          0          0          0
E-J-01           5467       d_01a            OVERFLOW   1          0          0          0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------          -------- --------
;Because SWMM uses Stage-Area and Stage-Discharge, a sythetic
;rectangular basin has been generated to substitute for the
;volume of the system. The artificial pond is a rectangular
;prism with a cross-section of 1 acre. This creates a pond such
;that every 1 foot of stage equals 1 acre foot of volume. This
;is particularlly handy in the sense that it allows us to equate
;volume directly to stage. Also, the rectangular shape allows for
;the proper use of linier interpolation on the pond stage (and
;consequently volume), and as such, the results should reasonably
;mimic those of UDSWMM. Please note that CUHP objects will not
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
;appear on the map, as it is impossible to determine their placement.
RES30            1036.705 1297       0          FUNCTIONAL 0         0         43560    0        0
RES201           1031.145 950000     0          FUNCTIONAL 0         0         43560    0        0
RES130           1000.01  70000      0          FUNCTIONAL 0         0         43560    0        0
RES156           1001.16  709        0          FUNCTIONAL 0         0         43560    0        0
HavanaPnd        5375.42  13         0          TABULAR    HavanaPark                    0        0
1st/HavanaPnd    5436.06  20         0          TABULAR    1st/HavanaREV                 0        0
ChesapeakePnd    5449.4   20         0          TABULAR    ChesapeakePnd                 0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
C_03a            D_03a            J7b              2438.93    0.019      0          0          0          235
;Increase Manning's n by 25% of engineered conveyance elements.
C_05a            D_05a            D_05b            2449.8     0.019      0          0          0          71
C_05b            D_05b            D_05d            193.7      0.019      0          0          0          140
C_05c            D_05d            D_03a            1131       0.019      0          0          0          140
;6th Ave
C_06a            D_06a            D_05d            1582.84    0.019      0          0          0          95
C_07a            D_07a            D_08b            815.55     0.019      0          0          0          24
C_08a            D_08a            J_08a            2002.62    0.019      0          0          0          101
C_08b            D_08b            J_08b            132.3      0.011      0          0          0          185.09
C_10a            J_10c            D_10a            753        0.013      0          0          0          0
C_10b            D_10a            D_10b            886.51     0.019      0          0          0          46
C_10c            D_10b            D_13a            2675.35    0.019      0          0          0          101
C_11a            D_11a            D_12a            1687.56    0.019      0          0          0          101
C_13a            D_13a            D_10_13_3        1030.28    0.019      0          0          0          139
;Galena/ Fulton
C_14a            D_12a            J_14a            2956.51    0.019      0          0          0          139
;Montview
C_15a            D_14a            D_15a            3128.33    0.019      0          0          0          237
C_15b            D_15a            J_15a            1216.95    0.019      0          0          0          325
C_16a            E-J-16           EC_Out_23rd      95.8       0.02       0          0          0          0
C_16thAv         D_AR2_a          J_16thAve_E      1680       0.013      0          0          0          0
C_JL2            JL2              J61              400        0.01       0          0          0          0
C1               DIV1             J151             1          .01        0          0          0          0
C101             J101             J171             1          .01        0          0          0          0
C102             J102             J160             1          .01        0          0          0          0
C104             J104             J159             1          .01        0          0          0          0
C105             DIV105           J151             250        0.04       0          0          0          0
C105-OVER        DIV105           J151             250        0.04       0          0          0          0
C106             J106             J169             1          .01        0          0          0          0
C107             J107             J170             1          .01        0          0          0          0
C111             J111             RES156           1          .01        0          0          0          0
C113             J113             DIV123           1          .01        0          0          0          0
C120             J120             J113             1050       0.019      0          0          0          0
C120_Overflow    J120             J113             1050       0.020      0          0          0          0
C121             J121             J120             1          .01        0          0          0          0
C122             J122             J124             1          .01        0          0          0          0
C123             DIV123           J124             550        0.019      0          0          0          0
C123-OVER        DIV123           J124             550        0.020      0          0          0          0
C124             J124             DIV125           1          .01        0          0          0          0
C125             DIV125           J126             320        0.019      0          0          0          0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C125-OVER	DIV125	J126	320	0.020	0	0	0	0
C126	J126	J127	1	.01	0	0	0	0
C127	J127	J128	185	0.019	0	0	0	0
C127_Overflow	J127	J128	185	0.020	0	0	0	0
C128	J128	DIV395	1	.01	0	0	0	0
C129	J129	J107	230	0.019	0	0	0	0
C129_Overflow	J129	J107	400	0.01	0	0	0	0
C12th	J11th	J12th	1029	.044	0	0	0	0
C131	J131	DIV135	1	.01	0	0	0	0
C132	J132	DIV136	1	.01	0	0	0	0
C133	J133	J161	1	.01	0	0	0	0
C134	J134	J163	1	.01	0	0	0	0
C135	DIV135	J161	540	0.019	0	0	0	0
C135-OVER	DIV135	J161	540	0.02	0	0	0	0
C136	DIV136	J161	500	0.019	0	0	0	0
C136-OVER	DIV136	J161	500	0.02	0	0	0	0
C13th	J12th	J13th-DIV	647	.044	0	0	0	0
C14	J14	RES130	1	.01	0	0	0	0
C140	J140	DIV396	1	.01	0	0	0	0
C141	J141	J107	540	0.019	0	0	0	0
C14th	J13th-DIV	J14th-DIV	737	.019	0	0	0	0
C14th-OVER	J13th-DIV	J14th-DIV	737	0.040	0	0	0	0
C150	J150	DIV376	1	.01	0	0	0	0
C151	J151	J165	1	.01	0	0	0	0
C154	J154	J128	1	.01	0	0	0	0
C155	J155	RES156	1	.01	0	0	0	0
C157	J157	J104	230	0.019	0	0	0	0
C158	J158	J159	60	0.019	0	0	0	0
C158_Overflow	J158	J159	60	0.01	0	0	0	0
C159	J159	J11th	1	.01	0	0	0	0
C160	J160	RES130	1	.01	0	0	0	0
C161	J161	DIV162	1	.01	0	0	0	0
C162	DIV162	J163	900	0.019	0	0	0	0
C162-OVER	DIV162	J163	900	0.02	0	0	0	0
C163	J163	DIV397	1	.01	0	0	0	0
C164	DIV164	J106	350	0.019	0	0	0	0
C164-OVER	DIV164	J106	350	.02	0	0	0	0
C165	J165	J101	300	0.044	0	0	0	0
C166	J166	RES156	250	0.044	0	0	0	0
C167	J167	J126	250	0.04	0	0	0	0
C168	J168	RES156	250	0.044	0	0	0	0
C169	J169	J101	250	0.044	0	0	0	0
C16th	JColfax-DIV	J16th-us	450	.044	0	0	0	0
C16th2	J16th-us	J16th-DIV	1	0.01	0	0	0	0
C16th-OVER	JColfax-DIV	J16th-us	450	0.04	0	0	0	0
C170	J170	J102	250	0.044	0	0	0	0
C171	J171	J102	500	0.044	0	0	0	0
C17th	J16th-DIV	J17th	1358	0.019	0	0	0	0
C17th-OVER	J16th-DIV	J17th	1358	0.044	0	0	0	0
C19th	J17th	J19th-us	661	0.044	0	0	0	0
C19th2	J19th-us	J19th-ds	1	0.01	0	0	0	0
C1-DIV	DIV1	J57	1	.01	4.599976	0	0	0
C20	J6th_Pipe	DIV105	400	0.01	0	0	0	0

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
C200            J200            RES201          1         .01       0         0         0         0
C202            J202            J203            900       0.015     0         0         0         0
C203            J203            J204            1         .01       0         0         0         0
;Overflow elements are now comprised by 2 conduits and 1 divider.
;The additional conduit will have -OVERFLOW appended.
;Diversion elements areo now comprised by 2 conduits and 1 divider.
;The additional conduit will have -DIV appended.
C204            J204            J345            1250      0.035     0         0         0         0
C230            J230            J319            1         .01       0         0         0         0
C231            J231            J230            1         .01       0         0         0         0
C232            J232            J241            1         .01       0         0         0         0
C233            J233            J322            1         .01       0         0         0         0
C234            J234            J236            1         .01       0         0         0         0
C235            J235            J320            1         .01       0         0         0         0
C236            J236            J390            886       0.019     0         0         0         0
C236_Overflow   J236            J390            886       0.02      0         0         0         0
C23rd           JMontview-ds    J23rd           1683      0.044     0         0         0         0
C24             J24             J242            1         .01       0         0         0         0
C241            J241            J242            750       0.019     0         0         0         0
C241_Overflow   J241            J242            750       0.02      0         0         0         0
C242            J242            J243            1         .01       0         0         0         0
C243            J243            J25             1200      0.019     0         0         0         0
C243_Overflow   J243            J25             1200      0.02      0         0         0         0
C244            J244            J245            144       0.019     0         0         0         0
C244_Overflow   J244            J245            144       0.02      0         0         0         0
C245            J245            J246            1         .01       0         0         0         0
C246            J246            J247            382       0.019     0         0         0         0
C246_Overflow   J246            J247            382       .02       0         0         0         0
C247            J247            J248            1         .01       0         0         0         0
C248            J248            J253            212       0.019     0         0         0         0
C25             J25             J244            1         .01       0         0         0         0
C250            J250            J151            800       0.019     0         0         0         0
C250_Overflow   J250            J151            800       0.02      0         0         0         0
C251            J251            J250            1         .01       0         0         0         0
C252            J252            J25             1         .01       0         0         0         0
C253            J253            J254            1         .01       0         0         0         0
C254            J254            J151            505       0.044     0         0         0         0
C26th           J23rd           J26th           1020      0.044     0         0         0         0
C29th           J26th           J29th           2077      0.044     0         0         0         0
C31             J31             J314            1         .01       0         0         0         0
C311            J311            J355            1         .01       0         0         0         0
C314            J314            J355            800       0.035     0         0         0         0
C315            J315            J350            1090      0.019     0         0         0         0
C316            DIV316          J352            470       0.019     0         0         0         0
C316-OVER       DIV316          J352            470       0.044     0         0         0         0
C317            J317            J36             765       0.019     0         0         0         0
C318            J318            J230            188       0.019     0         0         0         0
C319            J319            J235            1120      0.019     0         0         0         0
C319_Overflow   J319            J235            1120      0.02      0         0         0         0
C32             J32             J321            1         .01       0         0         0         0
C320            J320            J372            701       0.019     0         0         0         0
C320_Overflow   J320            J372            701       0.02      0         0         0         0
C321            J321            J341            687       0.019     0         0         0         0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
C321_Overflow    J321            J341            687       0.02      0         0         0         0
C322             J322            J36             594       0.019     0         0         0         0
C33              J33             J330            1         .01       0         0         0         0
C330             J330            J341            600       0.019     0         0         0         0
C330_Overflow    J330            J341            600       0.02      0         0         0         0
C34              J34             J345            1         .01       0         0         0         0
C341             J341            DIV342          1         .01       0         0         0         0
C342             DIV342          J343            2150      0.019     0         0         0         0
C342-OVER        DIV342          J343            2150      0.03      0         0         0         0
C343             J343            DIV344          1         .01       0         0         0         0
C344             DIV344          J345            1200      0.019     0         0         0         0
C344-OVER        DIV344          J345            1200      0.03      0         0         0         0
C345             J345            J346            1         .01       0         0         0         0
C346             J346            J347            700       0.035     0         0         0         0
C347             J347            J348            1         .01       0         0         0         0
C348             J348            J150            1250      0.035     0         0         0         0
C35              J35             J355            1         .01       0         0         0         0
C350             J350            DIV316          1         .01       0         0         0         0
C351             J351            J315            1         .01       0         0         0         0
C352             J352            J317            1         .01       0         0         0         0
C353             J353            J345            1500      0.035     0         0         0         0
C354             J354            J151            1700      0.019     0         0         0         0
C355             J355            RES30           1         .01       0         0         0         0
C36              J36             J318            1         .01       0         0         0         0
C361             J361            J352            1         .01       0         0         0         0
C362             J362            J363            1         .01       0         0         0         0
C363             J363            J343            1000      0.019     0         0         0         0
C37              J37             J372            1         .01       0         0         0         0
C371             J371            J235            1         .01       0         0         0         0
C372             J372            J373            1         .01       0         0         0         0
C373             J373            J374            500       0.019     0         0         0         0
C373_Overflow    J373            J374            500       0.02      0         0         0         0
C374             J374            J375            1         .01       0         0         0         0
C375             J375            J150            450       0.019     0         0         0         0
C375_Overflow    J375            J150            450       0.02      0         0         0         0
C376             DIV376          J151            1250      0.019     0         0         0         0
C376-OVER        DIV376          J151            1250      0.044     0         0         0         0
C38              J38             J343            1         .01       0         0         0         0
C389             DIV389          J157            1         .01       0         0         0         0
C389-DIV         DIV389          J158            1         .01       0         0         0         0
C390             J390            J394            1         .01       0         0         0         0
C391             J391            J390            1         .01       0         0         0         0
C392             J392            J150            1         .01       0         0         0         0
C393             J393            J151            1         .01       0         0         0         0
C394             J394            J374            350       0.019     0         0         0         0
C395             DIV395          J129            1         .01       0         0         0         0
C395-DIV         DIV395          J168            1         .01       0         0         0         0
C396             DIV396          J141            1         .01       0         0         0         0
C396-DIV         DIV396          J167            1         .01       2.875     0         0         0
C397             DIV397          DIV164          1         .01       0         0         0         0
C397-DIV         DIV397          J166            1         .01       0         0         0         0
;Manning's n was not increased by 25% to maximize 72-inch pipe capacity for determining split flow into H.E.A.T.
C399             DIV399          J6th_Pipe       3850      .013      0         0         0         0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C399-DIV	DIV399	JL2	1550	.040	0	0	0	0
C41	J41	J151	1	.01	0	0	0	0
C42	J42	J345	1	.01	0	0	0	0
C43	J43	J353	1	.01	0	0	0	0
C44	J44	J354	1	.01	0	0	0	0
C51	J51	J56	1	.01	0	0	0	0
C52	J52	J101	1	.01	0	0	0	0
C53	J53	J101	1	.01	0	0	0	0
C54	J54	J57	1	.01	0	0	0	0
C56	J56	DIV1	1400	0.019	0	0	0	0
C57	J57	J151	900	0.019	0	0	0	0
C57_Overflow	J57	J151	900	0.02	0	0	0	0
C61	J61	DIV71	1	.01	0	0	0	0
C62	J62	J67	1	.01	0	0	0	0
C63	J63	J72	1	.01	0	0	0	0
C64	J64	J65	1	.01	0	0	0	0
C65	J65	J104	1	.01	0	0	0	0
C67	J67	DIV70	1	.01	0	0	0	0
C68	J68	J73	1	.01	0	0	0	0
C70	DIV70	J74	860	0.019	0	0	0	0
C70-OVER	DIV70	J74	860	0.020	0	0	0	0
C71	DIV71	J67	800	0.019	0	0	0	0
C71-OVER	DIV71	J67	800	0.020	0	0	0	0
;Existing 42" pipe with zero slope per GIS data, however, the slope from MDP 2010 is used.								
;Manning's n was not increased by 25% for flow diversion analysis.								
C72	J72	J68	775	0.013	0	0	0	0
;48" CMP								
C73	J73	J65	1066	0.03	0	0	0	0
C73_Overlfow	J73	J65	850	0.01	0	0	0	0
C74	J74	J72	1	.01	0	0	0	0
CAD1	J_AD1	JMontview-us	1	0.01	0	0	0	0
CAD3	J_AD3	J17th	1	0.01	0	0	0	0
CAD4	J_AD4	J19th-us	1	0.01	0	0	0	0
CAD7	J_AD7	J16th-us	1	0.01	0	0	0	0
CAR1	J_AR1_a	J14th-DIV	1	0.01	0	0	0	0
CColfax	J14th-DIV	JColfax-DIV	686	.019	0	0	0	0
CColf-OVER	J14th-DIV	JColfax-DIV	686	0.040	0	0	0	0
CCPark	JMLK	J33rd	1164	0.044	0	0	0	0
CDE1	J_DE1	20841STMH	1	0.01	0	0	0	0
CDE2	J_DE2	773032STMH	1	0.01	0	0	0	0
CDE3	J_DE3	JColfax-DIV	1	0.01	0	0	0	0
CDE4	J_DE4	407546STMH	1	0.01	0	0	0	0
CDE5	J_DE5	23868STMH	1	0.01	0	0	0	0
CDE6	J_DE6	24797STIL	1	0.01	0	0	0	0
CDIV7b	J7b	DIV399	400	0.01	0	0	0	0
CJ_L1	J_L1	J72	400	0.01	0	0	0	0
CJ7b	J_7b	J7b	400	0.01	0	0	0	0
CJL2	J_L2	JL2	400	0.01	0	0	0	0
CMLK	J29th	JMLK	581	0.044	0	0	0	0
CMontview	J19th-ds	JMontview-us	651	0.044	0	0	0	0
CMontview2	JMontview-us	JMontview-ds	1	0.01	0	0	0	0
CSandCreek	J33rd	JSandCreek	2222	0.044	0	0	0	0
CST1	J_ST1	J33rd	1	0.01	0	0	0	0

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

CST2	J_ST2	JSandCreek	1	0.01	0	0	0	0
CST3	J_ST3	JMLK	1	0.01	0	0	0	0
CST4	J_ST4	JMLK	1	0.01	0	0	0	0
CST5	J_ST5	J29th	1	0.01	0	0	0	0
CST6	J_ST6	J26th	1	0.01	0	0	0	0
CST7	J_ST7	J26th	2336	0.044	0	0	0	0
CST8	J_ST8	J26th	1	0.01	0	0	0	0
CST9	J_ST9	J23rd	1	0.01	0	0	0	0
d_01a	E-J-01	J_01a	210.16	0.01	0	5	0	0
d_02a	E-J-02	ChesapeakePnd	180.32	0.01	0	0	0	0
d_02b	D_02a	J_02a	1449.89	0.01	0	0	0	0
d_03a	E-J-03	J_03a	122.45	0.01	0	0	0	0
d_03b	J_03a	D_03a	156.31	0.01	0	0	0	0
d_03c	D_03a	D_03b	24.36	0.01	0	0	0	0
d_04b	E-J-04	D_04b	34.17	0.01	0	0	0	0
d_04d	J_04a	D_05a	9.97	0.01	0	0	0	0
d_05a	E-J-05	J_05a	82.72	0.01	0	0	0	0
d_05b	J_05a	D_05b	2.47	0.01	0	0	0	0
d_05c	D_05d	D_05c	5.17	0.01	0	0	0	0
d_06a	E-J-06	J_06a	10.71	0.01	0	0	0	0
d_06b	J_06a	D_06a	2.64	0.01	0	0	0	0
d_06c	D_06a	D_06b	4.4	0.01	0	0	0	0
d_07b	E-J-07	J_07c	50.84	0.01	0	0	0	0
d_08a	E-J-08	J_08a	157.2	0.01	0	0	0	0
d_08b	J_08a	D_08b	31.61	0.01	0	0	0	0
d_08c	J_08b	HavanaPnd	238.76	0.01	0	0	0	0
d_09a	E-J-09	J_09a	56.19	0.01	0	0	0	0
d_09b	J_09a	D_08a	11.44	0.01	0	0	0	0
d_10a	E-J-10	D_10d	48.16	0.01	0	0	0	0
d_10a1	D_10a1	HavanaPnd	255.05	0.01	0	0	0	0
d_10a2	D_10a1	J-10a1	47.06	0.01	0	0	0	0
d_11a	E-J-11	D_11a	89.25	0.01	0	0	0	0
d_12a	E-J-12	D_12a	103.6	0.01	0	0	0	0
d_13a	E-J-13	EC_Out_19thAv	235.9	0.01	0	0	0	0
d_14a	E-J-14	J_14a	584.55	0.01	0	0	0	0
d_14b	J_14a	D_14a	22.68	0.01	0	0	0	0
d_15a	E-J-15	J_15a	72.41	0.01	0	0	0	0
d_17thAv	J_17thAv_Out	J17th	400	0.01	0	0	0	0
d_EC_Out_23rd	EC_Out_23rd	J23rd	71.05	0.01	0	0	0	0
d_EC_Out_19thAv	EC_Out_19thAv	J19th-ds	400	0.01	0	0	0	0
;overflow path west of Highline for E02 between Hihline and raised elevation at homes								
;Raise Manning's n to 0.15 considering vegetation, fences and structures								
S_02a	D_02a	J_01a	1034.82	0.1	0	0	0	0
;6th Ave								
S_03a	D_03b	J7b	2422.91	0.01	0	0	0	0
S_05_07a	D_05-07	J_05_07	758	0.01	0	0	0	0
S_05_07b	D_05-07	J_08a	1280	0.01	0	0	0	0
;Kenton								
S_05a	D_05a	J_05a	2456	0.01	0	0	0	0
S_05b	D_05b	D_05d	199.6	0.01	0	0	0	0
S_05c	D_05c	D_05-07	1300	0.01	0	0	0	0
;6th Ave								
S_05d	D_05c	D_03a	1120.05	0.01	0	0	0	0

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
;Park East Rd
S_06a            J_02a            J_06a            3268.93    0.01       0          0          0          0
S_06b            D_06b            D_05d            1349.1     0.01       0          0          0          0
S_07a            D_03b            J_07a            241.03     0.01       0          0          0          0
;Havana
S_07b            J_07a            J_05_07          756        0.01       0          0          0          0
S_07b2           J_05_07          D_07a            1015.59    0.01       0          0          0          0
S_07d            D_07a            J_07b            98.37      0.01       0          0          0          0
;10th Ave
S_07e            J_07b            J_07c            762.46     0.01       0          0          0          0
;Del Mar
S_08a            D_08a            J_08a            2002.69    0.01       0          0          0          0
S_08b            D_08b            D_10a1           29.48      0.01       0          0          0          0
;Moline St
S_09a            D_06b            J_09a            1335.64    0.01       0          0          0          0
S_10_13          D_10_13_3        J_17thAv_Out     1689       0.01       0          0          0          0
S_10a            J_10b            J_10a            194.52     0.01       0          0          0          0
S_10a1           J-10a1           J_10a            701.05     0.01       0          0          0          0
S_10b            J_10a            D_10a            800.87     0.01       0          0          0          0
;Flows from Havana reenter DelMar at Hanover
;Assume 42" RCP flowing full D/S (probably actually full at Geneva next block D/S)
S_10c            J_07c            D_10a            1481.34    0.01       0          0          0          0
;Del Mar
S_10d            D_10a            D_10b            814.55     0.01       0          0          0          0
;Del Mar
S_10e            D_10b            D_10d            2003.13    0.01       0          0          0          0
;Colfax
S_10f            D_12a            D_10c            671.65     0.01       0          0          0          0
;Colfax
S_10g            D_10c            D_10d            653.48     0.01       0          0          0          0
S_10i            D_10d            J_EC_Colfax_Out  1914.74    0.01       0          0          0          0
;Hanover
S_11a            D_11a            D_12a            1673.04    0.01       0          0          0          0
S_12_14          D_12_14          D_13a            400        0.01       0          0          0          0
;Florence
S_13a            D_10d            D_13a            671.79     0.01       0          0          0          0
S_13b1           D_13a            D_10_13          972        0.01       0          0          0          0
;Del Mar/ 19th
S_13b2           D_10_13_2        J_15             1310       0.01       0          0          0          0
S_14a1           D_10c            D_12_14          665        0.01       0          0          0          0
S_14a2           D_12_14          J_14a            1660.01    0.01       0          0          0          0
S_15a            D_14a            J_15             1640       0.01       0          0          0          0
S_15b            D_15a            J_15b            1286.74    0.02       0          0          0          0
S_15c            J_15b            EC_Out_23rd      105.3      0.02       0          0          0          0
S_Beeler         DIV72            D_AR1            500        0.01       0          0          0          0
C317_Overflow    J317             J36              765        0.02       0          0          0          0
C318_Overflow    J318             J230             188        0.02       0          0          0          0
C322_Overflow    J322             J36              594        0.02       0          0          0          0
C363_Overflow    J363             J343             1000       0.035      0          0          0          0
C_EC_Colfax_Out  J_EC_Colfax_Out  D_AR2_a          1632       0.01       0          0          0          0
S_AR2_a          D_AR2_a          D_10_13          720        0.01       0          0          0          0
d_16thAve_E      J_16thAve_E      J16th-DIV        400        0.01       0          0          0          0
d_72             J72              DIV72            400        0.01       0          0          0          0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
C72_Overflow     DIV72           J68             775       0.01      0         0         0         0
C_04b            D_04a           D_04b           2000      0.013     0         0         0         131.5
S_04a            J_01a           D_04a           632.95    0.01      0         0         0         0
d_04c            D_04b           1st/HavanaPnd   400       0.01      0         0         0         0
C_04c            D_04b           J_04a           360       0.013     0         0         0         0
S_04b            D_04a           J_04a           400       0.01      0         0         0         0
C_AR2_b          D_AR2_b         D_AR2_a         1638      0.019     0         0         0         140
S_AR2_b          D_AR2_b         D_AR2_a         1638      0.01      0         0         0         0
S_AR2_c          D_AR2_c         D_AR2_b         400       0.01      0         0         0         0
C_AR2_c          D_AR2_c         D_AR2_b         1348      0.01      0         0         0         137
S_AR2_d          J_AR2           D_AR2_c         400       0.01      0         0         0         0
19071STMH        19071STMH       JMontview-ds    64.055    0.019     0         0         0         0
19071STMH-OF     19071STMH       JMontview-ds    64.055    0.021     0         0         0         0
;4.76' - 15" - RCP - 1%
35191STGM        24791STMH       J11th           4.76      0.019     0         0         0         0
35191STGM-OF     24791STMH       J11th           4.76      0.01      0         0         0         0
;35.' - 15" - .35%
35325STGM        24788STMH       24800STMH       35        0.019     0         0         0         0
35325STGM-OF     24788STMH       24800STMH       35        0.01      0         0         0         0
;343' - 15" - RCP - 1%
35326STGM        24800STMH       24791STMH       343       0.019     0         0         0         0
35326STGM-OF     24800STMH       24791STMH       343       0.01      0         0         0         0
;322.67' - 15" - RCP - 0.35%
35328STGM        24797STIL       24796STMH       322.67    0.019     0         0         0         0
35328STGM-OF     24797STIL       24796STMH       322.67    0.01      0         0         0         0
;346.42' - 15" - RCP - 0.35%
35329STGM        24796STMH       24788STMH       346.42    0.019     0         0         0         0
35329STGM-OF     24796STMH       24788STMH       346.42    0.01      0         0         0         0
;276.22' - 42" - RCP - .45%
35355STGM        23868STMH       23861STMH       276.22    0.019     0         0         0         0
35355STGM-OF     23868STMH       23861STMH       276.22    0.01      0         0         0         0
;37.52' - 42" - RCP - 0.67%
35357STGM        23861STMH       23862STMH       37.52     0.019     0         0         0         0
35357STGM-OF     23861STMH       23862STMH       37.52     0.01      0         0         0         0
;318.84' - 42" - RCP - 0.47%
35358STGM        23862STMH       23855STMH       318.84    0.019     0         0         0         0
35358STGM-OF     23862STMH       23855STMH       318.84    0.01      0         0         0         0
;30.' - 42" - RCP - .52%
35362STGM        23855STMH       23856STMH       30        0.019     0         0         0         0
35362STGM-OF     23855STMH       23856STMH       30        0.01      0         0         0         0
;291.13' - 42" - RCP - .45%
35363STGM        23856STMH       23849STMH       291.13    0.019     0         0         0         0
35363STGM-OF     23856STMH       23849STMH       291.13    0.01      0         0         0         0
;326.65' - 42" - RCP - .63%
35365STGM        23849STMH       23852STMH       326.65    0.019     0         0         0         0
35365STGM-OF     23849STMH       23852STMH       326.65    0.01      0         0         0         0
;56.7' - 42" - RCP - .6%
35367STGM        23852STMH       23845STMH       56.7      0.019     0         0         0         0
35367STGM-OF     23852STMH       407546STMH      536.006   0.01      0         0         0         0
;287.08' - 42" - RCP - .64%
35368STGM        23845STMH       23839STMH       287.08    0.019     0         0         0         0
35368STGM-OF     23845STMH       23839STMH       287.08    0.01      0         0         0         0
;325.87' - 42" - RCP - .58%
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
35369STGM        23839STMH        23841STMH        325.87     0.019      0          0          0          0
35369STGM-OF     23839STMH        23841STMH        325.87     0.01       0          0          0          0
;53.48' - 34" - RCP - .82%
35370STGM        23841STMH        23840STMH        53.48      0.019      0          0          0          0
35370STGM-OF     23841STMH        23840STMH        53.48      0.01       0          0          0          0
;143.76' - 48" - RCP - .31%
35371STGM        23843STMH        J13th-DIV        143.76     0.019      0          0          0          0
;136.61' - 48" - RCP - 1.%
35372STGM        23840STMH        23843STMH        136.61     0.019      0          0          0          0
35372STGM-OF     23840STMH        23843STMH        136.61     0.01       0          0          0          0
;92.' - 60" - RCP - .41%
36715STGM        19139STMH        19111STMH        92         0.019      0          0          0          0
36715STGM-OF     19139STMH        19111STMH        92         0.01       0          0          0          0
;581.' - 60" - RCP - .28%
36716STGM        19097STMH        19079STMH        581        0.019      0          0          0          0
36716STGM-OF     19097STMH        19079STMH        581        0.01       0          0          0          0
;18.5' - 60" - RCP - .38%
36717STGM        19079STMH        19071STMH        18.5       0.019      0          0          0          0
36717STGM-OF     19079STMH        19071STMH        18.5       0.01       0          0          0          0
;552.7' - 60" - RCP - .31%
36718STGM        19111STMH        19097STMH        552.7      0.019      0          0          0          0
36718STGM-OF     19111STMH        19097STMH        552.7      0.01       0          0          0          0
;572' - 48" - RCP - 0.52%
36939STGM        20818STMH        20209STFT        572        0.019      0          0          0          0
36939STGM-OF     20818STMH        20209STFT        572        0.01       0          0          0          0
;46' - 48" - RCP - 0.91%
37665STGM        20209STFT        20135STMH        46         0.019      0          0          0          0
37665STGM-OF     20209STFT        20135STMH        46         0.01       0          0          0          0
;44' - 48" - RCP - 0.5%
37666STGM        20841STMH        20818STMH        44         0.019      0          0          0          0
37666STGM-OF     20841STMH        20818STMH        44         0.01       0          0          0          0
;630.' - 48" - RCP - .59%
37673STGM        20135STMH        19214STMH        630        0.019      0          0          0          0
37673STGMF-OFE   20135STMH        19162STMH        1312.732   0.01       0          0          0          0
;39.2' - 54" - RCP - .1%
37750STGM        19214STMH        19179STMH        39.2       0.019      0          0          0          0
37750STGM-OF     19214STMH        19179STMH        39.2       0.01       0          0          0          0
;317.3' - 54" - RCP - .38%
37757STGM        19171STMH        19162STMH        317.3      0.019      0          0          0          0
37757STGM-OF     19171STMH        19162STMH        317.3      0.01       0          0          0          0
;316.5' - 54" - RCP - .4%
37758STGM        19179STMH        19171STMH        316.5      0.019      0          0          0          0
37758STGM-OF     19179STMH        19171STMH        316.5      0.01       0          0          0          0
;340.5' - 54" - RCP - .41%
37759STGM        19162STMH        19154STMH        340.5      0.019      0          0          0          0
37759STGM-OF     19162STMH        19154STMH        340.5      0.01       0          0          0          0
;293.2' - 54" - RCP - .41%
37760STGM        19154STMH        19150STMH        293.2      0.019      0          0          0          0
37760STGM-OF     19154STMH        19150STMH        293.2      0.01       0          0          0          0
;329.2' - 54" - RCP - .45%
37761STGM        19150STMH        19143STMH        329.2      0.019      0          0          0          0
;328.5' - 54" - RCP - .48%
37762STGM        19143STMH        19134STMH        328.5      0.019      0          0          0          0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
37762STGM-OF     19143STMH        19134STMH        328.5      0.01       0          0          0          0
;185.' - 60" - RCP - .37%
37763STGM        19134STMH        19132STMH        185        0.019      0          0          0          0
37763STGM-OF     19134STMH        19132STMH        185        0.01       0          0          0          0
;161.5' - 60" - RCP - 1.74%
37764STGM        19132STMH        19139STMH        161.5      0.019      0          0          0          0
37764STGM-OF     19132STMH        19139STMH        161.5      0.01       0          0          0          0
;135' - 36" - RCP - 0.08148148148123 89%
406193STGM       407542STMH       407544STMH       130        0.019      0          0          0          0
406193STGM-OF    407542STMH       407544STMH       135        0.01       0          0          0          0
;164.3' - 36" - RCP - .19%
406197STGM       407541STMH       407542STMH       164.3      0.019      0          0          0          0
406197STGM-OF    407541STMH       407542STMH       164.3      0.01       0          0          0          0
;36.6' - 24" - .82%
406199STGM       407540STMH       407541STMH       36.6       0.019      0          0          0          0
406199STGM-OF    407540STMH       407541STMH       36.6       0.01       0          0          0          0
;20.1' - 30" - RCP - .52%
406200STGM       405658STFT       407540STMH       20.1       0.019      0          0          0          0
406200STGM-OF    405658STFT       407540STMH       20.1       0.01       0          0          0          0
;304.7' - 30" - RCP - .52%
406201STGM       407543STMH       405658STFT       304.7      0.019      0          0          0          0
406201STGM-OF    407543STMH       405658STFT       304.7      0.01       0          0          0          0
;20.12' - 30" - RCP - .48%
406205STGM       405659STFT       407543STMH       20.12      0.019      0          0          0          0
406205STGM-OF    405659STFT       407543STMH       20.12      0.01       0          0          0          0
;307.58' - 30" - RCP - .48%
406206STGM       407546STMH       405659STFT       307.58     0.019      0          0          0          0
407544STMH       407544STMH       J14th-DIV        35         0.019      0          0          0          0
407544STMH-OF    407544STMH       J14th-DIV        36.24      0.01       0          0          0          0
;37.7' - 29" - RCP - 0.27%
773049STMN       773032STMH       773050STMH       37.7       0.019      0          0          0          0
773049STMN-OF    773032STMH       773050STMH       37.7       0.01       0          0          0          0
;291.25' - 34" - RCP - 0.17%
773051STMN       773050STMH       773052STMH       291.25     0.019      0          0          0          0
773051STMN-OF    773050STMH       773052STMH       291.25     0.01       0          0          0          0
;329.41' - 34" - RCP - 0.28%
773387STMN       773052STMH       773389STMH       329.41     0.019      0          0          0          0
773387STMN-OF    773052STMH       773389STMH       329.41     0.01       0          0          0          0
;20.62' - 34" - RCP - 0.29%
773391STMN       773389STMH       773392STMH       20.62      0.019      0          0          0          0
773391STMN-OF    773389STMH       773392STMH       20.62      0.01       0          0          0          0
;285.15' - 34" - RCP - 0.32%
773393STMN       773392STMH       773410STMH       285.153    0.019      0          0          0          0
773393STMN-OF    773392STMH       773410STMH       285.15     0.01       0          0          0          0
;49.47' - 34" - RCP - 0.49%
773411STMN       773410STMH       773412STMH       49.47      0.019      0          0          0          0
773411STMN-OF    773410STMH       773412STMH       49.47      0.01       0          0          0          0
773413STMN       773412STMH       J16th-us         15.71      0.019      0          0          0          0
37761STGM-OF_BHI 19150STMH        19143STMH        329.2      0.01       0          0          0          0
406206STGM-OF_BHI 407546STMH      405659STFT       307.58     0.01       0          0          0          0
S_15_a           D_16a            EC_Out_23rd      442        0.01       0          0          0          0
S_15_b           D_16b2           D_16a            670        0.01       0          0          0          0
S_15_c           J_15             D_16b            1674       0.01       0          0          0          0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
C_15_a           D_16a            EC_Out_23rd      442        0.019      0          0          0          120
C_15_b           D_16b2           D_16a            670        0.019      0          0          0          34.4
C_AR2_d          J_EC_Colfax_Out  JColfax-DIV      2660       0.019      0          0          0          47
C_AR2_a          J_AR1_b          JColfax-DIV      1000       0.019      0          0          0          545
C_AR1_c          J_AR1_d          J_AR1_b          1471       0.019      0          0          0          545
C_AR1_d          D_AR1            J_AR1_d          553        0.019      0          0          0          545
S_AR1_d          D_AR1            J_AR1_d          553        0.01       0          0          0          0
S_AR1_a          J_AR1_b          J14th-DIV        720        0.01       0          0          0          0
S_AR1_c          J_AR1_d          J_AR1_b          1471       0.01       0          0          0          0
O_10a-100Yr      J_HP-OUT         J_10c            226.6      0.0111     0          0          0          0
d_15_b           D_16b            D_16b2           400        0.01       0          0          0          0
C_16b            D_16b            J_15b            875        0.019      0          0          0          185
C_15c            J_15a            J_15b            100        0.019      0          0          0          0
C_10_13          D_10_13_3        J_17thAv_Out     1950       0.019      0          0          0          371
d_10_13          D_10_13          D_10_13_2        400        0.01       0          0          0          0
C_13a_2          D_10_13_2        EC_Out_19thAv    2300       0.019      0          0          0          139
C_15_c           J_15             D_16b            1674       0.019      0          0          0          0
d_10_13_2        D_10_13          D_10_13_3        400        0.01       0          0          0          0
C_01a            E-J-01           ChesapeakePnd    660        0.019      0          0          0          48

[ORIFICES]
;;Name           From Node        To Node          Type         Offset     Qcoeff     Gated    CloseTime
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- ----------
W-1              HavanaPnd        J_HP-OUT         SIDE         0          0.65       NO       0

[WEIRS]
;;Name           From Node        To Node          Type         CrestHt    Qcoeff     Gated    EndCon   EndCoeff   Surcharge  RoadWidth  RoadSurf
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- -------- ---------- ---------- ---------- ----------
W_10a            HavanaPnd        J_10b            TRAPEZOIDAL  9.005      3.33       NO       0        0          YES
W_02             ChesapeakePnd    ChesapeakeHLC    TRANSVERSE   10.3       3.33       NO       0        0          YES

[OUTLETS]
;;Name           From Node        To Node          Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- --------
;These define our stage/discharge curves for the system.
;Note that 1 ft of stage exactly equals 1 acre-ft of
;volume. Thus this curve is the exact curve from the original
;UDSWMM input file.
OUT30            RES30            J351             0          TABULAR/DEPTH   RATINGCURVE_30               NO
OUT201           RES201           J202             0          TABULAR/DEPTH   RATINGCURVE_201              NO
OUT130           RES130           J104             0          TABULAR/DEPTH   RATINGCURVE_130              NO
OUT156           RES156           DIV389           0          TABULAR/DEPTH   RATINGCURVE_156              NO
OUT04            1st/HavanaPnd    J_04a            0          TABULAR/DEPTH   1st/HavanaOut                NO
OUT02            ChesapeakePnd    D_04a            0          TABULAR/DEPTH   ChesapeakePnd_Out             NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
C_03a            CIRCULAR     5.5              0          0          0          1
C_05a            CIRCULAR     3.5              0          0          0          1
C_05b            CIRCULAR     4.5              0          0          0          1
C_05c            CIRCULAR     4.5              0          0          0          1
C_06a            CIRCULAR     4                0          0          0          1
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C_07a	CIRCULAR	2.25	0	0	0	1
C_08a	CIRCULAR	4	0	0	0	1
C_08b	CIRCULAR	4	0	0	0	1
C_10a	CIRCULAR	3.5	0	0	0	1
C_10b	CIRCULAR	3.5	0	0	0	1
C_10c	CIRCULAR	4	0	0	0	1
C_11a	CIRCULAR	4	0	0	0	1
C_13a	CIRCULAR	4.5	0	0	0	1
C_14a	CIRCULAR	4.5	0	0	0	1
C_15a	CIRCULAR	5.5	0	0	0	1
C_15b	RECT_CLOSED	6.5	10	0	0	1
C_16a	TRAPEZOIDAL	10	8	3	3	1
C_16thAv	CIRCULAR	9	0	0	0	1
C_JL2	DUMMY	0	0	0	0	1
C1	DUMMY	0	0	0	0	1
C101	DUMMY	0	0	0	0	1
C102	DUMMY	0	0	0	0	1
C104	DUMMY	0	0	0	0	1
C105	TRAPEZOIDAL	6	15	3.33	3.33	1
C105-OVER	TRAPEZOIDAL	10	109.96	10	10	1
C106	DUMMY	0	0	0	0	1
C107	DUMMY	0	0	0	0	1
C111	DUMMY	0	0	0	0	1
C113	DUMMY	0	0	0	0	1
C120	CIRCULAR	3	0	0	0	1
C120_Overflow	TRAPEZOIDAL	4	13.5	20	20	1
C121	DUMMY	0	0	0	0	1
C122	DUMMY	0	0	0	0	1
C123	CIRCULAR	3.5	0	0	0	1
C123-OVER	TRAPEZOIDAL	4	13.5	20	20	1
C124	DUMMY	0	0	0	0	1
C125	CIRCULAR	3.5	0	0	0	1
C125-OVER	TRAPEZOIDAL	6	23.5	20	20	1
C126	DUMMY	0	0	0	0	1
C127	CIRCULAR	4.5	0	0	0	1
C127_Overflow	TRAPEZOIDAL	6	23.5	20	20	1
C128	DUMMY	0	0	0	0	1
C129	CIRCULAR	4	0	0	0	1
C129_Overflow	TRAPEZOIDAL	5	10	4	4	1
C12th	TRAPEZOIDAL	10	25	3	3.5	1
C131	DUMMY	0	0	0	0	1
C132	DUMMY	0	0	0	0	1
C133	DUMMY	0	0	0	0	1
C134	DUMMY	0	0	0	0	1
C135	CIRCULAR	2	0	0	0	1
C135-OVER	TRAPEZOIDAL	3.5	3	50	50	1
C136	CIRCULAR	4	0	0	0	1
C136-OVER	TRAPEZOIDAL	5	5	50	50	1
C13th	TRAPEZOIDAL	10	20	3	3	1
C14	DUMMY	0	0	0	0	1
C140	DUMMY	0	0	0	0	1
C141	CIRCULAR	3	0	0	0	1
C14th	RECT_CLOSED	6	9	0	0	2

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C14th-OVER	TRAPEZOIDAL	10	20	20	20	1
C150	DUMMY	0	0	0	0	1
C151	DUMMY	0	0	0	0	1
C154	DUMMY	0	0	0	0	1
C155	DUMMY	0	0	0	0	1
C157	CIRCULAR	4	0	0	0	1
C158	CIRCULAR	4	0	0	0	1
C158_Overflow	TRAPEZOIDAL	5	1	20	20	1
C159	DUMMY	0	0	0	0	1
C160	DUMMY	0	0	0	0	1
C161	DUMMY	0	0	0	0	1
C162	CIRCULAR	4	0	0	0	1
C162-OVER	TRAPEZOIDAL	5	5	50	50	1
C163	DUMMY	0	0	0	0	1
C164	CIRCULAR	4.5	0	0	0	1
C164-OVER	TRAPEZOIDAL	5.5	5.5	50	50	1
C165	TRAPEZOIDAL	10	10	4	4	1
C166	TRAPEZOIDAL	10	55	10	10	1
C167	TRAPEZOIDAL	10	55	10	10	1
C168	TRAPEZOIDAL	10	55	10	10	1
C169	TRAPEZOIDAL	10	55	10	10	1
C16th	TRAPEZOIDAL	6	8	4	4	1
C16th2	DUMMY	0	0	0	0	1
C16th-OVER	TRAPEZOIDAL	10	55	100	4	1
C170	TRAPEZOIDAL	10	55	10	10	1
C171	TRAPEZOIDAL	10	10	4	4	1
C17th	RECT_CLOSED	6	9	0	0	2
C17th-OVER	TRAPEZOIDAL	10	20	20	20	1
C19th	TRAPEZOIDAL	12	13	4	4	1
C19th2	DUMMY	0	0	0	0	1
C1-DIV	DUMMY	0	0	0	0	1
C20	DUMMY	0	0	0	0	1
C200	DUMMY	0	0	0	0	1
C202	CIRCULAR	4	0	0	0	1
C203	DUMMY	0	0	0	0	1
C204	TRAPEZOIDAL	10	20	5	5	1
C230	DUMMY	0	0	0	0	1
C231	DUMMY	0	0	0	0	1
C232	DUMMY	0	0	0	0	1
C233	DUMMY	0	0	0	0	1
C234	DUMMY	0	0	0	0	1
C235	DUMMY	0	0	0	0	1
C236	CIRCULAR	3	0	0	0	1
C236_Overflow	TRAPEZOIDAL	10	1	20	20	1
C23rd	TRAPEZOIDAL	10	14	19	5	1
C24	DUMMY	0	0	0	0	1
C241	CIRCULAR	5.5	0	0	0	1
C241_Overflow	TRAPEZOIDAL	10	1	20	20	1
C242	DUMMY	0	0	0	0	1
C243	CIRCULAR	6.7	0	0	0	1
C243_Overflow	TRAPEZOIDAL	10	1	20	20	1
C244	CIRCULAR	6.7	0	0	0	1
C244_Overflow	TRAPEZOIDAL	10	1	20	20	1

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C245	DUMMY	0	0	0	0	1
C246	CIRCULAR	8	0	0	0	1
C246_Overflow	TRAPEZOIDAL	10	1	20	20	1
C247	DUMMY	0	0	0	0	1
C248	CIRCULAR	8	0	0	0	1
C25	DUMMY	0	0	0	0	1
C250	CIRCULAR	4	0	0	0	1
C250_Overflow	TRAPEZOIDAL	10	1	20	20	1
C251	DUMMY	0	0	0	0	1
C252	DUMMY	0	0	0	0	1
C253	DUMMY	0	0	0	0	1
C254	TRAPEZOIDAL	5	8	3	3	1
C26th	TRAPEZOIDAL	10	13	30	7	1
C29th	TRAPEZOIDAL	10	20	18	20	1
C31	DUMMY	0	0	0	0	1
C311	DUMMY	0	0	0	0	1
C314	TRAPEZOIDAL	4	5	4	4	1
C315	CIRCULAR	4	0	0	0	1
C316	CIRCULAR	5	0	0	0	1
C316-OVER	TRAPEZOIDAL	6	6	50	50	1
C317	CIRCULAR	5	0	0	0	1
C318	CIRCULAR	6.7	0	0	0	1
C319	CIRCULAR	7.1	0	0	0	1
C319_Overflow	TRAPEZOIDAL	10	1	20	20	1
C32	DUMMY	0	0	0	0	1
C320	CIRCULAR	7.1	0	0	0	1
C320_Overflow	TRAPEZOIDAL	10	1	20	20	1
C321	CIRCULAR	7.1	0	0	0	1
C321_Overflow	TRAPEZOIDAL	10	1	20	20	1
C322	CIRCULAR	4.5	0	0	0	1
C33	DUMMY	0	0	0	0	1
C330	CIRCULAR	5.5	0	0	0	1
C330_Overflow	TRAPEZOIDAL	10	1	20	20	1
C34	DUMMY	0	0	0	0	1
C341	DUMMY	0	0	0	0	1
C342	CIRCULAR	5	0	0	0	1
C342-OVER	TRAPEZOIDAL	8.5	9	10	20	1
C343	DUMMY	0	0	0	0	1
C344	CIRCULAR	6	0	0	0	1
C344-OVER	TRAPEZOIDAL	9.5	10	10	20	1
C345	DUMMY	0	0	0	0	1
C346	TRAPEZOIDAL	8	10	4	4	1
C347	DUMMY	0	0	0	0	1
C348	TRAPEZOIDAL	8	20	4	4	1
C35	DUMMY	0	0	0	0	1
C350	DUMMY	0	0	0	0	1
C351	DUMMY	0	0	0	0	1
C352	DUMMY	0	0	0	0	1
C353	TRAPEZOIDAL	5	8	4	4	1
C354	CIRCULAR	4	0	0	0	1
C355	DUMMY	0	0	0	0	1
C36	DUMMY	0	0	0	0	1
C361	DUMMY	0	0	0	0	1

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C362	DUMMY	0	0	0	0	1
C363	CIRCULAR	4.5	0	0	0	1
C37	DUMMY	0	0	0	0	1
C371	DUMMY	0	0	0	0	1
C372	DUMMY	0	0	0	0	1
C373	CIRCULAR	8.3	0	0	0	1
C373_Overflow	TRAPEZOIDAL	10	1	20	20	1
C374	DUMMY	0	0	0	0	1
C375	CIRCULAR	8.3	0	0	0	1
C375_Overflow	TRAPEZOIDAL	10	1	20	20	1
C376	CIRCULAR	4	0	0	0	1
C376-OVER	TRAPEZOIDAL	10	24	4	4	1
C38	DUMMY	0	0	0	0	1
C389	DUMMY	0	0	0	0	1
C389-DIV	DUMMY	0	0	0	0	1
C390	DUMMY	0	0	0	0	1
C391	DUMMY	0	0	0	0	1
C392	DUMMY	0	0	0	0	1
C393	DUMMY	0	0	0	0	1
C394	CIRCULAR	8.3	0	0	0	1
C395	DUMMY	0	0	0	0	1
C395-DIV	DUMMY	0	0	0	0	1
C396	DUMMY	0	0	0	0	1
C396-DIV	DUMMY	0	0	0	0	1
C397	DUMMY	0	0	0	0	1
C397-DIV	DUMMY	0	0	0	0	1
C399	CIRCULAR	6	0	0	0	1
C399-DIV	IRREGULAR	36ftStreet	0	0	0	1
C41	DUMMY	0	0	0	0	1
C42	DUMMY	0	0	0	0	1
C43	DUMMY	0	0	0	0	1
C44	DUMMY	0	0	0	0	1
C51	DUMMY	0	0	0	0	1
C52	DUMMY	0	0	0	0	1
C53	DUMMY	0	0	0	0	1
C54	DUMMY	0	0	0	0	1
C56	CIRCULAR	5	0	0	0	1
C57	CIRCULAR	5	0	0	0	1
C57_Overflow	TRAPEZOIDAL	10	1	20	20	1
C61	DUMMY	0	0	0	0	1
C62	DUMMY	0	0	0	0	1
C63	DUMMY	0	0	0	0	1
C64	DUMMY	0	0	0	0	1
C65	DUMMY	0	0	0	0	1
C67	DUMMY	0	0	0	0	1
C68	DUMMY	0	0	0	0	1
C70	CIRCULAR	3	0	0	0	1
C70-OVER	IRREGULAR	36ftStreet	0	0	0	1
C71	CIRCULAR	2.5	0	0	0	1
C71-OVER	IRREGULAR	36ftStreet	0	0	0	1
C72	CIRCULAR	3.5	0	0	0	1
C73	CIRCULAR	4	0	0	0	1
C73_Overlfow	IRREGULAR	50ftStreet	0	0	0	1

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C74	DUMMY	0	0	0	0	1
CAD1	DUMMY	0	0	0	0	1
CAD3	DUMMY	0	0	0	0	1
CAD4	DUMMY	0	0	0	0	1
CAD7	DUMMY	0	0	0	0	1
CAR1	DUMMY	0	0	0	0	1
CColfax	RECT_CLOSED	6	9	0	0	2
CColf-OVER	TRAPEZOIDAL	10	20	20	20	1
CCPark	TRAPEZOIDAL	14	14	7	8	1
CDE1	DUMMY	0	0	0	0	1
CDE2	DUMMY	0	0	0	0	1
CDE3	DUMMY	0	0	0	0	1
CDE4	DUMMY	0	0	0	0	1
CDE5	DUMMY	0	0	0	0	1
CDE6	DUMMY	0	0	0	0	1
CDIV7b	DUMMY	0	0	0	0	1
CJ_L1	DUMMY	0	0	0	0	1
CJ7b	DUMMY	0	0	0	0	1
CJL2	DUMMY	0	0	0	0	1
CMLK	TRAPEZOIDAL	14	15	9	5	1
CMontview	TRAPEZOIDAL	20	13	4	4	1
CMontview2	DUMMY	0	0	0	0	1
CSandCreek	TRAPEZOIDAL	14	19	5	4	1
CST1	DUMMY	0	0	0	0	1
CST2	DUMMY	0	0	0	0	1
CST3	DUMMY	0	0	0	0	1
CST4	DUMMY	0	0	0	0	1
CST5	DUMMY	0	0	0	0	1
CST6	DUMMY	0	0	0	0	1
CST7	TRAPEZOIDAL	10	13	9	70	1
CST8	DUMMY	0	0	0	0	1
CST9	DUMMY	0	0	0	0	1
d_01a	DUMMY	0	0	0	0	1
d_02a	DUMMY	0	0	0	0	1
d_02b	DUMMY	0	0	0	0	1
d_03a	DUMMY	0	0	0	0	1
d_03b	DUMMY	0	0	0	0	1
d_03c	DUMMY	0	0	0	0	1
d_04b	DUMMY	0.1	0	0	0	1
d_04d	DUMMY	0	0	0	0	1
d_05a	DUMMY	0	0	0	0	1
d_05b	DUMMY	0	0	0	0	1
d_05c	DUMMY	0	0	0	0	1
d_06a	DUMMY	0.1	0	0	0	1
d_06b	DUMMY	0	0	0	0	1
d_06c	DUMMY	0	0	0	0	1
d_07b	DUMMY	0	0	0	0	1
d_08a	DUMMY	0	0	0	0	1
d_08b	DUMMY	0	0	0	0	1
d_08c	DUMMY	0	0	0	0	1
d_09a	DUMMY	0	0	0	0	1
d_09b	DUMMY	0	0	0	0	1
d_10a	DUMMY	0	0	0	0	1

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

d_10a1	DUMMY	0	0	0	0	1
d_10a2	DUMMY	0	0	0	0	1
d_11a	DUMMY	0	0	0	0	1
d_12a	DUMMY	0	0	0	0	1
d_13a	DUMMY	0	0	0	0	1
d_14a	DUMMY	0	0	0	0	1
d_14b	DUMMY	0	0	0	0	1
d_15a	DUMMY	0	0	0	0	1
d_17thAv	DUMMY	0	0	0	0	1
d_EC_Out_23rd	DUMMY	0	0	0	0	1
d_EC_Out_19thAv	DUMMY	0	0	0	0	1
S_02a	TRAPEZOIDAL	3	15	4	4	1
S_03a	IRREGULAR	6thAve	0	0	0	1
S_05_07a	IRREGULAR	36ftStreet	0	0	0	1
S_05_07b	IRREGULAR	36ftStreet	0	0	0	1
S_05a	IRREGULAR	36ftStreet	0	0	0	1
S_05b	IRREGULAR	50ftStreet	0	0	0	1
S_05c	IRREGULAR	36ftStreet	0	0	0	1
S_05d	IRREGULAR	6thAve	0	0	0	1
S_06a	IRREGULAR	36ftStreet	0	0	0	1
S_06b	IRREGULAR	6thAve	0	0	0	1
S_07a	IRREGULAR	50ftStreet	0	0	0	1
S_07b	IRREGULAR	50ftStreet	0	0	0	1
S_07b2	IRREGULAR	50ftStreet	0	0	0	1
S_07d	IRREGULAR	36ftStreet	0	0	0	1
S_07e	IRREGULAR	36ftStreet	0	0	0	1
S_08a	IRREGULAR	DelMarPkwy	0	0	0	1
S_08b	IRREGULAR	DelMarPkwy	0	0	0	1
S_09a	IRREGULAR	50ftStreet	0	0	0	1
S_10_13	IRREGULAR	50ftStreet	0	0	0	1
S_10a	IRREGULAR	36ftStreet	0	0	0	1
S_10a1	IRREGULAR	DelMarPkwy	0	0	0	1
S_10b	IRREGULAR	DelMarPkwy	0	0	0	1
S_10c	IRREGULAR	36ftStreet	0	0	0	1
S_10d	IRREGULAR	DelMarPkwy	0	0	0	1
S_10e	IRREGULAR	DelMarPkwy	0	0	0	1
S_10f	IRREGULAR	Colfax	0	0	0	1
S_10g	IRREGULAR	Colfax	0	0	0	1
S_10i	DUMMY	0	0	0	0	1
S_11a	IRREGULAR	36ftStreet	0	0	0	1
S_12_14	IRREGULAR	50ftStreet	0	0	0	1
S_13a	IRREGULAR	50ftStreet	0	0	0	1
S_13b1	IRREGULAR	DelMarPkwy	0	0	0	1
S_13b2	IRREGULAR	DelMarPkwy	0	0	0	1
S_14a1	IRREGULAR	36ftStreet	0	0	0	1
S_14a2	IRREGULAR	36ftStreet	0	0	0	1
S_15a	IRREGULAR	36ftStreet	0	0	0	1
S_15b	TRAPEZOIDAL	10	50	20	20	1
S_15c	TRAPEZOIDAL	10	10	3	3	1
S_Beeler	DUMMY	0	0	0	0	1
C317_Overflow	TRAPEZOIDAL	10	1	20	20	1
C318_Overflow	TRAPEZOIDAL	10	1	20	20	1
C322_Overflow	TRAPEZOIDAL	10	1	20	20	1

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C363_Overflow	TRAPEZOIDAL	10	1	20	20	1
C_EC_Colfax_Out	IRREGULAR	50ftStreet	0	0	0	1
S_AR2_a	IRREGULAR	36ftStreet	0	0	0	1
d_16thAve_E	DUMMY	0	0	0	0	1
d_72	DUMMY	0	0	0	0	1
C72_Overflow	IRREGULAR	50ftStreet	0	0	0	1
C_04b	CIRCULAR	4	0	0	0	1
S_04a	IRREGULAR	36ftStreet	0	0	0	1
d_04c	DUMMY	0	0	0	0	1
C_04c	CIRCULAR	3	0	0	0	1
S_04b	IRREGULAR	36ftStreet	0	0	0	1
C_AR2_b	CIRCULAR	4.5	0	0	0	1
S_AR2_b	IRREGULAR	36ftStreet	0	0	0	1
S_AR2_c	IRREGULAR	36ftStreet	0	0	0	1
C_AR2_c	CIRCULAR	4	0	0	0	1
S_AR2_d	DUMMY	0	0	0	0	1
19071STMH	DUMMY	0	0	0	0	1
19071STMH-OF	DUMMY	0	0	0	0	1
35191STGM	DUMMY	0	0	0	0	1
35191STGM-OF	DUMMY	0	0	0	0	1
35325STGM	CIRCULAR	1.25	0	0	0	1
35325STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35326STGM	CIRCULAR	1.25	0	0	0	1
35326STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35328STGM	CIRCULAR	1.25	0	0	0	1
35328STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35329STGM	CIRCULAR	1.25	0	0	0	1
35329STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35355STGM	CIRCULAR	3.5	0	0	0	1
35355STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35357STGM	CIRCULAR	3.5	0	0	0	1
35357STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35358STGM	CIRCULAR	3.5	0	0	0	1
35358STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35362STGM	CIRCULAR	3.5	0	0	0	1
35362STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35363STGM	CIRCULAR	3.5	0	0	0	1
35363STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35365STGM	CIRCULAR	3.5	0	0	0	1
35365STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35367STGM	CIRCULAR	3.5	0	0	0	1
35367STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35368STGM	CIRCULAR	3.5	0	0	0	1
35368STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35369STGM	CIRCULAR	3.5	0	0	0	1
35369STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35370STGM	HORIZ_ELLIPSE	2.833	4.417	0	0	1
35370STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35371STGM	DUMMY	0	0	0	0	1
35372STGM	CIRCULAR	4	0	0	0	1
35372STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
36715STGM	CIRCULAR	5	0	0	0	1
36715STGM-OF	IRREGULAR	50ftStreet	0	0	0	1

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

36716STGM	CIRCULAR	5	0	0	0	1
36716STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
36717STGM	CIRCULAR	5	0	0	0	1
36717STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
36718STGM	CIRCULAR	5	0	0	0	1
36718STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
36939STGM	CIRCULAR	4	0	0	0	1
36939STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
37665STGM	CIRCULAR	4	0	0	0	1
37665STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
37666STGM	CIRCULAR	4	0	0	0	1
37666STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
37673STGM	CIRCULAR	4	0	0	0	1
37673STGMF-OFE	IRREGULAR	36ftStreet	0	0	0	1
37750STGM	DUMMY	0	0	0	0	1
37750STGM-OF	DUMMY	0	0	0	0	1
37757STGM	CIRCULAR	4.5	0	0	0	1
37757STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
37758STGM	CIRCULAR	4.5	0	0	0	1
37758STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
37759STGM	CIRCULAR	4.5	0	0	0	1
37759STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
37760STGM	CIRCULAR	4.5	0	0	0	1
37760STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
37761STGM	CIRCULAR	4.5	0	0	0	1
37762STGM	CIRCULAR	4.5	0	0	0	1
37762STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
37763STGM	CIRCULAR	5	0	0	0	1
37763STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
37764STGM	CIRCULAR	5	0	0	0	1
37764STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
406193STGM	CIRCULAR	3	0	0	0	1
406193STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406197STGM	CIRCULAR	3	0	0	0	1
406197STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406199STGM	CIRCULAR	2	0	0	0	1
406199STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406200STGM	CIRCULAR	2.5	0	0	0	1
406200STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406201STGM	CIRCULAR	2.5	0	0	0	1
406201STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406205STGM	CIRCULAR	2.5	0	0	0	1
406205STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406206STGM	CIRCULAR	2.5	0	0	0	1
407544STMH	DUMMY	0	0	0	0	1
407544STMH-OF	DUMMY	0	0	0	0	1
773049STMN	HORIZ_ELLIPSE	2.417	3.75	0	0	1
773049STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773051STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
773051STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773387STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
773387STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773391STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
773391STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773393STMN       HORIZ_ELLIPSE 2.833            4.417      0          0          1
773393STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773411STMN       HORIZ_ELLIPSE 2.833            4.417      0          0          1
773411STMN-OF    IRREGULAR    36ftStreet       0          0          0          1
773413STMN       DUMMY        0                0          0          0          1
37761STGM-OF_BHI IRREGULAR    50ftStreet       0          0          0          1
406206STGM-OF_BHI IRREGULAR    36ftStreet       0          0          0          1
S_15_a           IRREGULAR    50ftStreet       0          0          0          1
S_15_b           IRREGULAR    50ftStreet       0          0          0          1
S_15_c           IRREGULAR    50ftStreet       0          0          0          1
C_15_a           HORIZ_ELLIPSE 4                6.33       0          0          1
C_15_b           CIRCULAR     2.5              0          0          0          1
C_AR2_d          CIRCULAR     3                0          0          0          1
C_AR2_a          CIRCULAR     7                0          0          0          1
C_AR1_c          CIRCULAR     7                0          0          0          1
C_AR1_d          CIRCULAR     6.5              0          0          0          1
S_AR1_d          IRREGULAR    36ftStreet       0          0          0          1
S_AR1_a          IRREGULAR    36ftStreet       0          0          0          1
S_AR1_c          IRREGULAR    36ftStreet       0          0          0          1
O_10a-100Yr      CIRCULAR     2.5              0          0          0          1
d_15_b           DUMMY        0                0          0          0          1
C_16b            CIRCULAR     5.5              0          0          0          1
C_15c            DUMMY        0                0          0          0          1
C_10_13          CIRCULAR     5.5              0          0          0          1
d_10_13          DUMMY        0                0          0          0          1
C_13a_2          CIRCULAR     4.5              0          0          0          1
C_15_c           CIRCULAR     4.5              0          0          0          1
d_10_13_2        DUMMY        0                0          0          0          1
C_01a            CIRCULAR     3                0          0          0          1
W-1              CIRCULAR     2                0          0          0
W_10a            TRAPEZOIDAL  0.575            100        4          4
W_02             RECT_OPEN    1                254        4          4

[TRANSECTS]
;;Transect Data in HEC-2 format
;
;Full street, width = 50ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.27ft.
NC 0.05     0.05     0.02
X1 50ftStreet        9        30       80       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.27     0        0.67     30       0        30       0.5      55
GR 0        80       0.67     80       1.27     110      10       110
;
;Full street, width = 36ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.67ft.
NC 0.05     0.05     0.02
X1 36ftStreet        9        50       86       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.67     0        0.67     50       0        50       0.36     68
GR 0        86       0.67     86       1.67     136      10       136
;
;Full street, width = 82ft, curb = .67ft , cross-slope = 0.02ft/ft, bank-slope = 0.01ft/ft, bank-height = .87ft.
;Increase Manning's n by 25% for roadway per UDFCD USDCM.
;Increase Manning's n to 0.10 for overbank area considering the lawn area, fences and vegetation.
NC 0.1      0.1      0.02
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
X1 6thAve           9       20      102     0.0     0.0     0.0     0.0     0.0
GR 6        0       0.87    0       0.67    20      0       20      0.82    61
GR 0        102     0.67    102     0.87    122     6       122
;
;Full street, width = 32ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 0.75ft.
NC 0.1      0.1     0.02
X1 DelMarPkwy       15      4       88      0.0     0.0     0.0     0.0     0.0
GR 8        -16     1.07    -16     0.67    4       0       4       0.32    20
GR 0        36      0.67    36      0.87    46      0.67    56      0       56
GR 0.32     72      0       88      0.67    88      1.07    108     8       108
;
;Full street, width = 80ft, curb = 0.67ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = .77ft.
NC 0.02     0.02    0.02
X1 Colfax           12      5       87      0.0     0.0     0.0     0.0     0.0
GR 10       0       0.77    0       0.67    5       0       5       0.8     45
GR 3.3      45      3.3     47      0.8     47      0       87      0.67    87
GR 0.77     92      10      92
;
NC 0.01     0.01    0.021
X1 19071STMH-OF     137     0       0       0.0     0.0     0       0       0
GR 5330     -1      5320    0       5314.877 2      5314.979 3      5314.979 5
GR 5314.622 6       5314.548 7      5314.548 8      5314.441 9      5314.441 11
GR 5314.267 12      5314.267 14     5314.079 15     5314.28  16     5314.28  17
GR 5314.255 18      5314.255 20     5314.304 21     5314.304 23     5314.246 24
GR 5314.323 25      5314.323 26     5314.233 27     5314.233 28     5314.314 29
GR 5314.257 30      5314.257 32     5314.169 33     5314.26  34     5314.26  35
GR 5314.148 36      5314.148 37     5314.172 38     5313.998 39     5313.998 41
GR 5314.041 42      5314.041 44     5313.978 45     5313.978 46     5314.03  47
GR 5313.789 48      5313.789 50     5313.817 51     5313.817 54     5313.9   55
GR 5313.9   57      5313.891 58     5313.891 59     5314.049 60     5314.04  61
GR 5314.04  63      5314.158 64     5314.158 66     5314.104 67     5314.305 68
GR 5314.305 69      5313.975 70     5313.975 72     5314.017 73     5314.017 75
GR 5314.03  76      5314.128 77     5314.128 78     5314.031 79     5314.031 81
GR 5313.997 82      5313.997 84     5313.993 85     5314.169 86     5314.169 87
GR 5314.095 88      5314.095 89     5314.25  90     5314.234 91     5314.234 93
GR 5314.034 94      5314.152 95     5314.152 96     5313.982 97     5313.982 98
GR 5314.088 99      5313.964 100    5313.964 102    5314.122 103    5314.122 105
GR 5314.167 106     5314.167 107    5314.356 108    5314.356 109    5314.341 110
GR 5314.341 111     5314.477 112    5314.391 113    5314.391 115    5314.418 116
GR 5314.418 118     5314.394 119    5314.394 120    5314.559 121    5314.628 122
GR 5314.628 124     5314.802 125    5314.802 127    5314.851 128    5314.946 129
GR 5314.946 130     5314.87  131    5314.87  133    5315.01  134    5315.01  136
GR 5314.874 137     5314.958 138    5314.958 139    5314.893 140    5314.893 141
GR 5314.997 142     5315.062 143    5315.062 145    5315.068 146    5315.211 147
GR 5315.211 148     5315.186 149    5315.186 150    5315.456 151    5315.415 152
GR 5315.415 154     5315.376 155    5315.45  156    5315.45  157    5315.432 158
GR 5315.432 159     5315.642 160    5315.615 161    5315.615 163    5315.64  164
GR 5320     165.93  5330     166
;
NC 0.01     0.01    0.021
X1 23370STMH-OF     46      0       0       0.0     0.0     0       0       0
GR 5335     1       5333.172 3      5333.079 4      5333.079 5      5332.902 6
GR 5332.902 8       5332.833 9      5332.833 10     5332.786 11     5332.786 13
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5333.028 14       5333.028 15       5333.107 16       5333.107 18       5333.216 19
GR 5333.216 20       5333.268 21       5333.268 23       5333.312 24       5333.312 25
GR 5333.223 26       5333.223 28       5333.187 29       5333.187 30       5333.18  31
GR 5333.18  33       5333.075 34       5333.075 35       5333.012 36       5333.012 38
GR 5332.937 39       5332.937 40       5332.861 41       5332.861 43       5332.799 44
GR 5332.799 45       5332.835 46       5332.835 48       5333.135 49       5333.135 50
GR 5333.261 51       5333.261 53       5333.341 54       5333.341 55       5333.475 56
GR 5335     57.24
;
NC 0.01     0.01     0.021
X1 35191STGM-OF      42       0        0        0.0      0.0      0        0        0
GR 5343     0        5341.433 1        5341.262 2        5341.262 3        5341.108 4
GR 5341.108 6        5341.011 7        5341.011 8        5341.14  9        5341.14  11
GR 5341.278 12       5341.278 13       5341.459 14       5341.459 16       5341.615 17
GR 5341.596 18       5341.683 19       5341.683 21       5341.783 22       5341.783 23
GR 5341.795 24       5341.795 26       5341.838 27       5341.838 28       5341.797 29
GR 5341.797 31       5341.743 32       5341.743 33       5341.637 34       5341.637 36
GR 5341.488 37       5341.488 38       5341.419 39       5341.419 41       5341.487 42
GR 5341.487 43       5341.762 44       5341.762 46       5342.008 47       5342.008 48
GR 5342.222 49       5343     49.66
;
NC 0.01     0.01     0.021
X1 35193STGM-OF      47       0        0        0.0      0.0      0        0        0
GR 5345     0        5331.757 1        5331.757 2        5331.406 3        5331.406 5
GR 5331.294 6        5331.294 7        5331.292 8        5331.292 10       5331.376 11
GR 5331.376 12       5331.509 13       5331.509 15       5331.609 16       5331.609 17
GR 5331.681 18       5331.681 20       5331.75  21       5331.75  22       5331.775 23
GR 5331.775 25       5331.799 26       5331.799 27       5331.869 28       5331.869 30
GR 5331.866 31       5331.866 32       5331.884 33       5331.884 35       5331.873 36
GR 5331.873 37       5331.849 38       5331.849 40       5331.802 41       5331.802 42
GR 5331.724 43       5331.724 45       5331.673 46       5331.673 47       5331.571 48
GR 5331.571 50       5331.46  51       5331.46  52       5331.816 53       5331.816 55
GR 5331.841 56       5345     57.55
;
NC 0.01     0.01     0.021
X1 35194STGM-OF      47       0        0        0.0      0.0      0        0        0
GR 5345     0        5331.757 1        5331.757 2        5331.406 3        5331.406 5
GR 5331.294 6        5331.294 7        5331.292 8        5331.292 10       5331.376 11
GR 5331.376 12       5331.509 13       5331.509 15       5331.609 16       5331.609 17
GR 5331.681 18       5331.681 20       5331.75  21       5331.75  22       5331.775 23
GR 5331.775 25       5331.799 26       5331.799 27       5331.869 28       5331.869 30
GR 5331.866 31       5331.866 32       5331.884 33       5331.884 35       5331.873 36
GR 5331.873 37       5331.849 38       5331.849 40       5331.802 41       5331.802 42
GR 5331.724 43       5331.724 45       5331.673 46       5331.673 47       5331.571 48
GR 5331.571 50       5331.46  51       5331.46  52       5331.816 53       5331.816 55
GR 5331.841 56       5345     57.55
;
NC 0.01     0.01     0.021
X1 35204STGM-OF      38       0        0        0.0      0.0      0        0        0
GR 5340     0        5334.952 1        5334.799 2        5334.799 3        5334.688 4
GR 5334.688 6        5334.665 7        5334.665 8        5334.785 9        5334.785 11
GR 5334.908 12       5334.908 13       5334.999 14       5334.999 16       5335.082 17
GR 5335.082 18       5335.147 19       5335.147 21       5335.187 22       5335.187 23
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5335.216 24      5335.216 26      5335.198 27      5335.198 28      5335.184 29
GR 5335.184 31      5335.149 32      5335.149 33      5335.054 34      5335.054 36
GR 5334.971 37      5334.971 38      5334.78  39      5334.78  41      5334.705 42
GR 5334.705 43      5334.859 44      5340     45.54
;
NC 0.01     0.01    0.021
X1 35325STGM-OF     75       0       0        0.0     0.0      0       0        0
GR 5347     0       5346.492 1       5346.492 3       5346.448 4       5346.448 7
GR 5346.45  8       5346.45  10      5346.417 11      5346.417 13      5346.31  14
GR 5346.131 15      5346.131 17      5345.833 18      5345.833 20      5346.005 21
GR 5346.063 22      5346.063 24      5346.178 25      5346.263 26      5346.263 27
GR 5346.337 28      5346.337 29      5346.363 30      5346.363 31      5346.402 32
GR 5346.408 33      5346.408 34      5346.443 35      5346.443 36      5346.439 37
GR 5346.481 38      5346.481 40      5346.434 41      5346.471 42      5346.471 43
GR 5346.408 44      5346.44  45      5346.44  47      5346.369 48      5346.399 49
GR 5346.399 51      5346.375 52      5346.375 54      5346.363 55      5346.363 58
GR 5346.227 59      5346.227 61      5346.259 62      5346.171 63      5346.171 65
GR 5346.034 66      5346.034 68      5346.042 69      5345.873 70      5345.873 72
GR 5345.884 73      5345.709 74      5345.709 75      5345.697 76      5345.697 78
GR 5345.794 79      5345.794 80      5346.016 81      5346.016 82      5346.242 83
GR 5346.242 84      5346.422 85      5346.523 86      5346.523 87      5346.699 88
GR 5346.699 89      5346.681 90      5346.681 91      5346.833 92      5346.888 92.54
;
NC 0.01     0.01    0.021
X1 35326STGM-OF     42       0       0        0.0     0.0      0       0        0
GR 5343     0       5341.433 1       5341.262 2       5341.262 3       5341.108 4
GR 5341.108 6       5341.011 7       5341.011 8       5341.14  9       5341.14  11
GR 5341.278 12      5341.278 13      5341.459 14      5341.459 16      5341.615 17
GR 5341.596 18      5341.683 19      5341.683 21      5341.783 22      5341.783 23
GR 5341.795 24      5341.795 26      5341.838 27      5341.838 28      5341.797 29
GR 5341.797 31      5341.743 32      5341.743 33      5341.637 34      5341.637 36
GR 5341.488 37      5341.488 38      5341.419 39      5341.419 41      5341.487 42
GR 5341.487 43      5341.762 44      5341.762 46      5342.008 47      5342.008 48
GR 5342.222 49      5343     49.66
;
NC 0.01     0.01    0.021
X1 35328STGM-OF     45       0       0        0.0     0.0      0       0        0
GR 5350     0       5348.68  1       5348.543 2       5348.543 3       5348.509 4
GR 5348.324 5       5348.324 6       5348.331 7       5348.331 9       5348.456 10
GR 5348.456 11      5348.671 12      5348.671 14      5348.701 15      5348.701 16
GR 5348.785 17      5348.785 19      5348.884 20      5348.884 22      5348.91  23
GR 5348.91  24      5348.902 25      5348.85  26      5348.85  27      5348.773 28
GR 5348.773 29      5348.7   30      5348.7   32      5348.567 33      5348.567 34
GR 5348.422 35      5348.422 36      5348.402 37      5348.247 38      5348.247 40
GR 5348.109 41      5348.109 42      5348.214 43      5348.214 45      5348.484 46
GR 5348.484 47      5349     48      5349     50      5349.333 51      5350     51.79
;
NC 0.01     0.01    0.021
X1 35329STGM-OF     40       0       0        0.0     0.0      0       0        0
GR 5348.003 0       5347.877 1       5347.877 2       5347.755 3       5347.755 4
GR 5347.77  5       5347.541 6       5347.541 7       5346.897 8       5346.897 10
GR 5346.9   11      5346.9   13      5347.159 14      5347.159 15      5347.302 16
GR 5347.302 18      5347.375 19      5347.374 20      5347.438 21      5347.438 23
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5347.486 24      5347.486 25      5347.434 26      5347.434 28      5347.359 29
GR 5347.359 30      5347.33  31      5347.33  33      5347.227 34      5347.227 35
GR 5347.077 36      5347.077 38      5346.777 39      5346.777 40      5346.598 41
GR 5346.598 43      5346.967 44      5346.967 46      5347.443 47      5348     47.92
;
NC 0.01     0.01    0.021
X1 35350STGM-OF     81       0       0        0.0     0.0      0       0        0
GR 5354     0       5352.802 1       5352.802 3       5352.808 4       5352.663 5
GR 5352.663 7       5352.491 8       5352.247 9       5352.247 10      5352.011 11
GR 5351.951 12      5351.951 14      5351.826 15      5351.896 16      5351.896 17
GR 5351.816 18      5351.742 19      5351.742 21      5351.583 22      5351.488 23
GR 5351.488 24      5351.495 25      5351.495 26      5351.551 27      5351.659 28
GR 5351.659 29      5351.731 30      5351.731 31      5351.832 32      5351.832 33
GR 5351.999 34      5352.047 35      5352.047 36      5352.149 37      5352.149 38
GR 5352.181 39      5352.181 40      5352.217 41      5352.22  42      5352.22  44
GR 5352.324 45      5352.328 46      5352.328 47      5352.38  48      5352.344 49
GR 5352.344 51      5352.423 52      5352.393 53      5352.393 55      5352.367 56
GR 5352.367 58      5352.376 59      5352.369 60      5352.369 61      5352.37  62
GR 5352.353 63      5352.353 65      5352.375 66      5352.379 67      5352.379 69
GR 5352.266 70      5352.266 72      5352.198 73      5352.125 74      5352.125 76
GR 5351.959 77      5351.959 79      5351.886 80      5351.859 81      5351.859 83
GR 5351.625 84      5351.625 87      5351.741 88      5351.741 90      5352.036 91
GR 5352.036 94      5352.327 95      5352.327 97      5352.322 98      5352.322 101
GR 5354     101.19
;
NC 0.01     0.01    0.021
X1 35351STGM-OF     66       0       0        0.0     0.0      0       0        0
GR 5352.921 0       5352.003 1       5352.003 2       5351.728 3       5351.728 5
GR 5351.478 6       5351.478 8       5351.361 9       5351.361 10      5351.366 11
GR 5351.366 13      5351.285 14      5351.285 15      5351.216 16      5351.216 18
GR 5351.195 19      5351.195 20      5351.121 21      5351.121 23      5350.676 24
GR 5350.676 25      5350.634 26      5350.634 28      5350.763 29      5350.763 30
GR 5351.149 31      5351.149 33      5351.278 34      5351.278 35      5351.403 36
GR 5351.403 38      5351.478 39      5351.478 40      5351.506 41      5351.506 43
GR 5351.502 44      5351.502 45      5351.48  46      5351.48  48      5351.409 49
GR 5351.409 50      5351.303 51      5351.303 53      5351.087 54      5351.076 55
GR 5350.982 56      5350.982 58      5350.91  59      5350.91  60      5351.128 61
GR 5351.128 63      5351.676 64      5351.676 65      5351.896 66      5351.896 68
GR 5352.009 69      5352.009 71      5352.151 72      5352.151 73      5352.394 74
GR 5352.318 75      5352.318 76      5352.615 77      5352.615 78      5352.879 79
GR 5352.879 80.69
;
NC 0.01     0.01    0.021
X1 35353STGM-OF     64       0       0        0.0     0.0      0       0        0
GR 5355     0       5350.429 2       5350.296 3       5350.296 4       5350.176 5
GR 5350.176 6       5350.022 7       5350.022 8       5349.782 9       5349.755 10
GR 5349.755 12      5349.986 13      5349.986 15      5350.025 16      5350.104 17
GR 5350.104 19      5350.283 20      5350.283 22      5350.431 23      5350.449 24
GR 5350.449 26      5350.514 27      5350.536 28      5350.536 29      5350.626 30
GR 5350.625 31      5350.625 32      5350.641 33      5350.641 34      5350.652 35
GR 5350.652 36      5350.655 37      5350.655 38      5350.685 39      5350.694 40
GR 5350.694 42      5350.728 43      5350.728 46      5350.699 47      5350.699 49
GR 5350.653 50      5350.653 52      5350.597 53      5350.598 54      5350.598 56
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5350.591 57      5350.607 58      5350.607 59      5350.576 60      5350.576 61
GR 5350.619 62      5350.604 63      5350.604 64      5350.458 65      5350.458 66
GR 5350.515 67      5350.515 68      5350.512 69      5350.817 70      5350.817 72
GR 5351.233 73      5351.233 76      5351.545 77      5355     79.06
;
NC 0.01     0.01    0.021
X1 35355STGM-OF     56       0       0        0.0     0.0      0       0        0
GR 5349.807 0       5349.831 1       5349.831 2       5349.71  3       5349.71  4
GR 5349.55  5       5349.55  7       5349.323 8       5349.323 9       5349.146 10
GR 5349.146 12      5348.846 13      5348.846 14      5348.691 15      5348.691 17
GR 5348.807 18      5348.807 19      5349.048 20      5349.048 22      5349.181 23
GR 5349.181 24      5349.479 25      5349.479 27      5349.57  28      5349.57  29
GR 5349.577 30      5349.577 32      5349.591 33      5349.591 34      5349.611 35
GR 5349.611 37      5349.538 38      5349.538 39      5349.521 40      5349.521 42
GR 5349.394 43      5349.394 44      5349.289 45      5349.289 47      5349.27  48
GR 5349.27  49      5349.475 50      5349.475 52      5349.758 53      5349.758 54
GR 5349.769 55      5349.769 57      5349.79  58      5349.79  59      5349.875 60
GR 5349.875 62      5349.943 63      5349.943 64      5350.095 65      5350.095 67
GR 5350.64  67.17
;
NC 0.01     0.01    0.021
X1 35357STGM-OF     47       0       0        0.0     0.0      0       0        0
GR 5355     0       5347.726 1       5347.726 2       5347.335 3       5347.335 5
GR 5347.191 6       5347.191 7       5347.159 8       5347.159 10      5347.571 11
GR 5347.571 12      5347.748 13      5347.748 15      5347.88  16      5347.88  17
GR 5348.042 18      5348.042 20      5348.091 21      5348.091 22      5348.155 23
GR 5348.155 25      5348.287 26      5348.287 27      5348.264 28      5348.264 30
GR 5348.242 31      5348.242 32      5348.249 33      5348.249 35      5348.149 36
GR 5348.149 37      5348.098 38      5348.098 40      5348.025 41      5348.025 42
GR 5347.972 43      5347.972 45      5347.96  46      5347.96  47      5348.087 48
GR 5348.087 50      5348.209 51      5348.209 52      5348.42  53      5348.42  55
GR 5348.487 56      5355     57.59
;
NC 0.01     0.01    0.021
X1 35358STGM-OF     44       0       0        0.0     0.0      0       0        0
GR 5355     0       5346.903 1       5346.836 2       5346.836 4       5346.532 5
GR 5346.532 6       5346.245 7       5346.258 8       5346.258 9       5346.087 10
GR 5346.087 11      5346.33  12      5346.33  14      5346.455 15      5346.455 16
GR 5346.625 17      5346.625 19      5346.751 20      5346.751 21      5346.911 22
GR 5346.911 24      5346.875 25      5346.875 26      5346.856 27      5346.856 29
GR 5346.819 30      5346.819 31      5346.806 32      5346.806 34      5346.734 35
GR 5346.734 36      5346.649 37      5346.649 39      5346.621 40      5346.621 41
GR 5346.759 42      5346.759 44      5346.938 45      5346.938 46      5347.166 47
GR 5347.166 49      5347.311 50      5347.311 51      5355     51.28
;
NC 0.01     0.01    0.021
X1 35362STGM-OF     60       0       0        0.0     0.0      0       0        0
GR 5355     1       5345.837 2       5345.704 3       5345.704 4       5345.355 5
GR 5345.202 6       5345.202 7       5345.121 8       5345.062 9       5345.062 11
GR 5344.928 12      5344.934 13      5344.934 15      5345.166 16      5345.166 18
GR 5345.246 19      5345.369 20      5345.369 22      5345.546 23      5345.546 25
GR 5345.75  26      5345.761 27      5345.761 29      5345.78  30      5345.78  32
GR 5345.83  33      5345.847 34      5345.847 36      5345.851 37      5345.882 38
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5345.882 39      5345.885 40      5345.848 41      5345.848 42      5345.836 43
GR 5345.836 44      5345.814 45      5345.814 46      5345.817 47      5345.817 48
GR 5345.801 49      5345.803 50      5345.803 52      5345.771 53      5345.778 54
GR 5345.778 55      5345.757 56      5345.724 57      5345.724 59      5345.618 60
GR 5345.618 63      5345.457 64      5345.457 66      5345.308 67      5345.308 70
GR 5345.083 71      5345.083 73      5345.156 74      5345.3   75      5355     77
;
NC 0.01     0.01    0.021
X1 35363STGM-OF     37       0       0       0.0     0.0     0       0       0
GR 5355     0       5345.087 1       5344.929 2       5344.929 4       5344.572 5
GR 5344.572 6       5344.392 7       5344.392 9       5344.405 10      5344.405 11
GR 5344.627 12      5344.654 13      5344.654 14      5344.783 15      5344.783 16
GR 5344.872 17      5344.872 19      5344.942 20      5344.942 21      5344.939 22
GR 5344.939 24      5344.949 25      5344.949 26      5344.911 27      5344.911 29
GR 5344.912 30      5344.886 31      5344.857 32      5344.857 34      5344.799 35
GR 5344.799 37      5344.662 38      5344.662 39      5344.582 40      5344.582 42
GR 5345.023 43      5355     43.4
;
NC 0.01     0.01    0.021
X1 35365STGM-OF     34       0       0       0.0     0.0     0       0       0
GR 5355     0       5343.423 2       5343.357 3       5343.357 4       5343.107 5
GR 5343.107 7       5343.103 8       5343.103 9       5343.229 10      5343.229 12
GR 5343.504 13      5343.504 14      5343.615 15      5343.615 17      5343.658 18
GR 5343.658 19      5343.605 20      5343.605 22      5343.564 23      5343.564 24
GR 5343.515 25      5343.515 27      5343.396 28      5343.396 29      5343.349 30
GR 5343.349 32      5343.26  33      5343.26  34      5343.081 35      5343.081 37
GR 5343.004 38      5343.004 39      5343.156 40      5355     41.92
;
NC 0.01     0.01    0.021
X1 35367STGM-OF     41       0       0       0.0     0.0     0       0       0
GR 5350     0       5341.911 1       5341.911 2       5341.821 3       5341.821 5
GR 5341.628 6       5341.628 7       5341.824 8       5341.824 10      5342.006 11
GR 5342.006 12      5342.147 13      5342.147 15      5342.375 16      5342.375 17
GR 5342.438 18      5342.438 20      5342.475 21      5342.475 22      5342.507 23
GR 5342.507 25      5342.551 26      5342.549 27      5342.537 28      5342.537 30
GR 5342.494 31      5342.494 32      5342.366 33      5342.366 35      5342.274 36
GR 5342.274 37      5342.148 38      5342.148 40      5341.886 41      5341.886 42
GR 5342.077 43      5342.077 45      5342.501 46      5342.501 47      5342.619 48
GR 5350     48.91
;
NC 0.01     0.01    0.021
X1 35368STGM-OF     39       0       0       0.0     0.0     0       0       0
GR 5350     0       5341.6   1       5341.6   3       5341.541 4       5341.541 5
GR 5341.425 6       5341.414 7       5341.414 8       5341.034 9       5341.034 10
GR 5341.213 11      5341.213 13      5341.392 14      5341.392 15      5341.509 16
GR 5341.509 18      5341.746 19      5341.743 20      5341.819 21      5341.819 23
GR 5341.856 24      5341.856 25      5341.844 26      5341.844 28      5341.831 29
GR 5341.831 31      5341.804 32      5341.804 33      5341.669 34      5341.669 36
GR 5341.593 37      5341.593 38      5341.514 39      5341.514 41      5341.385 42
GR 5341.385 43      5341.452 44      5341.452 46      5350     46.78
;
NC 0.01     0.01    0.021
X1 35369STGM-OF     54       0       0       0.0     0.0     0       0       0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5340.564 0        5340.564 1        5340.53  2        5340.53  3        5340.573 4
GR 5340.573 6        5340.506 7        5340.506 8        5340.518 9        5340.518 11
GR 5340.319 12       5340.319 13       5340.161 14       5340.161 16       5339.919 17
GR 5339.919 18       5339.783 19       5339.783 21       5339.546 22       5339.546 23
GR 5339.599 24       5339.599 26       5339.742 27       5339.742 28       5339.847 29
GR 5339.847 30       5339.854 31       5339.87  32       5339.87  33       5339.935 34
GR 5339.935 36       5339.967 37       5339.967 38       5339.941 39       5339.941 41
GR 5339.828 42       5339.828 43       5339.753 44       5339.753 46       5339.659 47
GR 5339.659 48       5339.457 49       5339.457 51       5339.333 52       5339.333 53
GR 5339.189 54       5339.189 56       5339.312 57       5339.312 58       5339.493 59
GR 5339.493 61       5340.019 62       5340.019 63       5340.705 63.75
;
NC 0.01     0.01     0.021
X1 35370STGM-OF      52       0        0        0.0      0.0      0        0        0
GR 5339.39  0        5339.239 1        5339.239 2        5339.154 3        5338.994 4
GR 5338.994 5        5338.53  6        5338.53  8        5338.427 9        5338.427 10
GR 5338.34  11       5338.34  13       5338.446 14       5338.446 15       5338.546 16
GR 5338.546 18       5338.568 19       5338.568 21       5338.627 22       5338.627 23
GR 5338.649 24       5338.649 25       5338.681 26       5338.663 27       5338.663 31
GR 5338.692 32       5338.692 33       5338.543 34       5338.543 36       5338.463 37
GR 5338.494 38       5338.494 39       5338.408 40       5338.408 41       5338.334 42
GR 5338.334 44       5338.249 45       5338.249 46       5338.185 47       5338.185 48
GR 5338.25  49       5338.218 50       5338.218 51       5338.191 52       5338.191 54
GR 5338.17  55       5338.17  56       5338.167 57       5338.167 59       5338.154 60
GR 5338.226 61       5340     61.72
;
NC 0.01     0.01     0.021
X1 35371STGM-OF      57       0        0        0.0      0.0      0        0        0
GR 5337.067 0        5337.107 1        5337.107 2        5337.069 3        5337.069 5
GR 5337.035 6        5337.035 7        5336.941 8        5336.941 10       5336.836 11
GR 5336.769 12       5336.718 13       5336.718 15       5336.705 16       5336.705 17
GR 5336.384 18       5336.384 20       5336.199 21       5336.199 22       5336.111 23
GR 5336.111 25       5336.299 26       5336.299 27       5336.45  28       5336.45  30
GR 5336.527 31       5336.527 32       5336.728 33       5336.728 35       5336.766 36
GR 5336.766 37       5336.814 38       5336.814 40       5336.792 41       5336.792 42
GR 5336.803 43       5336.803 45       5336.618 46       5336.618 47       5336.538 48
GR 5336.538 50       5336.452 51       5336.452 52       5336.388 53       5336.388 55
GR 5336.39  56       5336.39  57       5336.43  58       5336.43  60       5336.455 61
GR 5336.455 62       5336.568 63       5336.568 65       5336.588 66       5336.588 67
GR 5336.518 68       5337     68.12
;
NC 0.01     0.01     0.021
X1 35372STGM-OF      41       0        0        0.0      0.0      0        0        0
GR 5338.606 0        5338.606 1        5337.952 2        5337.952 4        5337.795 5
GR 5337.795 6        5337.625 7        5337.625 9        5337.69  10       5337.69  11
GR 5337.751 12       5337.751 14       5337.867 15       5337.867 16       5337.992 17
GR 5337.992 19       5338.055 20       5338.055 21       5338.053 22       5338.053 24
GR 5338.043 25       5338.043 26       5338.037 27       5338.037 29       5338.013 30
GR 5338.013 31       5337.759 32       5337.759 34       5337.68  35       5337.68  36
GR 5337.47  37       5337.47  39       5337.331 40       5337.331 41       5337.338 42
GR 5337.338 44       5337.504 45       5337.504 46       5338.223 47       5338.223 49
GR 5338.634 49.29
;
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
NC 0.01     0.01     0.021
X1 36715STGM-OF      113      0        0        0.0      0.0      0        0        0
GR 5325     0        5321.275 1        5321.275 3        5321.28  4        5321.28  5
GR 5321.322 6        5321.322 8        5321.291 9        5321.291 10       5321.258 11
GR 5321.258 13       5321.189 14       5321.189 16       5321.072 17       5321.072 18
GR 5321.011 19       5321.011 21       5320.935 22       5320.935 23       5320.832 24
GR 5320.832 26       5320.896 27       5320.978 28       5320.859 29       5320.859 31
GR 5320.925 32       5320.925 33       5321.012 34       5321.012 36       5321.089 37
GR 5321.089 38       5321.167 39       5321.167 41       5321.254 42       5321.254 43
GR 5321.331 44       5321.331 46       5321.395 47       5321.395 48       5321.51  49
GR 5321.467 50       5321.467 51       5321.503 52       5321.503 53       5321.596 54
GR 5321.596 56       5321.706 57       5321.706 58       5321.818 59       5321.818 61
GR 5322.163 62       5322.163 63       5322.353 64       5322.353 66       5322.348 67
GR 5322.348 68       5322.333 69       5322.333 70       5322.336 71       5322.128 72
GR 5322.128 73       5322.002 74       5322.002 76       5321.96  77       5321.96  78
GR 5322.049 79       5322.049 81       5322.178 82       5322.178 83       5322.289 84
GR 5322.289 86       5322.363 87       5322.363 88       5322.417 89       5322.417 91
GR 5322.504 92       5322.498 93       5322.498 94       5322.508 95       5322.508 96
GR 5322.435 97       5322.435 99       5322.395 100      5322.395 101      5322.339 102
GR 5322.339 104      5322.267 105      5322.267 106      5322.257 107      5322.257 109
GR 5322.186 110      5322.186 111      5322.073 112      5322.073 114      5322.015 115
GR 5322.015 116      5321.996 117      5321.996 119      5321.906 120      5321.906 121
GR 5321.875 122      5321.875 124      5321.858 125      5321.858 126      5321.816 127
GR 5321.816 129      5321.809 130      5321.809 131      5321.793 132      5321.793 134
GR 5321.74  135      5321.74  136      5325     137
;
NC 0.01     0.01     0.021
X1 36716STGM-OF      53       0        0        0.0      0.0      0        0        0
GR 5320     0        5317.652 2        5317.455 3        5317.455 4        5317.161 5
GR 5317.161 7        5317.023 8        5317.023 9        5317.197 10       5317.197 12
GR 5317.453 13       5317.453 14       5317.556 15       5317.556 17       5317.61  18
GR 5317.61  19       5317.669 20       5317.669 22       5317.646 23       5317.646 24
GR 5317.605 25       5317.605 27       5317.587 28       5317.587 29       5317.527 30
GR 5317.527 32       5317.463 33       5317.463 34       5317.579 35       5317.579 37
GR 5317.671 38       5317.671 39       5317.367 40       5317.367 42       5316.998 43
GR 5316.998 44       5316.724 45       5316.724 47       5316.742 48       5316.742 49
GR 5316.853 50       5316.813 51       5316.813 52       5316.856 53       5316.856 54
GR 5316.892 55       5316.892 57       5316.934 58       5316.934 59       5317.015 60
GR 5317.015 62       5317.047 63       5320     64.9
;
NC 0.01     0.01     0.021
X1 36717STGM-OF      137      0        0        0.0      0.0      0        0        0
GR 5330     -1       5320     0        5314.877 2        5314.979 3        5314.979 5
GR 5314.622 6        5314.548 7        5314.548 8        5314.441 9        5314.441 11
GR 5314.267 12       5314.267 14       5314.079 15       5314.28  16       5314.28  17
GR 5314.255 18       5314.255 20       5314.304 21       5314.304 23       5314.246 24
GR 5314.323 25       5314.323 26       5314.233 27       5314.233 28       5314.314 29
GR 5314.257 30       5314.257 32       5314.169 33       5314.26  34       5314.26  35
GR 5314.148 36       5314.148 37       5314.172 38       5313.998 39       5313.998 41
GR 5314.041 42       5314.041 44       5313.978 45       5313.978 46       5314.03  47
GR 5313.789 48       5313.789 50       5313.817 51       5313.817 54       5313.9   55
GR 5313.9   57       5313.891 58       5313.891 59       5314.049 60       5314.04  61
GR 5314.04  63       5314.158 64       5314.158 66       5314.104 67       5314.305 68
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5314.305 69       5313.975 70       5313.975 72       5314.017 73       5314.017 75
GR 5314.03  76       5314.128 77       5314.128 78       5314.031 79       5314.031 81
GR 5313.997 82       5313.997 84       5313.993 85       5314.169 86       5314.169 87
GR 5314.095 88       5314.095 89       5314.25  90       5314.234 91       5314.234 93
GR 5314.034 94       5314.152 95       5314.152 96       5313.982 97       5313.982 98
GR 5314.088 99       5313.964 100      5313.964 102      5314.122 103      5314.122 105
GR 5314.167 106      5314.167 107      5314.356 108      5314.356 109      5314.341 110
GR 5314.341 111      5314.477 112      5314.391 113      5314.391 115      5314.418 116
GR 5314.418 118      5314.394 119      5314.394 120      5314.559 121      5314.628 122
GR 5314.628 124      5314.802 125      5314.802 127      5314.851 128      5314.946 129
GR 5314.946 130      5314.87  131      5314.87  133      5315.01  134      5315.01  136
GR 5314.874 137      5314.958 138      5314.958 139      5314.893 140      5314.893 141
GR 5314.997 142      5315.062 143      5315.062 145      5315.068 146      5315.211 147
GR 5315.211 148      5315.186 149      5315.186 150      5315.456 151      5315.415 152
GR 5315.415 154      5315.376 155      5315.45  156      5315.45  157      5315.432 158
GR 5315.432 159      5315.642 160      5315.615 161      5315.615 163      5315.64  164
GR 5320     165.93   5330     166
;
NC 0.01     0.01     0.021
X1 36718STGM-OF      85       0        0       0.0      0.0      0        0        0
GR 5322.462 0        5322.462 2        5322.351 3        5322.351 5        5322.264 6
GR 5322.264 8        5322.201 9        5322.201 10       5321.964 11       5321.972 12
GR 5321.972 13       5321.789 14       5321.789 16       5321.64  17       5321.627 18
GR 5321.627 19       5321.47  20       5321.47  21       5321.37  22       5321.37  24
GR 5321.289 25       5321.289 27       5321.159 28       5321.159 29       5320.92  30
GR 5320.902 31       5320.902 32       5320.747 33       5320.747 35       5320.629 36
GR 5320.575 37       5320.575 38       5320.452 39       5320.452 40       5320.402 41
GR 5320.402 43       5320.406 44       5320.406 46       5320.591 47       5320.591 48
GR 5320.849 49       5320.821 50       5320.821 51       5320.973 52       5320.973 54
GR 5321.065 55       5321.054 56       5321.054 57       5321.074 58       5321.074 59
GR 5321.019 60       5321.019 62       5321.031 63       5321.031 65       5321.053 66
GR 5321.053 67       5321.058 68       5321.042 69       5321.042 70       5320.95  71
GR 5320.95  73       5320.659 74       5320.673 75       5320.673 76       5320.196 77
GR 5320.196 78       5320.138 79       5320.138 81       5320.29  82       5320.29  84
GR 5320.377 85       5320.377 87       5320.49  88       5320.49  89       5320.618 90
GR 5320.618 92       5320.68  93       5320.706 94       5320.706 95       5320.82  96
GR 5320.82  97       5320.946 98       5320.946 100      5321.1   101      5322     101.74
;
NC 0.01     0.01     0.01
X1 36939STGM-OF      45       0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5339.95  0        5339.839 1        5339.839 2        5339.267 3        5339.267 5
GR 5339.005 6        5339.005 7        5338.957 8        5338.957 10       5338.983 11
GR 5338.983 12       5339.046 13       5339.046 15       5339.075 16       5339.075 18
GR 5339.064 19       5339.042 20       5339.036 21       5339.036 23       5338.993 24
GR 5338.993 25       5338.926 26       5338.926 28       5338.851 29       5338.851 30
GR 5338.71  31       5338.71  33       5338.585 34       5338.585 35       5338.477 36
GR 5338.477 38       5338.396 39       5338.396 41       5338.353 42       5338.247 43
GR 5338.242 44       5338.242 46       5338.428 47       5338.428 48       5338.675 49
GR 5338.675 51       5339.01  52       5339.01  53       5338.98  54       5340     54.95
;
NC 0.01     0.01     0.021
X1 37665STGM-OF      47       0        0        0.0      0.0      0        0        0
GR 5345     -1       5339.95  0        5339.839 1        5339.839 2        5339.267 3
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5339.267 5       5339.005 6       5339.005 7       5338.957 8       5338.957 10
GR 5338.983 11      5338.983 12      5339.046 13      5339.046 15      5339.075 16
GR 5339.075 18      5339.064 19      5339.042 20      5339.036 21      5339.036 23
GR 5338.993 24      5338.993 25      5338.926 26      5338.926 28      5338.851 29
GR 5338.851 30      5338.71  31      5338.71  33      5338.585 34      5338.585 35
GR 5338.477 36      5338.477 38      5338.396 39      5338.396 41      5338.353 42
GR 5338.247 43      5338.242 44      5338.242 46      5338.428 47      5338.428 48
GR 5338.675 49      5338.675 51      5339.01  52      5339.01  53      5338.98  54
GR 5340     54.95   5345     55
;
NC 0.01     0.01    0.021
X1 37666STGM-OF     76       0       0       0.0     0.0     0       0       0
GR 5345     0       5341.433 1       5341.433 2       5341.188 3       5341.189 4
GR 5341.189 6       5341.249 7       5340.961 8       5340.961 9       5340.947 10
GR 5340.947 11      5340.811 12      5340.822 13      5340.822 15      5340.976 16
GR 5340.976 18      5340.992 19      5340.992 20      5341.125 21      5341.169 22
GR 5341.169 24      5341.261 25      5341.261 27      5341.271 28      5341.39  29
GR 5341.39  31      5341.448 32      5341.448 33      5341.529 34      5341.616 35
GR 5341.616 37      5341.733 38      5341.733 40      5341.781 41      5341.781 42
GR 5341.78  43      5341.819 44      5341.819 46      5341.814 47      5341.814 49
GR 5341.848 50      5341.843 51      5341.843 52      5341.882 53      5341.882 55
GR 5341.854 56      5341.854 58      5341.882 59      5341.874 60      5341.874 61
GR 5341.937 62      5341.937 63      5341.906 64      5341.905 65      5341.905 67
GR 5341.815 68      5341.802 69      5341.802 70      5341.754 71      5341.754 72
GR 5341.721 73      5341.652 74      5341.652 76      5341.512 77      5341.512 79
GR 5341.413 80      5341.413 81      5341.356 82      5341.356 83      5341.215 84
GR 5341.215 85      5341.104 86      5340.969 87      5340.969 89      5341.172 90
GR 5345     91.15
;
NC 0.01     0.01    0.021
X1 37668STGM-OF     52       0       0       0.0     0.0     0       0       0
GR 5350     0       5345.763 1       5345.612 2       5345.612 4       5345.427 5
GR 5345.427 6       5345.358 7       5345.358 9       5345.304 10      5345.304 11
GR 5345.146 12      5345.146 14      5344.952 15      5344.952 16      5344.739 17
GR 5344.739 19      5344.633 20      5344.633 21      5344.793 22      5344.793 24
GR 5344.876 25      5344.876 26      5344.957 27      5344.957 29      5345.021 30
GR 5345.021 31      5345.012 32      5345.012 34      5344.959 35      5344.959 36
GR 5344.925 37      5344.925 39      5344.856 40      5344.856 41      5344.708 42
GR 5344.708 44      5344.677 45      5344.677 46      5344.843 47      5344.843 49
GR 5345.153 50      5345.153 51      5345.431 52      5345.431 54      5345.581 55
GR 5345.581 56      5345.787 57      5345.787 59      5345.874 60      5345.874 61
GR 5345.953 62      5350     62.05
;
NC 0.01     0.01    0.021
X1 37673STGMF-OF    44       0       0       0.0     0.0     0       0       0
GR 5338     0       5335.726 1       5335.648 2       5335.648 4       5335.537 5
GR 5335.537 6       5335.205 7       5335.205 9       5335.169 10      5335.169 11
GR 5335.229 12      5335.229 14      5335.295 15      5335.295 16      5335.344 17
GR 5335.344 19      5335.378 20      5335.378 21      5335.316 22      5335.316 24
GR 5335.29  25      5335.29  26      5335.277 27      5335.277 29      5335.244 30
GR 5335.244 31      5335.202 32      5335.202 34      5335.113 35      5335.113 36
GR 5334.997 37      5334.997 39      5334.881 40      5334.881 41      5334.768 42
GR 5334.768 44      5334.664 45      5334.664 46      5334.697 47      5334.697 49
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5334.886 50       5334.886 51       5334.936 52       5338     53.91
;
NC 0.01     0.01     0.021
X1 37675STGM-OF      50       0        0        0.0      0.0      0        0        0
GR 5335     0        5328.801 1        5328.811 2        5328.811 4        5328.743 5
GR 5328.592 6        5328.454 7        5328.454 9        5328.316 10       5328.316 11
GR 5328.167 12       5328.167 14       5327.989 15       5327.989 16       5327.86  17
GR 5327.8   18       5327.8   19       5327.941 20       5327.941 22       5328.055 23
GR 5328.055 24       5328.107 25       5328.107 27       5328.143 28       5328.143 29
GR 5328.154 30       5328.154 32       5328.15  33       5328.15  34       5328.125 35
GR 5328.125 37       5328.086 38       5328.086 39       5328.035 40       5328.035 41
GR 5328.059 42       5328.02  43       5328.02  45       5327.865 46       5327.865 47
GR 5327.727 48       5327.727 50       5327.64  51       5327.64  52       5327.73  53
GR 5327.729 55       5327.942 56       5327.942 57       5328.191 58       5335     59.83
;
NC 0.01     0.01     0.021
X1 37713STGM-OF      49       0        0        0.0      0.0      0        0        0
GR 5349     0        5344.046 1        5344.046 3        5343.947 4        5343.947 5
GR 5343.755 6        5343.755 8        5343.411 9        5343.411 10       5343.221 11
GR 5343.221 13       5342.867 14       5342.867 15       5342.827 16       5342.827 18
GR 5342.894 19       5342.894 20       5342.98  21       5342.98  23       5342.962 24
GR 5342.962 25       5342.912 26       5342.912 28       5342.807 29       5342.807 30
GR 5342.737 31       5342.737 33       5342.701 34       5342.701 35       5342.499 36
GR 5342.499 38       5342.347 39       5342.347 40       5342.224 41       5342.224 43
GR 5342.323 44       5342.323 45       5342.617 46       5342.617 48       5342.913 49
GR 5342.913 50       5343.123 51       5343.123 53       5343.323 54       5343.323 55
GR 5343.5   56       5343.5   58       5343.708 59       5349     59.55
;
NC 0.01     0.01     0.021
X1 37717STGM-OF      33       0        0        0.0      0.0      0        0        0
GR 5337     0        5332.862 1        5332.862 3        5332.922 4        5332.922 5
GR 5333.088 6        5333.088 8        5333.21  9        5333.21  10       5333.362 11
GR 5333.362 13       5333.426 14       5333.426 15       5333.492 16       5333.492 18
GR 5333.549 19       5333.549 20       5333.55  21       5333.55  23       5333.502 24
GR 5333.502 25       5333.387 26       5333.387 28       5333.321 29       5333.321 30
GR 5333.274 31       5333.274 33       5333.218 34       5333.218 35       5333.183 36
GR 5333.183 38       5333.387 39       5337     39.91
;
NC 0.01     0.01     0.021
X1 37721STGM-OF      31       0        0        0.0      0.0      0        0        0
GR 5337     0        5331.538 2        5331.439 3        5331.439 4        5331.579 5
GR 5331.579 7        5331.703 8        5331.703 9        5331.814 10       5331.814 12
GR 5331.98  13       5331.98  14       5332.029 15       5332.025 16       5332.025 17
GR 5332.039 18       5332.039 19       5332.007 20       5332.007 22       5331.938 23
GR 5331.938 24       5331.852 25       5331.852 27       5331.767 28       5331.767 29
GR 5331.66  30       5331.66  32       5331.584 33       5331.584 34       5331.407 35
GR 5337     36.41
;
NC 0.01     0.01     0.021
X1 37731STGM-OF      61       0        0        0.0      0.0      0        0        0
GR 5332     0        5331.171 1        5331.039 2        5331.039 3        5330.971 4
GR 5330.732 5        5330.732 7        5330.831 8        5330.831 10       5330.87  11
GR 5330.87  12       5330.926 13       5330.926 14       5330.948 15       5330.948 16
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5331.019 17      5331.051 18      5331.051 20      5331.214 21      5331.214 23
GR 5331.215 24      5331.246 25      5331.246 26      5331.249 27      5331.249 29
GR 5331.262 30      5331.262 32      5331.255 33      5331.189 34      5331.189 35
GR 5331.214 36      5331.214 37      5331.2   38      5331.188 39      5331.188 41
GR 5331.171 42      5331.194 43      5331.194 44      5331.19  45      5331.19  46
GR 5331.163 47      5331.161 48      5331.161 50      5331.039 51      5331.039 54
GR 5330.959 55      5330.959 57      5331.006 58      5331.006 59      5330.884 60
GR 5330.86  61      5330.86  63      5330.723 64      5330.723 66      5330.684 67
GR 5330.498 68      5330.498 69      5330.52  70      5330.52  72      5330.626 73
GR 5332     73.9
;
NC 0.01     0.01    0.021
X1 37742STGM-OF     44       0       0       0.0     0.0     0       0       0
GR 5335     0       5330.685 1       5330.625 2       5330.625 4       5330.34  5
GR 5330.34  6       5330.149 7       5330.149 9       5329.961 10      5329.961 11
GR 5329.616 12      5329.616 14      5329.651 15      5329.651 16      5329.792 17
GR 5329.792 19      5330.057 20      5330.057 21      5330.164 22      5330.164 24
GR 5330.259 25      5330.259 26      5330.335 27      5330.335 29      5330.379 30
GR 5330.379 31      5330.403 32      5330.403 34      5330.336 35      5330.336 36
GR 5330.273 37      5330.273 39      5330.198 40      5330.198 41      5329.942 42
GR 5329.942 44      5329.805 45      5329.805 46      5329.705 47      5329.705 49
GR 5329.967 50      5329.967 51      5330.241 52      5335     52.35
;
NC 0.01     0.01    0.021
X1 37743STGM-OF     75       0       0       0.0     0.0     0       0       0
GR 5330.468 0       5330.468 1       5330.419 2       5330.53  3       5330.53  4
GR 5330.474 5       5330.474 6       5330.444 7       5330.25  8       5330.25  10
GR 5330.126 11      5329.787 12      5329.787 14      5329.389 15      5329.389 17
GR 5329.192 18      5329.192 21      5329.316 22      5329.316 24      5329.424 25
GR 5329.462 26      5329.462 27      5329.488 28      5329.488 29      5329.537 30
GR 5329.537 31      5329.549 32      5329.621 33      5329.621 34      5329.627 35
GR 5329.627 36      5329.73  37      5329.73  38      5329.753 39      5329.753 40
GR 5329.771 41      5329.791 42      5329.791 44      5329.773 45      5329.773 47
GR 5329.737 48      5329.712 49      5329.712 51      5329.706 52      5329.706 54
GR 5329.632 55      5329.639 56      5329.639 58      5329.626 59      5329.672 60
GR 5329.672 61      5329.646 62      5329.675 63      5329.675 64      5329.659 65
GR 5329.659 66      5329.622 67      5329.622 68      5329.609 69      5329.609 70
GR 5329.589 71      5329.557 72      5329.557 74      5329.402 75      5329.402 77
GR 5329.33  78      5329.308 79      5329.308 81      5329.563 82      5329.563 85
GR 5329.837 86      5329.837 88      5329.842 89      5330.125 90      5330.125 90.71
;
NC 0.01     0.01    0.021
X1 37746STGM-OF     49       0       0       0.0     0.0     0       0       0
GR 5335     0       5330.08  1       5330.08  3       5329.944 4       5329.944 5
GR 5329.751 6       5329.751 7       5329.825 8       5329.571 9       5329.571 10
GR 5329.205 11      5329.205 13      5328.948 14      5328.948 15      5328.917 16
GR 5328.917 18      5329.171 19      5329.171 20      5329.257 21      5329.257 23
GR 5329.312 24      5329.312 25      5329.353 26      5329.353 28      5329.391 29
GR 5329.391 30      5329.404 31      5329.404 33      5329.381 34      5329.381 35
GR 5329.309 36      5329.309 38      5329.215 39      5329.215 40      5329.122 41
GR 5329.122 43      5328.924 44      5328.924 45      5328.787 46      5328.787 48
GR 5328.751 49      5328.751 50      5328.897 51      5328.897 52      5328.911 53
GR 5329.179 54      5329.179 55      5329.447 56      5335     58.02
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
;
NC 0.01     0.01     0.01
X1 37750STGM-OF      24       0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5345     -1       5335.707 0        5335.627 1        5335.511 2        5335.148 3
GR 5335.109 4        5335.177 5        5335.249 6        5335.297 7        5335.328 8
GR 5335.316 9        5335.29  10       5335.277 11       5335.244 12       5335.202 13
GR 5335.113 14       5334.881 16       5334.768 17       5334.664 18       5334.697 19
GR 5334.886 20       5334.936 21       5334.933 21.23    5345     22
;
NC 0.01     0.01     0.021
X1 37753STGM-OF      51       0        0        0.0      0.0      0        0        0
GR 5330     0        5327.32  2        5327.239 3        5327.239 4        5327.14  5
GR 5327.14  7        5327.052 8        5327.052 9        5326.968 10       5326.968 12
GR 5326.833 13       5326.833 14       5326.677 15       5326.677 17       5326.691 18
GR 5326.691 19       5326.835 20       5326.835 22       5326.894 23       5326.894 24
GR 5326.893 25       5326.893 26       5326.884 27       5326.893 28       5326.893 29
GR 5326.92  30       5326.92  32       5326.918 33       5326.918 34       5326.879 35
GR 5326.879 37       5326.862 38       5326.862 39       5326.858 40       5326.858 42
GR 5326.838 43       5326.838 44       5326.77  45       5326.77  47       5326.738 48
GR 5326.738 49       5326.56  50       5326.56  52       5326.5   53       5326.5   54
GR 5326.57  55       5326.57  57       5326.644 58       5326.644 59       5326.674 60
GR 5330     60.65
;
NC 0.01     0.01     0.021
X1 37757STGM-OF      83       0        0        0.0      0.0      0        0        0
GR 5331.471 0        5331.471 2        5330.892 3        5330.892 4        5330.545 5
GR 5330.545 7        5330.384 8        5330.384 9        5330.43  10       5330.43  12
GR 5330.525 13       5330.525 14       5330.744 15       5330.744 17       5330.761 18
GR 5330.761 19       5330.716 20       5330.716 22       5330.487 23       5330.487 24
GR 5330.288 25       5330.288 27       5330.015 28       5330.015 29       5329.704 30
GR 5329.704 32       5329.51  33       5329.492 34       5329.507 35       5329.507 37
GR 5329.545 38       5329.545 39       5329.571 40       5329.571 42       5329.593 43
GR 5329.593 44       5329.674 45       5329.674 47       5329.72  48       5329.72  49
GR 5329.76  50       5329.76  52       5329.891 53       5329.891 54       5329.938 55
GR 5329.938 57       5329.981 58       5329.981 59       5329.982 60       5329.982 62
GR 5329.941 63       5329.941 64       5329.88  65       5329.88  66       5329.865 67
GR 5329.715 68       5329.715 69       5329.638 70       5329.638 72       5329.537 73
GR 5329.537 75       5329.476 76       5329.476 77       5329.411 78       5329.411 80
GR 5329.383 81       5329.383 82       5329.581 83       5329.581 85       5330.071 86
GR 5330.071 87       5330.379 88       5330.379 90       5330.462 91       5330.462 92
GR 5330.425 93       5330.425 95       5330.306 96       5330.306 97       5330.196 98
GR 5330.196 99       5330.179 100      5330.389 100.72
;
NC 0.01     0.01     0.021
X1 37758STGM-OF      81       0        0        0.0      0.0      0        0        0
GR 5331.185 0        5331.185 1        5331.324 2        5331.324 4        5331.486 5
GR 5331.486 6        5331.287 7        5331.287 9        5331.226 10       5331.226 11
GR 5331.28  12       5331.28  14       5331.219 15       5331.219 16       5331.064 17
GR 5331.064 19       5330.962 20       5330.962 21       5330.899 22       5330.899 24
GR 5330.853 25       5330.853 26       5330.66  27       5330.66  29       5330.525 30
GR 5330.525 31       5330.502 32       5330.502 34       5330.545 35       5330.545 36
GR 5330.574 37       5330.574 39       5330.61  40       5330.61  41       5330.75  42
GR 5330.75  44       5330.763 45       5330.763 46       5330.818 47       5330.818 49
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5330.888 50       5330.888 51       5331.017 52       5331.017 54       5331.079 55
GR 5331.079 56       5331.076 57       5331.076 59       5331.086 60       5331.086 61
GR 5331.038 62       5331.038 64       5330.928 65       5330.928 66       5330.881 67
GR 5330.881 69       5330.791 70       5330.791 71       5330.773 72       5330.773 74
GR 5330.707 75       5330.707 76       5330.658 77       5330.658 79       5330.586 80
GR 5330.586 81       5330.789 82       5330.789 84       5331.366 85       5331.366 86
GR 5331.562 87       5331.562 89       5331.618 90       5331.618 91       5331.683 92
GR 5331.683 94       5331.623 95       5331.623 96       5331.575 97       5331.575 99
GR 5331.6   99.48
;
NC 0.01     0.01     0.021
X1 37759STGM-OF      81       0        0        0.0      0.0      0        0        0
GR 5329.321 0        5329.321 1        5329.277 2        5329.277 4        5329.315 5
GR 5329.315 6        5329.374 7        5329.374 9        5329.421 10       5329.421 12
GR 5329.502 13       5329.502 14       5329.377 15       5329.398 16       5329.398 17
GR 5329.369 18       5329.369 19       5329.211 20       5329.211 22       5328.792 23
GR 5328.792 24       5328.462 25       5328.462 26       5328.416 27       5328.497 28
GR 5328.497 30       5328.532 31       5328.532 32       5328.549 33       5328.549 35
GR 5328.605 36       5328.595 37       5328.679 38       5328.679 40       5328.684 41
GR 5328.684 42       5328.797 43       5328.797 45       5328.815 46       5328.815 47
GR 5328.822 48       5328.893 49       5328.893 50       5328.897 51       5328.897 53
GR 5328.93  54       5328.93  55       5328.903 56       5328.903 58       5328.878 59
GR 5328.878 60       5328.847 61       5328.847 63       5328.771 64       5328.771 66
GR 5328.669 67       5328.669 68       5328.639 69       5328.617 70       5328.617 71
GR 5328.569 72       5328.569 73       5328.56  74       5328.56  76       5328.489 77
GR 5328.489 78       5328.864 79       5328.864 80       5328.881 81       5329.29  82
GR 5329.29  84       5329.459 85       5329.459 86       5329.485 87       5329.485 89
GR 5329.466 90       5329.435 91       5329.388 92       5329.388 94       5329.359 95
GR 5329.359 95.5
;
NC 0.01     0.01     0.021
X1 37760STGM-OF      68       0        0        0.0      0.0      0        0        0
GR 5335     0        5327.787 1        5327.727 2        5327.727 4        5327.755 5
GR 5327.755 6        5327.727 7        5327.727 9        5327.685 10       5327.685 11
GR 5327.695 12       5327.695 14       5327.602 15       5327.602 16       5327.514 17
GR 5327.514 19       5327.065 20       5327.065 21       5326.951 22       5326.951 24
GR 5326.967 25       5326.967 26       5326.984 27       5326.984 29       5327.047 30
GR 5327.047 31       5327.051 32       5327.051 34       5327.149 35       5327.149 36
GR 5327.242 37       5327.242 39       5327.281 40       5327.281 41       5327.384 42
GR 5327.384 44       5327.439 45       5327.439 47       5327.506 48       5327.506 49
GR 5327.429 50       5327.429 52       5327.407 53       5327.407 54       5327.35  55
GR 5327.35  57       5327.292 58       5327.292 59       5327.212 60       5327.212 62
GR 5327.161 63       5327.161 64       5327.107 65       5327.107 67       5327.122 68
GR 5327.122 69       5327.136 70       5327.136 72       5327.2   73       5327.2   74
GR 5327.44  75       5327.44  77       5327.584 78       5327.584 79       5327.823 80
GR 5327.823 82       5327.897 83       5335     84.3
;
NC 0.01     0.01     0.021
X1 37762STGM-OF      54       0        0        0.0      0.0      0        0        0
GR 5324.306 0        5323.928 1        5323.968 2        5323.968 3        5323.779 4
GR 5323.779 5        5323.697 6        5323.697 8        5323.731 9        5323.731 11
GR 5323.775 12       5323.775 14       5323.813 15       5323.824 16       5323.857 17
GR 5323.857 19       5323.88  20       5323.88  21       5323.866 22       5323.883 23
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5323.883 24      5323.966 25      5323.966 27      5324.009 28      5323.991 29
GR 5323.991 30      5324.056 31      5324.056 32      5324.028 33      5324.028 35
GR 5323.999 36      5323.999 38      5323.938 39      5323.938 41      5323.876 42
GR 5323.876 43      5323.806 44      5323.806 46      5323.699 47      5323.699 48
GR 5323.685 49      5323.666 50      5323.666 51      5323.651 52      5323.651 54
GR 5323.507 55      5323.507 57      5323.511 58      5323.511 59      5324.102 60
GR 5324.102 61      5324.168 62      5324.465 63      5324.465 63.93
;
NC 0.01     0.01     0.021
X1 37763STGM-OF     55       0       0        0.0     0.0      0       0        0
GR 5323.424 0       5322.792 1       5322.792 2       5322.734 3       5322.734 5
GR 5322.802 6       5322.802 7       5322.784 8       5322.846 9       5322.846 10
GR 5322.855 11      5322.855 13      5322.895 14      5322.895 15      5322.878 16
GR 5322.954 17      5322.954 18      5322.994 19      5322.994 21      5323.018 22
GR 5323.018 23      5322.996 24      5323.062 25      5323.062 26      5323.145 27
GR 5323.145 29      5323.185 30      5323.168 31      5323.19  32      5323.19  34
GR 5323.13  35      5323.13  37      5323.04  38      5323.017 39      5322.96  40
GR 5322.96  42      5322.919 43      5322.919 45      5322.778 46      5322.778 47
GR 5322.705 48      5322.705 50      5322.744 51      5322.744 53      5322.72  54
GR 5322.72  55      5322.665 56      5322.665 58      5322.82  59      5322.82  61
GR 5323.228 62      5323.228 63      5323.517 64      5323.517 66      5323.547 66.46
;
NC 0.01     0.01     0.021
X1 37764STGM-OF     61       0       0        0.0     0.0      0       0        0
GR 5323     1       5322.589 3       5322.602 4       5322.602 5       5322.427 6
GR 5322.427 8       5322.283 9       5322.283 10      5322.128 11      5322.128 13
GR 5321.917 14      5321.917 15      5322.029 16      5322.029 18      5322.138 19
GR 5322.138 20      5322.19  21      5322.19  23      5322.274 24      5322.274 25
GR 5322.271 26      5322.271 28      5322.321 29      5322.321 30      5322.362 31
GR 5322.362 33      5322.386 34      5322.386 35      5322.424 36      5322.424 38
GR 5322.436 39      5322.436 40      5322.472 41      5322.472 43      5322.463 44
GR 5322.463 45      5322.445 46      5322.445 48      5322.364 49      5322.364 50
GR 5322.333 51      5322.333 53      5322.296 54      5322.296 55      5322.26  56
GR 5322.26  58      5322.223 59      5322.223 60      5322.198 61      5322.198 63
GR 5322.132 64      5322.132 65      5322.122 66      5322.122 67      5322.079 68
GR 5322.608 69      5322.608 70      5322.832 71      5322.832 73      5323.041 74
GR 5323.041 74.62
;
NC 0.01     0.01     0.021
X1 40087STGM-OF     52       0       0        0.0     0.0      0       0        0
GR 5350     1       5344.717 2       5344.489 3       5344.489 5       5344.395 6
GR 5344.395 7       5344.256 8       5344.256 10      5344.057 11      5344.057 12
GR 5343.889 13      5343.889 15      5343.637 16      5343.637 18      5343.153 19
GR 5343.153 20      5343.089 21      5343.089 23      5343.271 24      5343.271 25
GR 5343.286 26      5343.286 28      5343.32  29      5343.32  30      5343.412 31
GR 5343.412 33      5343.385 34      5343.385 35      5343.359 36      5343.363 37
GR 5343.363 38      5343.371 39      5343.371 41      5343.253 42      5343.253 43
GR 5343.166 44      5343.166 46      5343.058 47      5343.058 48      5343.084 49
GR 5343.222 50      5343.222 51      5343.362 52      5343.362 53      5343.517 54
GR 5343.517 56      5343.636 57      5343.636 58      5343.73  59      5343.73  61
GR 5344.052 62      5350     62.97
;
NC 0.01     0.01     0.021
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
X1 406156STGM-OF     62       0        0        0.0      0.0      0        0        0
GR 5354.285 0        5354.285 1        5354.245 2        5354.245 3        5353.983 4
GR 5353.983 6        5353.882 7        5353.882 8        5353.78  9        5353.78  11
GR 5353.686 12       5353.686 13       5353.618 14       5353.618 16       5353.563 17
GR 5353.563 18       5353.368 19       5353.368 21       5353.185 22       5353.185 23
GR 5353.113 24       5353.113 26       5353.352 27       5353.352 28       5353.473 29
GR 5353.473 31       5353.568 32       5353.568 33       5353.695 34       5353.695 36
GR 5353.729 37       5353.729 38       5353.754 39       5353.754 43       5353.717 44
GR 5353.717 46       5353.691 47       5353.691 48       5353.492 49       5353.492 51
GR 5353.38  52       5353.38  53       5353.229 54       5353.229 56       5353.463 57
GR 5353.463 58       5353.772 59       5353.772 61       5354.052 62       5354.052 63
GR 5354.295 64       5354.295 66       5354.421 67       5354.421 68       5354.392 69
GR 5354.392 71       5354.271 72       5354.271 73       5354.288 74       5354.288 76
GR 5354.393 77       5354.393 77.92
;
NC 0.01     0.01     0.021
X1 406157STGM-OF     80       0        0        0.0      0.0      0        0        0
GR 5355.485 0        5355.506 1        5355.321 2        5355.321 3        5355.397 4
GR 5355.397 5        5355.288 6        5355.157 7        5355.157 9        5354.918 10
GR 5354.918 13       5354.413 14       5354.413 16       5354.372 17       5354.354 18
GR 5354.354 19       5354.414 20       5354.414 21       5354.5   22       5354.675 23
GR 5354.675 25       5354.746 26       5354.763 27       5354.763 28       5354.801 29
GR 5354.801 30       5354.792 31       5354.823 32       5354.823 34       5354.795 35
GR 5354.873 36       5354.873 38       5354.928 39       5354.928 41       5354.942 43
GR 5354.942 44       5354.972 45       5354.972 46       5354.943 47       5354.955 48
GR 5354.955 50       5354.931 51       5354.931 53       5354.923 54       5354.914 55
GR 5354.914 57       5354.909 58       5354.909 59       5354.892 60       5354.861 61
GR 5354.861 63       5354.763 64       5354.763 66       5354.714 67       5354.646 68
GR 5354.646 69       5354.587 70       5354.587 71       5354.51  72       5354.271 73
GR 5354.271 75       5354.324 76       5354.324 79       5354.521 80       5354.521 82
GR 5354.617 83       5354.881 84       5354.881 85       5355.047 86       5355.047 88
GR 5355.133 89       5355.133 91       5355.267 92       5355.22  93       5355.22  94
GR 5355.569 95       5355.569 96       5355.424 97       5355.627 98       5355.627 99.33
;
NC 0.01     0.01     0.021
X1 406158STGM-OF     65       0        0        0.0      0.0      0        0        0
GR 5357.083 0        5357.083 2        5356.946 3        5356.946 4        5356.515 5
GR 5356.515 7        5356.378 8        5356.378 10       5356.302 11       5356.162 12
GR 5356.101 13       5356.101 15       5356.062 16       5356.062 17       5356.026 18
GR 5356.026 20       5355.801 21       5355.801 22       5355.61  23       5355.61  24
GR 5355.53  25       5355.647 26       5355.647 27       5355.789 28       5355.789 30
GR 5355.921 31       5355.921 33       5356.156 34       5356.156 35       5356.237 36
GR 5356.237 37       5356.196 38       5356.219 39       5356.219 40       5356.204 41
GR 5356.204 43       5356.201 44       5356.201 45       5356.137 46       5356.137 48
GR 5356.075 49       5356.075 50       5355.839 51       5355.839 53       5355.708 54
GR 5355.708 55       5355.509 56       5355.509 58       5355.7   59       5355.7   61
GR 5355.965 62       5355.933 63       5356.104 64       5356.104 66       5356.253 67
GR 5356.253 68       5356.37  69       5356.37  71       5356.575 72       5356.575 73
GR 5356.705 74       5356.705 75       5356.721 76       5356.918 77       5356.918 78.07
;
NC 0.01     0.01     0.021
X1 406193STGM-OF     48       0        0        0.0      0.0      0        0        0
GR 5340     0        5335.269 1        5335.172 2        5335.172 3        5335.078 4
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5335.078 6       5334.972 7       5334.972 8       5334.862 9       5334.862 11
GR 5334.649 12      5334.649 13      5334.701 14      5334.701 16      5334.846 17
GR 5334.846 18      5335.03  19      5335.03  21      5335.086 22      5335.086 23
GR 5335.12  24      5335.12  26      5335.234 27      5335.234 28      5335.229 29
GR 5335.229 31      5335.201 32      5335.201 33      5335.129 34      5335.129 36
GR 5335.055 37      5335.055 38      5334.997 39      5334.997 41      5334.918 42
GR 5334.88  43      5334.69  44      5334.69  46      5334.622 47      5334.622 48
GR 5334.849 49      5334.849 51      5335.002 52      5335.002 53      5335.118 54
GR 5335.118 56      5335.234 57      5340     57.94
;
NC 0.01     0.01    0.021
X1 406197STGM-OF    53       0       0       0.0     0.0      0       0       0
GR 5345     -1      5336.047 0       5336.091 1       5336.091 2       5336.131 3
GR 5336.131 5       5336.078 6       5336.078 7       5335.639 8       5335.639 10
GR 5335.594 11      5335.577 12      5335.672 13      5335.672 15      5335.859 16
GR 5335.859 18      5335.918 19      5335.918 20      5335.968 21      5335.968 23
GR 5336.054 24      5336.033 25      5336.048 26      5336.048 28      5336.076 29
GR 5336.076 30      5336.063 31      5336.063 33      5335.985 34      5335.985 35
GR 5335.909 36      5335.909 37      5335.874 38      5335.773 39      5335.773 41
GR 5335.671 42      5335.671 43      5335.54  44      5335.54  46      5335.668 47
GR 5335.668 48      5335.919 49      5335.919 50      5335.882 51      5336.129 52
GR 5336.129 53      5336.211 54      5336.211 56      5336.325 57      5336.325 58
GR 5336.399 59      5336.399 59.22   5345     60
;
NC 0.01     0.01    0.021
X1 406199STGM-OF    74       0       0       0.0     0.0      0       0       0
GR 5345     -1      5337.281 0       5337.281 1       5337.106 2       5337.106 4
GR 5336.995 5       5336.874 6       5336.874 8       5336.669 9       5336.669 11
GR 5336.602 12      5336.692 13      5336.692 15      5336.803 16      5336.803 18
GR 5336.906 19      5336.973 20      5336.973 22      5336.998 23      5337.025 24
GR 5337.025 25      5337.069 26      5337.095 27      5337.095 28      5337.098 29
GR 5337.098 30      5337.087 31      5337.087 32      5337.072 33      5337.072 34
GR 5337.125 35      5337.103 36      5337.103 38      5337.075 39      5337.075 41
GR 5337.106 42      5337.086 43      5337.086 45      5336.98  46      5336.98  49
GR 5336.959 50      5336.959 52      5336.862 53      5336.862 55      5336.803 56
GR 5336.821 57      5336.821 59      5336.81  60      5336.687 61      5336.687 62
GR 5336.64  63      5336.607 64      5336.607 66      5336.554 67      5336.323 68
GR 5336.323 69      5336.223 70      5336.223 71      5336.153 72      5336.111 73
GR 5336.111 74      5336.125 75      5336.125 76      5336.221 77      5336.221 78
GR 5336.269 79      5336.39  80      5336.39  82      5336.842 83      5336.982 84
GR 5336.982 86      5337.154 87      5337.154 88      5345     89
;
NC 0.01     0.01    0.01
X1 406200STGM-OF    51       0.0     0.0     0.0     0.0      0.0     0.0     0.0
GR 5345     -1      5339.104 0       5339.275 1       5339.275 2       5339.34  3
GR 5339.34  5       5339.063 6       5339.063 7       5338.312 8       5338.312 10
GR 5337.939 11      5337.939 12      5337.728 13      5337.728 15      5337.792 16
GR 5337.792 17      5337.866 18      5337.866 20      5337.963 21      5337.963 22
GR 5338.059 23      5338.059 25      5338.074 26      5338.074 27      5338.039 28
GR 5338.039 30      5337.839 31      5337.839 32      5337.751 33      5337.751 35
GR 5337.453 36      5337.453 37      5337.312 38      5337.312 40      5337.18  41
GR 5337.18  42      5337.236 43      5337.236 45      5337.821 46      5337.821 47
GR 5338.132 48      5338.132 50      5338.51  51      5338.51  52      5338.561 53
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5338.561 55       5338.541 56       5338.541 57       5338.56  58       5338.56  59.53
GR 5345     60
;
NC 0.01     0.01     0.021
X1 406201STGM-OF     49       0        0        0.0      0.0      0        0        0
GR 5339.104 0        5339.275 1        5339.275 2        5339.34  3        5339.34  5
GR 5339.063 6        5339.063 7        5338.312 8        5338.312 10       5337.939 11
GR 5337.939 12       5337.728 13       5337.728 15       5337.792 16       5337.792 17
GR 5337.866 18       5337.866 20       5337.963 21       5337.963 22       5338.059 23
GR 5338.059 25       5338.074 26       5338.074 27       5338.039 28       5338.039 30
GR 5337.839 31       5337.839 32       5337.751 33       5337.751 35       5337.453 36
GR 5337.453 37       5337.312 38       5337.312 40       5337.18  41       5337.18  42
GR 5337.236 43       5337.236 45       5337.821 46       5337.821 47       5338.132 48
GR 5338.132 50       5338.51  51       5338.51  52       5338.561 53       5338.561 55
GR 5338.541 56       5338.541 57       5338.56  58       5338.56  59.53
;
NC 0.01     0.01     0.01
X1 406205STGM-OF     49       0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5339.104 0        5339.275 1        5339.275 2        5339.34  3        5339.34  5
GR 5339.063 6        5339.063 7        5338.312 8        5338.312 10       5337.939 11
GR 5337.939 12       5337.728 13       5337.728 15       5337.792 16       5337.792 17
GR 5337.866 18       5337.866 20       5337.963 21       5337.963 22       5338.059 23
GR 5338.059 25       5338.074 26       5338.074 27       5338.039 28       5338.039 30
GR 5337.839 31       5337.839 32       5337.751 33       5337.751 35       5337.453 36
GR 5337.453 37       5337.312 38       5337.312 40       5337.18  41       5337.18  42
GR 5337.236 43       5337.236 45       5337.821 46       5337.821 47       5338.132 48
GR 5338.132 50       5338.51  51       5338.51  52       5338.561 53       5338.561 55
GR 5338.541 56       5338.541 57       5338.56  58       5338.56  59.53
;
NC 0.01     0.01     0.021
X1 406754STGM-OF     41       0        0        0.0      0.0      0        0        0
GR 5340     1        5333.451 2        5333.455 3        5333.455 5        5333.353 6
GR 5333.353 8        5333.302 9        5333.302 10       5333.242 11       5333.242 13
GR 5333.341 14       5333.341 15       5333.438 16       5333.438 17       5333.404 18
GR 5333.563 19       5333.563 20       5333.621 21       5333.621 23       5333.678 24
GR 5333.678 25       5333.684 26       5333.684 28       5333.61  29       5333.61  30
GR 5333.586 31       5333.586 33       5333.449 34       5333.449 35       5333.365 36
GR 5333.365 38       5333.277 39       5333.277 40       5333.167 41       5333.167 43
GR 5333.002 44       5333.002 45       5333.089 46       5333.089 48       5333.187 49
GR 5340     49.85
;
NC 0.01     0.01     0.021
X1 406755STGM-OF     38       0        0        0.0      0.0      0        0        0
GR 5345     0        5334.465 2        5334.255 3        5334.255 4        5334.191 5
GR 5334.191 7        5334.139 8        5334.139 9        5334.142 10       5334.142 12
GR 5334.223 13       5334.223 14       5334.319 15       5334.319 17       5334.381 18
GR 5334.381 19       5334.42  20       5334.42  22       5334.463 23       5334.463 24
GR 5334.515 25       5334.515 27       5334.533 28       5334.533 29       5334.535 30
GR 5334.535 32       5334.459 33       5334.459 34       5334.406 35       5334.406 37
GR 5334.289 38       5334.289 39       5334.143 40       5334.143 42       5334.064 43
GR 5334.064 44       5334.186 45       5345     46.63
;
NC 0.01     0.01     0.021
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
X1 406756STGM-OF     49       0        0        0.0      0.0      0        0        0
GR 5345     1        5334.313 3        5334.21  4        5334.21  5        5334.038 6
GR 5334.038 8        5333.976 9        5333.976 10       5334.054 11       5334.054 13
GR 5334.184 14       5334.243 15       5334.377 16       5334.377 18       5334.552 19
GR 5334.552 20       5334.607 21       5334.607 23       5334.672 24       5334.672 25
GR 5334.692 26       5334.692 28       5334.671 29       5334.671 30       5334.645 31
GR 5334.645 33       5334.522 34       5334.522 35       5334.482 36       5334.482 38
GR 5334.402 39       5334.402 40       5334.334 41       5334.334 43       5334.125 44
GR 5334.125 45       5333.997 46       5333.997 48       5333.942 49       5333.942 50
GR 5333.988 51       5333.988 52       5333.956 53       5333.974 54       5333.974 55
GR 5334.042 56       5334.042 58       5334.212 59       5345     59.79
;
NC 0.01     0.01     0.021
X1 407544STMH-OF     50       0        0        0.0      0.0      0        0        0
GR 5340     0        5334.313 1        5334.313 3        5334.21  4        5334.21  5
GR 5334.038 6        5334.038 8        5333.976 9        5333.976 10       5334.054 11
GR 5334.054 13       5334.184 14       5334.243 15       5334.377 16       5334.377 18
GR 5334.552 19       5334.552 20       5334.607 21       5334.607 23       5334.672 24
GR 5334.672 25       5334.692 26       5334.692 28       5334.671 29       5334.671 30
GR 5334.645 31       5334.645 33       5334.522 34       5334.522 35       5334.482 36
GR 5334.482 38       5334.402 39       5334.402 40       5334.334 41       5334.334 43
GR 5334.125 44       5334.125 45       5333.997 46       5333.997 48       5333.942 49
GR 5333.942 50       5333.988 51       5333.988 52       5333.956 53       5333.974 54
GR 5333.974 55       5334.042 56       5334.042 58       5334.212 59       5340     59.79
;
NC 0.01     0.01     0.021
X1 407549STMH-OF     46       0        0        0.0      0.0      0        0        0
GR 5340     0        5333.3   1        5333.291 2        5333.291 3        5333.164 4
GR 5333.164 6        5333.021 7        5333.021 8        5332.839 9        5332.839 11
GR 5332.842 12       5332.842 13       5332.96  14       5332.96  16       5333.073 17
GR 5333.073 18       5333.19  19       5333.19  21       5333.237 22       5333.237 23
GR 5333.259 24       5333.259 26       5333.31  27       5333.31  31       5333.274 32
GR 5333.274 33       5333.085 34       5333.085 36       5332.993 37       5332.993 38
GR 5332.925 39       5332.925 41       5332.915 42       5332.915 43       5332.926 44
GR 5332.926 46       5332.953 47       5332.953 48       5333.236 49       5333.236 51
GR 5333.33  52       5333.33  53       5333.401 54       5333.401 56       5333.486 57
GR 5340     58.02
;
NC 0.01     0.01     0.021
X1 773049STMN-OF     72       0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5333.016 0        5332.888 1        5332.896 2        5332.896 3        5332.775 4
GR 5332.761 5        5332.761 7        5332.468 8        5332.095 9        5332.095 10
GR 5331.572 11       5331.572 12       5331.304 13       5331.304 14       5331.058 15
GR 5330.91  16       5330.91  17       5330.876 18       5330.876 19       5330.824 20
GR 5330.824 21       5330.891 22       5330.891 23       5330.976 24       5331.162 25
GR 5331.162 26       5331.106 27       5331.106 28       5331.215 29       5331.215 30
GR 5331.269 31       5331.335 32       5331.335 34       5331.515 35       5331.515 37
GR 5331.562 38       5331.581 39       5331.581 41       5331.646 42       5331.646 44
GR 5331.652 45       5331.695 46       5331.695 48       5331.788 49       5331.788 52
GR 5331.874 53       5331.874 55       5331.954 56       5331.954 58       5332.056 59
GR 5332.037 60       5332.037 62       5332.048 63       5332.014 64       5332.014 65
GR 5332.021 66       5331.978 67       5331.978 69       5332.005 70       5331.951 71
GR 5331.951 72       5331.935 73       5331.935 74       5331.885 75       5331.885 76
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
GR 5331.881 77      5331.963 78      5331.963 79      5332.139 80      5332.139 81
GR 5332.329 82      5332.329 82.69
;
NC 0.01     0.01    0.01
X1 773051STMN-OF    32      0.0     0.0     0.0     0.0     0.0     0.0     0.0
GR 5329.112 0       5329.112 2       5328.721 3       5328.721 4       5328.245 5
GR 5328.245 7       5328.187 8       5328.187 9       5328.333 10      5328.333 12
GR 5328.434 13      5328.434 14      5328.575 15      5328.575 17      5328.653 18
GR 5328.653 19      5328.672 20      5328.672 22      5328.702 23      5328.702 24
GR 5328.659 25      5328.659 27      5328.516 28      5328.516 29      5328.456 30
GR 5328.456 32      5328.308 33      5328.308 34      5328.316 35      5328.316 37
GR 5328.498 38      5328.498 38.03
;
NC 0.01     0.01    0.021
X1 773387STMN-OF    48      0       0       0.0     0.0     0       0       0
GR 5333     0       5328.186 1       5328.201 2       5328.201 3       5328.195 4
GR 5328.195 6       5328.114 7       5328.114 8       5328.069 9       5328.069 11
GR 5327.982 12      5327.982 13      5326.5   14      5326.5   16      5326.142 17
GR 5326.142 18      5325.978 19      5325.978 21      5326.071 22      5326.071 23
GR 5326.159 24      5326.159 26      5326.169 27      5326.169 28      5326.269 29
GR 5326.269 31      5326.319 32      5326.319 33      5326.283 34      5326.283 36
GR 5326.231 37      5326.231 38      5326.175 39      5326.175 41      5326.056 42
GR 5326.056 43      5325.974 44      5325.974 46      5325.926 47      5325.926 48
GR 5325.854 49      5325.854 51      5326.209 52      5326.209 53      5326.347 54
GR 5326.347 56      5326.428 57      5333     57.09
;
NC 0.01     0.01    0.021
X1 773391STMN-OF    62      0       0       0.0     0.0     0       0       0
GR 5330     1       5325.877 2       5325.877 3       5325.867 4       5325.867 5
GR 5325.565 6       5325.494 7       5325.494 9       5325.403 10      5325.403 13
GR 5325.582 14      5325.582 16      5325.652 17      5325.774 18      5325.774 19
GR 5325.819 20      5325.819 21      5325.874 22      5325.908 23      5325.908 25
GR 5325.96  26      5325.96  28      5325.957 29      5325.977 30      5325.977 31
GR 5325.93  32      5325.93  33      5325.918 34      5325.918 35      5325.884 36
GR 5325.884 38      5325.858 39      5325.858 41      5325.837 42      5325.796 43
GR 5325.796 44      5325.763 45      5325.763 47      5325.776 48      5325.776 50
GR 5325.709 51      5325.709 53      5325.685 54      5325.648 55      5325.648 57
GR 5325.632 58      5325.592 59      5325.592 60      5325.539 61      5325.539 62
GR 5325.47  63      5325.418 64      5325.418 66      5325.274 67      5325.274 69
GR 5325.199 70      5325.034 71      5325.034 72      5324.967 73      5324.967 75
GR 5324.679 76      5330     77.45
;
NC 0.01     0.01    0.021
X1 773393STMN-OF    43      0       0       0.0     0.0     0       0       0
GR 5330     0       5324.852 1       5324.852 2       5324.91  3       5324.576 4
GR 5324.576 5       5324.401 6       5324.401 8       5324.55  9       5324.55  10
GR 5324.783 11      5324.783 13      5325.006 14      5325.006 16      5325.206 17
GR 5325.206 18      5325.359 19      5325.359 21      5325.45  22      5325.45  23
GR 5325.542 24      5325.546 25      5325.546 26      5325.53  27      5325.53  28
GR 5325.404 29      5325.404 31      5325.283 32      5325.283 34      5325.113 35
GR 5325.171 36      5324.936 37      5324.936 39      5324.582 40      5324.582 41
GR 5324.314 42      5324.314 44      5323.977 45      5323.977 46      5324.139 47
GR 5324.139 49      5324.227 50      5330     50.38
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
;
NC 0.01     0.01     0.021
X1 773411STMN-OF     39       0        0        0.0      0.0      0        0        0
GR 5330     1        5324.342 2        5324.159 3        5324.159 5        5323.918 6
GR 5323.918 7        5323.861 8        5323.861 10       5324.084 11       5324.084 12
GR 5324.324 13       5324.324 15       5324.544 16       5324.544 17       5324.76  18
GR 5324.76  20       5324.911 21       5324.911 22       5325.002 23       5325.002 25
GR 5325.159 26       5325.159 27       5325.134 28       5325.134 30       5324.978 31
GR 5324.978 32       5324.898 33       5324.898 35       5324.765 36       5324.765 37
GR 5324.561 38       5324.561 40       5324.326 41       5324.326 42       5324.118 43
GR 5324.118 45       5324.054 46       5324.054 47       5330     47.91
;
NC 0.01     0.01     0.021
X1 37761STGM_BHI     54       0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5326.306 0        5325.928 1        5325.968 2        5325.968 3        5325.779 4
GR 5325.779 5        5325.697 6        5325.697 8        5325.731 9        5325.731 11
GR 5325.775 12       5325.775 14       5325.813 15       5325.824 16       5325.857 17
GR 5325.857 19       5325.88  20       5325.88  21       5325.866 22       5325.883 23
GR 5325.883 24       5325.966 25       5325.966 27       5326.009 28       5325.991 29
GR 5325.991 30       5326.056 31       5326.056 32       5326.028 33       5326.028 35
GR 5325.999 36       5325.999 38       5325.938 39       5325.938 41       5325.876 42
GR 5325.876 43       5325.806 44       5325.806 46       5325.699 47       5325.699 48
GR 5325.685 49       5325.666 50       5325.666 51       5325.651 52       5325.651 54
GR 5325.507 55       5325.507 57       5325.511 58       5325.511 59       5326.102 60
GR 5326.102 61       5326.168 62       5326.465 63       5326.465 63.93
;
NC 0.01     0.01     0.021
X1 406206STGM_BHI    49       0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5341.104 0        5341.275 1        5341.275 2        5341.34  3        5341.34  5
GR 5341.063 6        5341.063 7        5340.312 8        5340.312 10       5339.939 11
GR 5339.939 12       5339.728 13       5339.728 15       5339.792 16       5339.792 17
GR 5339.866 18       5339.866 20       5339.963 21       5339.963 22       5340.059 23
GR 5340.059 25       5340.074 26       5340.074 27       5340.039 28       5340.039 30
GR 5339.839 31       5339.839 32       5339.751 33       5339.751 35       5339.453 36
GR 5339.453 37       5339.312 38       5339.312 40       5339.18  41       5339.18  42
GR 5339.236 43       5339.236 45       5339.821 46       5339.821 47       5340.132 48
GR 5340.132 50       5340.51  51       5340.51  52       5340.561 53       5340.561 55
GR 5340.541 56       5340.541 57       5340.56  58       5340.56  59.53

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
19071STMH        0          1          0          NO         0
35191STGM        0          1          0          NO         0
35325STGM        0          0.45       0          NO         0
35326STGM        0          0.85       0          NO         0
35328STGM        0          0.45       0          NO         0
35329STGM        0          0.45       0          NO         0
35355STGM        0          0.45       0          NO         0
35357STGM        0          0.15       0          NO         0
35358STGM        0          0.45       0          NO         0
35362STGM        0          0.45       0          NO         0
35363STGM        0          0.15       0          NO         0
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
35365STGM       0          0.45       0          NO         0
35367STGM       0          0.45       0          NO         0
35368STGM       0          0.15       0          NO         0
35369STGM       0          0.45       0          NO         0
35370STGM       0          0.15       0          NO         0
35371STGM       0          1          0          NO         0
35372STGM       0          0.15       0          NO         0
36715STGM       0          0.75       0          NO         0
36716STGM       0          0.75       0          NO         0
36717STGM       0          0.75       0          NO         0
36718STGM       0          0.45       0          NO         0
36939STGM       0          0.45       0          NO         0
37665STGM       0          0.45       0          NO         0
37666STGM       0          0.75       0          NO         0
37673STGM       0          0.75       0          NO         0
37750STGM       0          0.85       0          NO         0
37757STGM       0          0.15       0          NO         0
37758STGM       0          0.15       0          NO         0
37759STGM       0          0.15       0          NO         0
37760STGM       0          0.15       0          NO         0
37761STGM       0          0.15       0          NO         0
37762STGM       0          0.15       0          NO         0
37763STGM       0          0.15       0          NO         0
37764STGM       0          0.75       0          NO         0
406193STGM      0          0.45       0          NO         0
406197STGM      0          0.15       0          NO         0
406199STGM      0          0.45       0          NO         0
406200STGM      0          0.45       0          NO         0
406201STGM      0          0.45       0          NO         0
406205STGM      0          0.15       0          NO         0
406206STGM      0          0.15       0          NO         0
407544STMH      0          1          0          NO         0
773049STMN      0          0.45       0          NO         0
773051STMN      0          0.15       0          NO         0
773387STMN      0          0.45       0          NO         0
773391STMN      0          0.45       0          NO         0
773393STMN      0          0.15       0          NO         0
773411STMN      0          1          0          NO         0
773413STMN      0          1          0          NO         0

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
J200            FLOW             INFLOW_200       FLOW     1.0      1.0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
DIVCURVE_389     DIVERSION  0          0
DIVCURVE_389                16         0
DIVCURVE_389                17         1
DIVCURVE_389                50         34
DIVCURVE_389                200        184
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
;
DIVCURVE_397     DIVERSION  0          0
DIVCURVE_397                100        0
DIVCURVE_397                101        1
DIVCURVE_397                200        100
DIVCURVE_397                600        500
;
DIVCURVE_395     DIVERSION  0          0
DIVCURVE_395                78         0
DIVCURVE_395                79         1
DIVCURVE_395                178        100
DIVCURVE_395                578        500
;
DIVCURVE_1       DIVERSION  0          0
DIVCURVE_1                  36         0
DIVCURVE_1                  37         1
DIVCURVE_1                  100        64
;
DIVCURVE_396     DIVERSION  0          0
DIVCURVE_396                16         0
DIVCURVE_396                17         1
DIVCURVE_396                50         34
DIVCURVE_396                200        184
;
DIVCURVE_399     Diversion  0          0
DIVCURVE_399                275        0
DIVCURVE_399                455        72
DIVCURVE_399                626        165
DIVCURVE_399                845        317
DIVCURVE_399                1155       502
DIVCURVE_399                1543       739
DIVCURVE_399                1977       1004
;
DIVCURVE_7a      Diversion  0          0
DIVCURVE_7a                 105        0
DIVCURVE_7a                 592        0
DIVCURVE_7a                 930        25
DIVCURVE_7a                 1363       101
;
DIV7a2           Diversion  0          0
DIV7a2                      127        0
DIV7a2                      137        10
DIV7a2                      192        59
DIV7a2                      300        133
DIV7a2                      447        243
DIV7a2                      645        383
DIV7a2                      1399       890
DIV7a2                      2302       1501
;
6thAv_Moline     Diversion  0          0
6thAv_Moline                100        11
6thAv_Moline                200        39
6thAv_Moline                300        81
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
6thAv_Moline                400         136
6thAv_Moline                500         201
6thAv_Moline                600         276
6thAv_Moline                700         358
6thAv_Moline                800         446
6thAv_Moline                900         540
6thAv_Moline                1000        638
;
Cofax_Galena     Diversion  0           0
Cofax_Galena                50          40
Cofax_Galena                100         70
Cofax_Galena                150         92
Cofax_Galena                200         104
Cofax_Galena                250         108
Cofax_Galena                300         110
Cofax_Galena                350         110
Cofax_Galena                400         110
Cofax_Galena                450         110
;
Colfax_Florence  Diversion  0           0
Colfax_Florence             200         34
Colfax_Florence             400         84
Colfax_Florence             600         141
Colfax_Florence             800         202
Colfax_Florence             1000        265
Colfax_Florence             1200        332
Colfax_Florence             1400        400
Colfax_Florence             1600        470
Colfax_Florence             1800        541
Colfax_Florence             2000        614
Colfax_Florence             2200        688
Colfax_Florence             2400        763
Colfax_Florence             2600        839
Colfax_Florence             2800        916
;
;street flows leaving Easterly Creek to Westerly Creek
6thAv&Havana     Diversion  0           0
6thAv&Havana                50          39
6thAv&Havana                100         75
6thAv&Havana                150         108
6thAv&Havana                200         141
6thAv&Havana                250         173
6thAv&Havana                300         205
6thAv&Havana                350         235
6thAv&Havana                400         266
6thAv&Havana                450         296
6thAv&Havana                500         326
;
;divides flow from Chsp Pond 10% to E04 90% to E06 - relative weir length to high point and direct basin contribution
Chspk_Pond_DS    Diversion  00          0
Chspk_Pond_DS               100         10
Chspk_Pond_DS               1000        100
;
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
Jamaica/Lowry    Diversion  0          0
Jamaica/Lowry               100        56
Jamaica/Lowry               200        101
Jamaica/Lowry               300        142
Jamaica/Lowry               400        180
Jamaica/Lowry               500        217
Jamaica/Lowry               600        253
Jamaica/Lowry               700        287
Jamaica/Lowry               800        319
Jamaica/Lowry               900        351
Jamaica/Lowry               1000       383
Jamaica/Lowry               1100       413
Jamaica/Lowry               1200       443
;
6thAv_Kenton     Diversion  0          0
6thAv_Kenton                200        177
6thAv_Kenton                400        375
6thAv_Kenton                600        574
6thAv_Kenton                800        773
6thAv_Kenton                1000       973
6thAv_Kenton                1200       1172
6thAv_Kenton                1400       1372
6thAv_Kenton                1600       1571
6thAv_Kenton                1800       1771
6thAv_Kenton                2000       1971
;
Galena/16thAv    Diversion  0          0
Galena/16thAv               50         20
Galena/16thAv               100        40
Galena/16thAv               150        58
Galena/16thAv               200        75
Galena/16thAv               250        91
Galena/16thAv               300        107
Galena/16thAv               350        121
Galena/16thAv               400        134
Galena/16thAv               450        146
;
17thAv/DelMar    Diversion  0          0
17thAv/DelMar               200        16
17thAv/DelMar               400        32
17thAv/DelMar               600        48
17thAv/DelMar               800        64
17thAv/DelMar               1000       80
17thAv/DelMar               1200       96
17thAv/DelMar               1400       112
17thAv/DelMar               1600       128
17thAv/DelMar               1800       144
17thAv/DelMar               2000       160
17thAv/DelMar               2200       176
17thAv/DelMar               2400       192
17thAv/DelMar               2600       208
17thAv/DelMar               2800       224
;
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
11thAv_Beeler    Diversion  0          0
11thAv_Beeler               100        97
11thAv_Beeler               200        188
11thAv_Beeler               300        275
11thAv_Beeler               400        361
11thAv_Beeler               500        446
11thAv_Beeler               600        530
11thAv_Beeler               700        612
11thAv_Beeler               800        694
11thAv_Beeler               900        776
11thAv_Beeler               1000       857
11thAv_Beeler               1100       937
11thAv_Beeler               1200       1017
11thAv_Beeler               1300       1096
11thAv_Beeler               1400       1175
;
1st/HavanaPnd    Diversion  0          0
1st/HavanaPnd               64.066     27.066
1st/HavanaPnd               90.536     22.336
1st/HavanaPnd               91         60
1st/HavanaPnd               225.868    60
;
;Curves are named using RATINGCURVE_ for rating (outflow) curves
;and DIVCURVE_ for diversion curves.
RATINGCURVE_30   RATING     0          0
RATINGCURVE_30              0.04       0.5
RATINGCURVE_30              1.12       5
RATINGCURVE_30              3.56       16
RATINGCURVE_30              7.55       19.5
RATINGCURVE_30              12.97      20
;
RATINGCURVE_201  RATING     0          0
RATINGCURVE_201             1          1
RATINGCURVE_201             50         10
RATINGCURVE_201             150        25
RATINGCURVE_201             175        34
RATINGCURVE_201             400        44
RATINGCURVE_201             500        48
RATINGCURVE_201             1150       58
RATINGCURVE_201             2150       67
RATINGCURVE_201             3100       76
RATINGCURVE_201             4500       83
RATINGCURVE_201             5850       90
RATINGCURVE_201             7500       96
RATINGCURVE_201             9500       102
;
RATINGCURVE_130  RATING     0          0
RATINGCURVE_130             1          5
RATINGCURVE_130             5          30
RATINGCURVE_130             15         55
RATINGCURVE_130             85         80
RATINGCURVE_130             250        105
RATINGCURVE_130             300        250
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
RATINGCURVE_130             345         565
RATINGCURVE_130             700         670
;
RATINGCURVE_156  RATING     0           0
RATINGCURVE_156             1.11        12
RATINGCURVE_156             3.49        25
RATINGCURVE_156             7.09        109
;
;OUTdelmar2
OUTdelmar2       Rating     0           0
OUTdelmar2                  1.06        4.7
OUTdelmar2                  2.06        9.7
OUTdelmar2                  3.06        12.9
OUTdelmar2                  4.06        15.5
OUTdelmar2                  5.06        17.7
OUTdelmar2                  6.06        19.6
OUTdelmar2                  7.06        21.4
OUTdelmar2                  7.31        52
OUTdelmar2                  7.56        139
OUTdelmar2                  7.81        266
OUTdelmar2                  8.06        443
OUTdelmar2                  8.31        673
OUTdelmar2                  8.56        988
OUTdelmar2                  8.81        1413
OUTdelmar2                  9.06        1976
;
1st/HavanaOut    Rating     0           0
1st/HavanaOut               1           0.09
1st/HavanaOut               2           0.2
1st/HavanaOut               3           0.32
1st/HavanaOut               4           0.43
1st/HavanaOut               5           0.83
1st/HavanaOut               6           2.68
1st/HavanaOut               7           3.63
1st/HavanaOut               8           4.37
1st/HavanaOut               9           4.99
1st/HavanaOut               10          5.55
1st/HavanaOut               11          23.64
1st/HavanaOut               12          87.08
;
ChesapeakePnd_Out Rating     0           0
ChesapeakePnd_Out            7.27        15.36
ChesapeakePnd_Out            9.62        16.77
;
;RESdelmar2
RESdelmar2       Storage    1.06        2550
RESdelmar2                  2.06        12300
RESdelmar2                  3.06        29600
RESdelmar2                  4.06        53925
RESdelmar2                  5.06        84425
RESdelmar2                  6.06        103200
RESdelmar2                  7.06        165000
RESdelmar2                  7.31        180000
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
RESdelmar2                  7.56       195000
RESdelmar2                  7.81       208000
RESdelmar2                  8.06       220000
RESdelmar2                  8.31       235000
RESdelmar2                  8.56       250000
RESdelmar2                  8.81       265000
RESdelmar2                  9.06       280000
;
;Storage curve from Enginuity 90% model/plans
;Depth 0 = elev 5375.42
HavanaPark       Storage    0          0
HavanaPark                  0.58       0
HavanaPark                  1.58       4112
HavanaPark                  2.58       15442
HavanaPark                  3.58       34210
HavanaPark                  4.58       59156
HavanaPark                  5.58       79264
HavanaPark                  6.58       89088
HavanaPark                  7.58       95006
HavanaPark                  8.58       100654
HavanaPark                  9.58       109000
HavanaPark                  10.58      109001
;
1st/HavanaREV    Storage    0          243.25
1st/HavanaREV               1          2899.85
1st/HavanaREV               2          8448.85
1st/HavanaREV               3          14051.31
1st/HavanaREV               4          21356.73
1st/HavanaREV               4.1        30011.16
1st/HavanaREV               5          41058.61
1st/HavanaREV               5.64       55019.53
1st/HavanaREV               6          62505
1st/HavanaREV               7          74533.8
1st/HavanaREV               8          76137.61
1st/HavanaREV               9          78504.32
1st/HavanaREV               10         82353.65
1st/HavanaREV               10.34      86880.06
1st/HavanaREV               10.85      111275.23
1st/HavanaREV               11         119000
1st/HavanaREV               12         127116
1st/HavanaREV               13         135520
;
ChesapeakePnd    Storage    0          2917
ChesapeakePnd               1          23196
ChesapeakePnd               2          51339
ChesapeakePnd               3          71578
ChesapeakePnd               4          76085
ChesapeakePnd               5          80703
ChesapeakePnd               6          85432
ChesapeakePnd               7          90272
ChesapeakePnd               8          95222
ChesapeakePnd               9          100284
ChesapeakePnd               10         106519
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
ChesapeakePnd               11         112551

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Timeseries INFLOW_200
INFLOW_200                  0          0
INFLOW_200                  0.5        80
INFLOW_200                  0.83       1350
INFLOW_200                  1          3280
INFLOW_200                  1.33       2860
INFLOW_200                  1.48       2610
INFLOW_200                  1.55       1800
INFLOW_200                  1.67       1600
INFLOW_200                  1.83       1400
INFLOW_200                  2.06       1200
INFLOW_200                  2.33       1100
INFLOW_200                  2.9        1080
INFLOW_200                  3.18       1000
INFLOW_200                  3.5        830
INFLOW_200                  3.98       720
INFLOW_200                  4.16       700
INFLOW_200                  5          625
INFLOW_200                  11.93      0

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       23843STMH        EX
Node       773412STMH       EX
Node       D_05a            Major_System
Node       D_06b            Major_System
Node       19071STMH        EX
Node       19079STMH        EX
Node       19097STMH        EX
Node       19111STMH        EX
Node       19139STMH        EX
Node       19132STMH        EX
Node       19134STMH        EX
Node       19143STMH        EX
Node       19154STMH        EX
Node       19162STMH        EX
Node       19171STMH        EX
Node       19179STMH        EX
Node       19214STMH        EX
Node       20135STMH        EX
Node       20209STFT        EX
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
Node        20818STMH        EX
Node        20841STMH        EX
Node        773410STMH       EX
Node        773392STMH       EX
Node        773389STMH       EX
Node        773052STMH       EX
Node        773050STMH       EX
Node        773032STMH       EX
Node        407544STMH       EX
Node        407542STMH       EX
Node        407541STMH       EX
Node        407540STMH       EX
Node        405658STFT       EX
Node        407543STMH       EX
Node        405659STFT       EX
Node        23840STMH        EX
Node        23841STMH        EX
Node        23839STMH        EX
Node        23845STMH        EX
Node        23856STMH        EX
Node        23855STMH        EX
Node        23862STMH        EX
Node        23861STMH        EX
Node        23868STMH        EX
Node        24791STMH        EX
Node        24800STMH        EX
Node        24788STMH        EX
Node        24796STMH        EX
Node        24797STIL        EX
Node        23849STMH        EX
Node        23852STMH        EX
Node        19150STMH        EX
Node        407546STMH       EX
Link        C_05a            Storm_Sewer
Link        C_05b            Storm_Sewer
Link        C_05c            Storm_Sewer
Link        C_06a            Storm_Sewer
Link        C_07a            Storm_Sewer
Link        C_08a            Storm_Sewer
Link        C_08b            Storm_Sewer
Link        C_10a            storm_sewer
Link        C_10b            Storm_Sewer
Link        C_10c            Storm_Sewer
Link        C_11a            Storm_Sewer
Link        C_13a            Storm_Sewer
Link        C_14a            Storm_Sewer
Link        C_15a            Storm_Sewer
Link        C_15b            Storm_Sewer
Link        C_16a            Major_System
Link        d_01a            Dummy
Link        d_02a            Dummy
Link        d_02b            Dummy
Link        d_03a            Dummy
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

Link	d_03b	Dummy
Link	d_03c	Dummy
Link	d_04b	Dummy
Link	d_04d	Dummy
Link	d_05a	Dummy
Link	d_05b	Dummy
Link	d_05c	Dummy
Link	d_06a	Dummy
Link	d_06b	Dummy
Link	d_06c	Dummy
Link	d_07b	Dummy
Link	d_08a	Dummy
Link	d_08b	Dummy
Link	d_08c	Dummy
Link	d_09a	Dummy
Link	d_09b	Dummy
Link	d_10a	Dummy
Link	d_10a1	dummy
Link	d_10a2	dummy
Link	d_11a	Dummy
Link	d_12a	Dummy
Link	d_13a	Dummy
Link	d_14a	Dummy
Link	d_14b	Dummy
Link	d_15a	dummy
Link	d_EC_Out_23rd	dummy
Link	S_02a	Major_System
Link	S_03a	Major_System
Link	S_05a	Major_System
Link	S_05b	Major_System
Link	S_05d	Major_System
Link	S_06a	Major_System
Link	S_06b	Major_System
Link	S_07a	Major_System
Link	S_07b	Major_System
Link	S_07d	Major_System
Link	S_07e	Major_System
Link	S_08a	Major_System
Link	S_08b	Major_System
Link	S_09a	Major_System
Link	S_10a	Major_System
Link	S_10a1	Major_System
Link	S_10b	Major_System
Link	S_10c	Major_System
Link	S_10d	Major_System
Link	S_10e	Major_System
Link	S_10f	Major_System
Link	S_10g	Major_System
Link	S_10i	Dummy
Link	S_11a	Major_System
Link	S_13a	Major_System
Link	S_13b2	Major_System
Link	S_14a2	Major_System

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
Link       S_15a           Major_System
Link       S_15b           Major_System
Link       S_15c           Major_System
Link       S_04a           Major_System
Link       19071STMH       EX
Link       19071STMH-OF    OF
Link       35191STGM       EX
Link       35191STGM-OF    OF
Link       35325STGM       EX
Link       35325STGM-OF    OF
Link       35326STGM       EX
Link       35326STGM-OF    OF
Link       35328STGM       EX
Link       35328STGM-OF    OF
Link       35329STGM       EX
Link       35329STGM-OF    OF
Link       35355STGM       EX
Link       35355STGM-OF    OF
Link       35357STGM       EX
Link       35357STGM-OF    OF
Link       35358STGM       EX
Link       35358STGM-OF    OF
Link       35362STGM       EX
Link       35362STGM-OF    OF
Link       35363STGM       EX
Link       35363STGM-OF    OF
Link       35365STGM       EX
Link       35365STGM-OF    OF
Link       35367STGM       EX
Link       35367STGM-OF    OF
Link       35368STGM       EX
Link       35368STGM-OF    OF
Link       35369STGM       EX
Link       35369STGM-OF    OF
Link       35370STGM       EX
Link       35370STGM-OF    OF
Link       35371STGM       EX
Link       35372STGM       EX
Link       35372STGM-OF    OF
Link       36715STGM       EX
Link       36715STGM-OF    OF
Link       36716STGM       EX
Link       36716STGM-OF    OF
Link       36717STGM       EX
Link       36717STGM-OF    OF
Link       36718STGM       EX
Link       36718STGM-OF    OF
Link       36939STGM       EX
Link       36939STGM-OF    OF
Link       37665STGM       EX
Link       37665STGM-OF    OF
Link       37666STGM       EX
Link       37666STGM-OF    OF
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
Link       37673STGM        EX
Link       37673STGMF-OFE   OF
Link       37750STGM        EX
Link       37750STGM-OF     OF
Link       37757STGM        EX
Link       37757STGM-OF     OF
Link       37758STGM        EX
Link       37758STGM-OF     OF
Link       37759STGM        EX
Link       37759STGM-OF     OF
Link       37760STGM        EX
Link       37760STGM-OF     OF
Link       37761STGM        EX
Link       37762STGM        EX
Link       37762STGM-OF     OF
Link       37763STGM        EX
Link       37763STGM-OF     OF
Link       37764STGM        EX
Link       37764STGM-OF     OF
Link       406193STGM       EX
Link       406193STGM-OF    OF
Link       406197STGM       EX
Link       406197STGM-OF    OF
Link       406199STGM       EX
Link       406199STGM-OF    OF
Link       406200STGM       EX
Link       406200STGM-OF    OF
Link       406201STGM       EX
Link       406201STGM-OF    OF
Link       406205STGM       EX
Link       406205STGM-OF    OF
Link       406206STGM       EX
Link       407544STMH       EX
Link       407544STMH-OF    OF
Link       773049STMN       EX
Link       773049STMN-OF    OF
Link       773051STMN       EX
Link       773051STMN-OF    OF
Link       773387STMN       EX
Link       773387STMN-OF    OF
Link       773391STMN       EX
Link       773391STMN-OF    OF
Link       773393STMN       EX
Link       773393STMN-OF    OF
Link       773411STMN       EX
Link       773411STMN-OF    OF
Link       773413STMN       EX

[MAP]
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
Units      None

[COORDINATES]
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

;;Node	X-Coord	Y-Coord
EC_Out_23rd	3174521.509	1699077.830
EC_Out_19thAv	3174457.567	1697083.194
E-J-02	3181690.538	1686708.934
E-J-03	3178574.934	1688917.803
E-J-04	3179702.026	1686913.000
E-J-05	3179839.389	1689382.701
E-J-06	3180865.876	1689410.897
E-J-07	3177535.385	1691600.056
E-J-08	3179241.043	1691903.960
E-J-09	3181239.307	1690987.377
E-J-10	3176536.499	1694830.918
E-J-11	3178364.362	1693571.563
E-J-12	3178084.501	1695058.327
E-J-13	3174523.362	1696775.802
E-J-14	3176620.329	1696763.482
E-J-15	3174702.172	1698637.894
E-J-16	3175902.371	1699440.598
J_01a	3181271.416	1685936.409
J_02a	3182594.638	1687816.368
J_03a	3178501.780	1689593.752
J_04a	3179228.492	1687184.457
J_05_07	3178378.880	1690796.429
J_05a	3179629.094	1689505.601
J_06a	3180864.918	1689604.416
J_07a	3178378.880	1690032.680
J_07b	3178256.491	1691783.663
J_07c	3177686.786	1691958.317
J_08a	3179152.260	1691856.403
J_08b	3179109.611	1691998.393
J_09a	3180834.384	1690977.968
J_10a	3178587.731	1692428.820
J_10b	3178770.814	1692348.675
J_10c	3178631.084	1692444.874
J_14a	3177008.599	1696919.585
J_15a	3174532.408	1698911.851
J_17thAv_Out	3174362.115	1696418.297
J_7b	3176715.915	1688684.249
J_AD1	3173538.576	1697378.478
J_AD3	3173644.612	1696024.963
J_AD4	3173531.287	1696813.017
J_AD7	3173909.314	1695285.787
J_AR1_a	3173287.460	1694166.748
J_AR2	3176061.147	1693891.756
J_DE1	3169871.415	1696047.192
J_DE2	3171948.041	1695656.957
J_DE3	3171399.213	1694801.912
J_DE4	3170024.245	1694409.777
J_DE5	3170032.933	1693775.542
J_DE6	3170742.039	1692921.247
J_L1	3174784.459	1692597.053
J_L2	3175669.580	1691420.211

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

J_ST1	3173309.381	1702734.958
J_ST2	3176374.052	1703239.480
J_ST3	3171743.217	1702135.822
J_ST4	3176651.035	1701357.935
J_ST5	3171732.706	1701063.683
J_ST6	3177553.497	1699806.993
J_ST7	3171701.635	1700154.778
J_ST8	3173214.231	1699673.838
J_ST9	3173123.018	1698521.700
23843STMH	3172564.139	1694008.173
773412STMH	3173381.359	1695740.069
J100	3175856.701	1689634.141
J101	3171638.866	1690958.108
J102	3171682.052	1691599.727
J104	3172129.334	1692459.258
J106	3171248.062	1690918.870
J107	3171171.769	1691632.757
J-10a1	3178871.305	1691930.921
J111	3170010.141	1692290.701
J113	3170016.311	1691559.626
J11th	3172376.236	1692784.025
J121	3168726.904	1691920.536
J122	3170282.612	1691251.791
J124	3170461.343	1691463.978
J126	3170742.204	1691600.447
J128	3170936.782	1691611.012
J12th	3172525.933	1693389.052
J131	3169390.116	1691130.852
J132	3168908.902	1690137.577
J133	3170059.497	1690208.525
J134	3170827.588	1690223.948
J14	3171351.988	1691978.044
J140	3170673.353	1691198.715
J141	3170898.537	1691405.391
J150	3171881.826	1688711.969
J151	3171444.529	1690091.306
J154	3170952.630	1691496.554
J155	3170793.657	1692089.093
J157	3171324.226	1692462.342
J159	3172203.367	1692576.476
J160	3171703.645	1691775.555
J161	3170185.970	1690739.094
J163	3170876.944	1690745.264
J165	3171577.172	1690334.998
J166	3170941.722	1691123.580
J167	3170746.606	1691501.837
J168	3170963.315	1691783.707
J169	3171373.581	1690918.007
J16th-us	3173402.573	1695690.577
J170	3171246.021	1691453.849
J171	3171657.374	1691143.191
J17th	3174101.141	1696418.297
J19th-ds	3174272.220	1697085.197

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

J19th-us	3174241.978	1696737.412
J200	3174812.838	1684923.600
J202	3174005.358	1687159.698
J203	3173936.316	1687606.796
J204	3173749.139	1687866.242
J230	3169578.765	1687307.093
J231	3169569.447	1687158.011
J232	3170010.141	1688518.106
J233	3168240.099	1687118.285
J234	3170187.798	1688400.880
J235	3170328.523	1687867.120
J23rd	3174255.876	1699237.221
J24	3169562.859	1689273.859
J242	3169732.518	1689230.673
J245	3171092.873	1689449.687
J247	3171348.904	1689684.125
J248	3171429.106	1689751.988
J25	3170926.299	1689289.283
J251	3170947.892	1689751.988
J252	3170602.405	1688986.982
J253	3171426.021	1689866.123
J254	3171429.106	1689958.664
J26th	3174249.639	1700197.780
J29th	3174904.565	1701632.380
J31	3167150.264	1685083.819
J311	3167787.145	1685828.149
J314	3167146.763	1685668.834
J315	3167715.298	1686655.960
J32	3170356.172	1685746.608
J33	3171078.245	1685568.031
J33rd	3175149.244	1703027.785
J34	3173228.936	1687874.006
J341	3170657.370	1686107.712
J343	3172398.164	1687478.031
J345	3173228.936	1688145.754
J346	3173096.944	1688316.567
J347	3172871.781	1688619.372
J348	3172739.790	1688829.006
J35	3166924.972	1686296.721
J350	3168514.994	1686652.836
J351	3167709.319	1686248.518
J352	3168830.500	1686652.836
J353	3174021.329	1688641.125
J354	3172935.984	1688889.590
J355	3167315.449	1685884.378
J36	3169302.627	1687124.371
J361	3168761.776	1686362.321
J362	3170930.725	1687423.681
J37	3171060.030	1687748.485
J371	3170644.359	1687552.980
J372	3171045.016	1688372.927
J374	3171482.942	1688596.550
J38	3172343.814	1687198.519

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

J390	3171147.509	1688792.219
J391	3170644.359	1688512.691
J392	3171697.631	1688145.214
J393	3171558.663	1689202.911
J394	3171250.003	1688754.949
J41	3171892.088	1689585.521
J42	3173997.594	1688091.405
J43	3174871.463	1688584.449
J44	3173444.752	1688937.040
J51	3172975.241	1690559.216
J52	3171943.693	1690479.118
J53	3172419.296	1690757.602
J54	3173006.063	1690004.426
J56	3172840.397	1690555.363
J61	3174871.637	1691083.479
J62	3175007.364	1691709.674
J63	3173696.364	1691558.524
J64	3172585.534	1691673.130
J65	3172157.054	1692352.276
J67	3174402.762	1691688.081
J68	3173065.185	1692165.261
J6th_Pipe	3172308.592	1689796.409
J74	3173927.691	1692295.707
J7b	3176080.853	1689820.134
JL2	3175090.696	1690751.809
JMLK	3175060.500	1702237.407
JMontview-ds	3174262.114	1697958.555
JMontview-us	3174393.748	1697665.173
J_16thAve_E	3174326.556	1695736.397
J_HP-OUT	3178902.778	1692381.270
J_15b	3174526.965	1698975.534
JSandCreek	3175194.607	1705114.495
ChesapeakeHLC	3181701.870	1686838.558
DIV344	3172545.684	1687571.202
DIV342	3170762.820	1686245.117
DIV135	3169784.958	1691047.565
DIV389	3171113.818	1692471.002
DIV397	3170978.739	1690769.941
DIV105	3172095.068	1689796.409
DIV376	3171849.910	1688860.593
DIV70	3174304.051	1691811.470
DIV395	3170984.908	1691623.302
DIV1	3172408.893	1690204.766
DIV164	3171049.687	1690806.958
DIV125	3170535.300	1691534.413
DIV316	3168593.090	1686655.960
DIV396	3170751.009	1691399.705
DIV71	3174788.350	1691194.528
DIV399	3175674.894	1689817.498
DIV162	3170466.678	1690680.485
DIV136	3169710.925	1690621.875
DIV123	3170099.598	1691485.593
J13th-DIV	3172719.293	1693975.367

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

J14th-DIV	3173058.297	1694509.277
JColfax-DIV	3173101.958	1695064.405
J16th-DIV	3174006.888	1695767.840
D_02a	3181545.309	1686815.819
D_03b	3178378.880	1689848.330
D_05-07	3179108.136	1690800.495
D_05a	3179220.387	1687205.087
D_05b	3179514.388	1689597.093
D_05c	3179511.150	1689852.184
D_05d	3179515.514	1689750.342
D_06a	3180863.552	1689700.875
D_06b	3180859.456	1689811.484
D_07a	3178375.954	1691732.808
D_08a	3180828.541	1690987.804
D_08b	3179086.534	1691897.386
D_10a	3178190.607	1693124.289
D_10a1	3179013.427	1691925.179
D_10b	3177506.187	1693480.664
D_10c	3177341.037	1695074.458
D_10d	3176685.570	1695087.272
D_11a	3178362.251	1693755.318
D_12a	3177993.794	1695108.374
D_13a	3176709.038	1695756.424
D_14a	3177004.000	1697100.082
D_15a	3174530.826	1697704.714
D_03a	3178387.658	1689757.618
D_12_14	3177323.333	1695759.004
D_10_13	3176022.859	1696423.569
J72	3173768.342	1692354.378
J120	3169095.103	1691833.239
J127	3170790.629	1691601.327
J129	3171058.751	1691620.951
J158	3171203.922	1692582.646
J73	3172904.425	1692314.718
J236	3170318.244	1688531.326
J244	3171012.671	1689369.485
J241	3170062.581	1688678.511
J243	3169855.906	1689236.843
J246	3171157.652	1689508.297
J375	3171626.786	1688641.125
J330	3170884.140	1685909.657
J320	3170607.225	1688082.717
J319	3169824.412	1687497.074
J321	3170356.998	1685915.985
J373	3171184.779	1688428.833
J57	3172528.327	1690039.100
J250	3171037.348	1689742.734
J317	3168874.233	1686780.913
J318	3169395.803	1687189.594
J322	3168883.335	1687459.804
J363	3171326.700	1687501.323
D_AR2_a	3175710.036	1695767.840
DIV72	3173768.342	1692488.300

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

D_04a	3181048.480	1686498.275
D_AR2_b	3176029.558	1694409.958
D_AR2_c	3176025.916	1693980.897
19071STMH	3174238.269	1697849.386
19079STMH	3174165.382	1697801.905
19097STMH	3173673.769	1697766.020
19111STMH	3173113.219	1697766.164
19139STMH	3173036.500	1697721.000
19132STMH	3172874.500	1697723.000
19134STMH	3172690.000	1697722.500
19143STMH	3172362.000	1697720.000
19154STMH	3171740.000	1697714.500
19162STMH	3171399.500	1697711.500
19171STMH	3171082.500	1697708.500
19179STMH	3170766.500	1697702.000
19214STMH	3170736.324	1697647.747
20135STMH	3170740.000	1697044.000
20209STFT	3170741.550	1696985.941
20818STMH	3170739.147	1696419.176
20841STMH	3170686.858	1696366.118
773410STMH	3173331.889	1695740.051
773392STMH	3173046.739	1695740.051
773389STMH	3172975.803	1695736.545
773052STMH	3172697.475	1695736.788
773050STMH	3172406.225	1695736.788
773032STMH	3172323.746	1695727.551
407544STMH	3172718.243	1694533.695
407542STMH	3172583.271	1694534.507
407541STMH	3172409.669	1694536.765
407540STMH	3172373.070	1694536.985
405658STFT	3172348.757	1694535.966
407543STMH	3172047.369	1694534.122
405659STFT	3172015.067	1694534.757
23840STMH	3172428.574	1694009.045
23841STMH	3172382.210	1694008.356
23839STMH	3172049.741	1694009.382
23845STMH	3171762.665	1694007.832
23856STMH	3171089.463	1693997.389
23855STMH	3171059.463	1693997.389
23862STMH	3170740.976	1693996.561
23861STMH	3170668.870	1693996.227
23868STMH	3170427.244	1693995.170
24791STMH	3172296.172	1692871.202
24800STMH	3172064.124	1692875.955
24788STMH	3172025.537	1692879.130
24796STMH	3171681.927	1692876.845
24797STIL	3171356.308	1692876.784
23849STMH	3171381.366	1693999.131
23852STMH	3171708.290	1693998.947
19150STMH	3172033.000	1697716.000
407546STMH	3171729.887	1694533.257
D_16a	3175343.860	1699079.913
D_16b	3175354.713	1698387.480

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
J_EC_Colfax_Out  3176281.246        1695091.821
D_AR1            3174053.764        1692902.208
J_AR1_d          3174062.925        1693434.779
J_AR1_b          3173700.792        1694546.904
D_04b            3179638.775        1687031.540
D_16b2           3175340.143        1698439.403
D_10_13_2        3175985.133        1696770.864
J_15             3175998.600        1697755.205
D_10_13_3        3175908.932        1696501.438
E-J-01           3181488.079        1685588.169
RES30            3167421.659        1686068.683
RES201           3173966.537        1686243.519
RES130           3171786.932        1692058.246
RES156           3170880.028        1692235.176
HavanaPnd        3178969.825        1692186.983
1st/HavanaPnd    3179472.003        1686941.310
ChesapeakePnd    3181653.428        1686774.875

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
C_05a            3179202.673        1687395.185
C_05a            3179474.407        1688139.203
C_06a            3180789.812        1689774.615
C_07a            3179013.848        1691738.869
C_08a            3180499.807        1691251.254
C_08a            3180410.327        1691339.549
C_08a            3180052.999        1691511.991
C_08a            3179533.304        1691650.656
C_10a            3178638.063        1692446.141
C_10a            3178219.026        1693123.966
C_10b            3178204.984        1693171.581
C_10b            3178070.600        1693354.343
C_10b            3177963.093        1693418.847
C_10b            3177533.064        1693515.604
C_10c            3177485.697        1693534.317
C_10c            3177385.019        1693649.377
C_10c            3177367.041        1694278.615
C_10c            3177298.724        1694433.228
C_10c            3177172.876        1694544.692
C_10c            3176788.142        1694681.327
C_10c            3176744.995        1694738.857
C_11a            3178014.263        1693769.232
C_13a            3176145.272        1696219.002
C_13a            3176070.309        1696434.113
C_14a            3177360.707        1695139.372
C_14a            3177356.773        1696412.077
C_14a            3177028.270        1696408.142
C_15a            3176340.001        1697072.030
C_15a            3176310.691        1697687.533
C105             3171846.398        1689804.085
C105-OVER        3171855.182        1689896.581
C120_Overflow    3169643.887        1691810.991
```

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

C123-OVER	3170290.850	1691519.525
C125-OVER	3170597.811	1691638.306
C127_Overflow	3170863.820	1691684.919
C129_Overflow	3171112.839	1691670.308
C135-OVER	3170087.259	1690967.362
C136	3169982.379	1690618.791
C136-OVER	3169966.955	1690655.807
C14th-OVER	3172721.477	1694315.918
C158_Overflow	3171866.470	1692663.957
C162-OVER	3170642.506	1690773.026
C164-OVER	3171084.576	1690951.567
C16th-OVER	3172958.498	1695370.037
C17th-OVER	3174255.876	1696031.201
C236_Overflow	3170752.103	1688794.835
C241_Overflow	3169955.112	1689061.177
C243_Overflow	3170418.668	1689355.982
C244_Overflow	3171004.212	1689480.004
C246_Overflow	3171246.156	1689677.218
C250_Overflow	3171196.249	1690045.332
C316-OVER	3168699.299	1686693.446
C319_Overflow	3169922.244	1687751.971
C320_Overflow	3170796.530	1688355.431
C321_Overflow	3170433.793	1686137.964
C330_Overflow	3170884.156	1686106.582
C342-OVER	3171171.416	1686864.657
C344-OVER	3172607.798	1687835.185
C373_Overflow	3171273.737	1688574.678
C375_Overflow	3171740.187	1688755.736
C376-OVER	3171834.094	1689242.828
C57_Overflow	3172177.409	1690105.872
C70-OVER	3174211.510	1692119.940
C71-OVER	3174717.402	1691465.983
C72	3173335.213	1692354.908
C73_Overlfow	3172565.113	1692506.003
CColf-OVER	3172839.988	1694852.333
S_02a	3181468.641	1686779.095
S_02a	3181528.949	1686446.584
S_02a	3181541.989	1686348.787
S_02a	3181533.839	1686281.959
S_02a	3181512.650	1686234.690
S_02a	3181436.042	1686068.435
S_03a	3177069.391	1689978.300
S_05_07b	3179132.743	1691195.476
S_05_07b	3179326.084	1691652.464
S_05a	3179234.171	1687384.206
S_05a	3179303.252	1687583.772
S_05a	3179514.331	1688132.579
S_05a	3179563.548	1689187.428
S_05b	3179610.082	1689676.143
S_05c	3179115.166	1690193.617
S_05d	3178742.971	1689856.549
S_05d	3178558.754	1689802.156
S_06a	3182530.569	1687868.314

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

S_06a	3181468.453	1688716.080
S_06a	3181734.774	1689095.066
S_06a	3181745.698	1689613.975
S_06b	3180209.453	1689905.707
S_07e	3177671.816	1691781.168
S_08a	3180416.373	1691342.352
S_08a	3180060.941	1691530.777
S_08a	3179538.644	1691669.844
S_09a	3180891.830	1690539.534
S_09a	3181082.469	1690752.104
S_10a1	3178772.450	1691994.867
S_10a1	3178659.181	1692211.683
S_10c	3177680.886	1692440.532
S_10c	3177791.081	1692445.908
S_10c	3177796.456	1692838.309
S_10c	3177858.273	1692932.377
S_10d	3178049.098	1693322.091
S_10d	3177952.342	1693383.907
S_10e	3177360.510	1693638.048
S_10e	3177332.412	1694260.218
S_10e	3177240.090	1694412.750
S_10e	3177143.754	1694509.086
S_10e	3176774.467	1694649.576
S_10e	3176718.271	1694733.870
S_10f	3177899.689	1695066.590
S_11a	3178038.405	1693764.584
S_11a	3178018.645	1695050.566
S_13a	3176683.266	1695627.055
S_13a	3176683.665	1695634.637
S_13a	3176690.773	1695671.104
S_13b1	3176102.757	1696187.510
S_13b2	3176005.195	1697052.949
S_14a2	3177325.300	1696382.570
S_14a2	3176975.159	1696374.702
S_15a	3176351.603	1697097.283
S_15a	3176340.448	1697725.827
S_15b	3174410.486	1698382.796
C317_Overflow	3169000.267	1687073.398
C318_Overflow	3169453.276	1687333.709
C322_Overflow	3169172.681	1687404.703
C363_Overflow	3171868.299	1687641.707
C_EC_Colfax_Out	3176019.223	1695138.985
C_EC_Colfax_Out	3176034.944	1695767.840
C72_Overflow	3173307.491	1692407.553
C_04b	3180977.006	1686912.924
C_04b	3180859.404	1686989.973
C_04b	3179908.449	1686981.863
S_04a	3181064.194	1686264.084
S_04b	3181039.102	1686912.924
S_04b	3180905.279	1687036.609
S_04b	3180069.898	1687018.360
S_04b	3179875.246	1687016.333
S_04b	3179674.511	1687135.963

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

S_04b	3179441.335	1687135.963
C_AR2_b	3175733.055	1694408.635
S_AR2_b	3175703.069	1694369.118
C_AR2_c	3176107.159	1694157.083
19071STMH-OF	3174280.894	1697887.612
35191STGM-OF	3172364.227	1692866.968
35325STGM-OF	3172041.936	1692780.512
35325STGM-OF	3172084.482	1692791.149
35326STGM-OF	3172223.452	1692826.702
35328STGM-OF	3171659.024	1692807.104
35328STGM-OF	3171425.022	1692809.763
35329STGM-OF	3171991.413	1692801.785
35329STGM-OF	3171752.093	1692807.104
35355STGM-OF	3170456.560	1694022.183
35355STGM-OF	3170663.572	1694022.183
35357STGM-OF	3170720.495	1693963.780
35357STGM-OF	3170739.417	1693962.519
35358STGM	3171043.138	1693997.346
35358STGM-OF	3171013.171	1694022.496
35358STGM-OF	3170767.513	1694013.762
35362STGM-OF	3171072.597	1694024.699
35362STGM-OF	3171083.998	1694021.442
35363STGM	3171360.815	1693999.008
35363STGM-OF	3171165.792	1694039.468
35363STGM-OF	3171298.246	1694040.730
35365STGM	3171685.358	1693998.960
35365STGM-OF	3171434.484	1694034.422
35365STGM-OF	3171662.810	1694034.422
35367STGM-OF	3171719.953	1694500.250
35367STGM-OF	3171712.020	1694042.359
35368STGM-OF	3171792.484	1694029.585
35368STGM-OF	3172017.245	1694030.400
35369STGM-OF	3172097.377	1694039.469
35369STGM-OF	3172323.817	1694038.545
35370STGM-OF	3172398.853	1694027.595
35370STGM-OF	3172424.728	1694031.515
35372STGM-OF	3172545.751	1694030.528
35372STGM-OF	3172461.597	1694030.528
36715STGM-OF	3173040.031	1697758.886
36715STGM-OF	3173075.780	1697781.635
36716STGM-OF	3174155.324	1697856.533
36716STGM-OF	3173797.284	1697847.871
36717STGM-OF	3174285.448	1697796.863
36718STGM-OF	3173210.922	1697812.474
36718STGM-OF	3173589.557	1697808.762
36939STGM-OF	3170696.116	1696477.494
36939STGM-OF	3170695.974	1696911.488
37665STGM	3170739.935	1697004.180
37665STGM	3170739.974	1697024.998
37665STGM-OF	3170712.581	1697009.638
37665STGM-OF	3170713.380	1697039.235
37666STGM-OF	3170754.735	1696397.913
37666STGM-OF	3170745.841	1696383.937

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

37673STGM	3170739.974	1697060.336
37673STGMF-OFE	3171391.697	1697050.552
37750STGM-OF	3170708.951	1697704.293
37750STGM-OF	3170728.411	1697729.841
37757STGM	3171396.997	1697711.476
37757STGM	3171365.498	1697711.178
37757STGM-OF	3171361.399	1697753.985
37757STGM-OF	3171166.750	1697753.985
37758STGM	3171035.932	1697707.542
37758STGM	3171068.921	1697708.221
37758STGM-OF	3170818.525	1697746.842
37758STGM-OF	3171020.317	1697750.414
37759STGM	3171696.500	1697714.000
37759STGM	3171730.070	1697714.413
37759STGM-OF	3171457.831	1697752.200
37759STGM-OF	3171691.767	1697752.200
37760STGM-OF	3171784.627	1697753.985
37760STGM-OF	3172007.848	1697750.414
37761STGM	3172352.404	1697719.883
37762STGM	3172663.471	1697722.298
37762STGM	3172388.661	1697720.203
37762STGM-OF	3172668.460	1697761.052
37762STGM-OF	3172416.052	1697757.802
37763STGM-OF	3172728.615	1697747.041
37763STGM-OF	3172855.010	1697747.041
37764STGM	3173010.017	1697721.327
37764STGM	3172990.612	1697721.566
37764STGM-OF	3173008.515	1697760.856
37764STGM-OF	3172911.229	1697760.856
406193STGM-OF	3172602.876	1694554.214
406193STGM-OF	3172694.073	1694551.976
406197STGM-OF	3172426.075	1694557.011
406197STGM-OF	3172560.913	1694554.773
406199STGM-OF	3172379.637	1694558.130
406199STGM-OF	3172405.374	1694558.690
406200STGM-OF	3172352.344	1694556.622
406200STGM-OF	3172367.325	1694556.057
406201STGM-OF	3172321.592	1694575.406
406201STGM-OF	3172091.218	1694575.406
406205STGM-OF	3172018.867	1694570.038
406205STGM-OF	3172049.518	1694571.517
407544STMH-OF	3172724.837	1694517.710
773049STMN-OF	3172381.934	1695766.829
773049STMN-OF	3172407.675	1695767.948
773051STMN-OF	3172463.313	1695760.040
773051STMN-OF	3172661.146	1695760.939
773387STMN-OF	3172796.280	1695628.067
773387STMN-OF	3173006.406	1695632.737
773391STMN-OF	3173025.070	1695787.090
773391STMN-OF	3173045.824	1695791.240
773393STMN-OF	3173310.609	1695770.201
773393STMN-OF	3173089.567	1695766.126
773411STMN-OF	3173349.316	1695766.126

Table F.4 – Conceptual Design Kinematic SWMM Input for 100-year (Future) Event in Aurora

```
773411STMN-OF    3173370.708        1695766.126
37761STGM-OF_BHI 3172132.334        1697761.217
37761STGM-OF_BHI 3172305.696        1697759.696
406206STGM-OF_BHI 3171871.399        1694570.751
S_15_c           3175681.215        1697741.401
S_15_c           3175670.362        1698366.544
C_15_a           3174906.904        1698993.383
C_15_b           3175569.317        1698799.702
C_AR1_c          3173702.445        1693439.020
S_AR1_d          3173894.226        1693173.212
S_AR1_a          3173377.182        1694444.533
S_AR1_c          3173632.156        1693343.533
S_AR1_c          3173528.747        1693688.229
C_10_13          3174688.621        1696529.741
C_13a_2          3175734.757        1697085.467
C_15_c           3175745.482        1697801.155
C_15_c           3175721.150        1698407.415
W-1              3179194.285        1692283.278


[BACKDROP]
FILE       "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\Background\Westerly_Creek_SWMM_Background.jpg"
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872

[PROFILES]
;;Name           Links
;;-------------- ----------
"1               " 37666STGM 36939STGM 37665STGM 37673STGM 37750STGM
"1               " 37758STGM 37757STGM 37759STGM 37760STGM 37761STGM
"1               " 37762STGM 37763STGM 37764STGM 36715STGM 36718STGM
"1               " 36716STGM 36717STGM
"2               " 773049STMN 773051STMN 773387STMN 773391STMN 773393STMN
"2               " 773411STMN
"3               " 35355STGM 35357STGM 35358STGM 35362STGM 35363STGM
"3               " 35365STGM 35367STGM 35368STGM 35369STGM 35370STGM
"3               " 35372STGM
```

Table F.5 – Conceptual Design Dynamic SWMM Input for 100-year (Future) Event in Denver

```
[TITLE]
;;Project Title/Notes
Basis of model: Denver SDMP - Basin 4401-02 - Updated by Enginuity 2018
Model inflows updated wtih Westerly Creek FHAD CUHP 100-year Future.
Pipe sizes increased to meet criteria for street flooding (<1')for Westerly Creek OSP Conceptual Design.
Models updated to include topographic data obtained from MHFD.
09/2021 BHI Job # 20210239

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/01/2005
END_TIME             06:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:00:30
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         0:00:05

INERTIAL_DAMPING     FULL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              4

[FILES]
;;Interfacing Files
USE INFLOWS "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\CUHP\6_Fut_100yr_0mi^2_WC_FHAD_2017_NOAA14.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
19071STMH        5304.4     9.369      0          0          0
19079STMH        5304.49    10.039     0          0          0
19097STMH        5307.4     13.756     0          0          0
19111STMH        5310.16    13.493     0          0          0
19132STMH        5311.43    9.163      0          0          0
19134STMH        5312.35    7.915      0          0          0
19139STMH        5310.62    13.499     0          0          0
19143STMH        5313.99    7.613      0          0          0
19150STMH        5315.64    7.866      0          0          0
19154STMH        5320.49    7.835      0          0          0
19162STMH        5321.94    7.527      0          0          0
19171STMH        5323.1     7.411      0          0          0
19179STMH        5324.36    7.035      0          0          0
19214STMH        5324.57    6.805      0          0          0
20135STMH        5328.82    9.354      0          0          0
20209STFT        5329.74    8.664      0          0          0
20818STMH        5332.32    8.638      0          0          0
20841STMH        5330.433   8.73       0          0          0
23839STMH        5333.38    7.559      0          0          0
23840STMH        5330.19    8.223      0          0          0
23841STMH        5330.48    8.305      0          0          0
23843STMH        5328.82    8.694      0          0          0
23845STMH        5335.33    6.982      0          0          0
23849STMH        5337.72    6.657      0          0          0
23852STMH        5335.67    7.2        0          0          0
23855STMH        5339.55    6.367      0          0          0
23856STMH        5339.16    6.555      0          0          0
23861STMH        5341.79    6.539      0          0          0
23862STMH        5341.65    6.487      0          0          0
23868STMH        5343.15    7.42       0          0          0
24788STMH        5341.35    4.772      0          0          0
24791STMH        5337.7     3.864      0          0          0
24796STMH        5342.67    4.897      0          0          0
24797STIL        5343.74    5.209      0          0          0
24800STMH        5341.13    4.648      0          0          0
405658STFT       5324.68    12.61      0          0          0
405659STFT       5326.98    11.733     0          0          0
407540STMH       5324.28    12.858     0          0          0
407541STMH       5323.97    12.814     0          0          0
407542STMH       5323.54    11.935     0          0          0
407543STMH       5326.58    12.1       0          0          0
407544STMH       5323.33    11.651     0          0          0
407546STMH       5328.26    11.773     0          0          0
;4401-02-210
J_DE6_1          5348.421   0          0          0          0
;4401-02-220
J_DE5            5354.476   0          0          0          0
;4401-02-230
J_DE3            5341.25    0          0          0          0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
;4401-02-240
J_DE2            5327.533   0          0          0          0
;4401-02-250
J_AD4            5315       0          0          0          0
;4401-02-260
J_AD1            5336.76    0          0          0          0
;4401-02-261
J_DE1            5348.234   0          0          0          0
773032STMH       5322.91    9.173      0          0          0
773050STMH       5322.77    8.551      0          0          0
773052STMH       5321.85    5.748      0          0          0
773389STMH       5320.69    5.041      0          0          0
773392STMH       5320.51    5.354      0          0          0
773410STMH       5319.46    4.806      0          0          0
773412STMH       5318.49    6.958      0          0          0
J_DE4            984.3      0          0          0          0
E17THAVE-01      5329.51    9.113      0          0          0
E17THAVE-02      5328.66    8.786      0          0          0
E17THAVE-03      5327.88    8.5        0          0          0
E17THAVE-04      5322.92    8.5        0          0          0
E17THAVE-05      5322.04    8.5        0          0          0
E17THAVE-06      5321.24    8.5        0          0          0
E17THAVE-07      5320.31    8.5        0          0          0
E17THAVE-08      5319.59    8.5        0          0          0
E17THAVE-09      5318.84    8.5        0          0          0
E17THAVE-10      5317.08    8.5        0          0          0
E17THAVE-11      5315.38    8.5        0          0          0
E17THAVE-12      5313.72    8.5        0          0          0
19198STMH        5319.09    7.837      0          0          0
19718STMH        5320.98    7.577      0          0          0
20050STMH        5322.11    7.361      0          0          0
20127STMH        5322.65    7.121      0          0          0
20128STMH        5323.53    7.598      0          0          0
20164STMH        5323.84    7.039      0          0          0
20493STMH        5325.34    7.378      0          0          0
20851STMH        5325.4     8.5        0          0          0
20866STMH        5325.27    8.5        0          0          0
20853STMH        5326.95    8.5        0          0          0
20861STMH        5323.89    8.5        0          0          0
J_DE6_2          5344       0          0          0          0
J_12th           5344       0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
18979STOF        5304.32    FREE                        NO
18979STOF2       5304.32    FREE                        NO
23842STFT        5325.94    FREE                        NO
24773STOF        5335.3     FREE                        NO
24773STOF2       5335.3     FREE                        NO
407544STMH-OF    5322.61    FREE                        NO
407550STMH       5322.61    FREE                        NO
4401-02-250-OF   5309.4     FREE                        NO
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
773412STMH-OF    5318       FREE                        NO
E17THAVE-OF      5311.8     FREE                        NO
J2               5336.2     FREE                        NO

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
19071STMH        19071STMH        18979STOF        64.055     0.019      5304.4     5304       0          0
19071STMH-OF     19071STMH        18979STOF2       64.055     0.021      5313.799   5304.32    0          0
;4.76' - 15" - RCP - 1%
35191STGM        24791STMH        24773STOF        4.76       0.019      5337.7     5335.3     0          0
35191STGM-OF     24791STMH        24773STOF2       4.76       0.021      5337.7     5335.3     0          0
;35.' - 15" - .35%
35325STGM        24788STMH        24800STMH        35         0.019      5341.35    5341.23    0          0
35325STGM-OF     24788STMH        24800STMH        35         0.021      5346.122   5345.778   0          0
;343' - 15" - RCP - 1%
35326STGM        24800STMH        24791STMH        343        0.019      5341.13    5337.7     0          0
35326STGM-OF     24800STMH        24791STMH        343        0.021      5345.778   5341.564   0          0
;322.67' - 15" - RCP - 0.35%
35328STGM        24797STIL        24796STMH        272.67     0.019      5343.74    5342.79    0          0
35328STGM-OF     24797STIL        24796STMH        322.67     0.021      5349.119   5347.567   0          0
;346.42' - 15" - RCP - 0.35%
35329STGM        24796STMH        24788STMH        346.42     0.019      5342.67    5341.46    0          0
35329STGM-OF     24796STMH        24788STMH        346.42     0.021      5347.567   5346.122   0          0
;276.22' - 42" - RCP - .45%
35355STGM        23868STMH        23861STMH        276.22     0.019      5343.15    5341.91    0          0
35355STGM-OF     23868STMH        23861STMH        276.22     0.021      5350.604   5348.329   0          0
;37.52' - 42" - RCP - 0.67%
35357STGM        23861STMH        23862STMH        37.52      0.019      5341.79    5341.54    0          0
35357STGM-OF     23861STMH        23862STMH        37.52      0.021      5348.329   5348.101   0          0
;318.84' - 42" - RCP - 0.47%
35358STGM        23862STMH        23855STMH        318.84     0.019      5341.19    5339.7     0          0
35358STGM-OF     23862STMH        23855STMH        318.84     0.021      5348.101   5345.912   0          0
;30.' - 42" - RCP - .52%
35362STGM        23855STMH        23856STMH        30         0.019      5339.55    5339.42    0          0
35362STGM-OF     23855STMH        23856STMH        30         0.021      5345.912   5345.711   0          0
;291.13' - 42" - RCP - .45%
35363STGM        23856STMH        23849STMH        291.13     0.019      5339.16    5337.86    0          0
35363STGM-OF     23856STMH        23849STMH        291.13     0.021      5345.711   5344.431   0          0
;326.65' - 42" - RCP - .63%
35365STGM        23849STMH        23852STMH        326.65     0.019      5337.72    5335.67    0          0
35365STGM-OF     23849STMH        23852STMH        326.65     0.021      5344.431   5342.863   0          0
;56.7' - 42" - RCP - .6%
35367STGM        23852STMH        23845STMH        56.7       0.019      5335.67    5335.33    0          0
35367STGM-OF     23852STMH        407546STMH       536.006    0.021      5342.863   5340.033   0          0
;287.08' - 42" - RCP - .64%
35368STGM        23845STMH        23839STMH        287.08     0.019      5335.33    5333.49    0          0
35368STGM-OF     23845STMH        23839STMH        287.08     0.021      5342.46    5340.939   0          0
;325.87' - 42" - RCP - .58%
35369STGM        23839STMH        23841STMH        325.87     0.019      5333.38    5330.48    0          0
35369STGM-OF     23839STMH        23841STMH        325.87     0.021      5340.939   5338.785   0          0
;53.48' - 34" - RCP - .82%
35370STGM        23841STMH        23840STMH        53.48      0.019      5330.63    5330.19    0          0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
35370STGM-OF     23841STMH        23840STMH        53.48      0.021      5338.785   5338.413   0          0
;143.76' - 48" - RCP - .31%
35371STGM        23843STMH        23842STFT        143.76     0.019      5328.82    5325.94    0          0
;136.61' - 48" - RCP - 1.%
35372STGM        23840STMH        23843STMH        136.61     0.019      5330.19    5328.82    0          0
35372STGM-OF     23840STMH        23843STMH        136.61     0.021      5338.413   5337.514   0          0
;92.' - 60" - RCP - .41%
36715STGM        19139STMH        19111STMH        92         0.019      5310.62    5310.16    0          0
36715STGM-OF     19139STMH        19111STMH        92         0.021      5322.569   5321.733   0          0
;581.' - 60" - RCP - .28%
36716STGM        19097STMH        19079STMH        581        0.019      5307.4     5304.49    0          0
36716STGM-OF     19097STMH        19079STMH        581        0.021      5320.176   5314.649   0          0
;18.5' - 60" - RCP - .38%
36717STGM        19079STMH        19071STMH        18.5       0.019      5304.49    5304.4     0          0
36717STGM-OF     19079STMH        19071STMH        18.5       0.035      5314.649   5313.799   0          0
;552.7' - 60" - RCP - .31%
36718STGM        19111STMH        19097STMH        552.7      0.019      5310.16    5307.4     0          0
36718STGM-OF     19111STMH        19097STMH        552.7      0.021      5321.733   5320.176   0          0
;572' - 48" - RCP - 0.52%
36939STGM        20818STMH        20209STFT        572        0.019      5332.32    5329.74    0          0
36939STGM-OF     20818STMH        20209STFT        572        0.021      5340.958   5338.404   0          0
;46' - 48" - RCP - 0.91%
37665STGM        20209STFT        20135STMH        46         0.019      5329.74    5328.84    0          0
37665STGM-OF     20209STFT        20135STMH        46         0.021      5338.404   5338.174   0          0
;44' - 48" - RCP - 0.5%
37666STGM        20841STMH        20818STMH        44         0.019      5332.52    5332.36    0          0
37666STGM-OF     20841STMH        20818STMH        44         0.021      5341.25    5340.958   0          0
;630.' - 48" - RCP - .59%
37673STGM        20135STMH        19214STMH        630        0.019      5328.82    5324.57    0          0
37673STGMF-OFE   20135STMH        19162STMH        1312.732   0.021      5338.174   5329.467   0          0
;39.2' - 54" - RCP - .1%
37750STGM        19214STMH        19179STMH        39.2       0.019      5324.57    5324.53    0          0
37750STGM-OF     19214STMH        19179STMH        39.2       0.021      5331.375   5331.395   0          0
;317.3' - 54" - RCP - .38%
37757STGM        19171STMH        19162STMH        317.3      0.019      5323.13    5321.94    0          0
37757STGM-OF     19171STMH        19162STMH        317.3      0.021      5330.5     5329.467   0          0
;316.5' - 54" - RCP - .4%
37758STGM        19179STMH        19171STMH        316.5      0.019      5324.36    5323.1     0          0
37758STGM-OF     19179STMH        19171STMH        316.5      0.021      5331.4     5330.5     0          0
;340.5' - 54" - RCP - .41%
37759STGM        19162STMH        19154STMH        340.5      0.019      5321.94    5320.54    0          0
37759STGM-OF     19162STMH        19154STMH        340.5      0.021      5329.467   5328.325   0          0
;293.2' - 54" - RCP - .41%
37760STGM        19154STMH        19150STMH        293.2      0.019      5320.49    5319.28    0          0
37760STGM-OF     19154STMH        19150STMH        293.2      0.021      5328.325   5326.816   0          0
;329.2' - 54" - RCP - .45%
37761STGM        19150STMH        19143STMH        329.2      0.019      5315.64    5313.99    0          0
;328.5' - 54" - RCP - .48%
37762STGM        19143STMH        19134STMH        328.5      0.019      5313.99    5312.35    0          0
37762STGM-OF     19143STMH        19134STMH        328.5      0.021      5324.973   5323.575   0          0
;185.' - 60" - RCP - .37%
37763STGM        19134STMH        19132STMH        185        0.019      5312.35    5311.43    0          0
37763STGM-OF     19134STMH        19132STMH        185        0.021      5323.575   5322.603   0          0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
;161.5' - 60" - RCP - 1.74%
37764STGM        19132STMH        19139STMH        161.5      0.019      5311.43    5310.62    0          0
37764STGM-OF     19132STMH        19139STMH        161.5      0.021      5322.603   5322.569   0          0
;135' - 36" - RCP - 0.08148148148123 89%
406193STGM       407542STMH       407544STMH       130        0.019      5323.54    5323.43    0          0
406193STGM-OF    407542STMH       407544STMH       135        0.021      5335.475   5334.981   0          0
;164.3' - 36" - RCP - .19%
406197STGM       407541STMH       407542STMH       164.3      0.019      5323.97    5323.65    0          0
406197STGM-OF    407541STMH       407542STMH       164.3      0.021      5336.784   5335.475   0          0
;36.6' - 24" - .82%
406199STGM       407540STMH       407541STMH       36.6       0.019      5324.28    5323.98    0          0
406199STGM-OF    407540STMH       407541STMH       36.6       0.021      5337.138   5336.784   0          0
;20.1' - 30" - RCP - .52%
406200STGM       405658STFT       407540STMH       20.1       0.019      5324.68    5324.28    0          0
406200STGM-OF    405658STFT       407540STMH       20.1       0.021      5337.29    5337.138   0          0
;304.7' - 30" - RCP - .52%
406201STGM       407543STMH       405658STFT       304.7      0.019      5326.58    5324.68    0          0
406201STGM-OF    407543STMH       405658STFT       304.7      0.021      5338.68    5337.29    0          0
;20.12' - 30" - RCP - .48%
406205STGM       405659STFT       407543STMH       20.12      0.019      5326.98    5326.68    0          0
406205STGM-OF    405659STFT       407543STMH       20.12      0.021      5338.713   5338.68    0          0
;307.58' - 30" - RCP - .48%
406206STGM       407546STMH       405659STFT       307.58     0.019      5328.26    5326.98    0          0
407544STMH       407544STMH       407550STMH       35         0.019      5323.33    5322.61    0          0
407544STMH-OF    407544STMH       407544STMH-OF    36.24      0.021      5334.981   5322.61    0          0
D_12th           J_DE6_1          J_12th           233.052    0.01       5348.421   5342.06    0          0
4401-02-220      J_DE5            23868STMH        419.058    0.01       5354.476   5342.23    0          0
4401-02-230      J_DE3            773032STMH       1661.078   0.01       5341.25    5326.58    0          0
4401-02-240      J_DE2            773032STMH       326.993    0.01       5327.533   5321.85    0          0
4401-02-250      J_AD4            4401-02-250-OF   959.793    0.01       5315       5309.4     0          0
4401-02-260      J_AD1            19111STMH        507.372    0.01       5336.76    5308.24    0          0
4401-02-261      J_DE1            20841STMH        1172.966   0.01       5348.234   5332.52    0          0
;37.7' - 29" - RCP - 0.27%
773049STMN       773032STMH       773050STMH       37.7       0.019      5322.91    5322.77    0          0
773049STMN-OF    773032STMH       773050STMH       37.7       0.021      5332.083   5331.321   0          0
;291.25' - 34" - RCP - 0.17%
773051STMN       773050STMH       773052STMH       291.25     0.019      5322.77    5321.85    0          0
773051STMN-OF    773050STMH       773052STMH       291.25     0.021      5331.321   5327.598   0          0
;329.41' - 34" - RCP - 0.28%
773387STMN       773052STMH       773389STMH       329.41     0.019      5321.85    5320.69    0          0
773387STMN-OF    773052STMH       773389STMH       329.41     0.021      5327.598   5325.731   0          0
;20.62' - 34" - RCP - 0.29%
773391STMN       773389STMH       773392STMH       20.62      0.019      5320.69    5320.63    0          0
773391STMN-OF    773389STMH       773392STMH       20.62      0.021      5325.731   5325.864   0          0
;285.15' - 34" - RCP - 0.32%
773393STMN       773392STMH       773410STMH       285.153    0.019      5320.51    5319.59    0          0
773393STMN-OF    773392STMH       773410STMH       285.15     0.021      5325.864   5324.266   0          0
;49.47' - 34" - RCP - 0.49%
773411STMN       773410STMH       773412STMH       49.47      0.019      5319.46    5318.49    0          0
773411STMN-OF    773410STMH       773412STMH       49.47      0.021      5324.266   5325.448   0          0
773413STMN       773412STMH       773412STMH-OF    15.71      0.019      5318.49    5318       0          0
CDE4             J_DE4            23862STMH        1          0.01       *          *          0          0
E17THAVE-01      20841STMH        E17THAVE-01      184.225    0.019      5330.433   5329.51    0          0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
E17THAVE01-OF    20841STMH       E17THAVE-01     184.225    0.021     5341.25    5340.893   0          0
E17THAVE-02      E17THAVE-01     E17THAVE-02     171.287    0.019     5329.51    5328.66    0          0
E17THAVE-03      E17THAVE-02     E17THAVE-03     156.342    0.019     5328.66    5327.88    0          0
E17THAVE-04      E17THAVE-03     20853STMH       185.922    0.019     5327.88    5326.995   0          0
E17THAVE04-OF    E17THAVE-03     20853STMH       185.922    0.021     5338.153   5336.803   0          0
E17THAVE-05      20861STMH       E17THAVE-04     193.636    0.019     5323.89    5322.92    0          0
E17THAVE-06      E17THAVE-04     E17THAVE-05     176.986    0.019     5322.92    5322.04    0          0
E17THAVE-07      E17THAVE-05     E17THAVE-06     159.903    0.019     5322.04    5321.24    0          0
E17THAVE-08      E17THAVE-06     E17THAVE-07     186.511    0.019     5321.24    5320.31    0          0
E17THAVE-09      E17THAVE-07     E17THAVE-08     142.743    0.019     5320.31    5319.59    0          0
E17THAVE-10      E17THAVE-08     E17THAVE-09     150.535    0.019     5319.59    5318.84    0          0
E17THAVE-11      E17THAVE-09     E17THAVE-10     352.09     0.019     5318.84    5317.08    0          0
E17THAVE-12      E17THAVE-10     E17THAVE-11     340.672    0.019     5317.08    5315.38    0          0
E17THAVE-13      E17THAVE-11     E17THAVE-12     330.677    0.019     5315.38    5313.72    0          0
E17THAVE-OF      E17THAVE-12     E17THAVE-OF     89.974     0.019     5313.73    5313.27    0          0
37753STGM        19198STMH       19150STMH       38.5       0.019     5319.09    5318.95    0          0
37753STGM-OF     19198STMH       19150STMH       38.5       0.021     5326.927   5326.816   0          0
;317.3' - 54" - RCP - .38%
37675STGM        19718STMH       19198STMH       359.7      0.019     5320.98    5319.09    0          0
37675STGM-OF     19718STMH       19198STMH       359.7      0.021     5328.557   5326.927   0          0
;276.' - 15" - RCP - .38%
37746STGM        20050STMH       19718STMH       237.5      0.019     5322.11    5320.98    0          0
37746STGM-OF     20050STMH       19718STMH       237.5      0.021     5329.471   5328.557   0          0
;39.2' - 54" - RCP - .1%
37714STGM        20866STMH       20861STMH       276        0.019     5325.27    5323.89    0          0
37714STGM-OF     20866STMH       20861STMH       276        0.021     5334.516   5333.082   0          0
;25.' - 15" - RCP - .24%
37715STGM        20851STMH       20866STMH       25         0.019     5325.4     5325.27    0          0
37715STGM-OF     20851STMH       20866STMH       25         0.021     5334.66    5334.516   0          0
;310.' - 18" - RCP - .8%
37716STGM        20853STMH       20851STMH       310        0.019     5326.95    5325.4     0          0
37716STGM-OF     20853STMH       20851STMH       803.88     0.021     5336.803   5334.66    0          0
37717STGM        20851STMH       20493STMH       304.5      0.019     5326.16    5325.34    0          0
37717STGM-OF     20851STMH       20493STMH       304.5      0.021     5334.66    5332.718   0          0
37721STGM        20493STMH       20164STMH       334        0.019     5325.34    5323.84    0          0
37721STGM-OF     20493STMH       20164STMH       334        0.021     5332.718   5330.879   0          0
37731STGM        20164STMH       20128STMH       27.5       0.019     5323.84    5323.53    0          0
37731STGM-OF     20164STMH       20128STMH       27.5       0.021     5330.879   5331.128   0          0
37742STGM        20128STMH       20127STMH       272.2      0.019     5323.53    5322.65    0          0
37742STGM-OF     20128STMH       20127STMH       272.2      0.021     5331.128   5329.771   0          0
37743STGM        20127STMH       20050STMH       49.5       0.019     5322.65    5322.11    0          0
37743STGM-OF     20127STMH       20050STMH       49.5       0.021     5329.771   5329.471   0          0
4401-02-210      J_DE6_2         24797STIL       400        0.01      *          *          0          0
C_12th           J_12th          J2              1200       0.01      *          *          0          0
37761STGM-OF_BHI 19150STMH       19143STMH       329.2      0.01      5326.816   5324.973   0          0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
19071STMH        CIRCULAR     5.5              0          0          0          1
19071STMH-OF     IRREGULAR    50ftStreet       0          0          0          1
35191STGM        CIRCULAR     1.25             0          0          0          1
35191STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

35325STGM	CIRCULAR	1.25	0	0	0	1
35325STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35326STGM	CIRCULAR	1.25	0	0	0	1
35326STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35328STGM	CIRCULAR	1.25	0	0	0	1
35328STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35329STGM	CIRCULAR	1.25	0	0	0	1
35329STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35355STGM	CIRCULAR	3.5	0	0	0	1
35355STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35357STGM	CIRCULAR	3.5	0	0	0	1
35357STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35358STGM	CIRCULAR	3.5	0	0	0	1
35358STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35362STGM	CIRCULAR	3.5	0	0	0	1
35362STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35363STGM	CIRCULAR	3.5	0	0	0	1
35363STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35365STGM	CIRCULAR	3.5	0	0	0	1
35365STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35367STGM	CIRCULAR	3.5	0	0	0	1
35367STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35368STGM	CIRCULAR	3.5	0	0	0	1
35368STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35369STGM	CIRCULAR	3.5	0	0	0	1
35369STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35370STGM	HORIZ_ELLIPSE	2.833	4.417	0	0	1
35370STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
35371STGM	CIRCULAR	4	0	0	0	1
35372STGM	CIRCULAR	4	0	0	0	1
35372STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
36715STGM	CIRCULAR	5.5	0	0	0	1
36715STGM-OF	IRREGULAR	Montview	0	0	0	1
36716STGM	CIRCULAR	5.5	0	0	0	1
36716STGM-OF	IRREGULAR	Montview	0	0	0	1
36717STGM	CIRCULAR	5.5	0	0	0	1
36717STGM-OF	IRREGULAR	50ftStreet	0	0	0	1
36718STGM	CIRCULAR	5.5	0	0	0	1
36718STGM-OF	IRREGULAR	Montview	0	0	0	1
36939STGM	CIRCULAR	4	0	0	0	1
36939STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
37665STGM	CIRCULAR	4	0	0	0	1
37665STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
37666STGM	CIRCULAR	4	0	0	0	1
37666STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
37673STGM	CIRCULAR	4	0	0	0	1
37673STGMF-OFE	IRREGULAR	36ftStreet	0	0	0	1
37750STGM	CIRCULAR	4.5	0	0	0	1
37750STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
37757STGM	CIRCULAR	4.5	0	0	0	1
37757STGM-OF	IRREGULAR	Montview	0	0	0	1
37758STGM	CIRCULAR	4.5	0	0	0	1
37758STGM-OF	IRREGULAR	Montview	0	0	0	1

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

37759STGM	CIRCULAR	4.5	0	0	0	1
37759STGM-OF	IRREGULAR	Montview	0	0	0	1
37760STGM	CIRCULAR	4.5	0	0	0	1
37760STGM-OF	IRREGULAR	Montview	0	0	0	1
37761STGM	CIRCULAR	5.5	0	0	0	1
37762STGM	CIRCULAR	5.5	0	0	0	1
37762STGM-OF	IRREGULAR	Montview	0	0	0	1
37763STGM	CIRCULAR	5.5	0	0	0	1
37763STGM-OF	IRREGULAR	Montview	0	0	0	1
37764STGM	CIRCULAR	5.5	0	0	0	1
37764STGM-OF	IRREGULAR	Montview	0	0	0	1
406193STGM	CIRCULAR	3	0	0	0	1
406193STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406197STGM	CIRCULAR	3	0	0	0	1
406197STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406199STGM	CIRCULAR	2	0	0	0	1
406199STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406200STGM	CIRCULAR	2.5	0	0	0	1
406200STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406201STGM	CIRCULAR	2.5	0	0	0	1
406201STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406205STGM	CIRCULAR	2.5	0	0	0	1
406205STGM-OF	IRREGULAR	36ftStreet	0	0	0	1
406206STGM	CIRCULAR	2.5	0	0	0	1
407544STMH	CIRCULAR	3	0	0	0	1
407544STMH-OF	IRREGULAR	36ftStreet	0	0	0	1
D_12th	DUMMY	0	0	0	0	1
4401-02-220	DUMMY	0	0	0	0	1
4401-02-230	DUMMY	0	0	0	0	1
4401-02-240	DUMMY	0	0	0	0	1
4401-02-250	DUMMY	0	0	0	0	1
4401-02-260	DUMMY	0	0	0	0	1
4401-02-261	DUMMY	0	0	0	0	1
773049STMN	HORIZ_ELLIPSE	2.417	3.75	0	0	1
773049STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773051STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
773051STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773387STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
773387STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773391STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
773391STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773393STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
773393STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773411STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
773411STMN-OF	IRREGULAR	36ftStreet	0	0	0	1
773413STMN	HORIZ_ELLIPSE	2.833	4.417	0	0	1
CDE4	DUMMY	0	0	0	0	1
E17THAVE-01	CIRCULAR	5.5	0	0	0	1
E17THAVE01-OF	IRREGULAR	36ftStreet	0	0	0	1
E17THAVE-02	CIRCULAR	5.5	0	0	0	1
E17THAVE-03	CIRCULAR	5.5	0	0	0	1
E17THAVE-04	CIRCULAR	5.5	0	0	0	1
E17THAVE04-OF	IRREGULAR	36ftStreet	0	0	0	1

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
E17THAVE-05      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-06      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-07      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-08      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-09      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-10      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-11      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-12      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-13      HORIZ_ELLIPSE 4.417           6.917      12         0          1
E17THAVE-OF      HORIZ_ELLIPSE 4.417           6.917      12         0          1
37753STGM        CIRCULAR     2.5              0          0          0          1
37753STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37675STGM        CIRCULAR     2.5              0          0          0          1
37675STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37746STGM        CIRCULAR     2.5              0          0          0          1
37746STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37714STGM        CIRCULAR     5.5              0          0          0          1
37714STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37715STGM        CIRCULAR     5.5              0          0          0          1
37715STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37716STGM        CIRCULAR     5.5              0          0          0          1
37716STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37717STGM        HORIZ_ELLIPSE 1.583            2.5        0          0          1
37717STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37721STGM        HORIZ_ELLIPSE 1.583            2.5        0          0          1
37721STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37731STGM        HORIZ_ELLIPSE 1.583            2.5        0          0          1
37731STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37742STGM        CIRCULAR     2.5              0          0          0          1
37742STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
37743STGM        CIRCULAR     2.5              0          0          0          1
37743STGM-OF     IRREGULAR    36ftStreet       0          0          0          1
4401-02-210      DUMMY        0                0          0          0          1
C_12th           IRREGULAR    36ftStreet       0          0          0          1
37761STGM-OF_BHI IRREGULAR    Montview         0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.01     0.01     0.021
X1 19071STMH-OF      137      0        0        0.0      0.0      0        0        0
GR 5330     -1       5320     0        5314.877 2        5314.979 3        5314.979 5
GR 5314.622 6        5314.548 7        5314.548 8        5314.441 9        5314.441 11
GR 5314.267 12       5314.267 14       5314.079 15       5314.28  16       5314.28  17
GR 5314.255 18       5314.255 20       5314.304 21       5314.304 23       5314.246 24
GR 5314.323 25       5314.323 26       5314.233 27       5314.233 28       5314.314 29
GR 5314.257 30       5314.257 32       5314.169 33       5314.26  34       5314.26  35
GR 5314.148 36       5314.148 37       5314.172 38       5313.998 39       5313.998 41
GR 5314.041 42       5314.041 44       5313.978 45       5313.978 46       5314.03  47
GR 5313.789 48       5313.789 50       5313.817 51       5313.817 54       5313.9   55
GR 5313.9   57       5313.891 58       5313.891 59       5314.049 60       5314.04  61
GR 5314.04  63       5314.158 64       5314.158 66       5314.104 67       5314.305 68
GR 5314.305 69       5313.975 70       5313.975 72       5314.017 73       5314.017 75
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
GR 5314.03  76       5314.128 77       5314.128 78       5314.031 79       5314.031 81
GR 5313.997 82       5313.997 84       5313.993 85       5314.169 86       5314.169 87
GR 5314.095 88       5314.095 89       5314.25  90       5314.234 91       5314.234 93
GR 5314.034 94       5314.152 95       5314.152 96       5313.982 97       5313.982 98
GR 5314.088 99       5313.964 100      5313.964 102      5314.122 103      5314.122 105
GR 5314.167 106      5314.167 107      5314.356 108      5314.356 109      5314.341 110
GR 5314.341 111      5314.477 112      5314.391 113      5314.391 115      5314.418 116
GR 5314.418 118      5314.394 119      5314.394 120      5314.559 121      5314.628 122
GR 5314.628 124      5314.802 125      5314.802 127      5314.851 128      5314.946 129
GR 5314.946 130      5314.87  131      5314.87  133      5315.01  134      5315.01  136
GR 5314.874 137      5314.958 138      5314.958 139      5314.893 140      5314.893 141
GR 5314.997 142      5315.062 143      5315.062 145      5315.068 146      5315.211 147
GR 5315.211 148      5315.186 149      5315.186 150      5315.456 151      5315.415 152
GR 5315.415 154      5315.376 155      5315.45  156      5315.45  157      5315.432 158
GR 5315.432 159      5315.642 160      5315.615 161      5315.615 163      5315.64  164
GR 5320     165.93   5330     166
;
;Full street, width = 50ft, curb = 0.5ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.27ft.
NC 0.05     0.05     0.02
X1 50ftStreet        9        30       80       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.27     0        0.5      30       0        30       0.5      55
GR 0        80       0.5      80       1.27     110      10       110
;
;Full street, width = 36ft, curb = 0.5ft , cross-slope = 0.02ft/ft, bank-slope = 0.02ft/ft, bank-height = 1.5ft.
NC 0.05     0.05     0.02
X1 36ftStreet        9        50       86       0.0      0.0      0.0      0.0      0.0
GR 10       0        1.5      0        .5       50       0        50       0.36     68
GR 0        86       .5       86       1.5      136      10       136
;
NC 0.05     0.05     0.02
X1 Montview          166      69.5824181116 134.19466353 0.0      0.0      0.0      0.0      0.0
GR 5332     0        5332     2.48508635381 5332     4.97017272234 5332     7.45525907596 5332     9.94034542963
GR 5332     12.4254318131 5332     14.9105181667 5332     17.3956045205 5332     19.8806908742 5331.7492 22.3657772576
GR 5331     24.8508636112 5331     27.3359499648 5331     29.8210363485 5331     32.3061227021 5331     34.7912090558
GR 5331     37.2762954094 5331     39.7613817929 5331     42.2464681467 5331     44.7315545003 5330.8089 47.2166408539
GR 5330     49.7017272374 5330     52.186813591 5330     54.6718999446 5330     57.1569863134 5330     59.642072667
GR 5330     62.1271590504 5330     64.6122454041 5330     67.0973317577 5330     69.5824181116 5329.8686 72.067504495
GR 5329     74.5525908486 5329     77.0376772022 5329     79.5227635857 5329     82.0078499395 5329     84.4929362931
GR 5329     86.9780226468 5329     89.4631090302 5329     91.9481953839 5329     94.4332817375 5329.0717 96.9183680913
GR 5330     99.4034544748 5330     101.888540828 5329.9462 104.373627182 5329     106.858713551 5329     109.343799904
GR 5329     111.828886288 5329     114.313972641 5329     116.799058995 5329     119.284145349 5329     121.769231732
GR 5329     124.254318086 5329     126.73940444 5329     129.224490823 5329.9881 131.709577177 5330     134.19466353
GR 5330     136.679749884 5330     139.164836268 5330     141.649922621 5330     144.135008975 5330.9523 146.620095329
GR 5331     149.105181712 5331     151.590268066 5331     154.075354419 5331     156.560440803 5331     159.045527142
GR 5331     161.530613525 5331     164.015699879 5331     166.500786232 5331     168.985872586 5331     171.47095897
GR 5331     173.956045323 5331     176.441131677 5331     178.92621806 5331     181.411304414 5331     183.896390768
GR 5331     186.381477121 5331     188.866563505 5331     191.351649859 5331     193.836736212 5331     196.321822566
GR 5331     198.806908949 5331     201.291995303 5331     203.777081657 5331     206.26216804 5331     208.747254379
GR 5331     211.232340762 5331     213.717427116 5331     216.20251347 5331     218.687599823 5331     221.172686207
GR 5331     223.657772561 5331     226.142858914 5331     228.627945268 5331     231.113031651 5331     233.598118005
GR 5331     236.083204359 5331     238.568290742 5331     241.053377096 5331     243.53846345 5331     246.023549803
GR 5331     248.508636187 5331     250.99372254 5331     253.478808894 5331     255.963895278 5331     258.448981631
GR 5331     260.934068 5331     263.419154353 5331     265.904240707 5331     268.389327061 5331     270.874413444
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
GR 5331     273.359499798 5331     275.844586152 5331     278.329672505 5331     280.814758889 5331     283.299845243
GR 5331     285.784931596 5331     288.27001798 5331     290.755104333 5331     293.240190687 5331     295.725277041
GR 5331     298.210363424 5331     300.695449778 5331     303.180536131 5331     305.665622515 5331     308.150708869
GR 5331     310.635795237 5331     313.120881591 5331     315.605967944 5331     318.091054298 5331     320.576140682
GR 5331     323.061227035 5331     325.546313389 5331     328.031399743 5331     330.516486126 5331     333.00157248
GR 5331     335.486658834 5331     337.971745217 5331     340.456831571 5331     342.941917924 5331     345.427004278
GR 5331     347.912090661 5331     350.397177015 5331     352.882263369 5331     355.367349722 5331     357.852436106
GR 5331     360.33752246 5331     362.822608828 5331     365.307695182 5331     367.792781535 5331     370.277867919
GR 5331     372.762954273 5331     375.248040626 5331     377.73312698 5331     380.218213363 5331     382.703299717
GR 5331     385.188386071 5331     387.673472454 5331     390.158558808 5331     392.643645162 5331     395.128731515
GR 5331     397.613817899 5331     400.098904253 5331     402.583990606 5331     405.06907696 5331     407.554163343
GR 5332     408

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
19071STMH        0          1          0          NO         0

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- --------
J_DE6_1          FLOW             J_DE6_1          FLOW     1.0      1.0
J_DE6_2          FLOW             J_DE6_2          FLOW     1.0      1.0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
HavanaPnd        Rating     0          0
HavanaPnd                   0.5        15
HavanaPnd                   1          100
;
VerbenaPnd       Storage    0          0
VerbenaPnd                  0.7        9450
VerbenaPnd                  1.7        66845

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
J_DE6_1                     0:00:30    0
J_DE6_1                     0:01:00    0
J_DE6_1                     0:01:30    0
J_DE6_1                     0:02:00    0
J_DE6_1                     0:02:30    0
J_DE6_1                     0:03:00    0
J_DE6_1                     0:03:30    0
J_DE6_1                     0:04:00    0
J_DE6_1                     0:04:30    0
J_DE6_1                     0:05:00    0
J_DE6_1                     0:05:30    0
J_DE6_1                     0:06:00    0
J_DE6_1                     0:06:30    0
J_DE6_1                     0:07:00    0
J_DE6_1                     0:07:30    0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	0:08:00	0
J_DE6_1	0:08:30	0
J_DE6_1	0:09:00	0
J_DE6_1	0:09:30	0
J_DE6_1	0:10:00	0
J_DE6_1	0:10:30	0.143
J_DE6_1	0:11:00	0.312
J_DE6_1	0:11:30	0.4875
J_DE6_1	0:12:00	0.6695
J_DE6_1	0:12:30	0.832
J_DE6_1	0:13:00	1.001
J_DE6_1	0:13:30	1.196
J_DE6_1	0:14:00	1.3715
J_DE6_1	0:14:30	1.5405
J_DE6_1	0:15:00	1.716
J_DE6_1	0:15:30	2.184
J_DE6_1	0:16:00	2.652
J_DE6_1	0:16:30	3.1265
J_DE6_1	0:17:00	3.601
J_DE6_1	0:17:30	4.0755
J_DE6_1	0:18:00	4.5435
J_DE6_1	0:18:30	5.018
J_DE6_1	0:19:00	5.4925
J_DE6_1	0:19:30	5.9605
J_DE6_1	0:20:00	6.435
J_DE6_1	0:20:30	7.579
J_DE6_1	0:21:00	8.7295
J_DE6_1	0:21:30	9.88
J_DE6_1	0:22:00	11.037
J_DE6_1	0:22:30	12.1875
J_DE6_1	0:23:00	13.338
J_DE6_1	0:23:30	14.495
J_DE6_1	0:24:00	15.6455
J_DE6_1	0:24:30	16.796
J_DE6_1	0:25:00	17.953
J_DE6_1	0:25:30	20.969
J_DE6_1	0:26:00	24.0175
J_DE6_1	0:26:30	27.066
J_DE6_1	0:27:00	30.121
J_DE6_1	0:27:30	33.1695
J_DE6_1	0:28:00	36.218
J_DE6_1	0:28:30	39.2665
J_DE6_1	0:29:00	42.3215
J_DE6_1	0:29:30	45.37
J_DE6_1	0:30:00	48.4185
J_DE6_1	0:30:30	51.792
J_DE6_1	0:31:00	55.172
J_DE6_1	0:31:30	58.5455
J_DE6_1	0:32:00	61.9255
J_DE6_1	0:32:30	65.299
J_DE6_1	0:33:00	68.679
J_DE6_1	0:33:30	72.059
J_DE6_1	0:34:00	75.4325

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	0:34:30	78.8125
J_DE6_1	0:35:00	82.186
J_DE6_1	0:35:30	84.1425
J_DE6_1	0:36:00	86.0665
J_DE6_1	0:36:30	87.997
J_DE6_1	0:37:00	89.921
J_DE6_1	0:37:30	91.845
J_DE6_1	0:38:00	93.7755
J_DE6_1	0:38:30	95.6995
J_DE6_1	0:39:00	97.63
J_DE6_1	0:39:30	99.554
J_DE6_1	0:40:00	101.4845
J_DE6_1	0:40:30	102.271
J_DE6_1	0:41:00	103.038
J_DE6_1	0:41:30	103.8115
J_DE6_1	0:42:00	104.5785
J_DE6_1	0:42:30	105.3455
J_DE6_1	0:43:00	106.1125
J_DE6_1	0:43:30	106.886
J_DE6_1	0:44:00	107.653
J_DE6_1	0:44:30	108.42
J_DE6_1	0:45:00	109.1935
J_DE6_1	0:45:30	109.2455
J_DE6_1	0:46:00	109.291
J_DE6_1	0:46:30	109.33
J_DE6_1	0:47:00	109.3755
J_DE6_1	0:47:30	109.421
J_DE6_1	0:48:00	109.46
J_DE6_1	0:48:30	109.5055
J_DE6_1	0:49:00	109.5445
J_DE6_1	0:49:30	109.59
J_DE6_1	0:50:00	109.6355
J_DE6_1	0:50:30	109.2585
J_DE6_1	0:51:00	108.8815
J_DE6_1	0:51:30	108.498
J_DE6_1	0:52:00	108.1145
J_DE6_1	0:52:30	107.7375
J_DE6_1	0:53:00	107.354
J_DE6_1	0:53:30	106.977
J_DE6_1	0:54:00	106.5935
J_DE6_1	0:54:30	106.2165
J_DE6_1	0:55:00	105.833
J_DE6_1	0:55:30	105.4105
J_DE6_1	0:56:00	104.9815
J_DE6_1	0:56:30	104.559
J_DE6_1	0:57:00	104.13
J_DE6_1	0:57:30	103.7075
J_DE6_1	0:58:00	103.285
J_DE6_1	0:58:30	102.856
J_DE6_1	0:59:00	102.4335
J_DE6_1	0:59:30	102.0045
J_DE6_1	1:00:00	101.582
J_DE6_1	1:00:30	101.166

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	1:01:00	100.7435
J_DE6_1	1:01:30	100.3275
J_DE6_1	1:02:00	99.9115
J_DE6_1	1:02:30	99.489
J_DE6_1	1:03:00	99.073
J_DE6_1	1:03:30	98.657
J_DE6_1	1:04:00	98.241
J_DE6_1	1:04:30	97.8185
J_DE6_1	1:05:00	97.4025
J_DE6_1	1:05:30	96.8305
J_DE6_1	1:06:00	96.2585
J_DE6_1	1:06:30	95.68
J_DE6_1	1:07:00	95.108
J_DE6_1	1:07:30	94.536
J_DE6_1	1:08:00	93.9575
J_DE6_1	1:08:30	93.3855
J_DE6_1	1:09:00	92.8135
J_DE6_1	1:09:30	92.2415
J_DE6_1	1:10:00	91.663
J_DE6_1	1:10:30	91.0325
J_DE6_1	1:11:00	90.402
J_DE6_1	1:11:30	89.7715
J_DE6_1	1:12:00	89.141
J_DE6_1	1:12:30	88.504
J_DE6_1	1:13:00	87.8735
J_DE6_1	1:13:30	87.243
J_DE6_1	1:14:00	86.6125
J_DE6_1	1:14:30	85.9755
J_DE6_1	1:15:00	85.345
J_DE6_1	1:15:30	84.6755
J_DE6_1	1:16:00	84.006
J_DE6_1	1:16:30	83.3365
J_DE6_1	1:17:00	82.667
J_DE6_1	1:17:30	81.9975
J_DE6_1	1:18:00	81.328
J_DE6_1	1:18:30	80.6585
J_DE6_1	1:19:00	79.989
J_DE6_1	1:19:30	79.3195
J_DE6_1	1:20:00	78.65
J_DE6_1	1:20:30	77.948
J_DE6_1	1:21:00	77.246
J_DE6_1	1:21:30	76.544
J_DE6_1	1:22:00	75.8355
J_DE6_1	1:22:30	75.1335
J_DE6_1	1:23:00	74.4315
J_DE6_1	1:23:30	73.7295
J_DE6_1	1:24:00	73.021
J_DE6_1	1:24:30	72.319
J_DE6_1	1:25:00	71.617
J_DE6_1	1:25:30	70.9345
J_DE6_1	1:26:00	70.252
J_DE6_1	1:26:30	69.563
J_DE6_1	1:27:00	68.8805

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	1:27:30	68.198
J_DE6_1	1:28:00	67.5155
J_DE6_1	1:28:30	66.833
J_DE6_1	1:29:00	66.1505
J_DE6_1	1:29:30	65.468
J_DE6_1	1:30:00	64.779
J_DE6_1	1:30:30	64.142
J_DE6_1	1:31:00	63.4985
J_DE6_1	1:31:30	62.8615
J_DE6_1	1:32:00	62.218
J_DE6_1	1:32:30	61.581
J_DE6_1	1:33:00	60.9375
J_DE6_1	1:33:30	60.294
J_DE6_1	1:34:00	59.657
J_DE6_1	1:34:30	59.0135
J_DE6_1	1:35:00	58.3765
J_DE6_1	1:35:30	57.7655
J_DE6_1	1:36:00	57.161
J_DE6_1	1:36:30	56.5565
J_DE6_1	1:37:00	55.9455
J_DE6_1	1:37:30	55.341
J_DE6_1	1:38:00	54.73
J_DE6_1	1:38:30	54.1255
J_DE6_1	1:39:00	53.521
J_DE6_1	1:39:30	52.91
J_DE6_1	1:40:00	52.3055
J_DE6_1	1:40:30	51.7595
J_DE6_1	1:41:00	51.22
J_DE6_1	1:41:30	50.6805
J_DE6_1	1:42:00	50.141
J_DE6_1	1:42:30	49.6015
J_DE6_1	1:43:00	49.0555
J_DE6_1	1:43:30	48.516
J_DE6_1	1:44:00	47.9765
J_DE6_1	1:44:30	47.437
J_DE6_1	1:45:00	46.8975
J_DE6_1	1:45:30	46.4945
J_DE6_1	1:46:00	46.098
J_DE6_1	1:46:30	45.7015
J_DE6_1	1:47:00	45.305
J_DE6_1	1:47:30	44.902
J_DE6_1	1:48:00	44.5055
J_DE6_1	1:48:30	44.109
J_DE6_1	1:49:00	43.7125
J_DE6_1	1:49:30	43.316
J_DE6_1	1:50:00	42.9195
J_DE6_1	1:50:30	42.588
J_DE6_1	1:51:00	42.263
J_DE6_1	1:51:30	41.938
J_DE6_1	1:52:00	41.613
J_DE6_1	1:52:30	41.2945
J_DE6_1	1:53:00	40.9695
J_DE6_1	1:53:30	40.6445

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	1:54:00	40.3195
J_DE6_1	1:54:30	39.9945
J_DE6_1	1:55:00	39.6695
J_DE6_1	1:55:30	39.3835
J_DE6_1	1:56:00	39.0975
J_DE6_1	1:56:30	38.8115
J_DE6_1	1:57:00	38.5255
J_DE6_1	1:57:30	38.2395
J_DE6_1	1:58:00	37.9535
J_DE6_1	1:58:30	37.6675
J_DE6_1	1:59:00	37.3815
J_DE6_1	1:59:30	37.0955
J_DE6_1	2:00:00	36.8095
J_DE6_1	2:00:30	36.4975
J_DE6_1	2:01:00	36.192
J_DE6_1	2:01:30	35.88
J_DE6_1	2:02:00	35.5745
J_DE6_1	2:02:30	35.2625
J_DE6_1	2:03:00	34.9505
J_DE6_1	2:03:30	34.645
J_DE6_1	2:04:00	34.333
J_DE6_1	2:04:30	34.0275
J_DE6_1	2:05:00	33.7155
J_DE6_1	2:05:30	33.3775
J_DE6_1	2:06:00	33.0395
J_DE6_1	2:06:30	32.7015
J_DE6_1	2:07:00	32.37
J_DE6_1	2:07:30	32.032
J_DE6_1	2:08:00	31.694
J_DE6_1	2:08:30	31.356
J_DE6_1	2:09:00	31.018
J_DE6_1	2:09:30	30.68
J_DE6_1	2:10:00	30.342
J_DE6_1	2:10:30	30.017
J_DE6_1	2:11:00	29.6855
J_DE6_1	2:11:30	29.354
J_DE6_1	2:12:00	29.0225
J_DE6_1	2:12:30	28.691
J_DE6_1	2:13:00	28.3595
J_DE6_1	2:13:30	28.028
J_DE6_1	2:14:00	27.6965
J_DE6_1	2:14:30	27.365
J_DE6_1	2:15:00	27.0335
J_DE6_1	2:15:30	26.7215
J_DE6_1	2:16:00	26.4095
J_DE6_1	2:16:30	26.0975
J_DE6_1	2:17:00	25.7855
J_DE6_1	2:17:30	25.467
J_DE6_1	2:18:00	25.155
J_DE6_1	2:18:30	24.843
J_DE6_1	2:19:00	24.531
J_DE6_1	2:19:30	24.219
J_DE6_1	2:20:00	23.907

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	2:20:30	23.6145
J_DE6_1	2:21:00	23.3285
J_DE6_1	2:21:30	23.036
J_DE6_1	2:22:00	22.7435
J_DE6_1	2:22:30	22.4575
J_DE6_1	2:23:00	22.165
J_DE6_1	2:23:30	21.879
J_DE6_1	2:24:00	21.5865
J_DE6_1	2:24:30	21.3005
J_DE6_1	2:25:00	21.008
J_DE6_1	2:25:30	20.735
J_DE6_1	2:26:00	20.462
J_DE6_1	2:26:30	20.1825
J_DE6_1	2:27:00	19.9095
J_DE6_1	2:27:30	19.6365
J_DE6_1	2:28:00	19.357
J_DE6_1	2:28:30	19.084
J_DE6_1	2:29:00	18.811
J_DE6_1	2:29:30	18.5315
J_DE6_1	2:30:00	18.2585
J_DE6_1	2:30:30	17.992
J_DE6_1	2:31:00	17.7255
J_DE6_1	2:31:30	17.459
J_DE6_1	2:32:00	17.199
J_DE6_1	2:32:30	16.9325
J_DE6_1	2:33:00	16.666
J_DE6_1	2:33:30	16.3995
J_DE6_1	2:34:00	16.133
J_DE6_1	2:34:30	15.8665
J_DE6_1	2:35:00	15.6
J_DE6_1	2:35:30	15.34
J_DE6_1	2:36:00	15.0865
J_DE6_1	2:36:30	14.8265
J_DE6_1	2:37:00	14.5665
J_DE6_1	2:37:30	14.3065
J_DE6_1	2:38:00	14.0465
J_DE6_1	2:38:30	13.7865
J_DE6_1	2:39:00	13.5265
J_DE6_1	2:39:30	13.2665
J_DE6_1	2:40:00	13.0065
J_DE6_1	2:40:30	12.7595
J_DE6_1	2:41:00	12.5125
J_DE6_1	2:41:30	12.259
J_DE6_1	2:42:00	12.012
J_DE6_1	2:42:30	11.765
J_DE6_1	2:43:00	11.518
J_DE6_1	2:43:30	11.2645
J_DE6_1	2:44:00	11.0175
J_DE6_1	2:44:30	10.7705
J_DE6_1	2:45:00	10.5235
J_DE6_1	2:45:30	10.283
J_DE6_1	2:46:00	10.049
J_DE6_1	2:46:30	9.8085

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	2:47:00	9.5745
J_DE6_1	2:47:30	9.334
J_DE6_1	2:48:00	9.1
J_DE6_1	2:48:30	8.8595
J_DE6_1	2:49:00	8.6255
J_DE6_1	2:49:30	8.3915
J_DE6_1	2:50:00	8.151
J_DE6_1	2:50:30	7.943
J_DE6_1	2:51:00	7.7285
J_DE6_1	2:51:30	7.5205
J_DE6_1	2:52:00	7.306
J_DE6_1	2:52:30	7.098
J_DE6_1	2:53:00	6.89
J_DE6_1	2:53:30	6.6755
J_DE6_1	2:54:00	6.4675
J_DE6_1	2:54:30	6.253
J_DE6_1	2:55:00	6.045
J_DE6_1	2:55:30	5.8955
J_DE6_1	2:56:00	5.7525
J_DE6_1	2:56:30	5.6095
J_DE6_1	2:57:00	5.4665
J_DE6_1	2:57:30	5.317
J_DE6_1	2:58:00	5.174
J_DE6_1	2:58:30	5.031
J_DE6_1	2:59:00	4.8815
J_DE6_1	2:59:30	4.7385
J_DE6_1	3:00:00	4.5955
J_DE6_1	3:00:30	4.4915
J_DE6_1	3:01:00	4.3875
J_DE6_1	3:01:30	4.2835
J_DE6_1	3:02:00	4.1795
J_DE6_1	3:02:30	4.0755
J_DE6_1	3:03:00	3.9715
J_DE6_1	3:03:30	3.8675
J_DE6_1	3:04:00	3.77
J_DE6_1	3:04:30	3.666
J_DE6_1	3:05:00	3.562
J_DE6_1	3:05:30	3.484
J_DE6_1	3:06:00	3.406
J_DE6_1	3:06:30	3.3215
J_DE6_1	3:07:00	3.2435
J_DE6_1	3:07:30	3.1655
J_DE6_1	3:08:00	3.0875
J_DE6_1	3:08:30	3.0095
J_DE6_1	3:09:00	2.9315
J_DE6_1	3:09:30	2.847
J_DE6_1	3:10:00	2.769
J_DE6_1	3:10:30	2.7105
J_DE6_1	3:11:00	2.6455
J_DE6_1	3:11:30	2.587
J_DE6_1	3:12:00	2.5285
J_DE6_1	3:12:30	2.4635
J_DE6_1	3:13:00	2.405

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	3:13:30	2.3465
J_DE6_1	3:14:00	2.2815
J_DE6_1	3:14:30	2.223
J_DE6_1	3:15:00	2.158
J_DE6_1	3:15:30	2.1125
J_DE6_1	3:16:00	2.067
J_DE6_1	3:16:30	2.0215
J_DE6_1	3:17:00	1.976
J_DE6_1	3:17:30	1.9305
J_DE6_1	3:18:00	1.885
J_DE6_1	3:18:30	1.8395
J_DE6_1	3:19:00	1.7875
J_DE6_1	3:19:30	1.742
J_DE6_1	3:20:00	1.6965
J_DE6_1	3:20:30	1.6575
J_DE6_1	3:21:00	1.625
J_DE6_1	3:21:30	1.586
J_DE6_1	3:22:00	1.547
J_DE6_1	3:22:30	1.508
J_DE6_1	3:23:00	1.4755
J_DE6_1	3:23:30	1.4365
J_DE6_1	3:24:00	1.3975
J_DE6_1	3:24:30	1.3585
J_DE6_1	3:25:00	1.326
J_DE6_1	3:25:30	1.2935
J_DE6_1	3:26:00	1.2675
J_DE6_1	3:26:30	1.235
J_DE6_1	3:27:00	1.209
J_DE6_1	3:27:30	1.1765
J_DE6_1	3:28:00	1.1505
J_DE6_1	3:28:30	1.1245
J_DE6_1	3:29:00	1.092
J_DE6_1	3:29:30	1.066
J_DE6_1	3:30:00	1.0335
J_DE6_1	3:30:30	1.014
J_DE6_1	3:31:00	0.9945
J_DE6_1	3:31:30	0.975
J_DE6_1	3:32:00	0.9555
J_DE6_1	3:32:30	0.936
J_DE6_1	3:33:00	0.9165
J_DE6_1	3:33:30	0.897
J_DE6_1	3:34:00	0.8775
J_DE6_1	3:34:30	0.858
J_DE6_1	3:35:00	0.832
J_DE6_1	3:35:30	0.819
J_DE6_1	3:36:00	0.7995
J_DE6_1	3:36:30	0.7865
J_DE6_1	3:37:00	0.767
J_DE6_1	3:37:30	0.754
J_DE6_1	3:38:00	0.7345
J_DE6_1	3:38:30	0.7215
J_DE6_1	3:39:00	0.702
J_DE6_1	3:39:30	0.689

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	3:40:00	0.6695
J_DE6_1	3:40:30	0.6565
J_DE6_1	3:41:00	0.6435
J_DE6_1	3:41:30	0.6305
J_DE6_1	3:42:00	0.6175
J_DE6_1	3:42:30	0.6045
J_DE6_1	3:43:00	0.5915
J_DE6_1	3:43:30	0.5785
J_DE6_1	3:44:00	0.5655
J_DE6_1	3:44:30	0.5525
J_DE6_1	3:45:00	0.533
J_DE6_1	3:45:30	0.5265
J_DE6_1	3:46:00	0.5135
J_DE6_1	3:46:30	0.5005
J_DE6_1	3:47:00	0.4875
J_DE6_1	3:47:30	0.4745
J_DE6_1	3:48:00	0.468
J_DE6_1	3:48:30	0.455
J_DE6_1	3:49:00	0.442
J_DE6_1	3:49:30	0.429
J_DE6_1	3:50:00	0.416
J_DE6_1	3:50:30	0.4095
J_DE6_1	3:51:00	0.3965
J_DE6_1	3:51:30	0.39
J_DE6_1	3:52:00	0.377
J_DE6_1	3:52:30	0.364
J_DE6_1	3:53:00	0.3575
J_DE6_1	3:53:30	0.3445
J_DE6_1	3:54:00	0.338
J_DE6_1	3:54:30	0.325
J_DE6_1	3:55:00	0.312
J_DE6_1	3:55:30	0.3055
J_DE6_1	3:56:00	0.299
J_DE6_1	3:56:30	0.286
J_DE6_1	3:57:00	0.2795
J_DE6_1	3:57:30	0.273
J_DE6_1	3:58:00	0.26
J_DE6_1	3:58:30	0.2535
J_DE6_1	3:59:00	0.247
J_DE6_1	3:59:30	0.234
J_DE6_1	4:00:00	0.2275
J_DE6_1	4:00:30	0.221
J_DE6_1	4:01:00	0.2145
J_DE6_1	4:01:30	0.2015
J_DE6_1	4:02:00	0.195
J_DE6_1	4:02:30	0.1885
J_DE6_1	4:03:00	0.182
J_DE6_1	4:03:30	0.1755
J_DE6_1	4:04:00	0.169
J_DE6_1	4:04:30	0.1625
J_DE6_1	4:05:00	0.1495
J_DE6_1	4:05:30	0.1495
J_DE6_1	4:06:00	0.143

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_1	4:06:30	0.1365
J_DE6_1	4:07:00	0.13
J_DE6_1	4:07:30	0.1235
J_DE6_1	4:08:00	0.117
J_DE6_1	4:08:30	0.1105
J_DE6_1	4:09:00	0.104
J_DE6_1	4:09:30	0.0975
J_DE6_1	4:10:00	0.091
J_DE6_1	4:10:30	0.091
J_DE6_1	4:11:00	0.0845
J_DE6_1	4:11:30	0.078
J_DE6_1	4:12:00	0.078
J_DE6_1	4:12:30	0.0715
J_DE6_1	4:13:00	0.065
J_DE6_1	4:13:30	0.0585
J_DE6_1	4:14:00	0.0585
J_DE6_1	4:14:30	0.052
J_DE6_1	4:15:00	0.0455
J_DE6_1	4:15:30	0.0455
J_DE6_1	4:16:00	0.039
J_DE6_1	4:16:30	0.039
J_DE6_1	4:17:00	0.0325
J_DE6_1	4:17:30	0.0325
J_DE6_1	4:18:00	0.0325
J_DE6_1	4:18:30	0.026
J_DE6_1	4:19:00	0.026
J_DE6_1	4:19:30	0.0195
J_DE6_1	4:20:00	0.0195
J_DE6_1	4:20:30	0.013
J_DE6_1	4:21:00	0.013
J_DE6_1	4:21:30	0.013
J_DE6_1	4:22:00	0.013
J_DE6_1	4:22:30	0.0065
J_DE6_1	4:23:00	0.0065
J_DE6_1	4:23:30	0.0065
J_DE6_1	4:24:00	0.0065
J_DE6_1	4:24:30	0
J_DE6_1	4:25:00	0
J_DE6_1	4:25:30	0
J_DE6_1	4:26:00	0
J_DE6_1	4:26:30	0
J_DE6_1	4:27:00	0
J_DE6_1	4:27:30	0
J_DE6_1	4:28:00	0
J_DE6_1	4:28:30	0
J_DE6_1	4:29:00	0
J_DE6_1	4:29:30	0
J_DE6_1	4:30:00	0
J_DE6_1	4:30:30	0
J_DE6_1	4:31:00	0
J_DE6_1	4:31:30	0
J_DE6_1	4:32:00	0
J_DE6_1	4:32:30	0

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_1                 4:33:00    0
J_DE6_1                 4:33:30    0
J_DE6_1                 4:34:00    0
J_DE6_1                 4:34:30    0
J_DE6_1                 4:35:00    0
J_DE6_1                 4:35:30    0
J_DE6_1                 4:36:00    0
J_DE6_1                 4:36:30    0
J_DE6_1                 4:37:00    0
J_DE6_1                 4:37:30    0
J_DE6_1                 4:38:00    0
J_DE6_1                 4:38:30    0
J_DE6_1                 4:39:00    0
J_DE6_1                 4:39:30    0
J_DE6_1                 4:40:00    0
J_DE6_1                 4:40:30    0
J_DE6_1                 4:41:00    0
J_DE6_1                 4:41:30    0
J_DE6_1                 4:42:00    0
J_DE6_1                 4:42:30    0
J_DE6_1                 4:43:00    0
J_DE6_1                 4:43:30    0
J_DE6_1                 4:44:00    0
J_DE6_1                 4:44:30    0
J_DE6_1                 4:45:00    0
J_DE6_1                 4:45:30    0
J_DE6_1                 4:46:00    0
J_DE6_1                 4:46:30    0
J_DE6_1                 4:47:00    0
J_DE6_1                 4:47:30    0
J_DE6_1                 4:48:00    0
J_DE6_1                 4:48:30    0
J_DE6_1                 4:49:00    0
J_DE6_1                 4:49:30    0
J_DE6_1                 4:50:00    0
J_DE6_1                 4:50:30    0
J_DE6_1                 4:51:00    0
J_DE6_1                 4:51:30    0
J_DE6_1                 4:52:00    0
J_DE6_1                 4:52:30    0
J_DE6_1                 4:53:00    0
J_DE6_1                 4:53:30    0
J_DE6_1                 4:54:00    0
J_DE6_1                 4:54:30    0
J_DE6_1                 4:55:00    0
J_DE6_1                 4:55:30    0
J_DE6_1                 4:56:00    0
J_DE6_1                 4:56:30    0
J_DE6_1                 4:57:00    0
J_DE6_1                 4:57:30    0
J_DE6_1                 4:58:00    0
J_DE6_1                 4:58:30    0
J_DE6_1                 4:59:00    0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_1                 4:59:30    0
J_DE6_1                 5:00:00    0
J_DE6_1                 5:00:30    0
J_DE6_1                 5:01:00    0
J_DE6_1                 5:01:30    0
J_DE6_1                 5:02:00    0
J_DE6_1                 5:02:30    0
J_DE6_1                 5:03:00    0
J_DE6_1                 5:03:30    0
J_DE6_1                 5:04:00    0
J_DE6_1                 5:04:30    0
J_DE6_1                 5:05:00    0
J_DE6_1                 5:05:30    0
J_DE6_1                 5:06:00    0
J_DE6_1                 5:06:30    0
J_DE6_1                 5:07:00    0
J_DE6_1                 5:07:30    0
J_DE6_1                 5:08:00    0
J_DE6_1                 5:08:30    0
J_DE6_1                 5:09:00    0
J_DE6_1                 5:09:30    0
J_DE6_1                 5:10:00    0
J_DE6_1                 5:10:30    0
J_DE6_1                 5:11:00    0
J_DE6_1                 5:11:30    0
J_DE6_1                 5:12:00    0
J_DE6_1                 5:12:30    0
J_DE6_1                 5:13:00    0
J_DE6_1                 5:13:30    0
J_DE6_1                 5:14:00    0
J_DE6_1                 5:14:30    0
J_DE6_1                 5:15:00    0
J_DE6_1                 5:15:30    0
J_DE6_1                 5:16:00    0
J_DE6_1                 5:16:30    0
J_DE6_1                 5:17:00    0
J_DE6_1                 5:17:30    0
J_DE6_1                 5:18:00    0
J_DE6_1                 5:18:30    0
J_DE6_1                 5:19:00    0
J_DE6_1                 5:19:30    0
J_DE6_1                 5:20:00    0
J_DE6_1                 5:20:30    0
J_DE6_1                 5:21:00    0
J_DE6_1                 5:21:30    0
J_DE6_1                 5:22:00    0
J_DE6_1                 5:22:30    0
J_DE6_1                 5:23:00    0
J_DE6_1                 5:23:30    0
J_DE6_1                 5:24:00    0
J_DE6_1                 5:24:30    0
J_DE6_1                 5:25:00    0
J_DE6_1                 5:25:30    0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_1                 5:26:00    0
J_DE6_1                 5:26:30    0
J_DE6_1                 5:27:00    0
J_DE6_1                 5:27:30    0
J_DE6_1                 5:28:00    0
J_DE6_1                 5:28:30    0
J_DE6_1                 5:29:00    0
J_DE6_1                 5:29:30    0
J_DE6_1                 5:30:00    0
J_DE6_1                 5:30:30    0
J_DE6_1                 5:31:00    0
J_DE6_1                 5:31:30    0
J_DE6_1                 5:32:00    0
J_DE6_1                 5:32:30    0
J_DE6_1                 5:33:00    0
J_DE6_1                 5:33:30    0
J_DE6_1                 5:34:00    0
J_DE6_1                 5:34:30    0
J_DE6_1                 5:35:00    0
J_DE6_1                 5:35:30    0
J_DE6_1                 5:36:00    0
J_DE6_1                 5:36:30    0
J_DE6_1                 5:37:00    0
J_DE6_1                 5:37:30    0
J_DE6_1                 5:38:00    0
J_DE6_1                 5:38:30    0
J_DE6_1                 5:39:00    0
J_DE6_1                 5:39:30    0
J_DE6_1                 5:40:00    0
J_DE6_1                 5:40:30    0
J_DE6_1                 5:41:00    0
J_DE6_1                 5:41:30    0
J_DE6_1                 5:42:00    0
J_DE6_1                 5:42:30    0
J_DE6_1                 5:43:00    0
J_DE6_1                 5:43:30    0
J_DE6_1                 5:44:00    0
J_DE6_1                 5:44:30    0
J_DE6_1                 5:45:00    0
J_DE6_1                 5:45:30    0
J_DE6_1                 5:46:00    0
J_DE6_1                 5:46:30    0
J_DE6_1                 5:47:00    0
J_DE6_1                 5:47:30    0
J_DE6_1                 5:48:00    0
J_DE6_1                 5:48:30    0
J_DE6_1                 5:49:00    0
J_DE6_1                 5:49:30    0
J_DE6_1                 5:50:00    0
J_DE6_1                 5:50:30    0
J_DE6_1                 5:51:00    0
J_DE6_1                 5:51:30    0
J_DE6_1                 5:52:00    0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_1                  5:52:30    0
J_DE6_1                  5:53:00    0
J_DE6_1                  5:53:30    0
J_DE6_1                  5:54:00    0
J_DE6_1                  5:54:30    0
J_DE6_1                  5:55:00    0
J_DE6_1                  5:55:30    0
J_DE6_1                  5:56:00    0
J_DE6_1                  5:56:30    0
J_DE6_1                  5:57:00    0
J_DE6_1                  5:57:30    0
J_DE6_1                  5:58:00    0
J_DE6_1                  5:58:30    0
J_DE6_1                  5:59:00    0
J_DE6_1                  5:59:30    0
J_DE6_1                  6:00:00    0
;
J_DE6_2                  0:00:30    0
J_DE6_2                  0:01:00    0
J_DE6_2                  0:01:30    0
J_DE6_2                  0:02:00    0
J_DE6_2                  0:02:30    0
J_DE6_2                  0:03:00    0
J_DE6_2                  0:03:30    0
J_DE6_2                  0:04:00    0
J_DE6_2                  0:04:30    0
J_DE6_2                  0:05:00    0
J_DE6_2                  0:05:30    0
J_DE6_2                  0:06:00    0
J_DE6_2                  0:06:30    0
J_DE6_2                  0:07:00    0
J_DE6_2                  0:07:30    0
J_DE6_2                  0:08:00    0
J_DE6_2                  0:08:30    0
J_DE6_2                  0:09:00    0
J_DE6_2                  0:09:30    0
J_DE6_2                  0:10:00    0
J_DE6_2                  0:10:30    0.077
J_DE6_2                  0:11:00    0.168
J_DE6_2                  0:11:30    0.2625
J_DE6_2                  0:12:00    0.3605
J_DE6_2                  0:12:30    0.448
J_DE6_2                  0:13:00    0.539
J_DE6_2                  0:13:30    0.644
J_DE6_2                  0:14:00    0.7385
J_DE6_2                  0:14:30    0.8295
J_DE6_2                  0:15:00    0.924
J_DE6_2                  0:15:30    1.176
J_DE6_2                  0:16:00    1.428
J_DE6_2                  0:16:30    1.6835
J_DE6_2                  0:17:00    1.939
J_DE6_2                  0:17:30    2.1945
J_DE6_2                  0:18:00    2.4465
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	0:18:30	2.702
J_DE6_2	0:19:00	2.9575
J_DE6_2	0:19:30	3.2095
J_DE6_2	0:20:00	3.465
J_DE6_2	0:20:30	4.081
J_DE6_2	0:21:00	4.7005
J_DE6_2	0:21:30	5.32
J_DE6_2	0:22:00	5.943
J_DE6_2	0:22:30	6.5625
J_DE6_2	0:23:00	7.182
J_DE6_2	0:23:30	7.805
J_DE6_2	0:24:00	8.4245
J_DE6_2	0:24:30	9.044
J_DE6_2	0:25:00	9.667
J_DE6_2	0:25:30	11.291
J_DE6_2	0:26:00	12.9325
J_DE6_2	0:26:30	14.574
J_DE6_2	0:27:00	16.219
J_DE6_2	0:27:30	17.8605
J_DE6_2	0:28:00	19.502
J_DE6_2	0:28:30	21.1435
J_DE6_2	0:29:00	22.7885
J_DE6_2	0:29:30	24.43
J_DE6_2	0:30:00	26.0715
J_DE6_2	0:30:30	27.888
J_DE6_2	0:31:00	29.708
J_DE6_2	0:31:30	31.5245
J_DE6_2	0:32:00	33.3445
J_DE6_2	0:32:30	35.161
J_DE6_2	0:33:00	36.981
J_DE6_2	0:33:30	38.801
J_DE6_2	0:34:00	40.6175
J_DE6_2	0:34:30	42.4375
J_DE6_2	0:35:00	44.254
J_DE6_2	0:35:30	45.3075
J_DE6_2	0:36:00	46.3435
J_DE6_2	0:36:30	47.383
J_DE6_2	0:37:00	48.419
J_DE6_2	0:37:30	49.455
J_DE6_2	0:38:00	50.4945
J_DE6_2	0:38:30	51.5305
J_DE6_2	0:39:00	52.57
J_DE6_2	0:39:30	53.606
J_DE6_2	0:40:00	54.6455
J_DE6_2	0:40:30	55.069
J_DE6_2	0:41:00	55.482
J_DE6_2	0:41:30	55.8985
J_DE6_2	0:42:00	56.3115
J_DE6_2	0:42:30	56.7245
J_DE6_2	0:43:00	57.1375
J_DE6_2	0:43:30	57.554
J_DE6_2	0:44:00	57.967
J_DE6_2	0:44:30	58.38

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	0:45:00	58.7965
J_DE6_2	0:45:30	58.8245
J_DE6_2	0:46:00	58.849
J_DE6_2	0:46:30	58.87
J_DE6_2	0:47:00	58.8945
J_DE6_2	0:47:30	58.919
J_DE6_2	0:48:00	58.94
J_DE6_2	0:48:30	58.9645
J_DE6_2	0:49:00	58.9855
J_DE6_2	0:49:30	59.01
J_DE6_2	0:50:00	59.0345
J_DE6_2	0:50:30	58.8315
J_DE6_2	0:51:00	58.6285
J_DE6_2	0:51:30	58.422
J_DE6_2	0:52:00	58.2155
J_DE6_2	0:52:30	58.0125
J_DE6_2	0:53:00	57.806
J_DE6_2	0:53:30	57.603
J_DE6_2	0:54:00	57.3965
J_DE6_2	0:54:30	57.1935
J_DE6_2	0:55:00	56.987
J_DE6_2	0:55:30	56.7595
J_DE6_2	0:56:00	56.5285
J_DE6_2	0:56:30	56.301
J_DE6_2	0:57:00	56.07
J_DE6_2	0:57:30	55.8425
J_DE6_2	0:58:00	55.615
J_DE6_2	0:58:30	55.384
J_DE6_2	0:59:00	55.1565
J_DE6_2	0:59:30	54.9255
J_DE6_2	1:00:00	54.698
J_DE6_2	1:00:30	54.474
J_DE6_2	1:01:00	54.2465
J_DE6_2	1:01:30	54.0225
J_DE6_2	1:02:00	53.7985
J_DE6_2	1:02:30	53.571
J_DE6_2	1:03:00	53.347
J_DE6_2	1:03:30	53.123
J_DE6_2	1:04:00	52.899
J_DE6_2	1:04:30	52.6715
J_DE6_2	1:05:00	52.4475
J_DE6_2	1:05:30	52.1395
J_DE6_2	1:06:00	51.8315
J_DE6_2	1:06:30	51.52
J_DE6_2	1:07:00	51.212
J_DE6_2	1:07:30	50.904
J_DE6_2	1:08:00	50.5925
J_DE6_2	1:08:30	50.2845
J_DE6_2	1:09:00	49.9765
J_DE6_2	1:09:30	49.6685
J_DE6_2	1:10:00	49.357
J_DE6_2	1:10:30	49.0175
J_DE6_2	1:11:00	48.678

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	1:11:30	48.3385
J_DE6_2	1:12:00	47.999
J_DE6_2	1:12:30	47.656
J_DE6_2	1:13:00	47.3165
J_DE6_2	1:13:30	46.977
J_DE6_2	1:14:00	46.6375
J_DE6_2	1:14:30	46.2945
J_DE6_2	1:15:00	45.955
J_DE6_2	1:15:30	45.5945
J_DE6_2	1:16:00	45.234
J_DE6_2	1:16:30	44.8735
J_DE6_2	1:17:00	44.513
J_DE6_2	1:17:30	44.1525
J_DE6_2	1:18:00	43.792
J_DE6_2	1:18:30	43.4315
J_DE6_2	1:19:00	43.071
J_DE6_2	1:19:30	42.7105
J_DE6_2	1:20:00	42.35
J_DE6_2	1:20:30	41.972
J_DE6_2	1:21:00	41.594
J_DE6_2	1:21:30	41.216
J_DE6_2	1:22:00	40.8345
J_DE6_2	1:22:30	40.4565
J_DE6_2	1:23:00	40.0785
J_DE6_2	1:23:30	39.7005
J_DE6_2	1:24:00	39.319
J_DE6_2	1:24:30	38.941
J_DE6_2	1:25:00	38.563
J_DE6_2	1:25:30	38.1955
J_DE6_2	1:26:00	37.828
J_DE6_2	1:26:30	37.457
J_DE6_2	1:27:00	37.0895
J_DE6_2	1:27:30	36.722
J_DE6_2	1:28:00	36.3545
J_DE6_2	1:28:30	35.987
J_DE6_2	1:29:00	35.6195
J_DE6_2	1:29:30	35.252
J_DE6_2	1:30:00	34.881
J_DE6_2	1:30:30	34.538
J_DE6_2	1:31:00	34.1915
J_DE6_2	1:31:30	33.8485
J_DE6_2	1:32:00	33.502
J_DE6_2	1:32:30	33.159
J_DE6_2	1:33:00	32.8125
J_DE6_2	1:33:30	32.466
J_DE6_2	1:34:00	32.123
J_DE6_2	1:34:30	31.7765
J_DE6_2	1:35:00	31.4335
J_DE6_2	1:35:30	31.1045
J_DE6_2	1:36:00	30.779
J_DE6_2	1:36:30	30.4535
J_DE6_2	1:37:00	30.1245
J_DE6_2	1:37:30	29.799

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	1:38:00	29.47
J_DE6_2	1:38:30	29.1445
J_DE6_2	1:39:00	28.819
J_DE6_2	1:39:30	28.49
J_DE6_2	1:40:00	28.1645
J_DE6_2	1:40:30	27.8705
J_DE6_2	1:41:00	27.58
J_DE6_2	1:41:30	27.2895
J_DE6_2	1:42:00	26.999
J_DE6_2	1:42:30	26.7085
J_DE6_2	1:43:00	26.4145
J_DE6_2	1:43:30	26.124
J_DE6_2	1:44:00	25.8335
J_DE6_2	1:44:30	25.543
J_DE6_2	1:45:00	25.2525
J_DE6_2	1:45:30	25.0355
J_DE6_2	1:46:00	24.822
J_DE6_2	1:46:30	24.6085
J_DE6_2	1:47:00	24.395
J_DE6_2	1:47:30	24.178
J_DE6_2	1:48:00	23.9645
J_DE6_2	1:48:30	23.751
J_DE6_2	1:49:00	23.5375
J_DE6_2	1:49:30	23.324
J_DE6_2	1:50:00	23.1105
J_DE6_2	1:50:30	22.932
J_DE6_2	1:51:00	22.757
J_DE6_2	1:51:30	22.582
J_DE6_2	1:52:00	22.407
J_DE6_2	1:52:30	22.2355
J_DE6_2	1:53:00	22.0605
J_DE6_2	1:53:30	21.8855
J_DE6_2	1:54:00	21.7105
J_DE6_2	1:54:30	21.5355
J_DE6_2	1:55:00	21.3605
J_DE6_2	1:55:30	21.2065
J_DE6_2	1:56:00	21.0525
J_DE6_2	1:56:30	20.8985
J_DE6_2	1:57:00	20.7445
J_DE6_2	1:57:30	20.5905
J_DE6_2	1:58:00	20.4365
J_DE6_2	1:58:30	20.2825
J_DE6_2	1:59:00	20.1285
J_DE6_2	1:59:30	19.9745
J_DE6_2	2:00:00	19.8205
J_DE6_2	2:00:30	19.6525
J_DE6_2	2:01:00	19.488
J_DE6_2	2:01:30	19.32
J_DE6_2	2:02:00	19.1555
J_DE6_2	2:02:30	18.9875
J_DE6_2	2:03:00	18.8195
J_DE6_2	2:03:30	18.655
J_DE6_2	2:04:00	18.487

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	2:04:30	18.3225
J_DE6_2	2:05:00	18.1545
J_DE6_2	2:05:30	17.9725
J_DE6_2	2:06:00	17.7905
J_DE6_2	2:06:30	17.6085
J_DE6_2	2:07:00	17.43
J_DE6_2	2:07:30	17.248
J_DE6_2	2:08:00	17.066
J_DE6_2	2:08:30	16.884
J_DE6_2	2:09:00	16.702
J_DE6_2	2:09:30	16.52
J_DE6_2	2:10:00	16.338
J_DE6_2	2:10:30	16.163
J_DE6_2	2:11:00	15.9845
J_DE6_2	2:11:30	15.806
J_DE6_2	2:12:00	15.6275
J_DE6_2	2:12:30	15.449
J_DE6_2	2:13:00	15.2705
J_DE6_2	2:13:30	15.092
J_DE6_2	2:14:00	14.9135
J_DE6_2	2:14:30	14.735
J_DE6_2	2:15:00	14.5565
J_DE6_2	2:15:30	14.3885
J_DE6_2	2:16:00	14.2205
J_DE6_2	2:16:30	14.0525
J_DE6_2	2:17:00	13.8845
J_DE6_2	2:17:30	13.713
J_DE6_2	2:18:00	13.545
J_DE6_2	2:18:30	13.377
J_DE6_2	2:19:00	13.209
J_DE6_2	2:19:30	13.041
J_DE6_2	2:20:00	12.873
J_DE6_2	2:20:30	12.7155
J_DE6_2	2:21:00	12.5615
J_DE6_2	2:21:30	12.404
J_DE6_2	2:22:00	12.2465
J_DE6_2	2:22:30	12.0925
J_DE6_2	2:23:00	11.935
J_DE6_2	2:23:30	11.781
J_DE6_2	2:24:00	11.6235
J_DE6_2	2:24:30	11.4695
J_DE6_2	2:25:00	11.312
J_DE6_2	2:25:30	11.165
J_DE6_2	2:26:00	11.018
J_DE6_2	2:26:30	10.8675
J_DE6_2	2:27:00	10.7205
J_DE6_2	2:27:30	10.5735
J_DE6_2	2:28:00	10.423
J_DE6_2	2:28:30	10.276
J_DE6_2	2:29:00	10.129
J_DE6_2	2:29:30	9.9785
J_DE6_2	2:30:00	9.8315
J_DE6_2	2:30:30	9.688

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	2:31:00	9.5445
J_DE6_2	2:31:30	9.401
J_DE6_2	2:32:00	9.261
J_DE6_2	2:32:30	9.1175
J_DE6_2	2:33:00	8.974
J_DE6_2	2:33:30	8.8305
J_DE6_2	2:34:00	8.687
J_DE6_2	2:34:30	8.5435
J_DE6_2	2:35:00	8.4
J_DE6_2	2:35:30	8.26
J_DE6_2	2:36:00	8.1235
J_DE6_2	2:36:30	7.9835
J_DE6_2	2:37:00	7.8435
J_DE6_2	2:37:30	7.7035
J_DE6_2	2:38:00	7.5635
J_DE6_2	2:38:30	7.4235
J_DE6_2	2:39:00	7.2835
J_DE6_2	2:39:30	7.1435
J_DE6_2	2:40:00	7.0035
J_DE6_2	2:40:30	6.8705
J_DE6_2	2:41:00	6.7375
J_DE6_2	2:41:30	6.601
J_DE6_2	2:42:00	6.468
J_DE6_2	2:42:30	6.335
J_DE6_2	2:43:00	6.202
J_DE6_2	2:43:30	6.0655
J_DE6_2	2:44:00	5.9325
J_DE6_2	2:44:30	5.7995
J_DE6_2	2:45:00	5.6665
J_DE6_2	2:45:30	5.537
J_DE6_2	2:46:00	5.411
J_DE6_2	2:46:30	5.2815
J_DE6_2	2:47:00	5.1555
J_DE6_2	2:47:30	5.026
J_DE6_2	2:48:00	4.9
J_DE6_2	2:48:30	4.7705
J_DE6_2	2:49:00	4.6445
J_DE6_2	2:49:30	4.5185
J_DE6_2	2:50:00	4.389
J_DE6_2	2:50:30	4.277
J_DE6_2	2:51:00	4.1615
J_DE6_2	2:51:30	4.0495
J_DE6_2	2:52:00	3.934
J_DE6_2	2:52:30	3.822
J_DE6_2	2:53:00	3.71
J_DE6_2	2:53:30	3.5945
J_DE6_2	2:54:00	3.4825
J_DE6_2	2:54:30	3.367
J_DE6_2	2:55:00	3.255
J_DE6_2	2:55:30	3.1745
J_DE6_2	2:56:00	3.0975
J_DE6_2	2:56:30	3.0205
J_DE6_2	2:57:00	2.9435

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	2:57:30	2.863
J_DE6_2	2:58:00	2.786
J_DE6_2	2:58:30	2.709
J_DE6_2	2:59:00	2.6285
J_DE6_2	2:59:30	2.5515
J_DE6_2	3:00:00	2.4745
J_DE6_2	3:00:30	2.4185
J_DE6_2	3:01:00	2.3625
J_DE6_2	3:01:30	2.3065
J_DE6_2	3:02:00	2.2505
J_DE6_2	3:02:30	2.1945
J_DE6_2	3:03:00	2.1385
J_DE6_2	3:03:30	2.0825
J_DE6_2	3:04:00	2.03
J_DE6_2	3:04:30	1.974
J_DE6_2	3:05:00	1.918
J_DE6_2	3:05:30	1.876
J_DE6_2	3:06:00	1.834
J_DE6_2	3:06:30	1.7885
J_DE6_2	3:07:00	1.7465
J_DE6_2	3:07:30	1.7045
J_DE6_2	3:08:00	1.6625
J_DE6_2	3:08:30	1.6205
J_DE6_2	3:09:00	1.5785
J_DE6_2	3:09:30	1.533
J_DE6_2	3:10:00	1.491
J_DE6_2	3:10:30	1.4595
J_DE6_2	3:11:00	1.4245
J_DE6_2	3:11:30	1.393
J_DE6_2	3:12:00	1.3615
J_DE6_2	3:12:30	1.3265
J_DE6_2	3:13:00	1.295
J_DE6_2	3:13:30	1.2635
J_DE6_2	3:14:00	1.2285
J_DE6_2	3:14:30	1.197
J_DE6_2	3:15:00	1.162
J_DE6_2	3:15:30	1.1375
J_DE6_2	3:16:00	1.113
J_DE6_2	3:16:30	1.0885
J_DE6_2	3:17:00	1.064
J_DE6_2	3:17:30	1.0395
J_DE6_2	3:18:00	1.015
J_DE6_2	3:18:30	0.9905
J_DE6_2	3:19:00	0.9625
J_DE6_2	3:19:30	0.938
J_DE6_2	3:20:00	0.9135
J_DE6_2	3:20:30	0.8925
J_DE6_2	3:21:00	0.875
J_DE6_2	3:21:30	0.854
J_DE6_2	3:22:00	0.833
J_DE6_2	3:22:30	0.812
J_DE6_2	3:23:00	0.7945
J_DE6_2	3:23:30	0.7735

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	3:24:00	0.7525
J_DE6_2	3:24:30	0.7315
J_DE6_2	3:25:00	0.714
J_DE6_2	3:25:30	0.6965
J_DE6_2	3:26:00	0.6825
J_DE6_2	3:26:30	0.665
J_DE6_2	3:27:00	0.651
J_DE6_2	3:27:30	0.6335
J_DE6_2	3:28:00	0.6195
J_DE6_2	3:28:30	0.6055
J_DE6_2	3:29:00	0.588
J_DE6_2	3:29:30	0.574
J_DE6_2	3:30:00	0.5565
J_DE6_2	3:30:30	0.546
J_DE6_2	3:31:00	0.5355
J_DE6_2	3:31:30	0.525
J_DE6_2	3:32:00	0.5145
J_DE6_2	3:32:30	0.504
J_DE6_2	3:33:00	0.4935
J_DE6_2	3:33:30	0.483
J_DE6_2	3:34:00	0.4725
J_DE6_2	3:34:30	0.462
J_DE6_2	3:35:00	0.448
J_DE6_2	3:35:30	0.441
J_DE6_2	3:36:00	0.4305
J_DE6_2	3:36:30	0.4235
J_DE6_2	3:37:00	0.413
J_DE6_2	3:37:30	0.406
J_DE6_2	3:38:00	0.3955
J_DE6_2	3:38:30	0.3885
J_DE6_2	3:39:00	0.378
J_DE6_2	3:39:30	0.371
J_DE6_2	3:40:00	0.3605
J_DE6_2	3:40:30	0.3535
J_DE6_2	3:41:00	0.3465
J_DE6_2	3:41:30	0.3395
J_DE6_2	3:42:00	0.3325
J_DE6_2	3:42:30	0.3255
J_DE6_2	3:43:00	0.3185
J_DE6_2	3:43:30	0.3115
J_DE6_2	3:44:00	0.3045
J_DE6_2	3:44:30	0.2975
J_DE6_2	3:45:00	0.287
J_DE6_2	3:45:30	0.2835
J_DE6_2	3:46:00	0.2765
J_DE6_2	3:46:30	0.2695
J_DE6_2	3:47:00	0.2625
J_DE6_2	3:47:30	0.2555
J_DE6_2	3:48:00	0.252
J_DE6_2	3:48:30	0.245
J_DE6_2	3:49:00	0.238
J_DE6_2	3:49:30	0.231
J_DE6_2	3:50:00	0.224

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	3:50:30	0.2205
J_DE6_2	3:51:00	0.2135
J_DE6_2	3:51:30	0.21
J_DE6_2	3:52:00	0.203
J_DE6_2	3:52:30	0.196
J_DE6_2	3:53:00	0.1925
J_DE6_2	3:53:30	0.1855
J_DE6_2	3:54:00	0.182
J_DE6_2	3:54:30	0.175
J_DE6_2	3:55:00	0.168
J_DE6_2	3:55:30	0.1645
J_DE6_2	3:56:00	0.161
J_DE6_2	3:56:30	0.154
J_DE6_2	3:57:00	0.1505
J_DE6_2	3:57:30	0.147
J_DE6_2	3:58:00	0.14
J_DE6_2	3:58:30	0.1365
J_DE6_2	3:59:00	0.133
J_DE6_2	3:59:30	0.126
J_DE6_2	4:00:00	0.1225
J_DE6_2	4:00:30	0.119
J_DE6_2	4:01:00	0.1155
J_DE6_2	4:01:30	0.1085
J_DE6_2	4:02:00	0.105
J_DE6_2	4:02:30	0.1015
J_DE6_2	4:03:00	0.098
J_DE6_2	4:03:30	0.0945
J_DE6_2	4:04:00	0.091
J_DE6_2	4:04:30	0.0875
J_DE6_2	4:05:00	0.0805
J_DE6_2	4:05:30	0.0805
J_DE6_2	4:06:00	0.077
J_DE6_2	4:06:30	0.0735
J_DE6_2	4:07:00	0.07
J_DE6_2	4:07:30	0.0665
J_DE6_2	4:08:00	0.063
J_DE6_2	4:08:30	0.0595
J_DE6_2	4:09:00	0.056
J_DE6_2	4:09:30	0.0525
J_DE6_2	4:10:00	0.049
J_DE6_2	4:10:30	0.049
J_DE6_2	4:11:00	0.0455
J_DE6_2	4:11:30	0.042
J_DE6_2	4:12:00	0.042
J_DE6_2	4:12:30	0.0385
J_DE6_2	4:13:00	0.035
J_DE6_2	4:13:30	0.0315
J_DE6_2	4:14:00	0.0315
J_DE6_2	4:14:30	0.028
J_DE6_2	4:15:00	0.0245
J_DE6_2	4:15:30	0.0245
J_DE6_2	4:16:00	0.021
J_DE6_2	4:16:30	0.021

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

J_DE6_2	4:17:00	0.0175
J_DE6_2	4:17:30	0.0175
J_DE6_2	4:18:00	0.0175
J_DE6_2	4:18:30	0.014
J_DE6_2	4:19:00	0.014
J_DE6_2	4:19:30	0.0105
J_DE6_2	4:20:00	0.0105
J_DE6_2	4:20:30	0.007
J_DE6_2	4:21:00	0.007
J_DE6_2	4:21:30	0.007
J_DE6_2	4:22:00	0.007
J_DE6_2	4:22:30	0.0035
J_DE6_2	4:23:00	0.0035
J_DE6_2	4:23:30	0.0035
J_DE6_2	4:24:00	0.0035
J_DE6_2	4:24:30	0
J_DE6_2	4:25:00	0
J_DE6_2	4:25:30	0
J_DE6_2	4:26:00	0
J_DE6_2	4:26:30	0
J_DE6_2	4:27:00	0
J_DE6_2	4:27:30	0
J_DE6_2	4:28:00	0
J_DE6_2	4:28:30	0
J_DE6_2	4:29:00	0
J_DE6_2	4:29:30	0
J_DE6_2	4:30:00	0
J_DE6_2	4:30:30	0
J_DE6_2	4:31:00	0
J_DE6_2	4:31:30	0
J_DE6_2	4:32:00	0
J_DE6_2	4:32:30	0
J_DE6_2	4:33:00	0
J_DE6_2	4:33:30	0
J_DE6_2	4:34:00	0
J_DE6_2	4:34:30	0
J_DE6_2	4:35:00	0
J_DE6_2	4:35:30	0
J_DE6_2	4:36:00	0
J_DE6_2	4:36:30	0
J_DE6_2	4:37:00	0
J_DE6_2	4:37:30	0
J_DE6_2	4:38:00	0
J_DE6_2	4:38:30	0
J_DE6_2	4:39:00	0
J_DE6_2	4:39:30	0
J_DE6_2	4:40:00	0
J_DE6_2	4:40:30	0
J_DE6_2	4:41:00	0
J_DE6_2	4:41:30	0
J_DE6_2	4:42:00	0
J_DE6_2	4:42:30	0
J_DE6_2	4:43:00	0

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_2                  4:43:30    0
J_DE6_2                  4:44:00    0
J_DE6_2                  4:44:30    0
J_DE6_2                  4:45:00    0
J_DE6_2                  4:45:30    0
J_DE6_2                  4:46:00    0
J_DE6_2                  4:46:30    0
J_DE6_2                  4:47:00    0
J_DE6_2                  4:47:30    0
J_DE6_2                  4:48:00    0
J_DE6_2                  4:48:30    0
J_DE6_2                  4:49:00    0
J_DE6_2                  4:49:30    0
J_DE6_2                  4:50:00    0
J_DE6_2                  4:50:30    0
J_DE6_2                  4:51:00    0
J_DE6_2                  4:51:30    0
J_DE6_2                  4:52:00    0
J_DE6_2                  4:52:30    0
J_DE6_2                  4:53:00    0
J_DE6_2                  4:53:30    0
J_DE6_2                  4:54:00    0
J_DE6_2                  4:54:30    0
J_DE6_2                  4:55:00    0
J_DE6_2                  4:55:30    0
J_DE6_2                  4:56:00    0
J_DE6_2                  4:56:30    0
J_DE6_2                  4:57:00    0
J_DE6_2                  4:57:30    0
J_DE6_2                  4:58:00    0
J_DE6_2                  4:58:30    0
J_DE6_2                  4:59:00    0
J_DE6_2                  4:59:30    0
J_DE6_2                  5:00:00    0
J_DE6_2                  5:00:30    0
J_DE6_2                  5:01:00    0
J_DE6_2                  5:01:30    0
J_DE6_2                  5:02:00    0
J_DE6_2                  5:02:30    0
J_DE6_2                  5:03:00    0
J_DE6_2                  5:03:30    0
J_DE6_2                  5:04:00    0
J_DE6_2                  5:04:30    0
J_DE6_2                  5:05:00    0
J_DE6_2                  5:05:30    0
J_DE6_2                  5:06:00    0
J_DE6_2                  5:06:30    0
J_DE6_2                  5:07:00    0
J_DE6_2                  5:07:30    0
J_DE6_2                  5:08:00    0
J_DE6_2                  5:08:30    0
J_DE6_2                  5:09:00    0
J_DE6_2                  5:09:30    0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_2                  5:10:00    0
J_DE6_2                  5:10:30    0
J_DE6_2                  5:11:00    0
J_DE6_2                  5:11:30    0
J_DE6_2                  5:12:00    0
J_DE6_2                  5:12:30    0
J_DE6_2                  5:13:00    0
J_DE6_2                  5:13:30    0
J_DE6_2                  5:14:00    0
J_DE6_2                  5:14:30    0
J_DE6_2                  5:15:00    0
J_DE6_2                  5:15:30    0
J_DE6_2                  5:16:00    0
J_DE6_2                  5:16:30    0
J_DE6_2                  5:17:00    0
J_DE6_2                  5:17:30    0
J_DE6_2                  5:18:00    0
J_DE6_2                  5:18:30    0
J_DE6_2                  5:19:00    0
J_DE6_2                  5:19:30    0
J_DE6_2                  5:20:00    0
J_DE6_2                  5:20:30    0
J_DE6_2                  5:21:00    0
J_DE6_2                  5:21:30    0
J_DE6_2                  5:22:00    0
J_DE6_2                  5:22:30    0
J_DE6_2                  5:23:00    0
J_DE6_2                  5:23:30    0
J_DE6_2                  5:24:00    0
J_DE6_2                  5:24:30    0
J_DE6_2                  5:25:00    0
J_DE6_2                  5:25:30    0
J_DE6_2                  5:26:00    0
J_DE6_2                  5:26:30    0
J_DE6_2                  5:27:00    0
J_DE6_2                  5:27:30    0
J_DE6_2                  5:28:00    0
J_DE6_2                  5:28:30    0
J_DE6_2                  5:29:00    0
J_DE6_2                  5:29:30    0
J_DE6_2                  5:30:00    0
J_DE6_2                  5:30:30    0
J_DE6_2                  5:31:00    0
J_DE6_2                  5:31:30    0
J_DE6_2                  5:32:00    0
J_DE6_2                  5:32:30    0
J_DE6_2                  5:33:00    0
J_DE6_2                  5:33:30    0
J_DE6_2                  5:34:00    0
J_DE6_2                  5:34:30    0
J_DE6_2                  5:35:00    0
J_DE6_2                  5:35:30    0
J_DE6_2                  5:36:00    0
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
J_DE6_2                  5:36:30    0
J_DE6_2                  5:37:00    0
J_DE6_2                  5:37:30    0
J_DE6_2                  5:38:00    0
J_DE6_2                  5:38:30    0
J_DE6_2                  5:39:00    0
J_DE6_2                  5:39:30    0
J_DE6_2                  5:40:00    0
J_DE6_2                  5:40:30    0
J_DE6_2                  5:41:00    0
J_DE6_2                  5:41:30    0
J_DE6_2                  5:42:00    0
J_DE6_2                  5:42:30    0
J_DE6_2                  5:43:00    0
J_DE6_2                  5:43:30    0
J_DE6_2                  5:44:00    0
J_DE6_2                  5:44:30    0
J_DE6_2                  5:45:00    0
J_DE6_2                  5:45:30    0
J_DE6_2                  5:46:00    0
J_DE6_2                  5:46:30    0
J_DE6_2                  5:47:00    0
J_DE6_2                  5:47:30    0
J_DE6_2                  5:48:00    0
J_DE6_2                  5:48:30    0
J_DE6_2                  5:49:00    0
J_DE6_2                  5:49:30    0
J_DE6_2                  5:50:00    0
J_DE6_2                  5:50:30    0
J_DE6_2                  5:51:00    0
J_DE6_2                  5:51:30    0
J_DE6_2                  5:52:00    0
J_DE6_2                  5:52:30    0
J_DE6_2                  5:53:00    0
J_DE6_2                  5:53:30    0
J_DE6_2                  5:54:00    0
J_DE6_2                  5:54:30    0
J_DE6_2                  5:55:00    0
J_DE6_2                  5:55:30    0
J_DE6_2                  5:56:00    0
J_DE6_2                  5:56:30    0
J_DE6_2                  5:57:00    0
J_DE6_2                  5:57:30    0
J_DE6_2                  5:58:00    0
J_DE6_2                  5:58:30    0
J_DE6_2                  5:59:00    0
J_DE6_2                  5:59:30    0
J_DE6_2                  6:00:00    0

[REPORT]
;;Reporting Options
INPUT      YES
CONTROLS   NO
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       19071STMH        EX
Node       19079STMH        EX
Node       19097STMH        EX
Node       19111STMH        EX
Node       19132STMH        EX
Node       19134STMH        EX
Node       19139STMH        EX
Node       19143STMH        EX
Node       19150STMH        EX
Node       19154STMH        EX
Node       19162STMH        EX
Node       19171STMH        EX
Node       19179STMH        EX
Node       19214STMH        EX
Node       20135STMH        EX
Node       20209STFT        EX
Node       20818STMH        EX
Node       20841STMH        EX
Node       23839STMH        EX
Node       23840STMH        EX
Node       23841STMH        EX
Node       23843STMH        EX
Node       23845STMH        EX
Node       23849STMH        EX
Node       23852STMH        EX
Node       23855STMH        EX
Node       23856STMH        EX
Node       23861STMH        EX
Node       23862STMH        EX
Node       23868STMH        EX
Node       24788STMH        EX
Node       24791STMH        EX
Node       24796STMH        EX
Node       24797STIL        EX
Node       24800STMH        EX
Node       405658STFT       EX
Node       405659STFT       EX
Node       407540STMH       EX
Node       407541STMH       EX
Node       407542STMH       EX
Node       407543STMH       EX
Node       407544STMH       EX
Node       407546STMH       EX
Node       J_DE6_1          BASIN
Node       J_DE5            BASIN
Node       J_DE3            BASIN
Node       J_DE2            BASIN
Node       J_AD4            BASIN
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
Node       J_AD1            BASIN
Node       J_DE1            BASIN
Node       773032STMH       EX
Node       773050STMH       EX
Node       773052STMH       EX
Node       773389STMH       EX
Node       773392STMH       EX
Node       773410STMH       EX
Node       773412STMH       EX
Node       E17THAVE-01      PROP
Node       E17THAVE-02      PROP
Node       E17THAVE-03      PROP
Node       E17THAVE-04      PROP
Node       E17THAVE-05      PROP
Node       E17THAVE-06      PROP
Node       E17THAVE-07      PROP
Node       E17THAVE-08      PROP
Node       E17THAVE-09      PROP
Node       E17THAVE-10      PROP
Node       E17THAVE-11      PROP
Node       E17THAVE-12      PROP
Node       18979STOF        OUT
Node       18979STOF2       OUT
Node       23842STFT        OUT
Node       24773STOF        OUT
Node       24773STOF2       OUT
Node       407544STMH-OF    OUT
Node       407550STMH       OUT
Node       4401-02-250-OF   OUT
Node       773412STMH-OF    OUT
Node       E17THAVE-OF      OUT
Link       19071STMH        EX
Link       19071STMH-OF     OF
Link       35191STGM        EX
Link       35191STGM-OF     OF
Link       35325STGM        EX
Link       35325STGM-OF     OF
Link       35326STGM        EX
Link       35326STGM-OF     OF
Link       35328STGM        EX
Link       35328STGM-OF     OF
Link       35329STGM        EX
Link       35329STGM-OF     OF
Link       35355STGM        EX
Link       35355STGM-OF     OF
Link       35357STGM        EX
Link       35357STGM-OF     OF
Link       35358STGM        EX
Link       35358STGM-OF     OF
Link       35362STGM        EX
Link       35362STGM-OF     OF
Link       35363STGM        EX
Link       35363STGM-OF     OF
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
Link       35365STGM        EX
Link       35365STGM-OF     OF
Link       35367STGM        EX
Link       35367STGM-OF     OF
Link       35368STGM        EX
Link       35368STGM-OF     OF
Link       35369STGM        EX
Link       35369STGM-OF     OF
Link       35370STGM        EX
Link       35370STGM-OF     OF
Link       35371STGM        EX
Link       35372STGM        EX
Link       35372STGM-OF     OF
Link       36715STGM        EX
Link       36715STGM-OF     OF
Link       36716STGM        EX
Link       36716STGM-OF     OF
Link       36717STGM        EX
Link       36717STGM-OF     OF
Link       36718STGM        EX
Link       36718STGM-OF     OF
Link       36939STGM        EX
Link       36939STGM-OF     OF
Link       37665STGM        EX
Link       37665STGM-OF     OF
Link       37666STGM        EX
Link       37666STGM-OF     OF
Link       37673STGM        EX
Link       37673STGMF-OFE   OF
Link       37750STGM        EX
Link       37750STGM-OF     OF
Link       37757STGM        EX
Link       37757STGM-OF     OF
Link       37758STGM        EX
Link       37758STGM-OF     OF
Link       37759STGM        EX
Link       37759STGM-OF     OF
Link       37760STGM        EX
Link       37760STGM-OF     OF
Link       37761STGM        EX
Link       37762STGM        EX
Link       37762STGM-OF     OF
Link       37763STGM        EX
Link       37763STGM-OF     OF
Link       37764STGM        EX
Link       37764STGM-OF     OF
Link       406193STGM       EX
Link       406193STGM-OF    OF
Link       406197STGM       EX
Link       406197STGM-OF    OF
Link       406199STGM       EX
Link       406199STGM-OF    OF
Link       406200STGM       EX
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
Link       406200STGM-OF    OF
Link       406201STGM       EX
Link       406201STGM-OF    OF
Link       406205STGM       EX
Link       406205STGM-OF    OF
Link       406206STGM       EX
Link       407544STMH       EX
Link       407544STMH-OF    OF
Link       D_12th           DUMMY
Link       4401-02-220      DUMMY
Link       4401-02-230      DUMMY
Link       4401-02-240      DUMMY
Link       4401-02-250      DUMMY
Link       4401-02-260      DUMMY
Link       4401-02-261      DUMMY
Link       773049STMN       EX
Link       773049STMN-OF    OF
Link       773051STMN       EX
Link       773051STMN-OF    OF
Link       773387STMN       EX
Link       773387STMN-OF    OF
Link       773391STMN       EX
Link       773391STMN-OF    OF
Link       773393STMN       EX
Link       773393STMN-OF    OF
Link       773411STMN       EX
Link       773411STMN-OF    OF
Link       773413STMN       EX
Link       E17THAVE-01      PROP
Link       E17THAVE01-OF    OF
Link       E17THAVE-02      PROP
Link       E17THAVE-03      PROP
Link       E17THAVE-04      PROP
Link       E17THAVE04-OF    OF
Link       E17THAVE-05      PROP
Link       E17THAVE-06      PROP
Link       E17THAVE-07      PROP
Link       E17THAVE-08      PROP
Link       E17THAVE-09      PROP
Link       E17THAVE-10      PROP
Link       E17THAVE-11      PROP
Link       E17THAVE-12      PROP
Link       E17THAVE-13      PROP
Link       E17THAVE-OF      PROP

[MAP]
DIMENSIONS 3169619.582 1692524.283 3174539.017 1698161.313
Units      Feet

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
19071STMH        3174275.326        1697808.991
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

19079STMH	3174259.103	1697799.410
19097STMH	3173673.769	1697766.020
19111STMH	3173113.219	1697766.164
19132STMH	3172874.500	1697723.000
19134STMH	3172690.000	1697722.500
19139STMH	3173036.500	1697721.000
19143STMH	3172362.000	1697720.000
19150STMH	3172033.000	1697716.000
19154STMH	3171740.000	1697714.500
19162STMH	3171399.500	1697711.500
19171STMH	3171082.500	1697708.500
19179STMH	3170766.500	1697702.000
19214STMH	3170739.000	1697672.500
20135STMH	3170740.000	1697044.000
20209STFT	3170741.550	1696985.941
20818STMH	3170739.147	1696419.176
20841STMH	3170713.500	1696393.000
23839STMH	3172049.741	1694009.382
23840STMH	3172428.574	1694009.045
23841STMH	3172382.210	1694008.356
23843STMH	3172564.139	1694008.173
23845STMH	3171762.665	1694007.832
23849STMH	3171381.366	1693999.131
23852STMH	3171708.290	1693998.947
23855STMH	3171059.463	1693997.389
23856STMH	3171089.463	1693997.389
23861STMH	3170703.457	1693996.561
23862STMH	3170740.976	1693996.561
23868STMH	3170427.244	1693995.170
24788STMH	3172025.537	1692879.130
24791STMH	3172411.991	1692878.221
24796STMH	3171681.927	1692876.845
24797STIL	3171356.308	1692876.784
24800STMH	3172064.124	1692875.955
405658STFT	3172348.757	1694535.966
405659STFT	3172015.067	1694534.757
407540STMH	3172373.070	1694536.985
407541STMH	3172409.669	1694536.765
407542STMH	3172583.271	1694534.507
407543STMH	3172047.369	1694534.122
407544STMH	3172718.243	1694533.695
407546STMH	3171729.887	1694533.257
J_DE6_1	3171168.070	1693014.184
J_DE5	3170142.651	1694302.763
J_DE3	3171996.496	1694855.529
J_DE2	3172338.749	1696058.653
J_AD4	3173355.797	1696939.911
J_AD1	3172990.092	1697273.960
J_DE1	3169843.193	1697179.382
773032STMH	3172368.712	1695733.037
773050STMH	3172406.225	1695736.788
773052STMH	3172697.475	1695736.788
773389STMH	3173026.215	1695742.040

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
773392STMH       3173046.739        1695740.051
773410STMH       3173331.889        1695740.051
773412STMH       3173381.359        1695740.069
J_DE4            3170977.372        1694422.402
E17THAVE-01      3170897.263        1696379.973
E17THAVE-02      3171068.538        1696378.069
E17THAVE-03      3171224.588        1696387.585
E17THAVE-04      3172208.469        1696391.391
E17THAVE-05      3172385.453        1696391.391
E17THAVE-06      3172545.310        1696395.197
E17THAVE-07      3172731.809        1696393.294
E17THAVE-08      3172874.539        1696391.391
E17THAVE-09      3173024.880        1696399.003
E17THAVE-10      3173376.946        1696395.197
E17THAVE-11      3173717.593        1696391.391
E17THAVE-12      3174048.234        1696396.064
19198STMH        3172037.499        1697656.695
19718STMH        3172042.263        1697317.878
20050STMH        3172056.302        1697075.743
20127STMH        3172006.855        1697048.220
20128STMH        3171758.641        1697056.437
20164STMH        3171709.277        1697016.557
20493STMH        3171718.781        1696710.122
20851STMH        3171720.423        1696385.833
20866STMH        3171741.972        1696377.013
20853STMH        3171410.464        1696383.540
20861STMH        3172015.243        1696378.820
J_DE6_2          3171343.998        1692810.991
J_12th           3171401.673        1693411.498
18979STOF        3174295.025        1697869.942
18979STOF2       3174314.795        1697905.084
23842STFT        3172709.496        1694008.428
24773STOF        3172450.008        1692925.330
24773STOF2       3172466.514        1693054.486
407544STMH-OF    3172752.219        1694500.022
407550STMH       3172753.190        1694524.102
4401-02-250-OF   3174308.834        1697053.510
773412STMH-OF    3173385.488        1695655.425
E17THAVE-OF      3174117.350        1696453.668
J2               3172512.620        1693421.785

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
19071STMH-OF     3174315.407        1697815.426
35191STGM-OF     3172395.271        1692922.437
35325STGM-OF     3172041.936        1692780.512
35325STGM-OF     3172084.482        1692791.149
35326STGM        3172343.096        1692877.971
35326STGM-OF     3172371.666        1692793.808
35326STGM-OF     3172145.642        1692799.126
35328STGM-OF     3171659.024        1692807.104
35328STGM-OF     3171425.022        1692809.763
```

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

35329STGM-OF	3171991.413	1692801.785
35329STGM-OF	3171752.093	1692807.104
35355STGM-OF	3170456.560	1694022.183
35355STGM-OF	3170663.572	1694022.183
35357STGM-OF	3170720.495	1693963.780
35357STGM-OF	3170739.417	1693962.519
35358STGM	3171043.138	1693997.346
35358STGM-OF	3171013.171	1694022.496
35358STGM-OF	3170767.513	1694013.762
35362STGM-OF	3171072.597	1694024.699
35362STGM-OF	3171083.998	1694021.442
35363STGM	3171360.815	1693999.008
35363STGM-OF	3171165.792	1694039.468
35363STGM-OF	3171298.246	1694040.730
35365STGM	3171685.358	1693998.960
35365STGM-OF	3171434.484	1694034.422
35365STGM-OF	3171662.810	1694034.422
35367STGM-OF	3171719.953	1694500.250
35367STGM-OF	3171712.020	1694042.359
35368STGM-OF	3171792.484	1694029.585
35368STGM-OF	3172017.245	1694030.400
35369STGM-OF	3172097.377	1694039.469
35369STGM-OF	3172323.817	1694038.545
35370STGM-OF	3172398.853	1694027.595
35370STGM-OF	3172424.728	1694031.515
35372STGM-OF	3172545.751	1694030.528
35372STGM-OF	3172461.597	1694030.528
36715STGM-OF	3173040.031	1697758.886
36715STGM-OF	3173075.780	1697781.635
36716STGM-OF	3174155.324	1697856.533
36716STGM-OF	3173797.284	1697847.871
36717STGM-OF	3174273.903	1697791.091
36717STGM-OF	3174285.448	1697796.863
36718STGM-OF	3173210.922	1697812.474
36718STGM-OF	3173589.557	1697808.762
36939STGM-OF	3170696.116	1696477.494
36939STGM-OF	3170695.974	1696911.488
37665STGM	3170739.935	1697004.180
37665STGM	3170739.974	1697024.998
37665STGM-OF	3170712.581	1697009.638
37665STGM-OF	3170713.380	1697039.235
37666STGM-OF	3170754.735	1696397.913
37666STGM-OF	3170745.841	1696383.937
37673STGM	3170739.974	1697060.336
37673STGMF-OFE	3171391.697	1697050.552
37750STGM-OF	3170708.951	1697704.293
37750STGM-OF	3170728.411	1697729.841
37757STGM	3171396.997	1697711.476
37757STGM	3171365.498	1697711.178
37757STGM-OF	3171361.399	1697753.985
37757STGM-OF	3171166.750	1697753.985
37758STGM	3171035.932	1697707.542
37758STGM	3171068.921	1697708.221

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

37758STGM-OF	3170818.525	1697746.842
37758STGM-OF	3171020.317	1697750.414
37759STGM	3171696.500	1697714.000
37759STGM	3171730.070	1697714.413
37759STGM-OF	3171457.831	1697752.200
37759STGM-OF	3171691.767	1697752.200
37760STGM-OF	3171784.627	1697753.985
37760STGM-OF	3172007.848	1697750.414
37761STGM	3172352.404	1697719.883
37762STGM	3172663.471	1697722.298
37762STGM	3172388.661	1697720.203
37762STGM-OF	3172668.460	1697761.052
37762STGM-OF	3172416.052	1697757.802
37763STGM-OF	3172728.615	1697747.041
37763STGM-OF	3172855.010	1697747.041
37764STGM	3173010.017	1697721.327
37764STGM	3172990.612	1697721.566
37764STGM-OF	3173008.515	1697760.856
37764STGM-OF	3172911.229	1697760.856
406193STGM-OF	3172602.876	1694554.214
406193STGM-OF	3172694.073	1694551.976
406197STGM-OF	3172426.075	1694557.011
406197STGM-OF	3172560.913	1694554.773
406199STGM-OF	3172379.637	1694558.130
406199STGM-OF	3172405.374	1694558.690
406200STGM-OF	3172352.344	1694556.622
406200STGM-OF	3172367.325	1694556.057
406201STGM-OF	3172321.592	1694575.406
406201STGM-OF	3172091.218	1694575.406
406205STGM-OF	3172018.867	1694570.038
406205STGM-OF	3172049.518	1694571.517
407544STMH-OF	3172724.837	1694517.710
773049STMN-OF	3172381.934	1695766.829
773049STMN-OF	3172407.675	1695767.948
773051STMN-OF	3172463.313	1695760.040
773051STMN-OF	3172661.146	1695760.939
773387STMN-OF	3172796.280	1695628.067
773387STMN-OF	3173006.406	1695632.737
773391STMN-OF	3173025.070	1695787.090
773391STMN-OF	3173045.824	1695791.240
773393STMN-OF	3173310.609	1695770.201
773393STMN-OF	3173089.567	1695766.126
773411STMN-OF	3173349.316	1695766.126
773411STMN-OF	3173370.708	1695766.126
E17THAVE01-OF	3170857.129	1696353.872
E17THAVE01-OF	3170740.496	1696360.158
E17THAVE04-OF	3171383.267	1696345.561
E17THAVE04-OF	3171254.790	1696345.561
37753STGM-OF	3172053.675	1697703.986
37753STGM-OF	3172053.916	1697668.176
37675STGM-OF	3172080.839	1697604.273
37675STGM-OF	3172080.394	1697389.399
37746STGM-OF	3172086.693	1697297.084

Table F.5 – Conceptual Design SWMM Input for 100-year (Future) Event in Denver

```
37746STGM-OF     3172091.582        1697133.135
37714STGM-OF     3171788.256        1696340.951
37714STGM-OF     3171987.573        1696339.171
37715STGM-OF     3171721.536        1696355.242
37715STGM-OF     3171734.702        1696352.952
37716STGM-OF     3171691.388        1696352.431
37716STGM-OF     3171446.445        1696350.254
37717STGM-OF     3171659.050        1696447.897
37717STGM-OF     3171653.821        1696662.741
37721STGM-OF     3171678.072        1696996.527
37721STGM-OF     3171675.604        1696800.484
37731STGM-OF     3171774.427        1697019.794
37731STGM-OF     3171736.631        1697012.000
37742STGM-OF     3171953.763        1697085.086
37742STGM-OF     3171813.734        1697084.143
37743STGM-OF     3172080.838        1697042.589
37743STGM-OF     3172056.378        1697021.691
37761STGM-OF_BHI 3172059.530        1697755.703
37761STGM-OF_BHI 3172347.413        1697757.926


[BACKDROP]
FILE       "P:\20210239\WR\Calculations\Programs\SWMM\Revised Models\NOAA14\Background\Westerly_Creek_SWMM_Background.jpg"
DIMENSIONS 3163335.158 1677992.393 3184941.518 1706800.872
```

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.011)
--------------------------------------------------------------

Basis of model: Westerly Creek FHAD 100-year SWMM
Alternative Plan 3:
-48" SD in E 23rd Ave

WARNING 02: maximum depth increased for Node D_10b

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/15/2021 00:00:00
Ending Date .............. 04/15/2021 06:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Routing Time Step ........ 30.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 4
Head Tolerance ........... 0.005000 ft


*************************        Volume        Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.000         0.000
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........       165.962        54.081
External Outflow .........       165.638        53.976
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
```

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

```
  Final Stored Volume ......         0.989         0.322
  Continuity Error (%) .....        -0.401


  ************************
  Highest Continuity Errors
  ************************
  Node J_15 (-9.21%)
  Node J_13th (4.97%)
  Node J_Beeler (2.48%)


  ***************************
  Time-Step Critical Elements
  ***************************
  Link C_10_13_d (83.54%)
  Link C_10_13_b (5.64%)
  Link C_15c (5.58%)
  Link C_10_13_a (1.31%)


  ******************************
  Highest Flow Instability Indexes
  ******************************
  All links are stable.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     0.80 sec
  Average Time Step           :    12.30 sec
  Maximum Time Step           :    30.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.15
  Percent Not Converging      :     0.63


  ******************
  Node Depth Summary
  ******************

  --------------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type        Feet     Feet     Feet  days hr:min        Feet
  --------------------------------------------------------------------------------
  D_10d                JUNCTION    6.80    10.30  5348.22     0  01:20       10.30
  D_10b                JUNCTION    8.85    14.35  5366.65     0  01:18       14.35
  E-J-10               JUNCTION    0.00     0.00  5344.00     0  00:00        0.00
  D_10c                JUNCTION    0.29     0.81  5352.81     0  01:07        0.81
  D_13a                JUNCTION    9.03    14.03  5341.39     0  01:23       14.03
  D_10_13_a            JUNCTION    6.04    11.10  5332.23     0  01:27       11.10
```

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

D_16a	JUNCTION	0.76	1.88	5304.06	0	00:50	1.88
D_16b	JUNCTION	1.69	4.41	5309.31	0	01:40	4.41
J_15	JUNCTION	5.63	6.97	5320.93	0	01:40	6.97
D_14a	JUNCTION	4.96	14.85	5337.19	0	01:12	14.85
D_12_14	JUNCTION	0.11	0.33	5349.33	0	01:10	0.33
J_AR1_d	JUNCTION	2.45	10.88	5338.64	0	01:19	10.87
DIV72	JUNCTION	2.40	12.28	5360.97	0	01:01	12.28
D_10_13_b	JUNCTION	3.72	7.75	5328.58	0	01:28	7.75
D_AR2_b	JUNCTION	0.26	0.71	5347.51	0	01:21	0.71
E-J-16_b	JUNCTION	0.00	0.00	5312.27	0	00:00	0.00
E-J-16_a	JUNCTION	0.00	0.00	5308.09	0	00:00	0.00
D_16c	JUNCTION	0.48	1.18	5300.31	0	00:50	1.18
D_10_13_c	JUNCTION	3.22	5.91	5323.43	0	01:28	5.91
D_10_13_d	JUNCTION	2.84	4.69	5318.89	0	01:29	4.69
J_AR1_a	JUNCTION	1.27	5.52	5350.08	0	01:13	5.52
J_AR1_b	JUNCTION	1.92	9.90	5344.09	0	01:16	9.90
DIV72_DUMMY	JUNCTION	0.00	0.00	5460.00	0	00:00	0.00
J_AR1_c	JUNCTION	2.80	12.41	5341.93	0	01:18	12.41
J_Beeler	JUNCTION	0.12	0.64	5359.02	0	01:05	0.64
J_13th	JUNCTION	0.11	0.48	5347.82	0	01:10	0.48
D_AR2_a	OUTFALL	0.25	0.71	5338.91	0	01:21	0.71
EC_Out_19thAv	OUTFALL	2.21	3.24	5314.11	0	01:27	3.24
EC_Out_23rd	OUTFALL	0.34	1.16	5299.96	0	00:50	1.16
EC_Out_23rd_OF	OUTFALL	0.00	0.00	5305.80	0	00:00	0.00
J_15b	OUTFALL	1.30	3.26	5305.50	0	01:40	3.26
J_17thAve_Out_OF	OUTFALL	0.00	0.00	5322.44	0	00:00	0.00
JColfax_Alton	OUTFALL	1.55	5.44	5328.44	0	01:19	5.44
J14th-DIV	OUTFALL	0.00	0.00	5328.00	0	00:00	0.00
EC_Out_23rd_New	OUTFALL	0.48	1.18	5290.41	0	00:50	1.18
D_15a	OUTFALL	2.36	4.39	5318.53	0	01:12	4.39
J_17thAv_Out	OUTFALL	2.51	3.98	5316.98	0	01:29	3.98

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
D_10d	JUNCTION	0.00	677.91	0	01:16	0	27.1	0.565
D_10b	JUNCTION	479.82	479.82	0	01:15	19.7	19.7	0.292
E-J-10	JUNCTION	159.60	159.60	0	00:55	5.48	5.48	0.000
D_10c	JUNCTION	82.30	82.30	0	01:05	2.01	2.01	0.115
D_13a	JUNCTION	0.00	515.72	0	01:20	0	23.5	0.072
D_10_13_a	JUNCTION	0.00	511.66	0	01:23	0	23.5	0.284
D_16a	JUNCTION	0.00	60.19	0	00:50	0	2.06	-0.008
D_16b	JUNCTION	0.00	156.54	0	01:39	0	4.38	0.016
J_15	JUNCTION	0.00	181.80	0	01:26	0	2.93	-8.430
D_14a	JUNCTION	263.99	263.99	0	01:05	12.3	12.3	0.006

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

D_12_14	JUNCTION	18.11	18.11	0	01:10	0.36	0.36	1.472	
J_AR1_d	JUNCTION	0.00	428.35	0	01:18	0	11.2	0.010	
DIV72	JUNCTION	0.00	485.10	0	01:00	0	11.3	-0.034	
D_10_13_b	JUNCTION	0.00	202.78	0	01:24	0	12.2	0.140	
D_AR2_b	JUNCTION	0.00	166.77	0	01:21	0	3.84	0.101	
E-J-16_b	JUNCTION	40.13	40.13	0	00:50	1.18	1.18	0.000	
E-J-16_a	JUNCTION	60.19	60.19	0	00:50	1.77	1.76	0.000	
D_16c	JUNCTION	0.00	45.15	0	00:50	0	1.66	0.013	
D_10_13_c	JUNCTION	0.00	202.50	0	01:27	0	12.2	0.158	
D_10_13_d	JUNCTION	0.00	202.45	0	01:29	0	12.1	0.117	
J_AR1_a	JUNCTION	0.00	420.95	0	01:02	0	10.9	0.020	
J_AR1_b	JUNCTION	0.00	419.79	0	01:02	0	10.9	-0.029	
DIV72_DUMMY	JUNCTION	485.10	485.10	0	01:00	11.3	11.3	0.000	
J_AR1_c	JUNCTION	0.00	461.47	0	01:09	0	11.2	-0.062	
J_Beeler	JUNCTION	0.00	61.34	0	01:02	0	0.401	2.548	
J_13th	JUNCTION	0.00	52.53	0	01:07	0	0.391	5.226	
D_AR2_a	OUTFALL	0.00	166.70	0	01:21	0	3.84	0.000	
EC_Out_19thAv	OUTFALL	0.00	120.83	0	01:27	0	8.37	0.000	
EC_Out_23rd	OUTFALL	0.00	14.97	0	00:50	0	0.406	0.000	
EC_Out_23rd_OF	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	gal
J_15b	OUTFALL	0.00	137.08	0	01:40	0	4.08	0.000	
J_17thAve_Out_OF	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	gal
JColfax_Alton	OUTFALL	0.00	427.65	0	01:19	0	11.2	0.000	
J14th-DIV	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	gal
EC_Out_23rd_New	OUTFALL	0.00	45.14	0	00:50	0	1.66	0.000	
D_15a	OUTFALL	0.00	247.89	0	01:12	0	12.3	0.000	
J_17thAv_Out	OUTFALL	0.00	202.45	0	01:29	0	12.1	0.000	

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
E-J-10	JUNCTION	6.00	0.000	0.000
E-J-16_b	JUNCTION	6.00	0.000	0.000
E-J-16_a	JUNCTION	6.00	0.000	0.000
DIV72_DUMMY	JUNCTION	6.00	0.000	0.000

****
Node Flooding Summary
****

No nodes were flooded.

****

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
D_AR2_a	91.57	40.53	166.70	3.839
EC_Out_19thAv	97.61	69.17	120.83	8.370
EC_Out_23rd	45.05	7.45	14.97	0.406
EC_Out_23rd_OF	0.00	0.00	0.00	0.000
J_15b	98.18	38.22	137.08	4.078
J_17thAve_Out_OF	0.00	0.00	0.00	0.000
JColfax_Alton	96.30	100.19	427.65	11.232
J14th-DIV	0.00	0.00	0.00	0.000
EC_Out_23rd_New	75.63	18.42	45.14	1.658
D_15a	98.23	105.87	247.89	12.253
J_17thAv_Out	97.27	104.07	202.45	12.135
System	63.62	483.93	1290.76	53.972

Link Flow Summary

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
S_10e	CHANNEL	388.04	0	01:18	4.32	0.02	0.15
C_10c	CONDUIT	81.74	0	03:10	6.63	1.18	1.00
C_10c_2	CONDUIT	121.58	0	00:55	10.04	1.75	1.00
d_10a	DUMMY	159.60	0	00:55			
J_EC_Colfax_Out	CHANNEL	166.70	0	01:21	7.18	0.00	0.07
S_13a	CHANNEL	401.44	0	01:20	5.79	0.02	0.13
S_10g	CHANNEL	81.91	0	01:07	2.80	0.00	0.08
S_13_b1	CHANNEL	380.83	0	01:23	5.22	0.02	0.13
C_13a	CONDUIT	167.51	0	01:04	10.82	1.56	1.00
C_10_13_b	CONDUIT	202.50	0	01:27	8.52	1.25	1.00
C_13a_2	CONDUIT	120.83	0	01:27	8.31	1.25	0.86
S_13b2	CHANNEL	181.37	0	01:27	4.24	0.01	0.11
S_15_a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
C_15_a	CONDUIT	14.97	0	00:50	4.33	0.12	0.23
C_15_b	CONDUIT	19.41	0	01:40	5.09	0.99	0.72
S_15_b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
C_16b	CONDUIT	137.08	0	01:40	7.76	1.04	0.70
S_15_c	CHANNEL	140.24	0	01:40	3.84	0.01	0.10
S_15a	CHANNEL	11.53	0	01:12	1.69	0.00	0.05
S_10_13_b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_12_14	CHANNEL	18.08	0	01:10	3.20	0.00	0.07

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

C_AR2_e	CONDUIT	427.65	0	01:19	11.84	1.49	0.89		
S_AR1_e	CHANNEL	0.00	0	00:00	0.00	0.00	0.00		
S_AR1_a	CHANNEL	61.34	0	01:02	3.74	0.01	0.08		
C_10_13_a	CONDUIT	202.51	0	01:10	10.31	1.58	1.00		
S_10_13_a	CHANNEL	23.02	0	01:27	1.32	0.01	0.06		
S_10i	CHANNEL	166.77	0	01:21	3.21	0.03	0.10		
C_16a_1	DUMMY	40.13	0	00:50					
C_16a_2	DUMMY	60.19	0	00:50					
C_15d	CONDUIT	45.14	0	00:50	10.05	0.16	0.29		
C_15c	CONDUIT	45.15	0	00:50	10.22	0.44	0.38		
C_15a	CONDUIT	247.89	0	01:12	11.01	1.54	0.90		
C_10_13_c	CONDUIT	202.45	0	01:29	8.81	1.25	0.93		
C_10_13_d	CONDUIT	202.45	0	01:29	10.07	1.24	0.79		
S_10_13_c	CHANNEL	0.00	0	00:00	0.00	0.00	0.00		
S_10_13_d	CHANNEL	0.00	0	00:00	0.00	0.00	0.00		
C_AR1_a	CONDUIT	420.95	0	01:02	13.59	1.66	0.92		
C_AR1_b	CONDUIT	419.79	0	01:02	16.07	0.83	0.92		
C_AR1_c	CONDUIT	418.07	0	01:02	12.60	0.70	1.00		
S_AR1_b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00		
S_AR1_c	CHANNEL	0.00	0	00:00	0.00	0.00	0.04		
18	DUMMY	485.10	0	01:00					
C_AR1_d	CONDUIT	396.70	0	00:59	10.31	1.56	1.00		
S_AR1_d	CHANNEL	80.51	0	01:19	3.37	0.01	0.08		
S_Beeler	CHANNEL	52.53	0	01:07	4.50	0.00	0.05		
S_13th	CHANNEL	46.24	0	01:10	3.58	0.00	0.06		

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class							
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
S_10e	1.00	0.44	0.03	0.00	0.53	0.00	0.00	0.00	0.85	0.00
C_10c	1.00	0.02	0.00	0.00	0.67	0.00	0.00	0.31	0.05	0.00
C_10c_2	1.00	0.02	0.00	0.00	0.49	0.00	0.00	0.49	0.00	0.00
J_EC_Colfax_Out	1.00	0.08	0.00	0.00	0.01	0.92	0.00	0.00	0.15	0.00
S_13a	1.00	0.44	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00
S_10g	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00
S_13_b1	1.00	0.53	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00
C_13a	1.00	0.02	0.00	0.00	0.38	0.00	0.00	0.60	0.00	0.00
C_10_13_b	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.58	0.00
C_13a_2	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
S_13b2	1.00	0.12	0.57	0.00	0.26	0.03	0.00	0.02	0.78	0.00
S_15_a	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_15_a	1.00	0.55	0.00	0.00	0.45	0.00	0.00	0.00	0.80	0.00
C_15_b	1.00	0.63	0.07	0.00	0.02	0.00	0.00	0.29	0.00	0.00
S_15_b	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_16b	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
S_15_c	1.00	0.12	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

S_15a	1.00	0.11	0.76	0.00	0.12	0.00	0.00	0.02	0.83	0.00
S_10_13_b	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S_12_14	1.00	0.06	0.00	0.00	0.45	0.01	0.00	0.48	0.31	0.00
C_AR2_e	1.00	0.03	0.00	0.00	0.74	0.23	0.00	0.00	0.00	0.00
S_AR1_e	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S_AR1_a	1.00	0.09	0.81	0.00	0.08	0.02	0.00	0.00	0.80	0.00
C_10_13_a	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00
S_10_13_a	1.00	0.69	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00
S_10i	1.00	0.07	0.36	0.00	0.56	0.00	0.00	0.00	0.47	0.00
C_15d	1.00	0.24	0.00	0.00	0.05	0.71	0.00	0.00	0.29	0.00
C_15c	1.00	0.02	0.00	0.00	0.26	0.72	0.00	0.00	0.00	0.00
C_15a	1.00	0.02	0.00	0.00	0.97	0.02	0.00	0.00	0.00	0.00
C_10_13_c	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.02	0.00
C_10_13_d	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
S_10_13_c	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S_10_13_d	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_AR1_a	1.00	0.44	0.00	0.00	0.33	0.22	0.00	0.00	0.63	0.00
C_AR1_b	1.00	0.36	0.08	0.00	0.25	0.31	0.00	0.00	0.69	0.00
C_AR1_c	1.00	0.03	0.33	0.00	0.47	0.17	0.00	0.00	0.73	0.00
S_AR1_b	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S_AR1_c	1.00	0.87	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_AR1_d	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.00	0.68	0.00
S_AR1_d	1.00	0.87	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
S_Beeler	1.00	0.09	0.00	0.00	0.84	0.07	0.00	0.00	0.78	0.00
S_13th	1.00	0.10	0.00	0.00	0.09	0.02	0.00	0.79	0.07	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C_10c	2.56	2.65	2.72	2.64	2.52
C_10c_2	1.99	2.87	1.99	2.98	1.99
C_13a	1.37	2.40	1.37	2.53	1.37
C_10_13_b	0.72	1.20	0.72	1.34	0.72
C_13a_2	0.01	1.40	0.01	1.47	0.01
C_16b	0.01	0.01	0.01	0.19	0.01
C_AR2_e	0.01	0.69	0.01	0.85	0.01
C_10_13_a	1.25	1.36	1.25	1.48	1.25
C_15a	0.01	1.40	0.01	1.49	0.01
C_10_13_c	0.01	0.72	0.01	1.34	0.01
C_10_13_d	0.01	0.01	0.01	1.34	0.01
C_AR1_a	0.01	0.71	0.01	0.86	0.01
C_AR1_b	0.01	0.01	0.64	0.01	0.01
C_AR1_c	0.64	0.64	0.80	0.01	0.01
C_AR1_d	0.69	0.77	0.69	0.90	0.69

Table F.6 – Conceptual Design Dynamic SWMM Output for 100-year (Future) Event in Aurora

```
  Analysis begun on:  Thu Mar 17 07:28:29 2022
  Analysis ended on:  Thu Mar 17 07:28:29 2022
  Total elapsed time: < 1 sec
```

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.011)
--------------------------------------------------------------

Basis of model: Westerly Creek FHAD 100-year SWMM
Alternative Plan 3:
Revised kinematic wave model used for determining inflows to conceptual design dynamic wave model.

WARNING 08: elevation drop exceeds length for Conduit C_JL2
WARNING 04: minimum elevation drop used for Conduit C1
WARNING 04: minimum elevation drop used for Conduit C101
WARNING 04: minimum elevation drop used for Conduit C102
WARNING 04: minimum elevation drop used for Conduit C104
WARNING 04: minimum elevation drop used for Conduit C106
WARNING 04: minimum elevation drop used for Conduit C107
WARNING 04: minimum elevation drop used for Conduit C111
WARNING 04: minimum elevation drop used for Conduit C113
WARNING 04: minimum elevation drop used for Conduit C121
WARNING 04: minimum elevation drop used for Conduit C122
WARNING 04: minimum elevation drop used for Conduit C124
WARNING 04: minimum elevation drop used for Conduit C126
WARNING 04: minimum elevation drop used for Conduit C128
WARNING 04: minimum elevation drop used for Conduit C131
WARNING 04: minimum elevation drop used for Conduit C132
WARNING 04: minimum elevation drop used for Conduit C133
WARNING 04: minimum elevation drop used for Conduit C134
WARNING 04: minimum elevation drop used for Conduit C14
WARNING 04: minimum elevation drop used for Conduit C140
WARNING 04: minimum elevation drop used for Conduit C150
WARNING 04: minimum elevation drop used for Conduit C151
WARNING 04: minimum elevation drop used for Conduit C154
WARNING 04: minimum elevation drop used for Conduit C155
WARNING 04: minimum elevation drop used for Conduit C159
WARNING 04: minimum elevation drop used for Conduit C160
WARNING 04: minimum elevation drop used for Conduit C161
WARNING 04: minimum elevation drop used for Conduit C163
WARNING 04: minimum elevation drop used for Conduit C16th2
WARNING 04: minimum elevation drop used for Conduit C19th2
WARNING 08: elevation drop exceeds length for Conduit C20
WARNING 04: minimum elevation drop used for Conduit C200
WARNING 04: minimum elevation drop used for Conduit C203
WARNING 04: minimum elevation drop used for Conduit C230
WARNING 04: minimum elevation drop used for Conduit C231
WARNING 04: minimum elevation drop used for Conduit C232
WARNING 04: minimum elevation drop used for Conduit C233
WARNING 04: minimum elevation drop used for Conduit C234
WARNING 04: minimum elevation drop used for Conduit C235
WARNING 04: minimum elevation drop used for Conduit C24
WARNING 04: minimum elevation drop used for Conduit C242
WARNING 04: minimum elevation drop used for Conduit C245
WARNING 04: minimum elevation drop used for Conduit C247
WARNING 04: minimum elevation drop used for Conduit C25
WARNING 04: minimum elevation drop used for Conduit C251
WARNING 04: minimum elevation drop used for Conduit C252
```

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
  WARNING 04: minimum elevation drop used for Conduit C253
  WARNING 04: minimum elevation drop used for Conduit C31
  WARNING 04: minimum elevation drop used for Conduit C311
  WARNING 04: minimum elevation drop used for Conduit C32
  WARNING 04: minimum elevation drop used for Conduit C33
  WARNING 04: minimum elevation drop used for Conduit C34
  WARNING 04: minimum elevation drop used for Conduit C341
  WARNING 04: minimum elevation drop used for Conduit C343
  WARNING 04: minimum elevation drop used for Conduit C345
  WARNING 04: minimum elevation drop used for Conduit C347
  WARNING 04: minimum elevation drop used for Conduit C35
  WARNING 04: minimum elevation drop used for Conduit C350
  WARNING 04: minimum elevation drop used for Conduit C351
  WARNING 04: minimum elevation drop used for Conduit C352
  WARNING 04: minimum elevation drop used for Conduit C355
  WARNING 04: minimum elevation drop used for Conduit C36
  WARNING 04: minimum elevation drop used for Conduit C361
  WARNING 04: minimum elevation drop used for Conduit C362
  WARNING 04: minimum elevation drop used for Conduit C37
  WARNING 04: minimum elevation drop used for Conduit C371
  WARNING 04: minimum elevation drop used for Conduit C372
  WARNING 04: minimum elevation drop used for Conduit C374
  WARNING 04: minimum elevation drop used for Conduit C38
  WARNING 04: minimum elevation drop used for Conduit C389
  WARNING 04: minimum elevation drop used for Conduit C390
  WARNING 04: minimum elevation drop used for Conduit C391
  WARNING 04: minimum elevation drop used for Conduit C392
  WARNING 04: minimum elevation drop used for Conduit C393
  WARNING 04: minimum elevation drop used for Conduit C395
  WARNING 04: minimum elevation drop used for Conduit C395-DIV
  WARNING 04: minimum elevation drop used for Conduit C396
  WARNING 08: elevation drop exceeds length for Conduit C396-DIV
  WARNING 04: minimum elevation drop used for Conduit C397
  WARNING 08: elevation drop exceeds length for Conduit C397-DIV
  WARNING 04: minimum elevation drop used for Conduit C41
  WARNING 04: minimum elevation drop used for Conduit C42
  WARNING 04: minimum elevation drop used for Conduit C43
  WARNING 04: minimum elevation drop used for Conduit C44
  WARNING 04: minimum elevation drop used for Conduit C51
  WARNING 04: minimum elevation drop used for Conduit C52
  WARNING 04: minimum elevation drop used for Conduit C53
  WARNING 04: minimum elevation drop used for Conduit C54
  WARNING 04: minimum elevation drop used for Conduit C61
  WARNING 04: minimum elevation drop used for Conduit C62
  WARNING 04: minimum elevation drop used for Conduit C64
  WARNING 04: minimum elevation drop used for Conduit C65
  WARNING 04: minimum elevation drop used for Conduit C67
  WARNING 04: minimum elevation drop used for Conduit C68
  WARNING 04: minimum elevation drop used for Conduit CAD1
  WARNING 04: minimum elevation drop used for Conduit CAD3
  WARNING 04: minimum elevation drop used for Conduit CAD4
  WARNING 04: minimum elevation drop used for Conduit CAD7
  WARNING 04: minimum elevation drop used for Conduit CAR1
```

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
WARNING 08: elevation drop exceeds length for Conduit CDE1
WARNING 08: elevation drop exceeds length for Conduit CDE2
WARNING 04: minimum elevation drop used for Conduit CDE3
WARNING 08: elevation drop exceeds length for Conduit CDE4
WARNING 08: elevation drop exceeds length for Conduit CDE5
WARNING 08: elevation drop exceeds length for Conduit CDE6
WARNING 04: minimum elevation drop used for Conduit CJL2
WARNING 04: minimum elevation drop used for Conduit CMontview2
WARNING 04: minimum elevation drop used for Conduit CST1
WARNING 04: minimum elevation drop used for Conduit CST2
WARNING 04: minimum elevation drop used for Conduit CST3
WARNING 04: minimum elevation drop used for Conduit CST4
WARNING 04: minimum elevation drop used for Conduit CST5
WARNING 04: minimum elevation drop used for Conduit CST6
WARNING 04: minimum elevation drop used for Conduit CST8
WARNING 04: minimum elevation drop used for Conduit CST9
WARNING 04: minimum elevation drop used for Conduit d_03c
WARNING 08: elevation drop exceeds length for Conduit d_04d
WARNING 04: minimum elevation drop used for Conduit d_05a
WARNING 04: minimum elevation drop used for Conduit d_05b
WARNING 04: minimum elevation drop used for Conduit d_05c
WARNING 04: minimum elevation drop used for Conduit d_06a
WARNING 04: minimum elevation drop used for Conduit d_06b
WARNING 04: minimum elevation drop used for Conduit d_06c
WARNING 04: minimum elevation drop used for Conduit d_07b
WARNING 04: minimum elevation drop used for Conduit d_08a
WARNING 04: minimum elevation drop used for Conduit d_08b
WARNING 04: minimum elevation drop used for Conduit d_09a
WARNING 04: minimum elevation drop used for Conduit d_09b
WARNING 04: minimum elevation drop used for Conduit d_10a
WARNING 04: minimum elevation drop used for Conduit d_10a2
WARNING 04: minimum elevation drop used for Conduit d_11a
WARNING 04: minimum elevation drop used for Conduit d_12a
WARNING 04: minimum elevation drop used for Conduit d_14a
WARNING 04: minimum elevation drop used for Conduit d_14b
WARNING 04: minimum elevation drop used for Conduit d_15a
WARNING 08: elevation drop exceeds length for Conduit d_17thAv
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_23rd
WARNING 08: elevation drop exceeds length for Conduit d_EC_Out_19thAv
WARNING 08: elevation drop exceeds length for Conduit d_16thAve_E
WARNING 08: elevation drop exceeds length for Conduit 19071STMH
WARNING 08: elevation drop exceeds length for Conduit 19071STMH-OF
WARNING 08: elevation drop exceeds length for Conduit 35191STGM
WARNING 08: elevation drop exceeds length for Conduit 35191STGM-OF
WARNING 08: elevation drop exceeds length for Conduit 35371STGM
WARNING 08: elevation drop exceeds length for Conduit 407544STMH
WARNING 08: elevation drop exceeds length for Conduit 407544STMH-OF
WARNING 08: elevation drop exceeds length for Conduit 773413STMN
WARNING 08: elevation drop exceeds length for Conduit C_AR2_d
WARNING 04: minimum elevation drop used for Conduit d_15_b
WARNING 04: minimum elevation drop used for Conduit d_10_13
WARNING 04: minimum elevation drop used for Conduit d_10_13_2
WARNING 10: crest elevation raised to downstream invert for regulator Link W_02
```

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
WARNING 10: crest elevation raised to downstream invert for regulator Link OUT04
WARNING 10: crest elevation raised to downstream invert for regulator Link OUT02
WARNING 02: maximum depth increased for Node EC_Out_23rd
WARNING 02: maximum depth increased for Node E-J-16
WARNING 02: maximum depth increased for Node J_01a
WARNING 02: maximum depth increased for Node J_02a
WARNING 02: maximum depth increased for Node J_04a
WARNING 02: maximum depth increased for Node J_05a
WARNING 02: maximum depth increased for Node J_06a
WARNING 02: maximum depth increased for Node J_07a
WARNING 02: maximum depth increased for Node J_07b
WARNING 02: maximum depth increased for Node J_07c
WARNING 02: maximum depth increased for Node J_08a
WARNING 02: maximum depth increased for Node J_08b
WARNING 02: maximum depth increased for Node J_09a
WARNING 02: maximum depth increased for Node J_10a
WARNING 02: maximum depth increased for Node J_10b
WARNING 02: maximum depth increased for Node J_14a
WARNING 02: maximum depth increased for Node J_15a
WARNING 02: maximum depth increased for Node 23843STMH
WARNING 02: maximum depth increased for Node 773412STMH
WARNING 02: maximum depth increased for Node J-10a1
WARNING 02: maximum depth increased for Node D_02a
WARNING 02: maximum depth increased for Node D_03b
WARNING 02: maximum depth increased for Node D_05a
WARNING 02: maximum depth increased for Node D_05b
WARNING 02: maximum depth increased for Node D_05c
WARNING 02: maximum depth increased for Node D_05d
WARNING 02: maximum depth increased for Node D_06a
WARNING 02: maximum depth increased for Node D_06b
WARNING 02: maximum depth increased for Node D_07a
WARNING 02: maximum depth increased for Node D_08a
WARNING 02: maximum depth increased for Node D_08b
WARNING 02: maximum depth increased for Node D_10a
WARNING 02: maximum depth increased for Node D_10a1
WARNING 02: maximum depth increased for Node D_10b
WARNING 02: maximum depth increased for Node D_10c
WARNING 02: maximum depth increased for Node D_10d
WARNING 02: maximum depth increased for Node D_11a
WARNING 02: maximum depth increased for Node D_12a
WARNING 02: maximum depth increased for Node D_13a
WARNING 02: maximum depth increased for Node D_14a
WARNING 02: maximum depth increased for Node D_15a
WARNING 02: maximum depth increased for Node D_03a
WARNING 02: maximum depth increased for Node D_04a
WARNING 02: maximum depth increased for Node 19071STMH
WARNING 02: maximum depth increased for Node 19132STMH
WARNING 02: maximum depth increased for Node 19134STMH
WARNING 02: maximum depth increased for Node 19143STMH
WARNING 02: maximum depth increased for Node 19154STMH
WARNING 02: maximum depth increased for Node 19162STMH
WARNING 02: maximum depth increased for Node 19171STMH
WARNING 02: maximum depth increased for Node 19179STMH
```

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
  WARNING 02: maximum depth increased for Node 20209STFT
  WARNING 02: maximum depth increased for Node 20818STMH
  WARNING 02: maximum depth increased for Node 20841STMH
  WARNING 02: maximum depth increased for Node 773410STMH
  WARNING 02: maximum depth increased for Node 773392STMH
  WARNING 02: maximum depth increased for Node 773389STMH
  WARNING 02: maximum depth increased for Node 773052STMH
  WARNING 02: maximum depth increased for Node 773050STMH
  WARNING 02: maximum depth increased for Node 773032STMH
  WARNING 02: maximum depth increased for Node 23840STMH
  WARNING 02: maximum depth increased for Node 23841STMH
  WARNING 02: maximum depth increased for Node 23839STMH
  WARNING 02: maximum depth increased for Node 23845STMH
  WARNING 02: maximum depth increased for Node 23856STMH
  WARNING 02: maximum depth increased for Node 23855STMH
  WARNING 02: maximum depth increased for Node 23862STMH
  WARNING 02: maximum depth increased for Node 23861STMH
  WARNING 02: maximum depth increased for Node 23868STMH
  WARNING 02: maximum depth increased for Node 24791STMH
  WARNING 02: maximum depth increased for Node 24800STMH
  WARNING 02: maximum depth increased for Node 24788STMH
  WARNING 02: maximum depth increased for Node 24796STMH
  WARNING 02: maximum depth increased for Node 24797STIL
  WARNING 02: maximum depth increased for Node 23849STMH
  WARNING 02: maximum depth increased for Node 23852STMH
  WARNING 02: maximum depth increased for Node 19150STMH
  WARNING 02: maximum depth increased for Node D_16a
  WARNING 02: maximum depth increased for Node D_16b
  WARNING 02: maximum depth increased for Node J_EC_Colfax_Out
  WARNING 02: maximum depth increased for Node E-J-01

  ********************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  ********************************************************

  ****************
  Analysis Options
  ****************
  Flow Units ............... CFS
  Process Models:
    Rainfall/Runoff ........ NO
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Flow Routing Method ...... KINWAVE
  Starting Date ............ 01/01/2005 00:00:00
  Ending Date .............. 01/02/2005 12:00:00
  Antecedent Dry Days ...... 0.0
```

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

```
  Report Time Step ......... 00:05:00
  Routing Time Step ........ 300.00 sec


  *************************        Volume        Volume
  Flow Routing Continuity        acre-feet      10^6 gal
  *************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.000         0.000
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........      1526.820       497.537
  External Outflow .........       906.406       295.366
  Flooding Loss ............         0.140         0.046
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......       630.284       205.388
  Continuity Error (%) .....        -0.656


  ******************************
  Highest Flow Instability Indexes
  ******************************
  Link C_13a (9)
  Link C105 (6)
  Link C_08b (5)
  Link d_08c (5)
  Link 35369STGM (5)


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :   300.00 sec
  Average Time Step           :   300.00 sec
  Maximum Time Step           :   300.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     1.03
  Percent Not Converging      :     0.00


  ******************
  Node Depth Summary
  ******************

  ---------------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type         Feet     Feet     Feet  days hr:min        Feet
  ---------------------------------------------------------------------------------
  EC_Out_23rd          JUNCTION     0.11     1.71  5296.71     0  01:25        1.71
  EC_Out_19thAv        JUNCTION     0.20     3.92  5313.92     0  02:10        3.92
```

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

E-J-02	JUNCTION	0.00	0.00	5463.00	0	00:00	0.00
E-J-03	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-04	JUNCTION	0.00	0.00	5449.20	0	00:00	0.00
E-J-05	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
E-J-06	JUNCTION	0.00	0.00	5421.20	0	00:00	0.00
E-J-07	JUNCTION	0.00	0.00	5387.00	0	00:00	0.00
E-J-08	JUNCTION	0.00	0.00	5389.00	0	00:00	0.00
E-J-09	JUNCTION	0.00	0.00	5409.00	0	00:00	0.00
E-J-10	JUNCTION	0.00	0.00	5344.00	0	00:00	0.00
E-J-11	JUNCTION	0.00	0.00	5371.00	0	00:00	0.00
E-J-12	JUNCTION	0.00	0.00	5357.00	0	00:00	0.00
E-J-13	JUNCTION	0.00	0.00	5315.00	0	00:00	0.00
E-J-14	JUNCTION	0.00	0.00	5336.00	0	00:00	0.00
E-J-15	JUNCTION	0.00	0.00	5303.00	0	00:00	0.00
E-J-16	JUNCTION	0.04	0.94	5302.94	0	00:50	0.94
J_01a	JUNCTION	5.00	5.00	5463.00	0	00:05	5.00
J_02a	JUNCTION	0.00	0.00	5460.00	0	00:00	0.00
J_03a	JUNCTION	0.00	0.00	5411.00	0	00:00	0.00
J_04a	JUNCTION	0.34	2.48	5439.48	0	00:45	2.48
J_05_07	JUNCTION	0.05	1.24	5397.24	0	01:00	1.24
J_05a	JUNCTION	0.00	0.00	5415.00	0	00:00	0.00
J_06a	JUNCTION	0.00	0.00	5421.20	0	00:00	0.00
J_07a	JUNCTION	0.01	0.52	5401.52	0	00:50	0.52
J_07b	JUNCTION	0.03	0.93	5393.93	0	01:10	0.93
J_07c	JUNCTION	0.06	0.97	5387.97	0	01:10	0.97
J_08a	JUNCTION	0.17	3.34	5392.34	0	01:20	3.34
J_08b	JUNCTION	0.12	1.91	5383.57	0	00:45	1.91
J_09a	JUNCTION	0.01	0.34	5409.34	0	01:00	0.34
J_10a	JUNCTION	0.04	0.83	5381.83	0	01:05	0.83
J_10b	JUNCTION	0.02	0.79	5384.48	0	01:50	0.79
J_10c	JUNCTION	0.33	2.50	5375.83	0	02:55	2.50
J_14a	JUNCTION	0.31	4.50	5340.50	0	00:50	4.50
J_15a	JUNCTION	0.14	2.12	5305.12	0	00:50	2.12
J_17thAv_Out	JUNCTION	0.52	4.82	5326.82	0	01:25	4.82
J_7b	JUNCTION	0.00	0.00	5384.00	0	00:00	0.00
J_AD1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_AD3	JUNCTION	0.00	0.00	969.20	0	00:00	0.00
J_AD4	JUNCTION	0.00	0.00	966.60	0	00:00	0.00
J_AD7	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_AR1_a	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_AR2	JUNCTION	0.00	0.00	5357.00	0	00:00	0.00
J_DE1	JUNCTION	0.00	0.00	964.60	0	00:00	0.00
J_DE2	JUNCTION	0.00	0.00	976.00	0	00:00	0.00
J_DE3	JUNCTION	0.00	0.00	980.90	0	00:00	0.00
J_DE4	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
J_DE5	JUNCTION	0.00	0.00	988.00	0	00:00	0.00
J_DE6	JUNCTION	0.00	0.00	992.00	0	00:00	0.00
J_L1	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J_L2	JUNCTION	0.00	0.00	5374.00	0	00:00	0.00
J_ST1	JUNCTION	0.00	0.00	928.00	0	00:00	0.00
J_ST2	JUNCTION	0.00	0.00	915.00	0	00:00	0.00
J_ST3	JUNCTION	0.00	0.00	931.00	0	00:00	0.00
J_ST4	JUNCTION	0.00	0.00	931.00	0	00:00	0.00

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J_ST5	JUNCTION	0.00	0.00	933.00	0	00:00	0.00
J_ST6	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST7	JUNCTION	0.08	1.51	973.51	0	00:50	1.51
J_ST8	JUNCTION	0.00	0.00	946.00	0	00:00	0.00
J_ST9	JUNCTION	0.00	0.00	951.00	0	00:00	0.00
23843STMH	JUNCTION	0.16	2.12	5330.94	0	02:05	2.12
773412STMH	JUNCTION	0.10	2.83	5321.32	0	00:50	2.83
J100	JUNCTION	0.00	0.00	1010.51	0	00:00	0.00
J101	JUNCTION	1.44	5.46	1010.47	0	01:05	5.46
J102	JUNCTION	1.46	5.73	1005.74	0	01:00	5.73
J104	JUNCTION	0.16	1.31	1001.31	0	01:15	1.31
J106	JUNCTION	0.19	4.44	1011.95	0	00:50	4.44
J107	JUNCTION	0.16	4.00	1006.51	0	00:50	4.00
J-10a1	JUNCTION	0.02	0.83	5389.33	0	01:00	0.83
J111	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J113	JUNCTION	0.08	2.18	1010.79	0	00:45	2.18
J11th	JUNCTION	1.14	2.62	1002.62	0	01:00	2.62
J121	JUNCTION	0.00	0.00	1013.87	0	00:00	0.00
J122	JUNCTION	0.00	0.00	1005.87	0	00:00	0.00
J124	JUNCTION	0.07	1.91	1007.78	0	00:45	1.91
J126	JUNCTION	0.16	3.50	1008.09	0	00:40	3.50
J128	JUNCTION	0.13	2.99	1006.65	0	00:50	2.99
J12th	JUNCTION	1.38	3.10	995.10	0	01:05	3.10
J131	JUNCTION	0.00	0.00	1015.92	0	00:00	0.00
J132	JUNCTION	0.00	0.00	1016.26	0	00:00	0.00
J133	JUNCTION	0.00	0.00	1013.76	0	00:00	0.00
J134	JUNCTION	0.00	0.00	1009.26	0	00:00	0.00
J14	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J140	JUNCTION	0.00	0.00	1005.21	0	00:00	0.00
J141	JUNCTION	0.07	1.49	1006.70	0	00:40	1.49
J150	JUNCTION	1.20	4.75	1017.76	0	00:50	4.75
J151	JUNCTION	2.92	4.00	1012.01	0	00:35	4.00
J154	JUNCTION	0.00	0.00	1003.66	0	00:00	0.00
J155	JUNCTION	0.00	0.00	1001.16	0	00:00	0.00
J157	JUNCTION	0.16	1.31	1002.46	0	01:15	1.31
J159	JUNCTION	0.01	0.38	1000.38	0	01:40	0.38
J160	JUNCTION	0.00	0.00	1000.01	0	00:00	0.00
J161	JUNCTION	0.14	2.66	1016.42	0	00:50	2.66
J163	JUNCTION	0.19	4.00	1013.26	0	00:40	4.00
J165	JUNCTION	1.44	5.46	1013.47	0	01:05	5.46
J166	JUNCTION	0.00	0.25	1003.91	0	00:55	0.25
J167	JUNCTION	0.00	0.05	1007.13	0	00:45	0.05
J168	JUNCTION	0.00	0.12	1003.78	0	00:50	0.12
J169	JUNCTION	0.03	0.69	1008.20	0	00:55	0.69
J16th-us	JUNCTION	1.77	5.34	981.34	0	01:10	5.34
J170	JUNCTION	0.03	0.65	1003.16	0	01:05	0.65
J171	JUNCTION	1.46	5.74	1010.75	0	01:00	5.74
J17th	JUNCTION	2.08	7.37	976.57	0	01:20	7.37
J19th-ds	JUNCTION	2.24	8.20	974.80	0	01:20	8.20
J19th-us	JUNCTION	2.08	7.36	973.96	0	01:20	7.36
J200	JUNCTION	0.00	0.00	1031.15	0	00:00	0.00
J202	JUNCTION	1.94	2.03	1033.17	0	11:30	2.03
J203	JUNCTION	1.93	2.03	1027.77	0	11:30	2.03

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J204	JUNCTION	0.77	0.81	1026.54	0	11:30	0.81
J230	JUNCTION	0.45	3.49	1026.69	0	00:45	3.49
J231	JUNCTION	0.00	0.00	1023.20	0	00:00	0.00
J232	JUNCTION	0.00	0.00	1024.21	0	00:00	0.00
J233	JUNCTION	0.00	0.00	1025.58	0	00:00	0.00
J234	JUNCTION	0.00	0.00	1022.41	0	00:00	0.00
J235	JUNCTION	0.47	4.08	1023.70	0	00:50	4.08
J23rd	JUNCTION	1.51	5.53	956.53	0	01:25	5.53
J24	JUNCTION	0.00	0.00	1022.33	0	00:00	0.00
J242	JUNCTION	0.16	3.42	1025.75	0	00:50	3.42
J245	JUNCTION	0.18	4.55	1020.74	0	00:45	4.55
J247	JUNCTION	0.21	5.05	1020.33	0	00:45	5.05
J248	JUNCTION	0.12	2.73	1018.01	0	00:45	2.73
J25	JUNCTION	0.17	4.17	1021.10	0	00:45	4.17
J251	JUNCTION	0.00	0.00	1011.21	0	00:00	0.00
J252	JUNCTION	0.00	0.00	1016.93	0	00:00	0.00
J253	JUNCTION	0.12	2.73	1013.77	0	00:45	2.73
J254	JUNCTION	0.13	3.12	1014.16	0	00:45	3.12
J26th	JUNCTION	1.50	5.52	951.52	0	01:30	5.52
J29th	JUNCTION	2.03	8.73	941.73	0	01:30	8.73
J31	JUNCTION	0.00	0.00	1039.11	0	00:00	0.00
J311	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J314	JUNCTION	0.09	2.32	1041.42	0	00:45	2.32
J315	JUNCTION	0.42	1.54	1038.24	0	02:10	1.54
J32	JUNCTION	0.00	0.00	1037.25	0	00:00	0.00
J33	JUNCTION	0.00	0.00	1036.79	0	00:00	0.00
J33rd	JUNCTION	2.22	9.41	937.41	0	01:30	9.41
J34	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J341	JUNCTION	0.20	3.67	1038.66	0	00:55	3.67
J343	JUNCTION	0.29	5.00	1029.23	0	00:45	5.00
J345	JUNCTION	1.04	6.00	1024.24	0	00:50	6.00
J346	JUNCTION	1.51	4.15	1022.39	0	01:10	4.15
J347	JUNCTION	1.50	4.15	1020.29	0	01:15	4.15
J348	JUNCTION	1.16	3.56	1019.69	0	01:15	3.56
J35	JUNCTION	0.00	0.00	1036.70	0	00:00	0.00
J350	JUNCTION	0.42	1.54	1033.88	0	02:15	1.54
J351	JUNCTION	0.00	0.00	1036.69	0	00:00	0.00
J352	JUNCTION	0.39	1.41	1031.87	0	02:15	1.41
J353	JUNCTION	0.09	1.85	1024.58	0	00:50	1.85
J354	JUNCTION	0.09	1.15	1014.26	0	01:05	1.15
J355	JUNCTION	0.09	2.30	1039.01	0	00:45	2.30
J36	JUNCTION	0.37	2.50	1026.30	0	00:45	2.50
J361	JUNCTION	0.00	0.00	1030.45	0	00:00	0.00
J362	JUNCTION	0.00	0.00	1027.23	0	00:00	0.00
J37	JUNCTION	0.00	0.00	1016.81	0	00:00	0.00
J371	JUNCTION	0.00	0.00	1019.61	0	00:00	0.00
J372	JUNCTION	0.47	4.40	1021.21	0	00:50	4.40
J374	JUNCTION	0.45	4.22	1019.03	0	00:50	4.22
J38	JUNCTION	0.00	0.00	1024.23	0	00:00	0.00
J390	JUNCTION	0.08	2.18	1018.39	0	00:45	2.18
J391	JUNCTION	0.00	0.00	1016.21	0	00:00	0.00
J392	JUNCTION	0.00	0.00	1013.01	0	00:00	0.00
J393	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J394	JUNCTION	0.08	1.87	1018.08	0	00:45	1.87
J41	JUNCTION	0.00	0.00	1008.01	0	00:00	0.00
J42	JUNCTION	0.00	0.00	1018.24	0	00:00	0.00
J43	JUNCTION	0.00	0.00	1022.74	0	00:00	0.00
J44	JUNCTION	0.00	0.00	1013.11	0	00:00	0.00
J51	JUNCTION	0.00	0.00	1013.61	0	00:00	0.00
J52	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J53	JUNCTION	0.00	0.00	1005.01	0	00:00	0.00
J54	JUNCTION	0.00	0.00	1011.61	0	00:00	0.00
J56	JUNCTION	0.08	1.82	1015.43	0	00:45	1.82
J61	JUNCTION	0.00	0.00	1013.85	0	00:00	0.00
J62	JUNCTION	0.00	0.00	1009.85	0	00:00	0.00
J63	JUNCTION	0.00	0.00	1007.00	0	00:00	0.00
J64	JUNCTION	0.00	0.00	1000.00	0	00:00	0.00
J65	JUNCTION	0.29	4.00	1004.00	0	00:35	4.00
J67	JUNCTION	0.17	2.50	1012.35	0	00:25	2.50
J68	JUNCTION	0.22	3.50	1006.90	0	00:35	3.50
J6th_Pipe	JUNCTION	0.89	6.00	5378.45	0	00:40	6.00
J74	JUNCTION	0.20	3.00	1009.60	0	00:30	3.00
J7b	JUNCTION	0.74	4.71	5389.71	0	01:15	4.71
JL2	JUNCTION	0.04	1.29	5375.29	0	01:00	1.29
JMLK	JUNCTION	2.22	9.41	940.41	0	01:30	9.41
JMontview-ds	JUNCTION	1.43	5.16	969.76	0	01:20	5.16
JMontview-us	JUNCTION	2.24	8.20	972.80	0	01:20	8.20
J_16thAve_E	JUNCTION	0.33	5.07	5339.71	0	01:25	5.07
J_HP-OUT	JUNCTION	0.68	10.58	5386.00	0	01:30	10.58
J_15b	JUNCTION	0.15	3.40	5303.40	0	01:25	3.40
JSandCreek	OUTFALL	1.80	8.89	923.89	0	01:35	8.89
ChesapeakeHLC	OUTFALL	0.00	0.00	5460.20	0	00:00	0.00
DIV344	DIVIDER	0.36	6.00	1030.23	0	00:45	6.00
DIV342	DIVIDER	0.28	5.00	1039.98	0	00:40	5.00
DIV135	DIVIDER	0.12	2.00	1017.92	0	00:45	2.00
DIV389	DIVIDER	0.00	0.00	1001.15	0	00:00	0.00
DIV397	DIVIDER	0.00	0.00	1009.26	0	00:00	0.00
DIV105	DIVIDER	0.34	2.14	1012.65	0	02:05	2.14
DIV376	DIVIDER	2.93	4.00	1017.01	0	00:35	4.00
DIV70	DIVIDER	0.20	3.00	1012.85	0	00:25	3.00
DIV395	DIVIDER	0.00	0.00	1003.66	0	00:00	0.00
DIV1	DIVIDER	4.60	4.60	1012.61	0	00:05	4.60
DIV164	DIVIDER	0.20	4.50	1013.76	0	00:45	4.50
DIV125	DIVIDER	0.16	3.50	1009.37	0	00:40	3.50
DIV316	DIVIDER	0.39	1.41	1033.75	0	02:15	1.41
DIV396	DIVIDER	2.88	2.88	1008.09	0	00:05	2.88
DIV71	DIVIDER	0.17	2.50	1016.35	0	00:25	2.50
DIV399	DIVIDER	0.89	6.00	5390.00	0	00:40	6.00
DIV162	DIVIDER	0.19	4.00	1017.76	0	00:40	4.00
DIV136	DIVIDER	0.11	2.67	1018.93	0	00:45	2.67
DIV123	DIVIDER	0.07	1.91	1010.53	0	00:45	1.91
J13th-DIV	DIVIDER	1.37	3.15	991.15	0	01:05	3.15
J14th-DIV	DIVIDER	1.12	3.93	988.23	0	01:10	3.93
JColfax-DIV	DIVIDER	1.79	7.00	987.90	0	01:00	7.00
J16th-DIV	DIVIDER	1.26	6.00	982.00	0	00:50	6.00
D_02a	DIVIDER	0.00	0.00	5460.20	0	00:00	0.00

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

D_03b	DIVIDER	0.01	0.40	5409.40	0	00:50	0.40
D_05-07	DIVIDER	0.05	1.24	5405.24	0	01:00	1.24
D_05a	DIVIDER	0.62	2.34	5451.34	0	01:25	2.34
D_05b	DIVIDER	0.86	4.50	5419.50	0	00:40	4.50
D_05c	DIVIDER	0.05	1.24	5415.24	0	00:55	1.24
D_05d	DIVIDER	0.93	4.50	5418.50	0	00:35	4.50
D_06a	DIVIDER	0.23	4.00	5425.20	0	00:35	4.00
D_06b	DIVIDER	0.02	0.81	5422.01	0	00:50	0.81
D_07a	DIVIDER	0.13	2.25	5396.25	0	00:50	2.25
D_08a	DIVIDER	0.18	4.00	5413.00	0	00:40	4.00
D_08b	DIVIDER	0.15	2.25	5391.25	0	00:55	2.25
D_10a	DIVIDER	0.58	3.50	5367.94	0	00:40	3.50
D_10a1	DIVIDER	0.02	0.73	5389.23	0	01:00	0.73
D_10b	DIVIDER	0.61	4.00	5366.60	0	00:50	4.00
D_10c	DIVIDER	0.03	0.84	5352.84	0	01:05	0.84
D_10d	DIVIDER	0.08	1.59	5345.59	0	01:15	1.59
D_11a	DIVIDER	0.25	4.00	5375.00	0	00:45	4.00
D_12a	DIVIDER	0.31	4.50	5361.50	0	00:40	4.50
D_13a	DIVIDER	0.52	4.50	5345.50	0	00:45	4.50
D_14a	DIVIDER	0.36	5.50	5341.50	0	00:40	5.50
D_15a	DIVIDER	0.36	5.50	5319.50	0	00:50	5.50
D_03a	DIVIDER	0.95	5.50	5414.50	0	00:40	5.50
D_12_14	DIVIDER	0.02	0.63	5349.63	0	01:05	0.63
D_10_13	DIVIDER	0.04	1.09	5332.09	0	01:20	1.09
J72	DIVIDER	0.22	3.50	1010.00	0	00:30	3.50
J120	DIVIDER	0.07	2.17	1016.04	0	00:45	2.17
J127	DIVIDER	0.13	2.99	1007.57	0	00:50	2.99
J129	DIVIDER	0.16	4.00	1007.66	0	00:45	4.00
J158	DIVIDER	0.01	0.38	1000.80	0	01:40	0.38
J73	DIVIDER	0.28	4.00	1007.40	0	00:30	4.00
J236	DIVIDER	0.08	2.17	1024.58	0	00:40	2.17
J244	DIVIDER	0.18	4.55	1021.48	0	00:45	4.55
J241	DIVIDER	0.16	3.41	1027.62	0	00:50	3.41
J243	DIVIDER	0.17	4.18	1026.52	0	00:45	4.18
J246	DIVIDER	0.21	5.07	1021.27	0	00:45	5.07
J375	DIVIDER	0.47	4.74	1019.55	0	00:50	4.74
J330	DIVIDER	0.20	3.60	1040.39	0	00:55	3.60
J320	DIVIDER	0.47	4.38	1024.00	0	00:45	4.38
J319	DIVIDER	0.47	4.10	1027.30	0	00:45	4.10
J321	DIVIDER	0.18	3.67	1040.92	0	00:50	3.67
J373	DIVIDER	0.45	4.20	1021.01	0	00:50	4.20
J57	DIVIDER	0.09	3.41	1015.02	0	00:40	3.41
J250	DIVIDER	0.11	2.08	1013.29	0	00:50	2.08
J317	DIVIDER	0.37	2.50	1032.96	0	00:45	2.50
J318	DIVIDER	0.45	3.48	1027.28	0	00:45	3.48
J322	DIVIDER	0.10	2.17	1027.76	0	00:45	2.17
J363	DIVIDER	0.10	2.38	1029.61	0	00:45	2.38
D_AR2_a	DIVIDER	0.36	5.07	5343.07	0	01:20	5.07
DIV72	DIVIDER	0.02	0.70	1007.15	0	01:00	0.70
D_04a	DIVIDER	0.41	3.01	5460.04	0	00:45	3.01
D_AR2_b	DIVIDER	0.36	4.50	5356.15	0	00:45	4.50
D_AR2_c	DIVIDER	0.20	2.34	5371.34	0	00:45	2.34
19071STMH	DIVIDER	0.32	5.00	5309.43	0	01:00	5.00

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

19079STMH	DIVIDER	0.39	5.00	5309.61	0	00:55	5.00
19097STMH	DIVIDER	0.39	5.00	5311.42	0	00:50	5.00
19111STMH	DIVIDER	0.38	5.00	5313.24	0	00:50	5.00
19139STMH	DIVIDER	0.32	5.00	5314.07	0	00:55	5.00
19132STMH	DIVIDER	0.31	5.00	5318.44	0	00:55	5.00
19134STMH	DIVIDER	0.36	5.00	5320.66	0	00:55	5.00
19143STMH	DIVIDER	0.35	4.50	5321.86	0	00:45	4.50
19154STMH	DIVIDER	0.35	4.50	5324.99	0	00:45	4.50
19162STMH	DIVIDER	0.35	4.50	5326.44	0	00:45	4.50
19171STMH	DIVIDER	0.30	4.50	5327.60	0	02:40	4.50
19179STMH	DIVIDER	0.29	4.50	5328.86	0	02:40	4.50
19214STMH	DIVIDER	0.31	4.00	5328.57	0	00:40	4.00
20135STMH	DIVIDER	0.31	4.00	5332.82	0	00:35	4.00
20209STFT	DIVIDER	0.32	4.00	5333.74	0	00:35	4.00
20818STMH	DIVIDER	0.32	4.00	5336.32	0	00:35	4.00
20841STMH	DIVIDER	0.32	4.00	5336.52	0	00:35	4.00
773410STMH	DIVIDER	0.15	2.83	5322.29	0	00:40	2.83
773392STMH	DIVIDER	0.15	2.83	5323.34	0	00:40	2.83
773389STMH	DIVIDER	0.15	2.83	5323.52	0	00:40	2.83
773052STMH	DIVIDER	0.15	2.83	5324.68	0	00:35	2.83
773050STMH	DIVIDER	0.16	2.83	5325.60	0	00:35	2.83
773032STMH	DIVIDER	0.14	2.42	5325.33	0	00:35	2.42
407544STMH	DIVIDER	0.26	3.00	5326.33	0	00:40	3.00
407542STMH	DIVIDER	0.25	3.00	5326.54	0	00:40	3.00
407541STMH	DIVIDER	0.24	3.00	5326.97	0	00:45	3.00
407540STMH	DIVIDER	0.20	2.50	5326.78	0	00:50	2.50
405658STFT	DIVIDER	0.20	2.50	5327.18	0	00:45	2.50
407543STMH	DIVIDER	0.20	2.50	5329.08	0	00:40	2.50
405659STFT	DIVIDER	0.21	2.50	5329.48	0	00:40	2.50
23840STMH	DIVIDER	0.17	2.83	5333.02	0	00:50	2.83
23841STMH	DIVIDER	0.19	2.83	5333.31	0	00:50	2.83
23839STMH	DIVIDER	0.20	2.79	5336.17	0	02:05	2.79
23845STMH	DIVIDER	0.24	3.50	5338.83	0	00:50	3.50
23856STMH	DIVIDER	0.24	3.50	5342.66	0	00:40	3.50
23855STMH	DIVIDER	0.23	3.50	5343.05	0	00:45	3.50
23862STMH	DIVIDER	0.25	3.50	5345.15	0	00:40	3.50
23861STMH	DIVIDER	0.25	3.50	5345.29	0	00:40	3.50
23868STMH	DIVIDER	0.24	3.50	5346.65	0	00:40	3.50
24791STMH	DIVIDER	0.12	1.25	5338.95	0	00:30	1.25
24800STMH	DIVIDER	0.12	1.25	5342.38	0	00:30	1.25
24788STMH	DIVIDER	0.12	1.25	5342.60	0	00:25	1.25
24796STMH	DIVIDER	0.12	1.25	5343.92	0	00:25	1.25
24797STIL	DIVIDER	0.12	1.25	5345.16	0	00:25	1.25
23849STMH	DIVIDER	0.24	3.50	5341.22	0	00:45	3.50
23852STMH	DIVIDER	0.24	3.50	5339.17	0	00:45	3.50
19150STMH	DIVIDER	0.35	4.50	5323.45	0	00:45	4.50
407546STMH	DIVIDER	0.21	2.50	5330.76	0	00:35	2.50
D_16a	DIVIDER	0.04	2.50	5310.50	0	01:25	2.50
D_16b	DIVIDER	0.17	4.50	5316.50	0	01:10	4.50
J_EC_Colfax_Out	DIVIDER	0.04	0.87	5343.87	0	01:15	0.87
D_AR1	DIVIDER	0.22	6.50	1014.67	0	00:40	6.50
J_AR1_d	DIVIDER	0.22	7.00	1012.40	0	01:00	7.00
J_AR1_b	DIVIDER	0.19	7.00	996.80	0	00:55	7.00

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

D_04b	DIVIDER	0.44	2.93	5443.03	0	00:50	2.93	
D_16b2	DIVIDER	0.03	2.50	5314.50	0	01:20	2.50	
D_10_13_2	DIVIDER	0.21	4.50	5335.50	0	01:00	4.50	
J_15	DIVIDER	0.16	4.50	5327.50	0	01:10	4.50	
D_10_13_3	DIVIDER	0.54	5.50	5336.50	0	01:10	5.50	
E-J-01	DIVIDER	0.08	1.75	5468.75	0	00:30	1.75	
RES30	STORAGE	1.25	8.93	1045.63	0	02:10	8.93	
RES201	STORAGE	506.08	597.62	1628.77	0	11:30	597.62	
RES130	STORAGE	142.95	185.83	1185.84	0	04:50	185.83	
RES156	STORAGE	0.15	2.14	1003.30	0	01:40	2.14	
HavanaPnd	STORAGE	1.20	9.55	5384.97	0	01:50	9.55	
1st/HavanaPnd	STORAGE	7.97	9.66	5445.72	0	03:35	9.66	
ChesapeakePnd	STORAGE	8.76	11.10	5460.50	0	01:25	11.10	

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min		Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent	
EC_Out_23rd	JUNCTION	0.00	657.34	0	01:30	0	27.1	0.000	
EC_Out_19thAv	JUNCTION	0.00	219.34	0	01:05	0	9.42	0.000	
E-J-02	JUNCTION	282.37	282.37	0	00:45	6.72	6.72	0.000	
E-J-03	JUNCTION	174.21	174.21	0	00:45	4.51	4.51	0.000	
E-J-04	JUNCTION	94.44	94.44	0	00:55	3.45	3.45	0.000	
E-J-05	JUNCTION	166.92	166.92	0	00:55	5.74	5.74	0.000	
E-J-06	JUNCTION	177.77	177.77	0	00:50	5.91	5.91	0.000	
E-J-07	JUNCTION	79.51	79.51	0	01:00	3.62	3.62	0.000	
E-J-08	JUNCTION	121.05	121.05	0	00:55	4.29	4.29	0.000	
E-J-09	JUNCTION	144.35	144.35	0	00:50	4.43	4.43	0.000	
E-J-10	JUNCTION	159.62	159.62	0	00:55	5.49	5.49	0.000	
E-J-11	JUNCTION	126.91	126.91	0	01:00	5.75	5.75	0.000	
E-J-12	JUNCTION	138.47	138.47	0	00:45	3.96	3.96	0.000	
E-J-13	JUNCTION	90.47	90.47	0	00:55	3.49	3.49	0.000	
E-J-14	JUNCTION	135.66	135.66	0	00:55	4.88	4.88	0.000	
E-J-15	JUNCTION	152.49	152.49	0	00:50	4.89	4.89	0.000	
E-J-16	JUNCTION	167.14	167.14	0	00:50	4.91	4.91	0.000	
J_01a	JUNCTION	0.00	126.54	0	00:40	0	1.57	0.000	
J_02a	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_03a	JUNCTION	0.00	174.21	0	00:45	0	4.51	0.000	
J_04a	JUNCTION	0.00	63.84	0	01:25	0	6.5	0.000	
J_05_07	JUNCTION	0.00	167.75	0	01:00	0	3.92	0.000	
J_05a	JUNCTION	0.00	166.92	0	00:55	0	5.74	0.000	
J_06a	JUNCTION	0.00	177.77	0	00:50	0	5.91	0.000	
J_07a	JUNCTION	0.00	36.12	0	00:50	0	0.375	0.000	
J_07b	JUNCTION	0.00	146.51	0	01:10	0	3.07	0.000	
J_07c	JUNCTION	0.00	223.88	0	01:10	0	6.69	0.000	
J_08a	JUNCTION	0.00	395.03	0	01:00	0	12.7	0.000	

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J_08b	JUNCTION	0.00	185.36	0	00:45	0	9.22	0.000	
J_09a	JUNCTION	0.00	152.21	0	00:55	0	4.7	0.000	
J_10a	JUNCTION	0.00	225.85	0	01:05	0	7.05	0.000	
J_10b	JUNCTION	0.00	135.06	0	01:50	0	2.71	0.000	
J_10c	JUNCTION	0.00	47.23	0	01:50	0	6.49	0.000	
J_14a	JUNCTION	0.00	264.01	0	01:05	0	12.4	0.000	
J_15a	JUNCTION	0.00	357.54	0	00:50	0	16	0.000	
J_17thAv_Out	JUNCTION	0.00	174.25	0	01:30	0	14.3	0.000	
J_7b	JUNCTION	273.66	273.66	0	00:50	8.45	8.45	0.000	
J_AD1	JUNCTION	37.54	37.54	0	00:50	1.27	1.27	0.000	
J_AD3	JUNCTION	26.69	26.69	0	00:45	0.793	0.793	0.000	
J_AD4	JUNCTION	31.70	31.70	0	00:45	0.818	0.818	0.000	
J_AD7	JUNCTION	53.99	53.99	0	00:45	1.33	1.33	0.000	
J_AR1_a	JUNCTION	0.00	0.00	0	00:00	0	0	0.000	gal
J_AR2	JUNCTION	266.74	266.74	0	01:05	12.6	12.6	0.000	
J_DE1	JUNCTION	402.94	402.94	0	00:55	14.8	14.8	0.000	
J_DE2	JUNCTION	104.26	104.26	0	00:50	3.19	3.19	0.000	
J_DE3	JUNCTION	50.78	50.78	0	01:00	2.22	2.22	0.000	
J_DE4	JUNCTION	54.00	54.00	0	01:00	2.5	2.5	0.000	
J_DE5	JUNCTION	96.31	96.31	0	01:00	4.09	4.09	0.000	
J_DE6	JUNCTION	168.67	168.67	0	00:55	5.8	5.8	0.000	
J_L1	JUNCTION	48.73	48.73	0	00:40	1.04	1.04	0.000	
J_L2	JUNCTION	19.46	19.46	0	00:55	0.756	0.756	0.000	
J_ST1	JUNCTION	46.16	46.16	0	01:15	3.5	3.5	0.000	
J_ST2	JUNCTION	133.26	133.26	0	00:55	5.3	5.3	0.000	
J_ST3	JUNCTION	106.52	106.52	0	01:05	5.07	5.07	0.000	
J_ST4	JUNCTION	376.84	376.84	0	00:50	10.9	10.9	0.000	
J_ST5	JUNCTION	339.33	339.33	0	01:05	15	15	0.000	
J_ST6	JUNCTION	100.24	100.24	0	01:00	4.59	4.59	0.000	
J_ST7	JUNCTION	346.72	346.72	0	00:50	10.7	10.7	0.000	
J_ST8	JUNCTION	69.95	69.95	0	00:55	2.52	2.52	0.000	
J_ST9	JUNCTION	131.69	131.69	0	00:50	3.99	3.99	0.000	
23843STMH	JUNCTION	0.00	54.43	0	02:05	0	3.24	0.000	
773412STMH	JUNCTION	0.00	105.15	0	00:50	0	3.21	0.000	
J100	JUNCTION	653.61	653.61	0	01:00	26	26	0.000	
J101	JUNCTION	0.00	1413.47	0	01:00	0	112	0.000	
J102	JUNCTION	0.00	1506.73	0	01:00	0	115	0.000	
J104	JUNCTION	0.00	256.98	0	01:05	0	92.6	0.000	
J106	JUNCTION	0.00	103.63	0	00:55	0	3.49	0.000	
J107	JUNCTION	0.00	94.72	0	01:05	0	3.01	0.000	
J-10a1	JUNCTION	0.00	226.81	0	01:00	0	4.34	0.000	
J111	JUNCTION	26.68	26.68	0	00:50	0.871	0.871	0.000	
J113	JUNCTION	0.00	28.25	0	00:45	0	0.672	0.000	
J11th	JUNCTION	0.00	421.00	0	01:00	0	98.5	0.000	
J121	JUNCTION	28.20	28.20	0	00:45	0.672	0.672	0.000	
J122	JUNCTION	44.97	44.97	0	00:50	1.48	1.48	0.000	
J124	JUNCTION	0.00	72.89	0	00:50	0	2.16	0.000	
J126	JUNCTION	0.00	74.08	0	00:50	0	2.17	0.000	
J128	JUNCTION	0.00	83.53	0	00:50	0	2.52	0.000	
J12th	JUNCTION	0.00	420.42	0	01:05	0	98.2	0.000	
J131	JUNCTION	11.83	11.83	0	01:00	0.567	0.567	0.000	
J132	JUNCTION	54.51	54.51	0	00:45	1.55	1.55	0.000	
J133	JUNCTION	42.82	42.82	0	00:45	1.03	1.03	0.000	

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J134	JUNCTION	15.37	15.37	0	00:45	0.44	0.44	0.000
J14	JUNCTION	92.70	92.70	0	00:45	2.64	2.64	0.000
J140	JUNCTION	17.33	17.33	0	00:45	0.509	0.509	0.000
J141	JUNCTION	0.00	16.00	0	00:40	0	0.502	0.000
J150	JUNCTION	0.00	707.56	0	01:10	0	77.2	0.000
J151	JUNCTION	0.00	1264.08	0	01:05	0	107	0.000
J154	JUNCTION	9.24	9.24	0	00:50	0.351	0.351	0.000
J155	JUNCTION	10.51	10.51	0	00:45	0.318	0.318	0.000
J157	JUNCTION	0.00	16.00	0	01:15	0	1.32	0.000
J159	JUNCTION	0.00	256.98	0	01:05	0	92.7	0.000
J160	JUNCTION	0.00	1506.73	0	01:00	0	115	0.000
J161	JUNCTION	0.00	106.28	0	00:45	0	3.15	0.000
J163	JUNCTION	0.00	118.30	0	00:55	0	3.6	0.000
J165	JUNCTION	0.00	1264.08	0	01:05	0	107	0.000
J166	JUNCTION	0.00	18.30	0	00:55	0	0.147	0.000
J167	JUNCTION	0.00	1.33	0	00:45	0	0.00698	0.000
J168	JUNCTION	0.00	5.53	0	00:50	0	0.0217	0.000
J169	JUNCTION	0.00	103.63	0	00:55	0	3.49	0.000
J16th-us	JUNCTION	0.00	1279.69	0	01:10	0	125	0.000
J170	JUNCTION	0.00	94.72	0	01:05	0	3.01	0.000
J171	JUNCTION	0.00	1413.47	0	01:00	0	112	0.000
J17th	JUNCTION	0.00	1735.72	0	01:20	0	155	0.000
J19th-ds	JUNCTION	0.00	1962.57	0	01:20	0	165	0.000
J19th-us	JUNCTION	0.00	1752.94	0	01:20	0	155	0.000
J200	JUNCTION	3280.00	3280.00	0	01:05	208	208	0.000
J202	JUNCTION	0.00	49.50	0	11:30	0	44.8	0.000
J203	JUNCTION	0.00	49.50	0	11:30	0	44.7	0.000
J204	JUNCTION	0.00	49.50	0	11:30	0	44.7	0.000
J230	JUNCTION	0.00	162.68	0	00:45	0	7.85	0.000
J231	JUNCTION	45.00	45.00	0	00:45	1.18	1.18	0.000
J232	JUNCTION	81.20	81.20	0	00:50	2.63	2.63	0.000
J233	JUNCTION	34.75	34.75	0	00:45	1.12	1.12	0.000
J234	JUNCTION	33.30	33.30	0	00:40	0.839	0.839	0.000
J235	JUNCTION	0.00	201.35	0	00:45	0	8.99	0.000
J23rd	JUNCTION	0.00	3086.86	0	01:25	0	211	0.000
J24	JUNCTION	112.76	112.76	0	00:40	2.35	2.35	0.000
J242	JUNCTION	0.00	186.10	0	00:45	0	4.98	0.000
J245	JUNCTION	0.00	223.04	0	00:45	0	5.94	0.000
J247	JUNCTION	0.00	221.70	0	00:45	0	5.94	0.000
J248	JUNCTION	0.00	221.70	0	00:45	0	5.94	0.000
J25	JUNCTION	0.00	223.30	0	00:45	0	5.94	0.000
J251	JUNCTION	33.29	33.29	0	00:50	1.17	1.17	0.000
J252	JUNCTION	38.36	38.36	0	00:45	0.964	0.964	0.000
J253	JUNCTION	0.00	221.61	0	00:45	0	5.94	0.000
J254	JUNCTION	0.00	221.61	0	00:45	0	5.94	0.000
J26th	JUNCTION	0.00	3481.20	0	01:25	0	229	0.000
J29th	JUNCTION	0.00	3748.69	0	01:30	0	244	0.000
J31	JUNCTION	95.10	95.10	0	00:45	2.3	2.3	0.000
J311	JUNCTION	15.90	15.90	0	00:50	0.568	0.568	0.000
J314	JUNCTION	0.00	95.10	0	00:45	0	2.3	0.000
J315	JUNCTION	0.00	19.63	0	02:10	0	3.85	0.000
J32	JUNCTION	137.69	137.69	0	00:50	4.71	4.71	0.000
J33	JUNCTION	96.15	96.15	0	00:55	3.72	3.72	0.000

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J33rd	JUNCTION	0.00	4077.56	0	01:30	0	262	0.000
J34	JUNCTION	40.61	40.61	0	01:10	2.22	2.22	0.000
J341	JUNCTION	0.00	233.67	0	00:55	0	8.43	0.000
J343	JUNCTION	0.00	310.93	0	01:05	0	12.4	0.000
J345	JUNCTION	0.00	473.13	0	01:10	0	65.3	0.000
J346	JUNCTION	0.00	473.13	0	01:10	0	65.3	0.000
J347	JUNCTION	0.00	472.69	0	01:15	0	65.2	0.000
J348	JUNCTION	0.00	472.69	0	01:15	0	65.2	0.000
J35	JUNCTION	47.49	47.49	0	00:40	0.981	0.981	0.000
J350	JUNCTION	0.00	19.63	0	02:15	0	3.85	0.000
J351	JUNCTION	0.00	19.63	0	02:10	0	3.85	0.000
J352	JUNCTION	0.00	83.16	0	00:45	0	5.55	0.000
J353	JUNCTION	0.00	75.49	0	00:50	0	2.56	0.000
J354	JUNCTION	0.00	9.65	0	01:05	0	0.511	0.000
J355	JUNCTION	0.00	153.37	0	00:45	0	3.86	0.000
J36	JUNCTION	0.00	117.46	0	00:45	0	6.67	0.000
J361	JUNCTION	79.36	79.36	0	00:40	1.71	1.71	0.000
J362	JUNCTION	40.40	40.40	0	00:45	1.14	1.14	0.000
J37	JUNCTION	21.75	21.75	0	00:40	0.529	0.529	0.000
J371	JUNCTION	40.41	40.41	0	00:45	1.15	1.15	0.000
J372	JUNCTION	0.00	222.45	0	00:50	0	9.51	0.000
J374	JUNCTION	0.00	270.86	0	00:50	0	10.8	0.000
J38	JUNCTION	51.66	51.66	0	01:05	2.68	2.68	0.000
J390	JUNCTION	0.00	48.42	0	00:45	0	1.34	0.000
J391	JUNCTION	15.28	15.28	0	00:50	0.497	0.497	0.000
J392	JUNCTION	53.38	53.38	0	00:45	1.32	1.32	0.000
J393	JUNCTION	32.74	32.74	0	00:40	0.712	0.712	0.000
J394	JUNCTION	0.00	48.42	0	00:45	0	1.34	0.000
J41	JUNCTION	39.63	39.63	0	00:55	1.74	1.74	0.000
J42	JUNCTION	48.44	48.44	0	01:15	3.59	3.59	0.000
J43	JUNCTION	75.49	75.49	0	00:50	2.56	2.56	0.000
J44	JUNCTION	9.65	9.65	0	01:05	0.511	0.511	0.000
J51	JUNCTION	32.01	32.01	0	00:45	0.871	0.871	0.000
J52	JUNCTION	29.96	29.96	0	00:40	0.655	0.655	0.000
J53	JUNCTION	41.33	41.33	0	00:40	0.794	0.794	0.000
J54	JUNCTION	91.20	91.20	0	00:40	1.57	1.57	0.000
J56	JUNCTION	0.00	32.01	0	00:45	0	0.871	0.000
J61	JUNCTION	186.58	426.88	0	00:55	3.63	10.3	0.000
J62	JUNCTION	101.83	101.83	0	00:40	1.97	1.97	0.000
J63	JUNCTION	88.36	88.36	0	00:45	2.63	2.63	0.000
J64	JUNCTION	87.65	87.65	0	00:40	1.77	1.77	0.000
J65	JUNCTION	0.00	175.98	0	01:00	0	6.59	0.000
J67	JUNCTION	0.00	499.36	0	00:55	0	12.3	0.000
J68	JUNCTION	0.00	123.91	0	01:00	0	4.77	0.000
J6th_Pipe	JUNCTION	0.00	239.68	0	02:05	0	17.7	0.000
J74	JUNCTION	0.00	495.11	0	01:00	0	12.3	0.000
J7b	JUNCTION	0.00	508.50	0	00:50	0	23.4	0.000
JL2	JUNCTION	0.00	290.15	0	01:00	0	6.69	0.000
JMLK	JUNCTION	0.00	4032.97	0	01:30	0	259	0.000
JMontview-ds	JUNCTION	0.00	2381.22	0	01:20	0	181	0.000
JMontview-us	JUNCTION	0.00	1988.41	0	01:20	0	166	0.000
J_16thAve_E	JUNCTION	0.00	339.48	0	01:25	0	14.2	0.000
J_HP-OUT	JUNCTION	0.00	47.93	0	01:50	0	6.51	0.000

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J_15b	JUNCTION	0.00	482.43	0	01:25	0	21.2	0.000	
JSandCreek	OUTFALL	0.00	4159.05	0	01:35	0	267	0.000	
ChesapeakeHLC	OUTFALL	0.00	142.13	0	01:25	0	2.05	0.000	
DIV344	DIVIDER	0.00	310.93	0	01:05	0	12.4	0.000	
DIV342	DIVIDER	0.00	233.67	0	00:55	0	8.43	0.000	
DIV135	DIVIDER	0.00	11.83	0	01:00	0	0.567	0.000	
DIV389	DIVIDER	0.00	17.61	0	01:40	0	1.36	0.000	
DIV397	DIVIDER	0.00	118.30	0	00:55	0	3.6	0.000	
DIV105	DIVIDER	0.00	239.68	0	02:05	0	17.7	0.000	
DIV376	DIVIDER	0.00	707.56	0	01:10	0	77.2	0.000	
DIV70	DIVIDER	0.00	499.36	0	00:55	0	12.3	0.000	
DIV395	DIVIDER	0.00	83.53	0	00:50	0	2.52	0.000	
DIV1	DIVIDER	0.00	31.66	0	00:50	0	0.871	0.000	
DIV164	DIVIDER	0.00	100.00	0	00:45	0	3.45	0.000	
DIV125	DIVIDER	0.00	72.89	0	00:50	0	2.16	0.000	
DIV316	DIVIDER	0.00	19.63	0	02:15	0	3.85	0.000	
DIV396	DIVIDER	0.00	17.33	0	00:45	0	0.509	0.000	
DIV71	DIVIDER	0.00	426.88	0	00:55	0	10.3	0.000	
DIV399	DIVIDER	0.00	508.50	0	00:50	0	23.4	0.000	
DIV162	DIVIDER	0.00	106.28	0	00:45	0	3.15	0.000	
DIV136	DIVIDER	0.00	54.51	0	00:45	0	1.55	0.000	
DIV123	DIVIDER	0.00	28.25	0	00:45	0	0.672	0.000	
J13th-DIV	DIVIDER	0.00	473.59	0	01:05	0	101	0.000	
J14th-DIV	DIVIDER	0.00	638.41	0	01:10	0	105	0.000	
JColfax-DIV	DIVIDER	0.00	1149.86	0	01:10	0	120	0.000	
J16th-DIV	DIVIDER	0.00	1559.52	0	01:15	0	139	0.000	
D_02a	DIVIDER	0.00	0.00	0	00:00	0	0	0.000	gal
D_03b	DIVIDER	0.00	46.48	0	00:50	0	0.479	0.000	
D_05-07	DIVIDER	0.00	270.07	0	01:00	0	7.17	0.000	
D_05a	DIVIDER	0.00	63.84	0	01:25	0	6.5	0.000	
D_05b	DIVIDER	0.00	227.97	0	00:50	0	12.2	0.000	
D_05c	DIVIDER	0.00	295.74	0	00:55	0	7.94	0.000	
D_05d	DIVIDER	0.00	385.20	0	00:55	0	17.9	0.000	
D_06a	DIVIDER	0.00	177.77	0	00:50	0	5.91	0.000	
D_06b	DIVIDER	0.00	111.48	0	00:50	0	2.32	0.000	
D_07a	DIVIDER	0.00	162.93	0	01:05	0	3.93	0.000	
D_08a	DIVIDER	0.00	152.21	0	00:55	0	4.7	0.000	
D_08b	DIVIDER	0.00	411.62	0	01:00	0	13.6	0.000	
D_10a	DIVIDER	0.00	483.50	0	01:10	0	20.2	0.000	
D_10a1	DIVIDER	0.00	226.81	0	01:00	0	4.34	0.000	
D_10b	DIVIDER	0.00	479.83	0	01:15	0	20.3	0.000	
D_10c	DIVIDER	0.00	128.31	0	01:05	0	2.91	0.000	
D_10d	DIVIDER	0.00	590.87	0	01:15	0	18.1	0.000	
D_11a	DIVIDER	0.00	126.91	0	01:00	0	5.75	0.000	
D_12a	DIVIDER	0.00	242.56	0	01:00	0	9.76	0.000	
D_13a	DIVIDER	0.00	555.16	0	01:20	0	24.4	0.000	
D_14a	DIVIDER	0.00	264.01	0	01:05	0	12.4	0.000	
D_15a	DIVIDER	0.00	200.00	0	01:55	0	11.1	0.000	
D_03a	DIVIDER	0.00	274.41	0	00:50	0	15.3	0.000	
D_12_14	DIVIDER	0.00	45.62	0	01:05	0	0.9	0.000	
D_10_13	DIVIDER	0.00	421.68	0	01:20	0	11.4	0.000	
J72	DIVIDER	0.00	610.20	0	01:00	0	16	0.000	
J120	DIVIDER	0.00	28.20	0	00:45	0	0.672	0.000	

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

J127	DIVIDER	0.00	74.08	0	00:50	0	2.17	0.000
J129	DIVIDER	0.00	78.00	0	00:50	0	2.5	0.000
J158	DIVIDER	0.00	1.61	0	01:40	0	0.0328	0.000
J73	DIVIDER	0.00	123.91	0	01:00	0	4.77	0.000
J236	DIVIDER	0.00	33.30	0	00:40	0	0.839	0.000
J244	DIVIDER	0.00	223.30	0	00:45	0	5.94	0.000
J241	DIVIDER	0.00	81.20	0	00:50	0	2.63	0.000
J243	DIVIDER	0.00	186.10	0	00:45	0	4.98	0.000
J246	DIVIDER	0.00	223.04	0	00:45	0	5.94	-0.000
J375	DIVIDER	0.00	270.86	0	00:50	0	10.8	0.000
J330	DIVIDER	0.00	96.15	0	00:55	0	3.72	0.000
J320	DIVIDER	0.00	201.35	0	00:45	0	8.99	0.000
J319	DIVIDER	0.00	162.68	0	00:45	0	7.85	0.000
J321	DIVIDER	0.00	137.69	0	00:50	0	4.71	0.000
J373	DIVIDER	0.00	222.45	0	00:50	0	9.51	0.000
J57	DIVIDER	0.00	91.20	0	00:40	0	1.57	0.000
J250	DIVIDER	0.00	33.29	0	00:50	0	1.17	0.000
J317	DIVIDER	0.00	83.16	0	00:45	0	5.55	0.000
J318	DIVIDER	0.00	117.46	0	00:45	0	6.67	0.000
J322	DIVIDER	0.00	34.75	0	00:45	0	1.12	0.000
J363	DIVIDER	0.00	40.40	0	00:45	0	1.14	0.000
D_AR2_a	DIVIDER	0.00	339.40	0	01:20	0	14.2	-0.000
DIV72	DIVIDER	0.00	546.57	0	01:00	0	12.4	0.000
D_04a	DIVIDER	0.00	120.65	0	00:45	0	4.15	0.000
D_AR2_b	DIVIDER	0.00	266.36	0	01:10	0	12.6	0.000
D_AR2_c	DIVIDER	0.00	266.74	0	01:05	0	12.6	0.000
19071STMH	DIVIDER	0.00	395.30	0	01:15	0	15	0.000
19079STMH	DIVIDER	0.00	395.12	0	01:15	0	15	0.000
19097STMH	DIVIDER	0.00	397.17	0	01:15	0	15	0.000
19111STMH	DIVIDER	0.00	397.34	0	01:10	0	14.9	0.000
19139STMH	DIVIDER	0.00	396.54	0	01:10	0	14.9	0.000
19132STMH	DIVIDER	0.00	399.82	0	01:10	0	14.9	0.000
19134STMH	DIVIDER	0.00	398.61	0	01:10	0	14.9	0.000
19143STMH	DIVIDER	0.00	398.50	0	01:10	0	14.9	0.000
19154STMH	DIVIDER	0.00	397.47	0	01:05	0	14.9	0.000
19162STMH	DIVIDER	0.00	399.11	0	01:05	0	14.9	0.000
19171STMH	DIVIDER	0.00	83.21	0	02:45	0	5.8	0.000
19179STMH	DIVIDER	0.00	85.06	0	02:40	0	5.8	0.000
19214STMH	DIVIDER	0.00	85.06	0	02:40	0	5.8	0.000
20135STMH	DIVIDER	0.00	403.23	0	01:00	0	14.8	0.000
20209STFT	DIVIDER	0.00	403.20	0	01:00	0	14.8	0.000
20818STMH	DIVIDER	0.00	402.32	0	00:55	0	14.8	0.000
20841STMH	DIVIDER	0.00	402.94	0	00:55	0	14.8	0.000
773410STMH	DIVIDER	0.00	105.67	0	00:50	0	3.21	0.000
773392STMH	DIVIDER	0.00	104.34	0	00:50	0	3.2	0.000
773389STMH	DIVIDER	0.00	103.82	0	00:50	0	3.2	0.000
773052STMH	DIVIDER	0.00	103.50	0	00:50	0	3.2	0.000
773050STMH	DIVIDER	0.00	104.21	0	00:50	0	3.19	0.000
773032STMH	DIVIDER	0.00	104.26	0	00:50	0	3.19	0.000
407544STMH	DIVIDER	0.00	98.31	0	01:05	0	3.43	0.000
407542STMH	DIVIDER	0.00	98.99	0	01:05	0	3.43	0.000
407541STMH	DIVIDER	0.00	98.85	0	01:05	0	3.43	0.000
407540STMH	DIVIDER	0.00	98.45	0	01:05	0	3.42	0.000

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

405658STFT	DIVIDER	0.00	98.17	0	01:05	0	3.42	0.000
407543STMH	DIVIDER	0.00	96.77	0	01:05	0	3.41	0.000
405659STFT	DIVIDER	0.00	96.80	0	01:05	0	3.4	0.000
23840STMH	DIVIDER	0.00	54.51	0	02:05	0	3.24	0.000
23841STMH	DIVIDER	0.00	54.95	0	02:05	0	3.24	0.000
23839STMH	DIVIDER	0.00	55.31	0	02:05	0	3.24	0.000
23845STMH	DIVIDER	0.00	55.80	0	02:05	0	3.24	0.000
23856STMH	DIVIDER	0.00	96.13	0	01:00	0	4.11	0.000
23855STMH	DIVIDER	0.00	96.25	0	01:00	0	4.11	0.000
23862STMH	DIVIDER	0.00	96.39	0	01:00	0	4.1	0.000
23861STMH	DIVIDER	0.00	96.45	0	01:00	0	4.1	0.000
23868STMH	DIVIDER	0.00	96.31	0	01:00	0	4.09	0.000
24791STMH	DIVIDER	0.00	168.39	0	00:55	0	5.81	0.000
24800STMH	DIVIDER	0.00	168.58	0	00:55	0	5.8	0.000
24788STMH	DIVIDER	0.00	168.78	0	00:55	0	5.8	0.000
24796STMH	DIVIDER	0.00	169.13	0	00:55	0	5.8	0.000
24797STIL	DIVIDER	0.00	168.67	0	00:55	0	5.8	0.000
23849STMH	DIVIDER	0.00	96.04	0	01:05	0	4.12	0.000
23852STMH	DIVIDER	0.00	95.98	0	01:05	0	4.12	0.000
19150STMH	DIVIDER	0.00	396.71	0	01:10	0	14.9	0.000
407546STMH	DIVIDER	0.00	98.42	0	01:00	0	3.4	0.000
D_16a	DIVIDER	0.00	111.14	0	01:30	0	1.04	0.000
D_16b	DIVIDER	0.00	300.59	0	01:30	0	6.24	0.000
J_EC_Colfax_Out	DIVIDER	0.00	138.40	0	01:15	0	3.74	0.000
D_AR1	DIVIDER	0.00	485.11	0	01:00	0	11.2	0.000
J_AR1_d	DIVIDER	0.00	484.54	0	01:00	0	11.3	0.000
J_AR1_b	DIVIDER	0.00	482.67	0	01:05	0	11.3	0.000
D_04b	DIVIDER	0.00	210.57	0	00:50	0	7.59	0.000
D_16b2	DIVIDER	0.00	115.59	0	01:30	0	1.02	0.000
D_10_13_2	DIVIDER	0.00	387.95	0	01:20	0	10.5	0.000
J_15	DIVIDER	0.00	307.89	0	01:25	0	6.17	0.000
D_10_13_3	DIVIDER	0.00	170.02	0	01:20	0	14.2	0.000
E-J-01	DIVIDER	174.54	174.54	0	00:40	3.35	3.35	0.000
RES30	STORAGE	0.00	153.37	0	00:45	0	3.86	0.064
RES201	STORAGE	0.00	3280.00	0	01:05	0	208	-0.000
RES130	STORAGE	0.00	1589.62	0	01:00	0	118	0.000
RES156	STORAGE	0.00	59.89	0	00:55	0	1.36	0.164
HavanaPnd	STORAGE	0.00	185.36	0	00:45	0	9.22	0.004
1st/HavanaPnd	STORAGE	0.00	150.57	0	00:50	0	4.52	0.026
ChesapeakePnd	STORAGE	0.00	330.59	0	00:45	0	8.5	0.115

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Volume 1000 ft3
J_HP-OUT	1.58	1.78	0 01:55	0.046	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
RES30	54.344	0	0	0	388.954	1	0 02:10	19.63
RES201	22044.761	0	0	0	26032.459	0	0 11:30	49.50
RES130	6227.056	0	0	0	8094.851	0	0 04:45	95.28
RES156	6.503	0	0	0	93.165	0	0 01:40	17.61
HavanaPnd	49.043	5	0	0	528.646	58	0 01:50	182.99
1st/HavanaPnd	270.922	14	0	0	396.681	21	0 03:30	4.82
ChesapeakePnd	607.539	29	0	0	850.082	41	0 01:25	149.47

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
JSandCreek	99.31	277.75	4159.05	267.288
ChesapeakeHLC	4.40	48.03	142.13	2.048
System	51.85	325.78	4273.77	269.336

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
C_03a	CONDUIT	236.04	0 01:15	11.18	1.04	0.92

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

C_05a	CONDUIT	63.75	0	01:25	10.65	0.79	0.67
C_05b	CONDUIT	99.47	0	01:50	6.94	1.03	1.00
C_05c	CONDUIT	95.05	0	02:25	6.66	1.06	1.00
C_06a	CONDUIT	67.98	0	02:00	6.36	1.03	1.00
C_07a	CONDUIT	17.40	0	02:25	5.05	1.05	1.00
C_08a	CONDUIT	99.89	0	01:20	9.35	1.02	0.92
C_08b	CONDUIT	185.36	0	00:45	31.25	0.46	0.48
C_10a	CONDUIT	47.27	0	01:45	10.96	0.43	0.46
C_10b	CONDUIT	33.56	0	05:35	4.11	1.07	1.00
C_10c	CONDUIT	93.94	0	01:00	8.57	1.06	1.00
C_11a	CONDUIT	93.09	0	00:50	8.39	1.04	1.00
C_13a	CONDUIT	136.70	0	00:55	9.75	1.03	0.99
C_14a	CONDUIT	120.52	0	02:00	8.61	1.06	1.00
C_15a	CONDUIT	200.00	0	01:55	9.58	1.04	1.00
C_15b	CONDUIT	205.05	0	00:50	9.89	0.27	0.32
C_16a	CONDUIT	167.21	0	00:50	16.34	0.01	0.09
C_16thAv	CONDUIT	339.48	0	01:25	9.22	0.61	0.56
C_JL2	DUMMY	290.15	0	01:00			
C1	DUMMY	31.66	0	00:50			
C101	DUMMY	1413.47	0	01:00			
C102	DUMMY	1506.73	0	01:00			
C104	DUMMY	256.98	0	01:05			
C105	CONDUIT	245.47	0	00:45	5.19	0.13	0.36
C105-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C106	DUMMY	103.63	0	00:55			
C107	DUMMY	94.72	0	01:05			
C111	DUMMY	26.68	0	00:50			
C113	DUMMY	28.25	0	00:45			
C120	CONDUIT	28.25	0	00:45	5.19	0.88	0.72
C120_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C121	DUMMY	28.20	0	00:45			
C122	DUMMY	44.97	0	00:50			
C123	CONDUIT	28.18	0	00:45	5.25	0.58	0.55
C123-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C124	DUMMY	72.89	0	00:50			
C125	CONDUIT	44.13	0	01:25	5.30	1.01	1.00
C125-OVER	CONDUIT	29.79	0	00:50	2.26	0.00	0.07
C126	DUMMY	74.08	0	00:50			
C127	CONDUIT	74.29	0	00:50	6.62	0.78	0.66
C127_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C128	DUMMY	83.53	0	00:50			
C129	CONDUIT	73.77	0	01:05	6.39	1.06	1.00
C129_Overflow	CONDUIT	8.59	0	00:55	3.04	0.00	0.05
C12th	CONDUIT	420.42	0	01:05	4.81	0.07	0.26
C131	DUMMY	11.83	0	01:00			
C132	DUMMY	54.51	0	00:45			
C133	DUMMY	42.82	0	00:45			
C134	DUMMY	15.37	0	00:45			
C135	CONDUIT	10.22	0	01:30	3.68	1.04	1.00
C135-OVER	CONDUIT	1.94	0	01:10	2.25	0.00	0.05
C136	CONDUIT	54.26	0	00:50	6.14	0.78	0.66
C136-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C13th	CONDUIT	420.34	0	01:05	4.62	0.10	0.31

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

C14	DUMMY	92.70	0	00:45			
C140	DUMMY	17.33	0	00:45			
C141	CONDUIT	16.22	0	00:45	4.59	0.50	0.50
C14th	CONDUIT	473.00	0	01:05	8.36	0.53	0.52
C14th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C150	DUMMY	707.56	0	01:10			
C151	DUMMY	1264.08	0	01:05			
C154	DUMMY	9.24	0	00:50			
C155	DUMMY	10.51	0	00:45			
C157	CONDUIT	16.01	0	01:15	4.49	0.23	0.33
C158	CONDUIT	1.61	0	01:40	2.61	0.02	0.10
C158_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C159	DUMMY	256.98	0	01:05			
C160	DUMMY	1506.73	0	01:00			
C161	DUMMY	106.28	0	00:45			
C162	CONDUIT	72.18	0	01:20	6.52	1.04	1.00
C162-OVER	CONDUIT	34.36	0	00:55	5.27	0.00	0.10
C163	DUMMY	118.30	0	00:55			
C164	CONDUIT	98.76	0	00:55	6.87	1.04	0.99
C164-OVER	CONDUIT	4.86	0	00:55	2.33	0.00	0.04
C165	CONDUIT	1263.18	0	01:05	7.27	0.24	0.55
C166	CONDUIT	19.38	0	00:55	1.34	0.00	0.03
C167	CONDUIT	1.00	0	00:55	0.81	0.00	0.00
C168	CONDUIT	4.37	0	00:55	1.02	0.00	0.01
C169	CONDUIT	103.22	0	00:55	2.44	0.01	0.07
C16th	CONDUIT	1151.85	0	01:10	7.36	0.76	0.89
C16th2	DUMMY	1279.69	0	01:10			
C16th-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C170	CONDUIT	94.33	0	01:05	2.37	0.01	0.06
C171	CONDUIT	1412.79	0	01:00	7.48	0.27	0.57
C17th	CONDUIT	991.88	0	01:45	10.14	1.12	1.00
C17th-OVER	CONDUIT	665.29	0	01:20	4.98	0.04	0.27
C19th	CONDUIT	1735.52	0	01:20	5.55	0.32	0.61
C19th2	DUMMY	1752.94	0	01:20			
C1-DIV	DUMMY	0.00	0	00:00			
C20	DUMMY	239.68	0	02:05			
C200	DUMMY	3280.00	0	01:05			
C202	CONDUIT	49.50	0	11:30	7.72	0.51	0.51
C203	DUMMY	49.50	0	11:30			
C204	CONDUIT	49.50	0	11:35	2.56	0.01	0.08
C230	DUMMY	162.68	0	00:45			
C231	DUMMY	45.00	0	00:45			
C232	DUMMY	81.20	0	00:50			
C233	DUMMY	34.75	0	00:45			
C234	DUMMY	33.30	0	00:40			
C235	DUMMY	201.35	0	00:45			
C236	CONDUIT	33.42	0	00:45	6.12	0.88	0.72
C236_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C23rd	CONDUIT	2371.14	0	01:25	6.09	0.19	0.52
C24	DUMMY	112.76	0	00:40			
C241	CONDUIT	81.30	0	00:50	5.25	0.71	0.62
C241_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C242	DUMMY	186.10	0	00:45			

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

C243	CONDUIT	184.95	0	00:45	8.06	0.71	0.62
C243_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C244	CONDUIT	223.04	0	00:45	8.75	0.80	0.68
C244_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C245	DUMMY	223.04	0	00:45			
C246	CONDUIT	221.70	0	00:45	6.64	0.73	0.63
C246_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C247	DUMMY	221.70	0	00:45			
C248	CONDUIT	221.61	0	00:45	14.61	0.25	0.34
C25	DUMMY	223.30	0	00:45			
C250	CONDUIT	33.16	0	00:55	5.04	0.53	0.52
C250_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C251	DUMMY	33.29	0	00:50			
C252	DUMMY	38.36	0	00:45			
C253	DUMMY	221.61	0	00:45			
C254	CONDUIT	223.69	0	00:50	4.12	0.37	0.63
C26th	CONDUIT	3074.61	0	01:30	4.84	0.22	0.55
C29th	CONDUIT	3468.61	0	01:30	5.46	0.20	0.53
C31	DUMMY	95.10	0	00:45			
C311	DUMMY	15.90	0	00:50			
C314	CONDUIT	93.61	0	00:45	2.90	0.28	0.58
C315	CONDUIT	19.63	0	02:15	4.38	0.32	0.39
C316	CONDUIT	19.63	0	02:15	4.31	0.17	0.28
C316-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C317	CONDUIT	83.29	0	00:45	8.47	0.50	0.50
C318	CONDUIT	117.69	0	00:45	6.35	0.53	0.52
C319	CONDUIT	161.35	0	00:50	6.87	0.63	0.58
C319_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C32	DUMMY	137.69	0	00:50			
C320	CONDUIT	202.39	0	00:50	7.88	0.70	0.62
C320_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C321	CONDUIT	137.95	0	00:55	6.69	0.53	0.52
C321_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322	CONDUIT	34.85	0	00:50	4.58	0.47	0.48
C33	DUMMY	96.15	0	00:55			
C330	CONDUIT	95.72	0	00:55	5.84	0.76	0.65
C330_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C34	DUMMY	40.61	0	01:10			
C341	DUMMY	233.67	0	00:55			
C342	CONDUIT	129.50	0	01:50	7.79	1.03	1.00
C342-OVER	CONDUIT	98.96	0	01:05	5.84	0.01	0.15
C343	DUMMY	310.93	0	01:05			
C344	CONDUIT	213.26	0	01:50	8.61	1.04	1.00
C344-OVER	CONDUIT	103.46	0	01:10	4.10	0.01	0.13
C345	DUMMY	473.13	0	01:10			
C346	CONDUIT	472.69	0	01:15	4.29	0.22	0.52
C347	DUMMY	472.69	0	01:15			
C348	CONDUIT	470.58	0	01:20	3.89	0.19	0.44
C35	DUMMY	47.49	0	00:40			
C350	DUMMY	19.63	0	02:15			
C351	DUMMY	19.63	0	02:10			
C352	DUMMY	83.16	0	00:45			
C353	CONDUIT	73.78	0	01:00	2.67	0.11	0.36

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

C354	CONDUIT	9.61	0	01:10	3.27	0.18	0.29
C355	DUMMY	153.37	0	00:45			
C36	DUMMY	117.46	0	00:45			
C361	DUMMY	79.36	0	00:40			
C362	DUMMY	40.40	0	00:45			
C363	CONDUIT	40.14	0	00:50	4.76	0.54	0.52
C37	DUMMY	21.75	0	00:40			
C371	DUMMY	40.41	0	00:45			
C372	DUMMY	222.45	0	00:50			
C373	CONDUIT	223.64	0	00:50	8.12	0.51	0.51
C373_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C374	DUMMY	270.86	0	00:50			
C375	CONDUIT	271.35	0	00:50	8.49	0.62	0.57
C375_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C376	CONDUIT	66.84	0	06:50	5.73	1.08	1.00
C376-OVER	CONDUIT	642.91	0	01:15	4.20	0.14	0.39
C38	DUMMY	51.66	0	01:05			
C389	DUMMY	16.00	0	01:15			
C389-DIV	DUMMY	1.61	0	01:40			
C390	DUMMY	48.42	0	00:45			
C391	DUMMY	15.28	0	00:50			
C392	DUMMY	53.38	0	00:45			
C393	DUMMY	32.74	0	00:40			
C394	CONDUIT	48.42	0	00:45	5.31	0.11	0.23
C395	DUMMY	78.00	0	00:50			
C395-DIV	DUMMY	5.53	0	00:50			
C396	DUMMY	16.00	0	00:40			
C396-DIV	DUMMY	1.33	0	00:45			
C397	DUMMY	100.00	0	00:45			
C397-DIV	DUMMY	18.30	0	00:55			
C399	CONDUIT	239.68	0	02:05	10.00	1.03	1.00
C399-DIV	CHANNEL	271.20	0	01:00	7.86	0.02	0.13
C41	DUMMY	39.63	0	00:55			
C42	DUMMY	48.44	0	01:15			
C43	DUMMY	75.49	0	00:50			
C44	DUMMY	9.65	0	01:05			
C51	DUMMY	32.01	0	00:45			
C52	DUMMY	29.96	0	00:40			
C53	DUMMY	41.33	0	00:40			
C54	DUMMY	91.20	0	00:40			
C56	CONDUIT	31.66	0	00:50	4.97	0.28	0.36
C57	CONDUIT	91.78	0	00:40	6.45	0.81	0.68
C57_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C61	DUMMY	426.88	0	00:55			
C62	DUMMY	101.83	0	00:40			
C63	DUMMY	88.36	0	00:45			
C64	DUMMY	87.65	0	00:40			
C65	DUMMY	175.98	0	01:00			
C67	DUMMY	499.36	0	00:55			
C68	DUMMY	123.91	0	01:00			
C70	CONDUIT	28.84	0	02:15	4.98	1.03	1.00
C70-OVER	CHANNEL	467.05	0	01:00	6.04	0.03	0.18
C71	CONDUIT	20.84	0	02:10	5.00	1.05	1.00

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

C71-OVER	CHANNEL	402.82	0	00:55	6.51	0.03	0.16
C72	CONDUIT	64.27	0	02:10	7.76	1.01	1.00
C73	CONDUIT	35.15	0	00:35	3.66	1.00	1.00
C73_Overlfow	CHANNEL	88.57	0	01:05	8.55	0.01	0.08
C74	DUMMY	495.11	0	01:00			
CAD1	DUMMY	37.54	0	00:50			
CAD3	DUMMY	26.69	0	00:45			
CAD4	DUMMY	31.70	0	00:45			
CAD7	DUMMY	53.99	0	00:45			
CAR1	DUMMY	0.00	0	00:00			
CColfax	CONDUIT	642.13	0	01:10	9.06	0.73	0.66
CColf-OVER	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
CCPark	CONDUIT	4033.57	0	01:30	5.08	0.37	0.67
CDE1	DUMMY	402.94	0	00:55			
CDE2	DUMMY	104.26	0	00:50			
CDE3	DUMMY	50.78	0	01:00			
CDE4	DUMMY	54.00	0	01:00			
CDE5	DUMMY	96.31	0	01:00			
CDE6	DUMMY	168.67	0	00:55			
CDIV7b	DUMMY	508.50	0	00:50			
CJ_L1	DUMMY	48.73	0	00:40			
CJ7b	DUMMY	273.66	0	00:50			
CJL2	DUMMY	19.46	0	00:55			
CMLK	CONDUIT	3748.75	0	01:30	5.64	0.31	0.62
CMontview	CONDUIT	1960.14	0	01:20	5.22	0.12	0.41
CMontview2	DUMMY	1988.41	0	01:20			
CSandCreek	CONDUIT	4068.20	0	01:35	7.77	0.35	0.63
CST1	DUMMY	46.16	0	01:15			
CST2	DUMMY	133.26	0	00:55			
CST3	DUMMY	106.52	0	01:05			
CST4	DUMMY	376.84	0	00:50			
CST5	DUMMY	339.33	0	01:05			
CST6	DUMMY	100.24	0	01:00			
CST7	CONDUIT	326.41	0	01:05	3.18	0.01	0.15
CST8	DUMMY	69.95	0	00:55			
CST9	DUMMY	131.69	0	00:50			
d_01a	DUMMY	126.54	0	00:40			
d_02a	DUMMY	282.37	0	00:45			
d_02b	DUMMY	0.00	0	00:00			
d_03a	DUMMY	174.21	0	00:45			
d_03b	DUMMY	174.21	0	00:45			
d_03c	DUMMY	46.48	0	00:50			
d_04b	DUMMY	94.44	0	00:55			
d_04d	DUMMY	63.84	0	01:25			
d_05a	DUMMY	166.92	0	00:55			
d_05b	DUMMY	166.92	0	00:55			
d_05c	DUMMY	295.74	0	00:55			
d_06a	DUMMY	177.77	0	00:50			
d_06b	DUMMY	177.77	0	00:50			
d_06c	DUMMY	111.48	0	00:50			
d_07b	DUMMY	79.51	0	01:00			
d_08a	DUMMY	121.05	0	00:55			
d_08b	DUMMY	395.03	0	01:00			

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

d_08c	DUMMY	185.36	0	00:45			
d_09a	DUMMY	144.35	0	00:50			
d_09b	DUMMY	152.21	0	00:55			
d_10a	DUMMY	159.62	0	00:55			
d_10a1	DUMMY	0.00	0	00:00			
d_10a2	DUMMY	226.81	0	01:00			
d_11a	DUMMY	126.91	0	01:00			
d_12a	DUMMY	138.47	0	00:45			
d_13a	DUMMY	90.47	0	00:55			
d_14a	DUMMY	135.66	0	00:55			
d_14b	DUMMY	264.01	0	01:05			
d_15a	DUMMY	152.49	0	00:50			
d_17thAv	DUMMY	174.25	0	01:30			
d_EC_Out_23rd	DUMMY	657.34	0	01:30			
d_EC_Out_19thAv	DUMMY	219.34	0	01:05			
S_02a	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
S_03a	CHANNEL	7.92	0	01:05	8.04	0.00	0.05
S_05_07a	CHANNEL	140.70	0	01:05	5.35	0.01	0.09
S_05_07b	CHANNEL	129.51	0	01:05	9.98	0.01	0.08
S_05a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_05b	CHANNEL	131.67	0	00:55	9.35	0.01	0.09
S_05c	CHANNEL	270.07	0	01:00	8.10	0.01	0.12
S_05d	CHANNEL	23.81	0	01:10	5.43	0.00	0.08
S_06a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_06b	CHANNEL	94.60	0	01:00	7.05	0.01	0.13
S_07a	CHANNEL	36.12	0	00:50	14.10	0.00	0.04
S_07b	CHANNEL	35.00	0	00:55	10.61	0.00	0.05
S_07b2	CHANNEL	162.93	0	01:05	6.00	0.02	0.12
S_07d	CHANNEL	146.51	0	01:10	7.76	0.01	0.09
S_07e	CHANNEL	146.54	0	01:10	8.20	0.01	0.09
S_08a	CHANNEL	50.78	0	01:00	10.63	0.00	0.05
S_08b	CHANNEL	226.81	0	01:00	6.00	0.01	0.09
S_09a	CHANNEL	13.22	0	01:00	12.92	0.00	0.03
S_10_13	CHANNEL	11.62	0	01:35	9.80	0.00	0.04
S_10a	CHANNEL	135.68	0	01:50	10.64	0.01	0.08
S_10a1	CHANNEL	225.85	0	01:05	10.77	0.01	0.10
S_10b	CHANNEL	226.47	0	01:05	14.59	0.01	0.09
S_10c	CHANNEL	221.57	0	01:15	11.40	0.01	0.10
S_10d	CHANNEL	448.46	0	01:15	5.13	0.05	0.20
S_10e	CHANNEL	386.48	0	01:20	10.43	0.02	0.13
S_10f	CHANNEL	128.31	0	01:05	11.32	0.01	0.08
S_10g	CHANNEL	82.32	0	01:05	14.75	0.00	0.07
S_10i	DUMMY	138.40	0	01:15			
S_11a	CHANNEL	36.27	0	01:10	8.44	0.00	0.05
S_12_14	CHANNEL	18.11	0	01:10	4.93	0.00	0.03
S_13a	CHANNEL	452.02	0	01:20	9.00	0.03	0.16
S_13b1	CHANNEL	421.68	0	01:20	10.43	0.02	0.14
S_13b2	CHANNEL	254.93	0	01:25	8.47	0.02	0.12
S_14a1	CHANNEL	45.62	0	01:05	6.20	0.00	0.06
S_14a2	CHANNEL	26.56	0	01:15	8.18	0.00	0.05
S_15a	CHANNEL	70.60	0	01:10	8.23	0.00	0.07
S_15b	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
S_15c	CONDUIT	482.75	0	01:25	18.71	0.02	0.17

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

S_Beeler	DUMMY	485.11	0	01:00			
C317_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C318_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C322_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C363_Overflow	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C_EC_Colfax_Out	CHANNEL	86.35	0	01:25	7.39	0.01	0.08
S_AR2_a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
d_16thAve_E	DUMMY	339.48	0	01:25			
d_72	DUMMY	546.57	0	01:00			
C72_Overflow	CHANNEL	60.28	0	01:00	8.21	0.00	0.07
C_04b	CONDUIT	117.11	0	00:50	12.13	0.89	0.73
S_04a	CHANNEL	120.65	0	00:45	4.18	0.01	0.12
d_04c	DUMMY	150.57	0	00:50			
C_04c	CONDUIT	62.40	0	00:45	10.17	1.01	0.81
S_04b	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
C_AR2_b	CONDUIT	130.74	0	00:50	9.16	1.06	1.00
S_AR2_b	CHANNEL	142.39	0	01:10	8.76	0.01	0.09
S_AR2_c	CHANNEL	129.37	0	01:05	14.83	0.00	0.06
C_AR2_c	CONDUIT	137.21	0	00:50	17.93	0.65	0.59
S_AR2_d	DUMMY	266.74	0	01:05			
19071STMH	DUMMY	395.30	0	01:15			
19071STMH-OF	DUMMY	0.00	0	00:00			
35191STGM	DUMMY	168.39	0	00:55			
35191STGM-OF	DUMMY	0.00	0	00:00			
35325STGM	CONDUIT	3.59	0	03:30	3.12	1.02	1.00
35325STGM-OF	CHANNEL	165.08	0	00:55	4.37	0.01	0.10
35326STGM	CONDUIT	4.48	0	03:25	4.24	1.01	1.00
35326STGM-OF	CHANNEL	163.97	0	00:55	9.08	0.01	0.09
35328STGM	CONDUIT	2.76	0	03:25	2.67	1.01	1.00
35328STGM-OF	CHANNEL	166.39	0	00:55	5.72	0.01	0.12
35329STGM	CONDUIT	2.75	0	03:30	2.70	1.01	1.00
35329STGM-OF	CHANNEL	166.05	0	00:55	5.68	0.01	0.12
35355STGM	CONDUIT	49.78	0	02:00	5.79	1.03	1.00
35355STGM-OF	CHANNEL	48.15	0	01:00	6.46	0.00	0.06
35357STGM	CONDUIT	42.76	0	02:10	4.96	1.02	1.00
35357STGM-OF	CHANNEL	54.34	0	01:00	2.81	0.00	0.07
35358STGM	CONDUIT	58.95	0	01:50	6.63	1.06	1.00
35358STGM-OF	CHANNEL	40.39	0	01:00	7.39	0.00	0.06
35362STGM	CONDUIT	82.44	0	01:25	9.36	1.05	1.00
35362STGM-OF	CHANNEL	17.64	0	01:00	9.60	0.00	0.04
35363STGM	CONDUIT	49.89	0	02:05	5.82	1.03	1.00
35363STGM-OF	CHANNEL	47.62	0	01:05	6.46	0.00	0.06
35365STGM	CONDUIT	55.29	0	02:00	6.55	1.01	1.00
35365STGM-OF	CHANNEL	41.44	0	01:05	7.29	0.00	0.06
35367STGM	CONDUIT	55.80	0	02:05	6.21	1.05	1.00
35367STGM-OF	CHANNEL	44.41	0	01:00	10.72	0.00	0.05
35368STGM	CONDUIT	55.31	0	02:05	6.74	0.97	0.80
35368STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
35369STGM	CONDUIT	54.95	0	02:05	7.57	0.85	0.71
35369STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
35370STGM	CONDUIT	53.53	0	01:10	6.20	1.00	1.00
35370STGM-OF	CHANNEL	1.16	0	02:05	5.71	0.00	0.01
35371STGM	DUMMY	54.43	0	02:05			

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

35372STGM	CONDUIT	54.43	0	02:05	8.02	0.55	0.53
35372STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36715STGM	CONDUIT	175.38	0	02:10	9.81	1.04	1.00
36715STGM-OF	CHANNEL	228.08	0	01:10	9.26	0.01	0.10
36716STGM	CONDUIT	106.02	0	02:55	6.06	1.07	1.00
36716STGM-OF	CHANNEL	295.65	0	01:15	7.49	0.02	0.14
36717STGM	CONDUIT	183.67	0	02:15	10.18	1.04	1.00
36717STGM-OF	CHANNEL	219.52	0	01:15	10.09	0.01	0.10
36718STGM	CONDUIT	107.06	0	02:45	6.20	1.05	1.00
36718STGM-OF	CHANNEL	294.91	0	01:15	7.67	0.02	0.14
36939STGM	CONDUIT	66.01	0	00:35	6.25	1.00	1.00
36939STGM-OF	CHANNEL	337.19	0	01:00	6.24	0.02	0.15
37665STGM	CONDUIT	147.97	0	02:10	12.71	1.06	1.00
37665STGM-OF	CHANNEL	264.22	0	01:00	11.32	0.01	0.10
37666STGM	CONDUIT	69.75	0	02:45	5.95	1.05	1.00
37666STGM-OF	CHANNEL	336.06	0	00:55	5.46	0.02	0.15
37673STGM	CONDUIT	85.06	0	02:40	7.45	1.05	1.00
37673STGMF-OFE	CHANNEL	318.36	0	01:05	7.00	0.02	0.14
37750STGM	DUMMY	85.06	0	02:40			
37750STGM-OF	DUMMY	0.00	0	00:00			
37757STGM	CONDUIT	82.93	0	02:45	5.89	1.02	0.92
37757STGM-OF	CHANNEL	1.60	0	02:50	8.20	0.00	0.02
37758STGM	CONDUIT	83.21	0	02:45	6.19	0.98	0.90
37758STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37759STGM	CONDUIT	94.49	0	02:45	6.29	1.08	1.00
37759STGM-OF	CHANNEL	309.67	0	01:05	8.52	0.02	0.14
37760STGM	CONDUIT	101.04	0	02:40	7.09	1.04	1.00
37760STGM-OF	CHANNEL	299.19	0	01:10	9.13	0.02	0.13
37761STGM	CONDUIT	94.30	0	02:50	6.85	1.01	1.00
37762STGM	CONDUIT	100.52	0	02:50	7.00	1.04	1.00
37762STGM-OF	CHANNEL	301.82	0	01:10	9.37	0.02	0.13
37763STGM	CONDUIT	195.52	0	02:05	11.40	1.00	1.00
37763STGM-OF	CHANNEL	204.60	0	01:10	7.46	0.01	0.09
37764STGM	CONDUIT	301.65	0	01:40	16.92	1.03	1.00
37764STGM-OF	CHANNEL	103.35	0	01:10	14.12	0.00	0.06
406193STGM	CONDUIT	18.43	0	02:40	3.01	1.00	1.00
406193STGM-OF	CHANNEL	79.97	0	01:05	2.56	0.01	0.10
406197STGM	CONDUIT	24.24	0	02:25	3.78	1.04	1.00
406197STGM-OF	CHANNEL	75.65	0	01:05	4.66	0.01	0.09
406199STGM	CONDUIT	14.88	0	02:50	5.18	1.04	1.00
406199STGM-OF	CHANNEL	84.61	0	01:05	7.83	0.00	0.07
406200STGM	CONDUIT	41.16	0	02:00	9.11	1.04	1.00
406200STGM-OF	CHANNEL	58.85	0	01:05	11.68	0.00	0.05
406201STGM	CONDUIT	23.45	0	00:40	5.21	1.06	1.00
406201STGM-OF	CHANNEL	76.01	0	01:05	7.30	0.00	0.07
406205STGM	CONDUIT	42.38	0	00:45	9.11	1.07	1.00
406205STGM-OF	CHANNEL	57.20	0	01:05	12.87	0.00	0.05
406206STGM	CONDUIT	19.39	0	02:30	4.23	1.07	1.00
407544STMH	DUMMY	98.31	0	01:05			
407544STMH-OF	DUMMY	0.00	0	00:00			
773049STMN	CONDUIT	28.91	0	00:35	4.59	1.00	1.00
773049STMN-OF	CHANNEL	75.30	0	00:50	5.15	0.01	0.08
773051STMN	CONDUIT	40.72	0	00:35	4.78	1.00	1.00

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

773051STMN-OF	CHANNEL	62.78	0	00:50	5.15	0.01	0.08
773387STMN	CONDUIT	42.99	0	00:40	5.13	1.00	1.00
773387STMN-OF	CHANNEL	60.83	0	00:50	5.45	0.00	0.07
773391STMN	CONDUIT	67.69	0	00:45	7.76	1.00	1.00
773391STMN-OF	CHANNEL	36.65	0	00:50	8.46	0.00	0.05
773393STMN	CONDUIT	43.96	0	00:40	5.10	1.00	1.00
773393STMN-OF	CHANNEL	61.71	0	00:50	5.54	0.00	0.07
773411STMN	CONDUIT	101.46	0	00:50	11.75	1.00	1.00
773411STMN-OF	CHANNEL	3.70	0	00:50	3.17	0.00	0.02
773413STMN	DUMMY	105.15	0	00:50			
37761STGM-OF_BHI	CHANNEL	304.99	0	01:10	8.95	0.02	0.13
406206STGM-OF_BHI	CHANNEL	78.70	0	01:05	5.96	0.01	0.08
S_15_a	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
S_15_b	CHANNEL	89.45	0	01:30	10.03	0.01	0.08
S_15_c	CHANNEL	191.52	0	01:30	10.99	0.01	0.10
C_15_a	CONDUIT	112.05	0	01:35	14.26	0.36	0.42
C_15_b	CONDUIT	21.68	0	01:25	11.51	1.00	1.00
C_AR2_d	CONDUIT	47.48	0	01:05	49.97	0.08	0.19
C_AR2_a	CONDUIT	433.01	0	01:15	12.43	1.05	1.00
C_AR1_c	CONDUIT	465.13	0	01:00	13.48	1.03	0.93
C_AR1_d	CONDUIT	269.81	0	01:30	8.82	1.06	1.00
S_AR1_d	CHANNEL	230.88	0	01:00	6.86	0.01	0.13
S_AR1_a	CHANNEL	69.95	0	01:10	8.62	0.00	0.07
S_AR1_c	CHANNEL	24.30	0	01:10	11.01	0.00	0.04
O_10a-100Yr	CONDUIT	47.23	0	01:50	10.74	1.02	1.00
d_15_b	DUMMY	115.59	0	01:30			
C_16b	CONDUIT	189.20	0	01:25	12.37	0.70	0.61
C_15c	DUMMY	357.54	0	00:50			
C_10_13	CONDUIT	164.14	0	01:25	7.65	1.05	0.94
d_10_13	DUMMY	387.95	0	01:20			
C_13a_2	CONDUIT	134.83	0	02:10	9.86	1.05	0.94
C_15_c	CONDUIT	115.41	0	02:00	8.52	1.06	1.00
d_10_13_2	DUMMY	33.73	0	01:20			
C_01a	CONDUIT	48.97	0	00:35	11.33	0.66	0.59
W-1	ORIFICE	47.93	0	01:50			0.00
W_10a	WEIR	135.06	0	01:50			0.00
W_02	WEIR	142.13	0	01:25			0.00
OUT30	DUMMY	19.63	0	02:10			
OUT201	DUMMY	49.50	0	11:30			
OUT130	DUMMY	95.28	0	04:50			
OUT156	DUMMY	17.61	0	01:40			
OUT04	DUMMY	4.82	0	03:35			
OUT02	DUMMY	7.34	0	01:25			

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Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

C_03a	0.58	0.58	0.58	0.58	0.58
C_05b	1.25	1.25	1.25	1.25	1.25
C_05c	1.92	1.92	1.92	1.92	1.92
C_06a	1.33	1.33	1.33	0.08	1.33
C_07a	1.58	1.58	1.58	1.58	1.58
C_08a	0.83	0.83	0.83	0.83	0.83
C_10b	5.17	5.17	5.17	0.42	5.17
C_10c	2.00	2.00	2.00	2.08	2.00
C_11a	1.00	1.00	1.00	1.00	1.00
C_13a	2.08	2.08	2.08	2.08	2.08
C_14a	1.33	1.33	1.33	1.42	1.33
C_15a	1.17	1.17	1.17	1.25	1.17
C125	0.83	0.83	0.83	0.83	0.83
C129	0.50	0.50	0.50	0.17	0.50
C135	0.75	0.75	0.75	0.75	0.75
C14th	0.01	0.01	0.01	0.42	0.01
C162	0.67	0.67	0.67	0.08	0.67
C164	0.58	0.58	0.58	0.58	0.58
C17th	1.08	1.08	1.08	1.83	1.08
C342	1.08	1.08	1.08	1.17	1.08
C344	1.08	1.08	1.08	1.08	1.08
C376	6.75	6.75	6.75	6.92	6.75
C399	1.33	1.33	1.33	0.17	1.33
C70	1.83	1.83	1.83	0.08	1.83
C71	1.83	1.83	1.83	1.83	1.83
C72	1.67	1.67	1.67	1.67	1.67
C73	1.92	1.92	1.92	1.92	1.92
CColfax	0.01	0.01	0.01	0.83	0.01
C_04c	0.01	0.01	0.01	0.08	0.01
C_AR2_b	1.67	1.67	1.67	1.67	1.67
35325STGM	3.08	3.08	3.08	0.08	3.08
35326STGM	2.92	2.92	2.92	0.08	2.92
35328STGM	3.00	3.00	3.00	0.08	3.00
35329STGM	3.08	3.08	3.08	0.08	3.08
35355STGM	1.42	1.42	1.42	0.08	1.42
35357STGM	1.58	1.58	1.58	1.58	1.58
35358STGM	1.17	1.17	1.17	1.17	1.17
35362STGM	0.67	0.67	0.67	0.67	0.67
35363STGM	1.50	1.50	1.50	1.42	1.50
35365STGM	1.33	1.33	1.33	1.33	1.33
35367STGM	1.42	1.42	1.42	1.42	1.42
35370STGM	0.25	0.25	0.25	0.50	0.25
36715STGM	1.33	1.33	1.33	1.33	1.33
36716STGM	2.17	2.17	2.17	2.17	2.17
36717STGM	1.33	1.33	1.33	1.33	1.33
36718STGM	2.08	2.08	2.08	2.08	2.08
36939STGM	2.25	2.25	2.25	2.25	2.25
37665STGM	1.58	1.58	1.58	1.58	1.58
37666STGM	2.25	2.25	2.25	2.25	2.25
37673STGM	2.17	2.17	2.17	2.08	2.17
37757STGM	0.17	0.17	0.17	0.08	0.17
37758STGM	0.08	0.08	0.08	0.01	0.08

Table F.7 – Conceptual Design Kinematic SWMM Output for 100-year (Future) Event in Aurora

37759STGM	2.08	2.08	2.08	0.08	2.08
37760STGM	2.08	2.08	2.08	2.08	2.08
37761STGM	2.17	2.17	2.17	2.17	2.17
37762STGM	2.17	2.17	2.17	2.17	2.17
37763STGM	1.17	1.17	1.17	1.25	1.17
37764STGM	0.75	0.75	0.75	0.75	0.75
406193STGM	2.00	2.00	2.00	2.08	2.00
406197STGM	1.75	1.75	1.75	1.75	1.75
406199STGM	2.25	2.25	2.25	0.08	2.25
406200STGM	1.25	1.25	1.25	1.25	1.25
406201STGM	1.83	1.83	1.83	0.25	1.83
406205STGM	1.33	1.33	1.33	0.17	1.33
406206STGM	2.00	2.00	2.00	1.92	2.00
773049STMN	1.50	1.50	1.50	1.50	1.50
773051STMN	1.17	1.17	1.17	1.25	1.17
773387STMN	1.25	1.25	1.25	1.17	1.25
773391STMN	0.75	0.75	0.75	0.75	0.75
773393STMN	1.17	1.17	1.17	1.25	1.17
773411STMN	0.17	0.17	0.17	0.17	0.17
C_15_b	0.50	0.50	0.50	0.42	0.50
C_AR2_a	0.42	0.42	0.42	0.08	0.42
C_AR1_c	0.17	0.17	0.17	0.25	0.17
C_AR1_d	0.92	0.92	0.92	0.83	0.92
O_10a-100Yr	1.50	1.50	1.50	1.58	1.50
C_10_13	0.83	0.83	0.83	0.83	0.83
C_13a_2	1.25	1.25	1.25	1.25	1.25
C_15_c	0.83	0.83	0.83	0.92	0.83

Analysis begun on: Thu Mar 17 07:39:18 2022
Analysis ended on: Thu Mar 17 07:39:18 2022
Total elapsed time: < 1 sec

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.011)
--------------------------------------------------------------

Basis of model: Denver SDMP - Basin 4401-02 - Updated by Enginuity 2018
Model inflows updated wtih Westerly Creek FHAD CUHP 100-year Future.
Pipe sizes increased to meet criteria for street flooding (<1')for Westerly Creek OSP Conceptual Design.

WARNING 03: negative offset ignored for Link 19071STMH
WARNING 03: negative offset ignored for Link 35357STGM
WARNING 03: negative offset ignored for Link 35358STGM
WARNING 03: negative offset ignored for Link D_12th
WARNING 03: negative offset ignored for Link 4401-02-220
WARNING 03: negative offset ignored for Link 4401-02-240
WARNING 03: negative offset ignored for Link 4401-02-260
WARNING 08: elevation drop exceeds length for Conduit CDE4
WARNING 02: maximum depth increased for Node 19071STMH
WARNING 02: maximum depth increased for Node 19079STMH
WARNING 02: maximum depth increased for Node 19097STMH
WARNING 02: maximum depth increased for Node 19111STMH
WARNING 02: maximum depth increased for Node 19132STMH
WARNING 02: maximum depth increased for Node 19134STMH
WARNING 02: maximum depth increased for Node 19139STMH
WARNING 02: maximum depth increased for Node 19143STMH
WARNING 02: maximum depth increased for Node 19150STMH
WARNING 02: maximum depth increased for Node 19154STMH
WARNING 02: maximum depth increased for Node 19162STMH
WARNING 02: maximum depth increased for Node 19171STMH
WARNING 02: maximum depth increased for Node 19179STMH
WARNING 02: maximum depth increased for Node 19214STMH
WARNING 02: maximum depth increased for Node 20135STMH
WARNING 02: maximum depth increased for Node 20209STFT
WARNING 02: maximum depth increased for Node 20818STMH
WARNING 02: maximum depth increased for Node 20841STMH
WARNING 02: maximum depth increased for Node 23839STMH
WARNING 02: maximum depth increased for Node 23840STMH
WARNING 02: maximum depth increased for Node 23841STMH
WARNING 02: maximum depth increased for Node 23843STMH
WARNING 02: maximum depth increased for Node 23845STMH
WARNING 02: maximum depth increased for Node 23849STMH
WARNING 02: maximum depth increased for Node 23852STMH
WARNING 02: maximum depth increased for Node 23855STMH
WARNING 02: maximum depth increased for Node 23856STMH
WARNING 02: maximum depth increased for Node 23861STMH
WARNING 02: maximum depth increased for Node 23862STMH
WARNING 02: maximum depth increased for Node 23868STMH
WARNING 02: maximum depth increased for Node 24788STMH
WARNING 02: maximum depth increased for Node 24791STMH
WARNING 02: maximum depth increased for Node 24796STMH
WARNING 02: maximum depth increased for Node 24797STIL
WARNING 02: maximum depth increased for Node 24800STMH
WARNING 02: maximum depth increased for Node 405658STFT
WARNING 02: maximum depth increased for Node 405659STFT
WARNING 02: maximum depth increased for Node 407540STMH
```

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

```
WARNING 02: maximum depth increased for Node 407541STMH
WARNING 02: maximum depth increased for Node 407542STMH
WARNING 02: maximum depth increased for Node 407543STMH
WARNING 02: maximum depth increased for Node 407544STMH
WARNING 02: maximum depth increased for Node 407546STMH
WARNING 02: maximum depth increased for Node 773032STMH
WARNING 02: maximum depth increased for Node 773050STMH
WARNING 02: maximum depth increased for Node 773052STMH
WARNING 02: maximum depth increased for Node 773389STMH
WARNING 02: maximum depth increased for Node 773392STMH
WARNING 02: maximum depth increased for Node 773410STMH
WARNING 02: maximum depth increased for Node 773412STMH
WARNING 02: maximum depth increased for Node E17THAVE-01
WARNING 02: maximum depth increased for Node E17THAVE-03
WARNING 02: maximum depth increased for Node 19198STMH
WARNING 02: maximum depth increased for Node 19718STMH
WARNING 02: maximum depth increased for Node 20050STMH
WARNING 02: maximum depth increased for Node 20127STMH
WARNING 02: maximum depth increased for Node 20128STMH
WARNING 02: maximum depth increased for Node 20164STMH
WARNING 02: maximum depth increased for Node 20493STMH
WARNING 02: maximum depth increased for Node 20851STMH
WARNING 02: maximum depth increased for Node 20866STMH
WARNING 02: maximum depth increased for Node 20853STMH
WARNING 02: maximum depth increased for Node 20861STMH

*************
Element Count
*************
Number of rain gages ...... 0
Number of subcatchments ... 0
Number of nodes ........... 94
Number of links ........... 145
Number of pollutants ...... 0
Number of land uses ....... 0


************
Node Summary
************
                                  Invert      Max.    Ponded    External
Name                 Type          Elev.     Depth      Area    Inflow
--------------------------------------------------------------------------------
19071STMH            JUNCTION     5304.40     19.40       0.0
19079STMH            JUNCTION     5304.49     20.16       0.0
19097STMH            JUNCTION     5307.40     15.78       0.0
19111STMH            JUNCTION     5310.16     14.57       0.0
19132STMH            JUNCTION     5311.43     14.17       0.0
19134STMH            JUNCTION     5312.35     14.22       0.0
19139STMH            JUNCTION     5310.62     14.95       0.0
19143STMH            JUNCTION     5313.99     13.98       0.0
19150STMH            JUNCTION     5315.64     21.18       0.0
19154STMH            JUNCTION     5320.49     10.84       0.0
```

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

19162STMH	JUNCTION	5321.94	17.53	0.0	
19171STMH	JUNCTION	5323.10	10.40	0.0	
19179STMH	JUNCTION	5324.36	17.04	0.0	
19214STMH	JUNCTION	5324.57	16.81	0.0	
20135STMH	JUNCTION	5328.82	19.35	0.0	
20209STFT	JUNCTION	5329.74	18.66	0.0	
20818STMH	JUNCTION	5332.32	18.64	0.0	
20841STMH	JUNCTION	5330.43	20.82	0.0	
23839STMH	JUNCTION	5333.38	17.56	0.0	
23840STMH	JUNCTION	5330.19	18.22	0.0	
23841STMH	JUNCTION	5330.48	18.31	0.0	
23843STMH	JUNCTION	5328.82	18.69	0.0	
23845STMH	JUNCTION	5335.33	17.13	0.0	
23849STMH	JUNCTION	5337.72	16.71	0.0	
23852STMH	JUNCTION	5335.67	17.19	0.0	
23855STMH	JUNCTION	5339.55	16.36	0.0	
23856STMH	JUNCTION	5339.16	16.55	0.0	
23861STMH	JUNCTION	5341.79	16.54	0.0	
23862STMH	JUNCTION	5341.65	16.45	0.0	
23868STMH	JUNCTION	5343.15	17.45	0.0	
24788STMH	JUNCTION	5341.35	14.77	0.0	
24791STMH	JUNCTION	5337.70	13.86	0.0	
24796STMH	JUNCTION	5342.67	14.90	0.0	
24797STIL	JUNCTION	5343.74	15.38	0.0	
24800STMH	JUNCTION	5341.13	14.65	0.0	
405658STFT	JUNCTION	5324.68	22.61	0.0	
405659STFT	JUNCTION	5326.98	21.73	0.0	
407540STMH	JUNCTION	5324.28	22.86	0.0	
407541STMH	JUNCTION	5323.97	22.81	0.0	
407542STMH	JUNCTION	5323.54	21.94	0.0	
407543STMH	JUNCTION	5326.58	22.10	0.0	
407544STMH	JUNCTION	5323.33	21.65	0.0	
407546STMH	JUNCTION	5328.26	21.77	0.0	
J_DE6_1	JUNCTION	5348.42	0.00	0.0	Yes
J_DE5	JUNCTION	5354.48	0.00	0.0	
J_DE3	JUNCTION	5341.25	0.00	0.0	
J_DE2	JUNCTION	5327.53	0.00	0.0	
J_AD4	JUNCTION	5315.00	0.00	0.0	
J_AD1	JUNCTION	5336.76	0.00	0.0	
J_DE1	JUNCTION	5348.23	0.00	0.0	
773032STMH	JUNCTION	5322.91	19.17	0.0	
773050STMH	JUNCTION	5322.77	18.55	0.0	
773052STMH	JUNCTION	5321.85	15.75	0.0	
773389STMH	JUNCTION	5320.69	15.04	0.0	
773392STMH	JUNCTION	5320.51	15.35	0.0	
773410STMH	JUNCTION	5319.46	14.81	0.0	
773412STMH	JUNCTION	5318.49	16.96	0.0	
J_DE4	JUNCTION	984.30	0.00	0.0	
E17THAVE-01	JUNCTION	5329.51	21.38	0.0	
E17THAVE-02	JUNCTION	5328.66	8.79	0.0	
E17THAVE-03	JUNCTION	5327.88	20.27	0.0	
E17THAVE-04	JUNCTION	5322.92	8.50	0.0	
E17THAVE-05	JUNCTION	5322.04	8.50	0.0	

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

E17THAVE-06	JUNCTION	5321.24	8.50	0.0	
E17THAVE-07	JUNCTION	5320.31	8.50	0.0	
E17THAVE-08	JUNCTION	5319.59	8.50	0.0	
E17THAVE-09	JUNCTION	5318.84	8.50	0.0	
E17THAVE-10	JUNCTION	5317.08	8.50	0.0	
E17THAVE-11	JUNCTION	5315.38	8.50	0.0	
E17THAVE-12	JUNCTION	5313.72	8.50	0.0	
19198STMH	JUNCTION	5319.09	17.84	0.0	
19718STMH	JUNCTION	5320.98	17.58	0.0	
20050STMH	JUNCTION	5322.11	17.36	0.0	
20127STMH	JUNCTION	5322.65	17.12	0.0	
20128STMH	JUNCTION	5323.53	17.60	0.0	
20164STMH	JUNCTION	5323.84	17.04	0.0	
20493STMH	JUNCTION	5325.34	17.38	0.0	
20851STMH	JUNCTION	5325.40	19.26	0.0	
20866STMH	JUNCTION	5325.27	19.25	0.0	
20853STMH	JUNCTION	5326.95	19.85	0.0	
20861STMH	JUNCTION	5323.89	19.19	0.0	
J_DE6_2	JUNCTION	5344.00	0.00	0.0	Yes
J_12th	JUNCTION	5344.00	10.00	0.0	
18979STOF	OUTFALL	5304.32	5.50	0.0	
18979STOF2	OUTFALL	5304.32	10.00	0.0	
23842STFT	OUTFALL	5325.94	4.00	0.0	
24773STOF	OUTFALL	5335.30	1.25	0.0	
24773STOF2	OUTFALL	5335.30	10.00	0.0	
407544STMH-OF	OUTFALL	5322.61	10.00	0.0	
407550STMH	OUTFALL	5322.61	3.00	0.0	
4401-02-250-OF	OUTFALL	5309.40	0.00	0.0	
773412STMH-OF	OUTFALL	5318.00	2.83	0.0	
E17THAVE-OF	OUTFALL	5311.80	5.89	0.0	
J2	OUTFALL	5336.20	10.00	0.0	

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
19071STMH	19071STMH	18979STOF	CONDUIT	64.1	0.1249	0.0190
19071STMH-OF	19071STMH	18979STOF2	CONDUIT	64.1	14.9630	0.0200
35191STGM	24791STMH	24773STOF	CONDUIT	4.8	58.3847	0.0190
35191STGM-OF	24791STMH	24773STOF2	CONDUIT	4.8	58.3847	0.0200
35325STGM	24788STMH	24800STMH	CONDUIT	35.0	0.3429	0.0190
35325STGM-OF	24788STMH	24800STMH	CONDUIT	35.0	0.9829	0.0200
35326STGM	24800STMH	24791STMH	CONDUIT	343.0	1.0001	0.0190
35326STGM-OF	24800STMH	24791STMH	CONDUIT	343.0	1.2287	0.0200
35328STGM	24797STIL	24796STMH	CONDUIT	272.7	0.3484	0.0190
35328STGM-OF	24797STIL	24796STMH	CONDUIT	322.7	0.4810	0.0200
35329STGM	24796STMH	24788STMH	CONDUIT	346.4	0.3493	0.0190
35329STGM-OF	24796STMH	24788STMH	CONDUIT	346.4	0.4171	0.0200
35355STGM	23868STMH	23861STMH	CONDUIT	276.2	0.4489	0.0190
35355STGM-OF	23868STMH	23861STMH	CONDUIT	276.2	0.8236	0.0200
35357STGM	23861STMH	23862STMH	CONDUIT	37.5	0.3731	0.0190

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

35357STGM-OF	23861STMH	23862STMH	CONDUIT	37.5	0.6077	0.0200
35358STGM	23862STMH	23855STMH	CONDUIT	318.8	0.6116	0.0190
35358STGM-OF	23862STMH	23855STMH	CONDUIT	318.8	0.6866	0.0200
35362STGM	23855STMH	23856STMH	CONDUIT	30.0	0.4333	0.0190
35362STGM-OF	23855STMH	23856STMH	CONDUIT	30.0	0.6700	0.0200
35363STGM	23856STMH	23849STMH	CONDUIT	291.1	0.4465	0.0190
35363STGM-OF	23856STMH	23849STMH	CONDUIT	291.1	0.4397	0.0200
35365STGM	23849STMH	23852STMH	CONDUIT	326.6	0.6276	0.0190
35365STGM-OF	23849STMH	23852STMH	CONDUIT	326.6	0.4800	0.0200
35367STGM	23852STMH	23845STMH	CONDUIT	56.7	0.5997	0.0190
35367STGM-OF	23852STMH	407546STMH	CONDUIT	536.0	0.5280	0.0200
35368STGM	23845STMH	23839STMH	CONDUIT	287.1	0.6409	0.0190
35368STGM-OF	23845STMH	23839STMH	CONDUIT	287.1	0.5298	0.0200
35369STGM	23839STMH	23841STMH	CONDUIT	325.9	0.8900	0.0190
35369STGM-OF	23839STMH	23841STMH	CONDUIT	325.9	0.6610	0.0200
35370STGM	23841STMH	23840STMH	CONDUIT	53.5	0.8228	0.0190
35370STGM-OF	23841STMH	23840STMH	CONDUIT	53.5	0.6956	0.0200
35371STGM	23843STMH	23842STFT	CONDUIT	143.8	2.0037	0.0190
35372STGM	23840STMH	23843STMH	CONDUIT	136.6	1.0029	0.0190
35372STGM-OF	23840STMH	23843STMH	CONDUIT	136.6	0.6581	0.0200
36715STGM	19139STMH	19111STMH	CONDUIT	92.0	0.5000	0.0190
36715STGM-OF	19139STMH	19111STMH	CONDUIT	92.0	0.9087	0.0200
36716STGM	19097STMH	19079STMH	CONDUIT	581.0	0.5009	0.0190
36716STGM-OF	19097STMH	19079STMH	CONDUIT	581.0	0.9513	0.0200
36717STGM	19079STMH	19071STMH	CONDUIT	18.5	0.4865	0.0190
36717STGM-OF	19079STMH	19071STMH	CONDUIT	18.5	4.5995	0.0200
36718STGM	19111STMH	19097STMH	CONDUIT	552.7	0.4994	0.0190
36718STGM-OF	19111STMH	19097STMH	CONDUIT	552.7	0.2817	0.0200
36939STGM	20818STMH	20209STFT	CONDUIT	572.0	0.4511	0.0190
36939STGM-OF	20818STMH	20209STFT	CONDUIT	572.0	0.4465	0.0200
37665STGM	20209STFT	20135STMH	CONDUIT	46.0	1.9569	0.0190
37665STGM-OF	20209STFT	20135STMH	CONDUIT	46.0	0.5000	0.0200
37666STGM	20841STMH	20818STMH	CONDUIT	44.0	0.3636	0.0190
37666STGM-OF	20841STMH	20818STMH	CONDUIT	44.0	0.6637	0.0200
37673STGM	20135STMH	19214STMH	CONDUIT	630.0	0.6746	0.0190
37673STGMF-OFE	20135STMH	19162STMH	CONDUIT	1312.7	0.6633	0.0200
37750STGM	19214STMH	19179STMH	CONDUIT	39.2	0.1020	0.0190
37750STGM-OF	19214STMH	19179STMH	CONDUIT	39.2	-0.0510	0.0200
37757STGM	19171STMH	19162STMH	CONDUIT	317.3	0.3750	0.0190
37757STGM-OF	19171STMH	19162STMH	CONDUIT	317.3	0.3256	0.0200
37758STGM	19179STMH	19171STMH	CONDUIT	316.5	0.3981	0.0190
37758STGM-OF	19179STMH	19171STMH	CONDUIT	316.5	0.2844	0.0200
37759STGM	19162STMH	19154STMH	CONDUIT	340.5	0.4112	0.0190
37759STGM-OF	19162STMH	19154STMH	CONDUIT	340.5	0.3354	0.0200
37760STGM	19154STMH	19150STMH	CONDUIT	293.2	0.4127	0.0190
37760STGM-OF	19154STMH	19150STMH	CONDUIT	293.2	0.5147	0.0200
37761STGM	19150STMH	19143STMH	CONDUIT	329.2	0.5012	0.0190
37762STGM	19143STMH	19134STMH	CONDUIT	328.5	0.4992	0.0190
37762STGM-OF	19143STMH	19134STMH	CONDUIT	328.5	0.4256	0.0200
37763STGM	19134STMH	19132STMH	CONDUIT	185.0	0.4973	0.0190
37763STGM-OF	19134STMH	19132STMH	CONDUIT	185.0	0.5254	0.0200
37764STGM	19132STMH	19139STMH	CONDUIT	161.5	0.5016	0.0190
37764STGM-OF	19132STMH	19139STMH	CONDUIT	161.5	0.0211	0.0200

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

406193STGM	407542STMH	407544STMH	CONDUIT	130.0	0.0846	0.0190
406193STGM-OF	407542STMH	407544STMH	CONDUIT	135.0	0.3659	0.0200
406197STGM	407541STMH	407542STMH	CONDUIT	164.3	0.1948	0.0190
406197STGM-OF	407541STMH	407542STMH	CONDUIT	164.3	0.7967	0.0200
406199STGM	407540STMH	407541STMH	CONDUIT	36.6	0.8197	0.0190
406199STGM-OF	407540STMH	407541STMH	CONDUIT	36.6	0.9673	0.0200
406200STGM	405658STFT	407540STMH	CONDUIT	20.1	1.9904	0.0190
406200STGM-OF	405658STFT	407540STMH	CONDUIT	20.1	0.7562	0.0200
406201STGM	407543STMH	405658STFT	CONDUIT	304.7	0.6236	0.0190
406201STGM-OF	407543STMH	405658STFT	CONDUIT	304.7	0.4562	0.0200
406205STGM	405659STFT	407543STMH	CONDUIT	20.1	1.4912	0.0190
406205STGM-OF	405659STFT	407543STMH	CONDUIT	20.1	0.1640	0.0200
406206STGM	407546STMH	405659STFT	CONDUIT	307.6	0.4162	0.0190
407544STMH	407544STMH	407550STMH	CONDUIT	35.0	2.0576	0.0190
407544STMH-OF	407544STMH	407544STMH-OF	CONDUIT	36.2	36.3179	0.0200
D_12th	J_DE6_1	J_12th	CONDUIT	233.1	1.8973	0.0100
4401-02-220	J_DE5	23868STMH	CONDUIT	419.1	2.7037	0.0100
4401-02-230	J_DE3	773032STMH	CONDUIT	1661.1	0.8832	0.0100
4401-02-240	J_DE2	773032STMH	CONDUIT	327.0	1.4139	0.0100
4401-02-250	J_AD4	4401-02-250-OF	CONDUIT	959.8	0.5835	0.0100
4401-02-260	J_AD1	19111STMH	CONDUIT	507.4	5.2499	0.0100
4401-02-261	J_DE1	20841STMH	CONDUIT	1173.0	1.3398	0.0100
773049STMN	773032STMH	773050STMH	CONDUIT	37.7	0.3714	0.0190
773049STMN-OF	773032STMH	773050STMH	CONDUIT	37.7	2.0216	0.0200
773051STMN	773050STMH	773052STMH	CONDUIT	291.3	0.3159	0.0190
773051STMN-OF	773050STMH	773052STMH	CONDUIT	291.3	1.2784	0.0200
773387STMN	773052STMH	773389STMH	CONDUIT	329.4	0.3521	0.0190
773387STMN-OF	773052STMH	773389STMH	CONDUIT	329.4	0.5668	0.0200
773391STMN	773389STMH	773392STMH	CONDUIT	20.6	0.2910	0.0190
773391STMN-OF	773389STMH	773392STMH	CONDUIT	20.6	-0.6450	0.0200
773393STMN	773392STMH	773410STMH	CONDUIT	285.2	0.3226	0.0190
773393STMN-OF	773392STMH	773410STMH	CONDUIT	285.1	0.5604	0.0200
773411STMN	773410STMH	773412STMH	CONDUIT	49.5	1.9612	0.0190
773411STMN-OF	773410STMH	773412STMH	CONDUIT	49.5	-2.3900	0.0200
773413STMN	773412STMH	773412STMH-OF	CONDUIT	15.7	3.1206	0.0190
CDE4	J_DE4	23862STMH	CONDUIT	1.0	-435735.0000	0.0100
E17THAVE-01	20841STMH	E17THAVE-01	CONDUIT	184.2	0.5010	0.0190
E17THAVE01-OF	20841STMH	E17THAVE-01	CONDUIT	184.2	0.1938	0.0200
E17THAVE-02	E17THAVE-01	E17THAVE-02	CONDUIT	171.3	0.4962	0.0190
E17THAVE-03	E17THAVE-02	E17THAVE-03	CONDUIT	156.3	0.4989	0.0190
E17THAVE-04	E17THAVE-03	20853STMH	CONDUIT	185.9	0.4760	0.0190
E17THAVE04-OF	E17THAVE-03	20853STMH	CONDUIT	185.9	0.7261	0.0200
E17THAVE-05	20861STMH	E17THAVE-04	CONDUIT	193.6	0.5009	0.0190
E17THAVE-06	E17THAVE-04	E17THAVE-05	CONDUIT	177.0	0.4972	0.0190
E17THAVE-07	E17THAVE-05	E17THAVE-06	CONDUIT	159.9	0.5003	0.0190
E17THAVE-08	E17THAVE-06	E17THAVE-07	CONDUIT	186.5	0.4986	0.0190
E17THAVE-09	E17THAVE-07	E17THAVE-08	CONDUIT	142.7	0.5044	0.0190
E17THAVE-10	E17THAVE-08	E17THAVE-09	CONDUIT	150.5	0.4982	0.0190
E17THAVE-11	E17THAVE-09	E17THAVE-10	CONDUIT	352.1	0.4999	0.0190
E17THAVE-12	E17THAVE-10	E17THAVE-11	CONDUIT	340.7	0.4990	0.0190
E17THAVE-13	E17THAVE-11	E17THAVE-12	CONDUIT	330.7	0.5020	0.0190
E17THAVE-OF	E17THAVE-12	E17THAVE-OF	CONDUIT	90.0	0.5113	0.0190
37753STGM	19198STMH	19150STMH	CONDUIT	38.5	0.3636	0.0190

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

37753STGM-OF	19198STMH	19150STMH	CONDUIT	38.5	0.2883	0.0200
37675STGM	19718STMH	19198STMH	CONDUIT	359.7	0.5254	0.0190
37675STGM-OF	19718STMH	19198STMH	CONDUIT	359.7	0.4532	0.0200
37746STGM	20050STMH	19718STMH	CONDUIT	237.5	0.4758	0.0190
37746STGM-OF	20050STMH	19718STMH	CONDUIT	237.5	0.3848	0.0200
37714STGM	20866STMH	20861STMH	CONDUIT	276.0	0.5000	0.0190
37714STGM-OF	20866STMH	20861STMH	CONDUIT	276.0	0.5196	0.0200
37715STGM	20851STMH	20866STMH	CONDUIT	25.0	0.5200	0.0190
37715STGM-OF	20851STMH	20866STMH	CONDUIT	25.0	0.5760	0.0200
37716STGM	20853STMH	20851STMH	CONDUIT	310.0	0.5000	0.0190
37716STGM-OF	20853STMH	20851STMH	CONDUIT	803.9	0.2666	0.0200
37717STGM	20851STMH	20493STMH	CONDUIT	304.5	0.2693	0.0190
37717STGM-OF	20851STMH	20493STMH	CONDUIT	304.5	0.6378	0.0200
37721STGM	20493STMH	20164STMH	CONDUIT	334.0	0.4491	0.0190
37721STGM-OF	20493STMH	20164STMH	CONDUIT	334.0	0.5506	0.0200
37731STGM	20164STMH	20128STMH	CONDUIT	27.5	1.1273	0.0190
37731STGM-OF	20164STMH	20128STMH	CONDUIT	27.5	-0.9055	0.0200
37742STGM	20128STMH	20127STMH	CONDUIT	272.2	0.3233	0.0190
37742STGM-OF	20128STMH	20127STMH	CONDUIT	272.2	0.4985	0.0200
37743STGM	20127STMH	20050STMH	CONDUIT	49.5	1.0910	0.0190
37743STGM-OF	20127STMH	20050STMH	CONDUIT	49.5	0.6061	0.0200
4401-02-210	J_DE6_2	24797STIL	CONDUIT	400.0	0.0650	0.0100
C_12th	J_12th	J2	CONDUIT	1200.0	0.6500	0.0200
37761STGM-OF_BHI	19150STMH	19143STMH	CONDUIT	329.2	0.5599	0.0200

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
19071STMH	CIRCULAR	5.50	23.76	1.38	5.50	1	81.20
19071STMH-OF	50ftStreet	10.00	1034.40	4.92	110.00	1	86002.40
35191STGM	CIRCULAR	1.25	1.23	0.31	1.25	1	33.77
35191STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	169535.96
35325STGM	CIRCULAR	1.25	1.23	0.31	1.25	1	2.59
35325STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	21997.24
35326STGM	CIRCULAR	1.25	1.23	0.31	1.25	1	4.42
35326STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	24593.99
35328STGM	CIRCULAR	1.25	1.23	0.31	1.25	1	2.61
35328STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	15387.98
35329STGM	CIRCULAR	1.25	1.23	0.31	1.25	1	2.61
35329STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	14330.02
35355STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	46.12
35355STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	20136.45
35357STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	42.05
35357STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	17296.27
35358STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	53.84
35358STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	18384.59
35362STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	45.32
35362STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	18161.63
35363STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	46.00

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

35363STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	14712.15
35365STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	54.53
35365STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	15372.58
35367STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	53.31
35367STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	16122.18
35368STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	55.11
35368STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	16150.23
35369STGM	CIRCULAR	3.50	9.62	0.88	3.50	1	64.94
35369STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	18039.22
35370STGM	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	65.72
35370STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	18505.19
35371STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	139.12
35372STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	98.42
35372STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	17999.31
36715STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.47
36715STGM-OF	Montview	3.00	532.32	0.89	408.00	1	3496.68
36716STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.61
36716STGM-OF	Montview	3.00	532.32	0.89	408.00	1	3577.70
36717STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	160.26
36717STGM-OF	50ftStreet	10.00	1034.40	4.92	110.00	1	47682.04
36718STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.37
36718STGM-OF	Montview	3.00	532.32	0.89	408.00	1	1946.88
36939STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	66.01
36939STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	14826.10
37665STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	137.49
37665STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	15689.18
37666STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	59.27
37666STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	18075.17
37673STGM	CIRCULAR	4.00	12.57	1.00	4.00	1	80.72
37673STGMF-OFE	36ftStreet	10.00	1253.52	3.68	136.00	1	18070.22
37750STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	42.98
37750STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	5011.69
37757STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	82.40
37757STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2092.93
37758STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	84.89
37758STGM-OF	Montview	3.00	532.32	0.89	408.00	1	1956.02
37759STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	86.28
37759STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2124.29
37760STGM	CIRCULAR	4.50	15.90	1.13	4.50	1	86.44
37760STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2631.50
37761STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.67
37762STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.35
37762STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2392.91
37763STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.03
37763STGM-OF	Montview	3.00	532.32	0.89	408.00	1	2658.82
37764STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.72
37764STGM-OF	Montview	3.00	532.32	0.89	408.00	1	532.22
406193STGM	CIRCULAR	3.00	7.07	0.75	3.00	1	13.27
406193STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	13421.79
406197STGM	CIRCULAR	3.00	7.07	0.75	3.00	1	20.14
406197STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	19804.80
406199STGM	CIRCULAR	2.00	3.14	0.50	2.00	1	14.01
406199STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	21821.46

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

406200STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	39.59
406200STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	19294.90
406201STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	22.16
406201STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	14986.01
406205STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	34.27
406205STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	8985.78
406206STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	18.10
407544STMH	CIRCULAR	3.00	7.07	0.75	3.00	1	65.46
407544STMH-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	133712.70
D_12th	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-220	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-230	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-240	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-250	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-260	DUMMY	0.00	0.00	0.00	0.00	1	0.00
4401-02-261	DUMMY	0.00	0.00	0.00	0.00	1	0.00
773049STMN	HORIZ_ELLIPSE	2.42	7.41	0.74	3.75	1	28.91
773049STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	31547.40
773051STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	40.72
773051STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	25086.71
773387STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	42.99
773387STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	16703.97
773391STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	39.08
773391STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	17819.62
773393STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	41.15
773393STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	16609.92
773411STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	101.46
773411STMN-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	34301.43
773413STMN	HORIZ_ELLIPSE	2.83	10.19	0.87	4.42	1	127.98
CDE4	DUMMY	0.00	0.00	0.00	0.00	1	0.00
E17THAVE-01	CIRCULAR	5.50	23.76	1.38	5.50	1	162.63
E17THAVE01-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	9767.26
E17THAVE-02	CIRCULAR	5.50	23.76	1.38	5.50	1	161.86
E17THAVE-03	CIRCULAR	5.50	23.76	1.38	5.50	1	162.29
E17THAVE-04	CIRCULAR	5.50	23.76	1.38	5.50	1	158.52
E17THAVE04-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	18906.87
E17THAVE-05	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	167.85
E17THAVE-06	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	167.23
E17THAVE-07	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	167.75
E17THAVE-08	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	167.47
E17THAVE-09	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	168.43
E17THAVE-10	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	167.40
E17THAVE-11	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	167.67
E17THAVE-12	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	167.53
E17THAVE-13	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	168.03
E17THAVE-OF	HORIZ_ELLIPSE	4.42	24.80	1.35	6.92	1	169.57
37753STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	16.92
37753STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	11913.64
37675STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	20.34
37675STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	14936.14
37746STGM	CIRCULAR	2.50	4.91	0.63	2.50	1	19.36
37746STGM-OF	36ftStreet	10.00	1253.52	3.68	136.00	1	13764.34
37714STGM	CIRCULAR	5.50	23.76	1.38	5.50	1	162.47

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

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37714STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 15993.20
37715STGM        CIRCULAR            5.50    23.76     1.38     5.50        1   165.69
37715STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 16839.43
37716STGM        CIRCULAR            5.50    23.76     1.38     5.50        1   162.47
37716STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 11455.89
37717STGM        HORIZ_ELLIPSE       1.58     3.18     0.48     2.50        1     7.96
37717STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 17719.35
37721STGM        HORIZ_ELLIPSE       1.58     3.18     0.48     2.50        1    10.28
37721STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 16463.93
37731STGM        HORIZ_ELLIPSE       1.58     3.18     0.48     2.50        1    16.29
37731STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 21113.23
37742STGM        CIRCULAR            2.50     4.91     0.63     2.50        1    15.96
37742STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 15666.10
37743STGM        CIRCULAR            2.50     4.91     0.63     2.50        1    29.31
37743STGM-OF     36ftStreet         10.00  1253.52     3.68   136.00        1 17273.27
4401-02-210      DUMMY               0.00     0.00     0.00     0.00        1     0.00
C_12th           36ftStreet         10.00  1253.52     3.68   136.00        1 17888.49
37761STGM-OF_BHI Montview            3.00   532.32     0.89   408.00        1  2744.57


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Transect Summary
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Transect 19071STMH-OF
Area:
            0.0026     0.0130     0.0275     0.0439     0.0625
            0.0825     0.1029     0.1234     0.1439     0.1644
            0.1850     0.2056     0.2263     0.2469     0.2677
            0.2884     0.3092     0.3300     0.3509     0.3717
            0.3926     0.4135     0.4344     0.4553     0.4762
            0.4971     0.5180     0.5389     0.5598     0.5807
            0.6016     0.6226     0.6435     0.6644     0.6854
            0.7063     0.7273     0.7482     0.7692     0.7901
            0.8111     0.8321     0.8531     0.8740     0.8950
            0.9160     0.9370     0.9580     0.9790     1.0000
Hrad:
            0.0104     0.0232     0.0423     0.0557     0.0765
            0.0926     0.1150     0.1373     0.1595     0.1815
            0.2033     0.2251     0.2466     0.2680     0.2893
            0.3105     0.3315     0.3523     0.3731     0.3944
            0.4158     0.4370     0.4582     0.4793     0.5004
            0.5213     0.5421     0.5629     0.5836     0.6042
            0.6247     0.6452     0.6656     0.6858     0.7061
            0.7262     0.7462     0.7662     0.7861     0.8059
            0.8257     0.8453     0.8649     0.8845     0.9039
            0.9233     0.9426     0.9618     0.9809     1.0000
Width:
            0.2982     0.6497     0.7135     0.8635     0.9004
            0.9723     0.9739     0.9755     0.9772     0.9788
            0.9804     0.9820     0.9836     0.9853     0.9869
            0.9885     0.9901     0.9917     0.9933     0.9938
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Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

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              0.9940     0.9942     0.9944     0.9946     0.9948
              0.9950     0.9952     0.9954     0.9956     0.9958
              0.9961     0.9963     0.9965     0.9967     0.9969
              0.9971     0.9973     0.9975     0.9977     0.9979
              0.9981     0.9983     0.9985     0.9988     0.9990
              0.9992     0.9994     0.9996     0.9998     1.0000

  Transect 50ftStreet
  Area:
              0.0019     0.0077     0.0173     0.0300     0.0457
              0.0644     0.0855     0.1067     0.1280     0.1493
              0.1705     0.1918     0.2131     0.2343     0.2556
              0.2769     0.2981     0.3194     0.3407     0.3619
              0.3832     0.4045     0.4258     0.4470     0.4683
              0.4896     0.5108     0.5321     0.5534     0.5746
              0.5959     0.6172     0.6384     0.6597     0.6810
              0.7022     0.7235     0.7448     0.7660     0.7873
              0.8086     0.8299     0.8511     0.8724     0.8937
              0.9149     0.9362     0.9575     0.9787     1.0000
  Hrad:
              0.0198     0.0397     0.0674     0.0941     0.1133
              0.1281     0.1432     0.1615     0.1810     0.2010
              0.2214     0.2420     0.2627     0.2834     0.3042
              0.3249     0.3456     0.3663     0.3870     0.4076
              0.4282     0.4487     0.4691     0.4895     0.5099
              0.5301     0.5504     0.5705     0.5906     0.6107
              0.6307     0.6506     0.6705     0.6903     0.7100
              0.7297     0.7494     0.7690     0.7885     0.8080
              0.8274     0.8468     0.8661     0.8854     0.9046
              0.9238     0.9429     0.9620     0.9810     1.0000
  Width:
              0.1818     0.3636     0.5254     0.6671     0.8087
              0.9504     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000

  Transect 36ftStreet
  Area:
              0.0016     0.0063     0.0125     0.0214     0.0335
              0.0488     0.0673     0.0886     0.1103     0.1320
              0.1537     0.1754     0.1971     0.2188     0.2405
              0.2622     0.2839     0.3056     0.3273     0.3490
              0.3707     0.3924     0.4141     0.4358     0.4575
              0.4792     0.5009     0.5226     0.5443     0.5660
              0.5877     0.6094     0.6311     0.6528     0.6745
              0.6962     0.7179     0.7396     0.7613     0.7830
              0.8047     0.8264     0.8481     0.8698     0.8915
```

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

```
              0.9132     0.9349     0.9566     0.9783     1.0000
  Hrad:
              0.0266     0.0583     0.1059     0.1300     0.1424
              0.1506     0.1572     0.1669     0.1829     0.2009
              0.2200     0.2398     0.2600     0.2804     0.3009
              0.3216     0.3423     0.3630     0.3837     0.4044
              0.4251     0.4457     0.4663     0.4868     0.5073
              0.5278     0.5482     0.5685     0.5888     0.6090
              0.6291     0.6492     0.6692     0.6892     0.7091
              0.7289     0.7487     0.7684     0.7880     0.8076
              0.8271     0.8466     0.8660     0.8853     0.9046
              0.9238     0.9429     0.9620     0.9810     1.0000
  Width:
              0.1471     0.2647     0.3382     0.4853     0.6324
              0.7794     0.9265     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000
              1.0000     1.0000     1.0000     1.0000     1.0000

  Transect Montview
  Area:
              0.0049     0.0100     0.0152     0.0205     0.0258
              0.0313     0.0368     0.0423     0.0480     0.0537
              0.0594     0.0653     0.0712     0.0772     0.0833
              0.0895     0.0975     0.1082     0.1189     0.1296
              0.1404     0.1513     0.1621     0.1730     0.1840
              0.1950     0.2060     0.2171     0.2282     0.2393
              0.2505     0.2618     0.2732     0.3059     0.3491
              0.3923     0.4355     0.4787     0.5220     0.5653
              0.6086     0.6519     0.6953     0.7387     0.7821
              0.8256     0.8691     0.9126     0.9563     1.0000
  Hrad:
              0.0650     0.1298     0.1941     0.2575     0.3200
              0.3817     0.4424     0.5024     0.5616     0.6201
              0.6778     0.7349     0.7913     0.8470     0.8943
              0.9242     0.8616     0.8888     0.9204     0.9548
              0.9913     1.0292     1.0682     1.1080     1.1484
              1.1892     1.2304     1.2719     1.3136     1.3554
              1.3959     1.4359     1.4720     1.3051     1.1914
              1.1142     1.0608     1.0237     0.9984     0.9818
              0.9717     0.9667     0.9656     0.9678     0.9726
              0.9795     0.9877     0.9974     1.0084     1.0000
  Width:
              0.1098     0.1123     0.1139     0.1154     0.1170
              0.1186     0.1202     0.1217     0.1233     0.1249
              0.1264     0.1280     0.1296     0.1312     0.1340
              0.1394     0.2317     0.2326     0.2334     0.2342
              0.2351     0.2359     0.2367     0.2376     0.2384
```

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

```
            0.2393     0.2401     0.2409     0.2418     0.2426
            0.2447     0.2470     0.2526     0.9384     0.9389
            0.9395     0.9400     0.9406     0.9411     0.9417
            0.9422     0.9428     0.9433     0.9439     0.9445
            0.9452     0.9467     0.9482     0.9498     1.0000

  ***********************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  ***********************************************************

  ***************
  Analysis Options
  ***************
  Flow Units ............... CFS
  Process Models:
    Rainfall/Runoff ........ NO
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Flow Routing Method ...... DYNWAVE
  Starting Date ............ 01/01/2005 00:00:00
  Ending Date .............. 01/01/2005 06:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:00:30
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 4
  Head Tolerance ........... 0.005000 ft


  *************************        Volume        Volume
  Flow Routing Continuity        acre-feet      10^6 gal
  *************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.000         0.000
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........       106.501        34.705
  External Outflow .........       103.790        33.822
  Flooding Loss ............         2.601         0.848
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.004         0.001
  Continuity Error (%) .....         0.099
```

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

```
**************************
Time-Step Critical Elements
**************************
Link 35191STGM (47.63%)
Link 773413STMN (36.60%)
Link 35362STGM (5.74%)
Link 773391STMN (1.25%)


*******************************
Highest Flow Instability Indexes
*******************************
Link 35372STGM (19)
Link 35370STGM (11)
Link 35371STGM (9)
Link 773411STMN (2)
Link 773413STMN (1)


************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.09 sec
Maximum Time Step           :     5.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.01
Percent Not Converging      :     0.01


******************
Node Depth Summary
******************

--------------------------------------------------------------------------------
                            Average  Maximum  Maximum  Time of Max    Reported
                              Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type      Feet     Feet     Feet  days hr:min        Feet
--------------------------------------------------------------------------------
19071STMH            JUNCTION  2.73     4.94  5309.34     0  01:09        4.94
19079STMH            JUNCTION  2.69     4.93  5309.42     0  01:09        4.93
19097STMH            JUNCTION  2.36     4.57  5311.97     0  01:08        4.57
19111STMH            JUNCTION  2.33     4.45  5314.61     0  01:07        4.45
19132STMH            JUNCTION  2.03     4.06  5315.49     0  01:08        4.06
19134STMH            JUNCTION  1.97     3.89  5316.24     0  01:08        3.89
19139STMH            JUNCTION  2.18     4.29  5314.91     0  01:08        4.29
19143STMH            JUNCTION  1.93     3.74  5317.73     0  01:08        3.74
19150STMH            JUNCTION  1.92     3.69  5319.33     0  01:08        3.69
19154STMH            JUNCTION  1.88     3.99  5324.48     0  01:07        3.99
19162STMH            JUNCTION  2.02     4.59  5326.53     0  01:07        4.59
19171STMH            JUNCTION  2.24     5.46  5328.56     0  01:08        5.46
19179STMH            JUNCTION  2.38     6.24  5330.60     0  01:08        6.24
```

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

19214STMH	JUNCTION	2.38	6.28	5330.85	0	01:08	6.28
20135STMH	JUNCTION	3.12	9.61	5338.43	0	01:06	9.61
20209STFT	JUNCTION	2.84	9.12	5338.86	0	01:02	9.12
20818STMH	JUNCTION	3.45	9.33	5341.65	0	00:57	9.33
20841STMH	JUNCTION	5.26	11.45	5341.88	0	00:55	11.45
23839STMH	JUNCTION	3.27	4.99	5338.37	0	01:04	4.99
23840STMH	JUNCTION	2.15	2.85	5333.04	0	01:00	2.85
23841STMH	JUNCTION	2.42	3.31	5333.79	0	01:00	3.31
23843STMH	JUNCTION	1.74	2.28	5331.10	0	01:04	2.28
23845STMH	JUNCTION	4.60	7.33	5342.66	0	01:03	7.33
23849STMH	JUNCTION	4.98	7.58	5345.30	0	00:59	7.58
23852STMH	JUNCTION	4.90	7.88	5343.55	0	01:01	7.88
23855STMH	JUNCTION	4.89	7.20	5346.75	0	00:56	7.20
23856STMH	JUNCTION	5.08	7.44	5346.60	0	00:57	7.44
23861STMH	JUNCTION	4.92	7.21	5349.00	0	00:55	7.21
23862STMH	JUNCTION	4.95	7.22	5348.87	0	00:56	7.22
23868STMH	JUNCTION	5.11	7.96	5351.11	0	00:55	7.96
24788STMH	JUNCTION	4.23	5.34	5346.69	0	00:51	5.34
24791STMH	JUNCTION	0.18	0.28	5337.98	0	00:52	0.28
24796STMH	JUNCTION	4.54	5.60	5348.27	0	00:51	5.60
24797STIL	JUNCTION	4.90	6.05	5349.79	0	00:50	6.04
24800STMH	JUNCTION	4.11	5.19	5346.32	0	00:52	5.19
405658STFT	JUNCTION	2.21	5.38	5330.06	0	01:30	5.38
405659STFT	JUNCTION	3.69	9.22	5336.20	0	01:29	9.22
407540STMH	JUNCTION	2.24	5.40	5329.68	0	01:30	5.40
407541STMH	JUNCTION	1.47	3.43	5327.40	0	01:30	3.43
407542STMH	JUNCTION	1.26	2.84	5326.38	0	01:30	2.84
407543STMH	JUNCTION	3.72	9.24	5335.82	0	01:30	9.24
407544STMH	JUNCTION	0.73	1.66	5324.99	0	01:31	1.66
407546STMH	JUNCTION	5.52	13.75	5342.01	0	01:28	13.75
J_DE6_1	JUNCTION	0.00	0.00	5348.42	0	00:00	0.00
J_DE5	JUNCTION	0.00	0.00	5354.48	0	00:00	0.00
J_DE3	JUNCTION	0.00	0.00	5341.25	0	00:00	0.00
J_DE2	JUNCTION	0.00	0.00	5327.53	0	00:00	0.00
J_AD4	JUNCTION	0.00	0.00	5315.00	0	00:00	0.00
J_AD1	JUNCTION	0.00	0.00	5336.76	0	00:00	0.00
J_DE1	JUNCTION	0.00	0.00	5348.23	0	00:00	0.00
773032STMH	JUNCTION	5.48	9.77	5332.68	0	00:45	9.77
773050STMH	JUNCTION	5.13	9.16	5331.93	0	00:46	9.16
773052STMH	JUNCTION	3.85	6.58	5328.43	0	00:48	6.58
773389STMH	JUNCTION	3.35	6.03	5326.72	0	00:51	6.03
773392STMH	JUNCTION	3.38	6.07	5326.58	0	00:52	6.07
773410STMH	JUNCTION	1.69	3.62	5323.08	0	00:52	3.62
773412STMH	JUNCTION	1.34	2.34	5320.83	0	00:52	2.34
J_DE4	JUNCTION	0.00	0.00	984.30	0	00:00	0.00
E17THAVE-01	JUNCTION	4.92	10.32	5339.83	0	00:55	10.32
E17THAVE-02	JUNCTION	4.53	8.79	5337.45	0	00:43	8.79
E17THAVE-03	JUNCTION	4.34	8.24	5336.12	0	01:23	8.24
E17THAVE-04	JUNCTION	3.02	5.46	5328.38	0	01:23	5.46
E17THAVE-05	JUNCTION	2.92	5.13	5327.17	0	01:23	5.13
E17THAVE-06	JUNCTION	2.83	4.83	5326.07	0	01:23	4.83
E17THAVE-07	JUNCTION	2.73	4.48	5324.79	0	01:23	4.48
E17THAVE-08	JUNCTION	2.68	4.29	5323.88	0	01:23	4.29

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

E17THAVE-09	JUNCTION	2.65	4.19	5323.03	0	01:24	4.19
E17THAVE-10	JUNCTION	2.58	4.00	5321.08	0	01:24	4.00
E17THAVE-11	JUNCTION	2.49	3.77	5319.15	0	01:24	3.77
E17THAVE-12	JUNCTION	2.31	3.37	5317.09	0	01:24	3.37
19198STMH	JUNCTION	1.08	1.47	5320.56	0	01:24	1.47
19718STMH	JUNCTION	1.17	1.63	5322.61	0	01:24	1.63
20050STMH	JUNCTION	1.20	1.67	5323.78	0	01:24	1.67
20127STMH	JUNCTION	1.03	1.44	5324.09	0	01:24	1.44
20128STMH	JUNCTION	1.34	1.84	5325.37	0	01:23	1.84
20164STMH	JUNCTION	1.22	1.80	5325.64	0	01:23	1.80
20493STMH	JUNCTION	1.86	3.58	5328.92	0	01:23	3.58
20851STMH	JUNCTION	3.60	6.51	5331.91	0	01:23	6.51
20866STMH	JUNCTION	3.58	6.46	5331.73	0	01:23	6.46
20853STMH	JUNCTION	4.09	7.59	5334.54	0	01:23	7.59
20861STMH	JUNCTION	3.13	5.82	5329.71	0	01:23	5.82
J_DE6_2	JUNCTION	0.00	0.00	5344.00	0	00:00	0.00
J_12th	JUNCTION	0.52	0.84	5344.84	0	00:50	0.84
18979STOF	OUTFALL	1.97	3.52	5307.84	0	01:09	3.52
18979STOF2	OUTFALL	0.00	0.00	5304.32	0	00:00	0.00
23842STFT	OUTFALL	1.73	2.28	5328.22	0	01:04	2.28
24773STOF	OUTFALL	0.17	0.27	5335.57	0	00:52	0.27
24773STOF2	OUTFALL	0.16	0.26	5335.56	0	00:52	0.26
407544STMH-OF	OUTFALL	0.00	0.00	5322.61	0	00:00	0.00
407550STMH	OUTFALL	0.72	1.66	5324.27	0	01:31	1.66
4401-02-250-OF	OUTFALL	0.00	0.00	5309.40	0	00:00	0.00
773412STMH-OF	OUTFALL	1.32	2.20	5320.20	0	00:42	2.20
E17THAVE-OF	OUTFALL	0.00	0.00	5311.80	0	00:00	0.00
J2	OUTFALL	0.50	0.84	5337.04	0	00:50	0.84

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
19071STMH	JUNCTION	0.00	158.51	0	01:09	0	5.54	0.000
19079STMH	JUNCTION	0.00	158.52	0	01:08	0	5.54	0.004
19097STMH	JUNCTION	0.00	158.57	0	01:07	0	5.54	0.001
19111STMH	JUNCTION	0.00	158.59	0	01:07	0	5.54	-0.008
19132STMH	JUNCTION	0.00	127.41	0	01:09	0	4.27	0.008
19134STMH	JUNCTION	0.00	127.36	0	01:09	0	4.27	0.008
19139STMH	JUNCTION	0.00	127.48	0	01:10	0	4.27	-0.005
19143STMH	JUNCTION	0.00	127.35	0	01:08	0	4.27	0.001
19150STMH	JUNCTION	0.00	127.35	0	01:08	0	4.27	-0.008
19154STMH	JUNCTION	0.00	112.15	0	01:07	0	3.38	0.043
19162STMH	JUNCTION	0.00	112.18	0	01:06	0	3.39	0.269
19171STMH	JUNCTION	0.00	108.62	0	01:16	0	3.37	-0.003
19179STMH	JUNCTION	0.00	108.89	0	00:54	0	3.37	-0.019

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

19214STMH	JUNCTION	0.00	110.24	0	00:54	0	3.37	0.016
20135STMH	JUNCTION	0.00	124.24	0	00:57	0	3.39	-0.034
20209STFT	JUNCTION	0.00	124.82	0	00:57	0	3.39	0.007
20818STMH	JUNCTION	0.00	133.65	0	00:50	0	3.39	-0.006
20841STMH	JUNCTION	0.00	402.94	0	00:50	0	14.8	0.021
23839STMH	JUNCTION	0.00	86.15	0	01:02	0	5.36	-0.008
23840STMH	JUNCTION	0.00	86.22	0	01:00	0	5.36	0.008
23841STMH	JUNCTION	0.00	86.14	0	01:04	0	5.36	0.006
23843STMH	JUNCTION	0.00	87.82	0	01:04	0	5.36	-0.005
23845STMH	JUNCTION	0.00	88.89	0	00:45	0	5.36	0.024
23849STMH	JUNCTION	0.00	149.93	0	00:57	0	6.58	-0.058
23852STMH	JUNCTION	0.00	149.59	0	00:59	0	6.58	0.119
23855STMH	JUNCTION	0.00	150.02	0	00:56	0	6.57	-0.346
23856STMH	JUNCTION	0.00	149.93	0	00:56	0	6.6	0.286
23861STMH	JUNCTION	0.00	96.24	0	00:55	0	4.09	-0.039
23862STMH	JUNCTION	0.00	150.11	0	00:55	0	6.6	0.375
23868STMH	JUNCTION	0.00	96.31	0	00:55	0	4.09	-0.001
24788STMH	JUNCTION	0.00	58.75	0	00:51	0	2.03	0.025
24791STMH	JUNCTION	0.00	58.70	0	00:52	0	2.03	0.000
24796STMH	JUNCTION	0.00	59.00	0	00:50	0	2.01	-0.791
24797STIL	JUNCTION	0.00	59.03	0	00:50	0	2.03	0.858
24800STMH	JUNCTION	0.00	58.75	0	00:51	0	2.03	-0.039
405658STFT	JUNCTION	0.00	38.59	0	01:29	0	1.22	-0.019
405659STFT	JUNCTION	0.00	42.89	0	00:54	0	1.22	-0.029
407540STMH	JUNCTION	0.00	38.58	0	01:30	0	1.22	0.032
407541STMH	JUNCTION	0.00	38.58	0	01:30	0	1.22	0.180
407542STMH	JUNCTION	0.00	38.58	0	01:30	0	1.22	-0.030
407543STMH	JUNCTION	0.00	38.59	0	01:28	0	1.22	0.007
407544STMH	JUNCTION	0.00	38.58	0	01:31	0	1.22	0.002
407546STMH	JUNCTION	0.00	62.97	0	01:01	0	1.21	-0.628
J_DE6_1	JUNCTION	109.63	109.63	0	00:50	3.77	3.77	0.000
J_DE5	JUNCTION	96.31	96.31	0	00:55	4.09	4.09	0.000
J_DE3	JUNCTION	50.78	50.78	0	00:55	2.22	2.22	0.000
J_DE2	JUNCTION	104.26	104.26	0	00:45	3.19	3.19	0.000
J_AD4	JUNCTION	31.70	31.70	0	00:40	0.818	0.818	0.000
J_AD1	JUNCTION	37.54	37.54	0	00:45	1.27	1.27	0.000
J_DE1	JUNCTION	402.94	402.94	0	00:50	14.8	14.8	0.000
773032STMH	JUNCTION	0.00	152.69	0	00:45	0	5.41	0.007
773050STMH	JUNCTION	0.00	152.71	0	00:45	0	5.41	0.174
773052STMH	JUNCTION	0.00	152.46	0	00:45	0	5.4	-0.031
773389STMH	JUNCTION	0.00	151.94	0	00:48	0	5.41	-0.202
773392STMH	JUNCTION	0.00	151.31	0	00:50	0	5.42	-0.007
773410STMH	JUNCTION	0.00	151.00	0	00:52	0	5.42	0.002
773412STMH	JUNCTION	0.00	151.00	0	00:52	0	5.42	0.000
J_DE4	JUNCTION	54.00	54.00	0	00:55	2.5	2.5	0.000
E17THAVE-01	JUNCTION	0.00	271.22	0	00:55	0	11.4	-0.000
E17THAVE-02	JUNCTION	0.00	271.23	0	00:55	0	11.4	-0.000
E17THAVE-03	JUNCTION	0.00	239.44	0	00:43	0	10.6	0.019
E17THAVE-04	JUNCTION	0.00	200.09	0	00:43	0	9.68	-0.000
E17THAVE-05	JUNCTION	0.00	199.45	0	00:43	0	9.68	-0.000
E17THAVE-06	JUNCTION	0.00	198.85	0	00:44	0	9.68	-0.000
E17THAVE-07	JUNCTION	0.00	196.96	0	00:44	0	9.68	-0.000
E17THAVE-08	JUNCTION	0.00	196.46	0	00:55	0	9.68	-0.000

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

E17THAVE-09	JUNCTION	0.00	196.46	0	01:23	0	9.68	-0.004	
E17THAVE-10	JUNCTION	0.00	196.46	0	01:24	0	9.68	-0.001	
E17THAVE-11	JUNCTION	0.00	196.46	0	01:24	0	9.68	-0.000	
E17THAVE-12	JUNCTION	0.00	196.46	0	01:24	0	9.68	0.005	
19198STMH	JUNCTION	0.00	15.20	0	01:24	0	0.884	0.022	
19718STMH	JUNCTION	0.00	15.20	0	01:24	0	0.884	-0.007	
20050STMH	JUNCTION	0.00	15.20	0	01:24	0	0.884	-0.013	
20127STMH	JUNCTION	0.00	15.20	0	01:23	0	0.884	0.010	
20128STMH	JUNCTION	0.00	15.20	0	01:23	0	0.884	-0.011	
20164STMH	JUNCTION	0.00	15.20	0	01:23	0	0.884	0.004	
20493STMH	JUNCTION	0.00	15.57	0	00:45	0	0.884	0.008	
20851STMH	JUNCTION	0.00	227.14	0	00:43	0	10.6	-0.000	
20866STMH	JUNCTION	0.00	208.24	0	00:42	0	9.68	0.000	
20853STMH	JUNCTION	0.00	233.77	0	00:43	0	10.6	0.014	
20861STMH	JUNCTION	0.00	205.79	0	00:42	0	9.68	-0.000	
J_DE6_2	JUNCTION	59.03	59.03	0	00:50	2.03	2.03	0.000	
J_12th	JUNCTION	0.00	109.63	0	00:50	0	3.77	0.092	
18979STOF	OUTFALL	0.00	158.51	0	01:09	0	5.54	0.000	
18979STOF2	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	gal
23842STFT	OUTFALL	0.00	86.21	0	01:04	0	5.36	0.000	
24773STOF	OUTFALL	0.00	3.34	0	00:52	0	0.139	0.000	
24773STOF2	OUTFALL	0.00	55.36	0	00:52	0	1.89	0.000	
407544STMH-OF	OUTFALL	0.00	0.00	0	00:00	0	0	0.000	gal
407550STMH	OUTFALL	0.00	38.58	0	01:31	0	1.22	0.000	
4401-02-250-OF	OUTFALL	0.00	31.70	0	00:40	0	0.818	0.000	
773412STMH-OF	OUTFALL	0.00	151.00	0	00:52	0	5.42	0.000	
E17THAVE-OF	OUTFALL	0.00	196.46	0	01:24	0	9.68	0.000	
J2	OUTFALL	0.00	109.23	0	00:50	0	3.76	0.000	

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
J_DE6_1	JUNCTION	6.00	0.000	0.000
J_DE5	JUNCTION	6.00	0.000	0.000
J_DE3	JUNCTION	6.00	0.000	0.000
J_DE2	JUNCTION	6.00	0.000	0.000
J_AD4	JUNCTION	6.00	0.000	0.000
J_AD1	JUNCTION	6.00	0.000	0.000
J_DE1	JUNCTION	6.00	0.000	0.000
J_DE4	JUNCTION	6.00	0.000	0.000
E17THAVE-02	JUNCTION	0.90	3.286	0.000
E17THAVE-04	JUNCTION	0.81	1.044	3.039
E17THAVE-05	JUNCTION	0.78	0.710	3.373
E17THAVE-06	JUNCTION	0.74	0.413	3.671
E17THAVE-07	JUNCTION	0.64	0.063	4.021

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

J_DE6_2	JUNCTION	6.00	0.000	0.000

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Node Flooding Summary
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Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Depth Feet
E17THAVE-02	0.68	59.56	0 00:55	0.848	0.000

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
18979STOF	99.04	70.49	158.51	5.536
18979STOF2	0.00	0.00	0.00	0.000
23842STFT	98.00	60.80	86.21	5.361
24773STOF	96.38	1.71	3.34	0.139
24773STOF2	97.41	24.12	55.36	1.889
407544STMH-OF	0.00	0.00	0.00	0.000
407550STMH	73.34	21.98	38.58	1.217
4401-02-250-OF	88.34	11.76	31.70	0.818
773412STMH-OF	99.05	67.57	151.00	5.417
E17THAVE-OF	96.79	119.08	196.46	9.679
J2	99.17	47.49	109.23	3.764
System	77.05	425.00	809.45	33.819

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Link Flow Summary
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Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
19071STMH	CONDUIT	158.51	0 01:09	8.09	1.95	0.77
19071STMH-OF	CHANNEL	0.00	0 00:00	0.00	0.00	0.00
35191STGM	CONDUIT	3.34	0 00:52	17.01	0.10	0.22

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

35191STGM-OF	CHANNEL	55.36	0	00:52	14.34	0.00	0.03
35325STGM	CONDUIT	8.71	0	00:32	7.09	3.36	1.00
35325STGM-OF	CHANNEL	54.19	0	00:51	3.75	0.00	0.06
35326STGM	CONDUIT	5.51	0	00:52	7.36	1.25	0.61
35326STGM-OF	CHANNEL	53.18	0	00:52	3.99	0.00	0.05
35328STGM	CONDUIT	5.58	0	00:23	4.55	2.14	1.00
35328STGM-OF	CHANNEL	55.71	0	00:50	2.79	0.00	0.07
35329STGM	CONDUIT	5.05	0	00:28	4.12	1.93	1.00
35329STGM-OF	CHANNEL	55.77	0	00:51	2.93	0.00	0.07
35355STGM	CONDUIT	61.29	0	00:35	6.37	1.33	1.00
35355STGM-OF	CHANNEL	36.19	0	00:55	2.38	0.00	0.06
35357STGM	CONDUIT	53.23	0	00:35	5.53	1.27	1.00
35357STGM-OF	CHANNEL	55.57	0	00:55	2.46	0.00	0.07
35358STGM	CONDUIT	74.68	0	00:34	7.76	1.39	1.00
35358STGM-OF	CHANNEL	93.86	0	00:56	3.46	0.01	0.08
35362STGM	CONDUIT	79.63	0	00:38	8.28	1.76	1.00
35362STGM-OF	CHANNEL	101.42	0	00:56	3.35	0.01	0.09
35363STGM	CONDUIT	71.47	0	00:37	7.43	1.55	1.00
35363STGM-OF	CHANNEL	103.74	0	00:57	3.26	0.01	0.09
35365STGM	CONDUIT	78.10	0	00:41	8.12	1.43	1.00
35365STGM-OF	CHANNEL	99.25	0	00:59	3.36	0.01	0.08
35367STGM	CONDUIT	88.89	0	00:45	9.24	1.67	1.00
35367STGM-OF	CHANNEL	62.97	0	01:01	3.05	0.00	0.13
35368STGM	CONDUIT	85.08	0	00:45	8.84	1.54	1.00
35368STGM-OF	CHANNEL	1.92	0	01:03	1.17	0.00	0.02
35369STGM	CONDUIT	86.14	0	01:04	9.02	1.33	0.97
35369STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
35370STGM	CONDUIT	86.22	0	01:00	8.46	1.31	1.00
35370STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
35371STGM	CONDUIT	86.21	0	01:04	11.65	0.62	0.57
35372STGM	CONDUIT	87.82	0	01:04	10.33	0.89	0.64
35372STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36715STGM	CONDUIT	127.57	0	01:10	6.48	0.79	0.79
36715STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36716STGM	CONDUIT	158.52	0	01:08	7.27	0.97	0.86
36716STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36717STGM	CONDUIT	158.51	0	01:09	7.05	0.99	0.90
36717STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36718STGM	CONDUIT	158.57	0	01:07	7.66	0.98	0.82
36718STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
36939STGM	CONDUIT	104.33	0	00:41	8.39	1.58	1.00
36939STGM-OF	CHANNEL	55.61	0	00:57	2.97	0.00	0.07
37665STGM	CONDUIT	113.17	0	00:52	9.01	0.82	1.00
37665STGM-OF	CHANNEL	21.52	0	01:02	2.40	0.00	0.04
37666STGM	CONDUIT	111.15	0	00:42	8.84	1.88	1.00
37666STGM-OF	CHANNEL	55.65	0	00:55	3.26	0.00	0.07
37673STGM	CONDUIT	110.24	0	00:54	8.77	1.37	1.00
37673STGMF-OFE	CHANNEL	4.55	0	01:06	1.55	0.00	0.02
37750STGM	CONDUIT	108.89	0	00:54	6.85	2.53	1.00
37750STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37757STGM	CONDUIT	109.07	0	01:15	6.87	1.32	1.00
37757STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37758STGM	CONDUIT	108.62	0	01:16	6.83	1.28	1.00

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

37758STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37759STGM	CONDUIT	112.15	0	01:07	7.24	1.30	0.94
37759STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37760STGM	CONDUIT	112.15	0	01:08	8.32	1.30	0.79
37760STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37761STGM	CONDUIT	127.35	0	01:08	7.46	0.78	0.68
37762STGM	CONDUIT	127.36	0	01:09	7.28	0.78	0.69
37762STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37763STGM	CONDUIT	127.41	0	01:09	7.04	0.79	0.72
37763STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37764STGM	CONDUIT	127.48	0	01:10	6.75	0.78	0.76
37764STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406193STGM	CONDUIT	38.58	0	01:31	6.29	2.91	0.81
406193STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406197STGM	CONDUIT	38.58	0	01:30	5.55	1.92	0.96
406197STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406199STGM	CONDUIT	38.58	0	01:30	12.28	2.75	1.00
406199STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406200STGM	CONDUIT	38.58	0	01:30	7.86	0.97	1.00
406200STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406201STGM	CONDUIT	38.59	0	01:29	7.86	1.74	1.00
406201STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406205STGM	CONDUIT	38.59	0	01:28	7.86	1.13	1.00
406205STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
406206STGM	CONDUIT	42.89	0	00:54	8.74	2.37	1.00
407544STMH	CONDUIT	38.58	0	01:31	9.63	0.59	0.55
407544STMH-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
D_12th	DUMMY	109.63	0	00:50			
4401-02-220	DUMMY	96.31	0	00:55			
4401-02-230	DUMMY	50.78	0	00:55			
4401-02-240	DUMMY	104.26	0	00:45			
4401-02-250	DUMMY	31.70	0	00:40			
4401-02-260	DUMMY	37.54	0	00:45			
4401-02-261	DUMMY	402.94	0	00:50			
773049STMN	CONDUIT	90.27	0	00:31	12.17	3.12	1.00
773049STMN-OF	CHANNEL	85.89	0	00:45	5.48	0.00	0.06
773051STMN	CONDUIT	83.15	0	00:33	8.16	2.04	1.00
773051STMN-OF	CHANNEL	72.93	0	00:46	3.61	0.00	0.07
773387STMN	CONDUIT	74.26	0	00:32	7.29	1.73	1.00
773387STMN-OF	CHANNEL	99.65	0	00:48	3.25	0.01	0.09
773391STMN	CONDUIT	92.43	0	00:37	9.07	2.37	1.00
773391STMN-OF	CHANNEL	92.40	0	00:51	2.79	0.01	0.09
773393STMN	CONDUIT	93.90	0	00:42	9.48	2.28	1.00
773393STMN-OF	CHANNEL	70.66	0	00:52	3.32	0.00	0.07
773411STMN	CONDUIT	151.00	0	00:52	15.52	1.49	0.91
773411STMN-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
773413STMN	CONDUIT	151.00	0	00:52	17.04	1.18	0.80
CDE4	DUMMY	54.00	0	00:55			
E17THAVE-01	CONDUIT	247.16	0	00:46	10.40	1.52	1.00
E17THAVE01-OF	CHANNEL	28.82	0	00:55	2.14	0.00	0.05
E17THAVE-02	CONDUIT	271.23	0	00:55	11.42	1.68	1.00
E17THAVE-03	CONDUIT	239.44	0	00:43	10.08	1.48	1.00
E17THAVE-04	CONDUIT	233.77	0	00:43	9.84	1.47	1.00

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

E17THAVE04-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
E17THAVE-05	CONDUIT	200.09	0	00:43	8.19	1.19	1.00
E17THAVE-06	CONDUIT	199.45	0	00:43	8.18	1.19	1.00
E17THAVE-07	CONDUIT	198.85	0	00:44	8.19	1.19	1.00
E17THAVE-08	CONDUIT	196.96	0	00:44	8.19	1.18	1.00
E17THAVE-09	CONDUIT	196.46	0	00:55	8.20	1.17	0.99
E17THAVE-10	CONDUIT	196.46	0	01:23	8.20	1.17	0.96
E17THAVE-11	CONDUIT	196.46	0	01:24	8.25	1.17	0.93
E17THAVE-12	CONDUIT	196.46	0	01:24	8.47	1.17	0.88
E17THAVE-13	CONDUIT	196.46	0	01:24	9.03	1.17	0.81
E17THAVE-OF	CONDUIT	196.46	0	01:24	9.75	1.16	0.74
37753STGM	CONDUIT	15.20	0	01:24	5.42	0.90	0.56
37753STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37675STGM	CONDUIT	15.20	0	01:24	4.77	0.75	0.62
37675STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37746STGM	CONDUIT	15.20	0	01:24	4.44	0.79	0.66
37746STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37714STGM	CONDUIT	205.79	0	00:42	9.84	1.27	1.00
37714STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37715STGM	CONDUIT	208.24	0	00:42	9.09	1.26	1.00
37715STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37716STGM	CONDUIT	227.14	0	00:43	9.56	1.40	1.00
37716STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37717STGM	CONDUIT	15.57	0	00:45	4.90	1.96	1.00
37717STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37721STGM	CONDUIT	15.20	0	01:23	4.78	1.48	1.00
37721STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37731STGM	CONDUIT	15.20	0	01:23	4.78	0.93	1.00
37731STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37742STGM	CONDUIT	15.20	0	01:23	4.46	0.95	0.66
37742STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
37743STGM	CONDUIT	15.20	0	01:24	4.75	0.52	0.62
37743STGM-OF	CHANNEL	0.00	0	00:00	0.00	0.00	0.00
4401-02-210	DUMMY	59.03	0	00:50			
C_12th	CHANNEL	109.23	0	00:50	3.70	0.01	0.08
37761STGM-OF_BHI	CHANNEL	0.00	0	00:00	0.00	0.00	0.00

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Flow Classification Summary
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	Adjusted	Fraction of Time in Flow Class								
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
19071STMH	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00
19071STMH-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35191STGM	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
35191STGM-OF	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.27	0.00
35325STGM	1.00	0.01	0.00	0.00	0.87	0.00	0.00	0.13	0.00	0.00
35325STGM-OF	1.00	0.23	0.01	0.00	0.13	0.00	0.00	0.63	0.52	0.00

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

35326STGM	1.00	0.01	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00
35326STGM-OF	1.00	0.23	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00
35328STGM	1.00	0.01	0.00	0.00	0.91	0.00	0.00	0.09	0.01	0.00
35328STGM-OF	1.00	0.17	0.04	0.00	0.75	0.00	0.00	0.04	0.89	0.00
35329STGM	1.00	0.01	0.00	0.00	0.87	0.00	0.00	0.12	0.01	0.00
35329STGM-OF	1.00	0.19	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00
35355STGM	1.00	0.01	0.00	0.00	0.93	0.00	0.00	0.07	0.22	0.00
35355STGM-OF	1.00	0.40	0.16	0.00	0.44	0.00	0.00	0.00	0.90	0.00
35357STGM	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.21	0.00
35357STGM-OF	1.00	0.39	0.01	0.00	0.60	0.00	0.00	0.00	0.70	0.00
35358STGM	1.00	0.01	0.00	0.00	0.76	0.00	0.00	0.24	0.01	0.00
35358STGM-OF	1.00	0.39	0.00	0.00	0.57	0.00	0.00	0.04	0.88	0.00
35362STGM	1.00	0.01	0.00	0.00	0.81	0.00	0.00	0.18	0.00	0.00
35362STGM-OF	1.00	0.41	0.00	0.00	0.56	0.00	0.00	0.04	0.01	0.00
35363STGM	1.00	0.01	0.00	0.00	0.79	0.00	0.00	0.20	0.00	0.00
35363STGM-OF	1.00	0.41	0.00	0.00	0.47	0.00	0.00	0.12	0.00	0.00
35365STGM	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.56	0.00
35365STGM-OF	1.00	0.46	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00
35367STGM	1.00	0.01	0.00	0.00	0.98	0.02	0.00	0.00	0.38	0.00
35367STGM-OF	1.00	0.53	0.00	0.00	0.40	0.00	0.00	0.08	0.18	0.00
35368STGM	1.00	0.01	0.00	0.00	0.65	0.00	0.00	0.34	0.00	0.00
35368STGM-OF	1.00	0.67	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
35369STGM	1.00	0.01	0.00	0.00	0.74	0.25	0.00	0.00	0.49	0.00
35369STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35370STGM	1.00	0.02	0.00	0.00	0.94	0.05	0.00	0.00	0.28	0.00
35370STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35371STGM	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	0.50	0.00
35372STGM	1.00	0.02	0.00	0.00	0.03	0.96	0.00	0.00	0.33	0.00
35372STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36715STGM	1.00	0.01	0.01	0.00	0.99	0.00	0.00	0.00	0.47	0.00
36715STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36716STGM	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.74	0.00
36716STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36717STGM	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.18	0.00
36717STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36718STGM	1.00	0.01	0.00	0.00	0.99	0.01	0.00	0.00	0.75	0.00
36718STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36939STGM	1.00	0.03	0.00	0.00	0.83	0.14	0.00	0.00	0.42	0.00
36939STGM-OF	1.00	0.76	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
37665STGM	1.00	0.03	0.00	0.00	0.51	0.33	0.00	0.14	0.17	0.00
37665STGM-OF	1.00	0.85	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00
37666STGM	1.00	0.20	0.04	0.00	0.74	0.00	0.00	0.02	0.57	0.00
37666STGM-OF	1.00	0.76	0.00	0.00	0.19	0.00	0.00	0.05	0.80	0.00
37673STGM	1.00	0.03	0.06	0.00	0.89	0.02	0.00	0.00	0.74	0.00
37673STGMF-OFE	1.00	0.86	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
37750STGM	1.00	0.03	0.00	0.00	0.61	0.00	0.00	0.36	0.00	0.00
37750STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37757STGM	1.00	0.06	0.00	0.00	0.93	0.01	0.00	0.00	0.61	0.00
37757STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37758STGM	1.00	0.04	0.01	0.00	0.94	0.01	0.00	0.00	0.72	0.00
37758STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37759STGM	1.00	0.06	0.00	0.00	0.86	0.00	0.00	0.09	0.11	0.00
37759STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

37760STGM	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00
37760STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37761STGM	1.00	0.04	0.00	0.00	0.94	0.02	0.00	0.00	0.74	0.00
37762STGM	1.00	0.04	0.00	0.00	0.94	0.02	0.00	0.00	0.73	0.00
37762STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37763STGM	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.65	0.00
37763STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37764STGM	1.00	0.01	0.03	0.00	0.95	0.00	0.00	0.00	0.56	0.00
37764STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406193STGM	1.00	0.15	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00
406193STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406197STGM	1.00	0.15	0.00	0.00	0.56	0.00	0.00	0.29	0.05	0.00
406197STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406199STGM	1.00	0.26	0.03	0.00	0.70	0.00	0.00	0.02	0.65	0.00
406199STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406200STGM	1.00	0.28	0.03	0.00	0.67	0.01	0.00	0.00	0.65	0.00
406200STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406201STGM	1.00	0.14	0.00	0.00	0.85	0.01	0.00	0.00	0.51	0.00
406201STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406205STGM	1.00	0.14	0.00	0.00	0.46	0.01	0.00	0.40	0.01	0.00
406205STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
406206STGM	1.00	0.13	0.00	0.00	0.86	0.01	0.00	0.00	0.66	0.00
407544STMH	1.00	0.16	0.00	0.00	0.11	0.73	0.00	0.00	0.07	0.00
407544STMH-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
773049STMN	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.32	0.00
773049STMN-OF	1.00	0.58	0.00	0.00	0.00	0.21	0.00	0.21	0.07	0.00
773051STMN	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.42	0.00
773051STMN-OF	1.00	0.52	0.07	0.00	0.37	0.02	0.00	0.02	0.90	0.00
773387STMN	1.00	0.01	0.01	0.00	0.99	0.00	0.00	0.00	0.29	0.00
773387STMN-OF	1.00	0.52	0.00	0.00	0.36	0.00	0.00	0.12	0.16	0.00
773391STMN	1.00	0.01	0.00	0.00	0.94	0.00	0.00	0.05	0.00	0.00
773391STMN-OF	1.00	0.61	0.01	0.00	0.00	0.00	0.39	0.00	0.00	0.00
773393STMN	1.00	0.01	0.00	0.00	0.27	0.00	0.00	0.72	0.00	0.00
773393STMN-OF	1.00	0.62	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00
773411STMN	1.00	0.01	0.00	0.00	0.04	0.95	0.00	0.00	0.40	0.00
773411STMN-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
773413STMN	1.00	0.01	0.00	0.00	0.02	0.98	0.00	0.00	0.50	0.00
E17THAVE-01	1.00	0.04	0.00	0.00	0.95	0.00	0.00	0.00	0.65	0.00
E17THAVE01-OF	1.00	0.76	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
E17THAVE-02	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.56	0.00
E17THAVE-03	1.00	0.01	0.03	0.00	0.96	0.00	0.00	0.00	0.55	0.00
E17THAVE-04	1.00	0.01	0.00	0.00	0.95	0.00	0.00	0.05	0.00	0.00
E17THAVE04-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E17THAVE-05	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.70	0.00
E17THAVE-06	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.72	0.00
E17THAVE-07	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.70	0.00
E17THAVE-08	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.63	0.00
E17THAVE-09	1.00	0.02	0.00	0.00	0.97	0.00	0.00	0.00	0.61	0.00
E17THAVE-10	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.00	0.71	0.00
E17THAVE-11	1.00	0.02	0.00	0.00	0.96	0.02	0.00	0.00	0.69	0.00
E17THAVE-12	1.00	0.02	0.00	0.00	0.96	0.02	0.00	0.00	0.57	0.00
E17THAVE-13	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.50	0.00
E17THAVE-OF	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

37753STGM	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00
37753STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37675STGM	1.00	0.03	0.02	0.00	0.94	0.01	0.00	0.00	0.49	0.00
37675STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37746STGM	1.00	0.04	0.02	0.00	0.93	0.01	0.00	0.00	0.49	0.00
37746STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37714STGM	1.00	0.01	0.00	0.00	0.61	0.38	0.00	0.00	0.00	0.00
37714STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37715STGM	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.26	0.00
37715STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37716STGM	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.44	0.00
37716STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37717STGM	1.00	0.01	0.10	0.00	0.88	0.00	0.00	0.00	0.46	0.00
37717STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37721STGM	1.00	0.01	0.00	0.00	0.98	0.01	0.00	0.00	0.47	0.00
37721STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37731STGM	1.00	0.02	0.06	0.00	0.92	0.01	0.00	0.00	0.44	0.00
37731STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37742STGM	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.27	0.00
37742STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37743STGM	1.00	0.05	0.01	0.00	0.92	0.01	0.00	0.00	0.47	0.00
37743STGM-OF	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_12th	1.00	0.01	0.00	0.00	0.67	0.32	0.00	0.00	0.07	0.00
37761STGM-OF_BHI	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
19071STMH	0.01	0.01	0.01	1.09	0.01
35325STGM	2.94	2.96	2.94	3.05	2.94
35326STGM	0.01	2.96	0.01	2.77	0.01
35328STGM	2.99	3.02	3.02	2.74	2.70
35329STGM	2.94	3.03	2.95	3.04	2.94
35355STGM	1.88	1.88	1.90	1.45	1.45
35357STGM	1.91	1.91	1.91	0.16	0.16
35358STGM	1.89	1.91	1.89	1.95	1.89
35362STGM	1.90	1.90	1.90	2.02	1.90
35363STGM	1.85	1.92	1.85	1.47	1.31
35365STGM	1.79	1.86	1.79	0.65	0.49
35367STGM	1.76	1.79	1.76	1.96	1.76
35368STGM	1.48	1.76	1.48	1.94	1.48
35369STGM	0.01	1.54	0.01	1.83	0.01
35370STGM	0.47	1.40	0.47	1.81	0.47
36939STGM	0.79	0.90	0.79	0.97	0.79
37665STGM	0.79	0.79	0.84	0.01	0.01
37666STGM	0.90	0.90	0.90	1.02	0.89

Table F.8 – Conceptual Design SWMM Output for 100-year (Future) Event in Denver

37673STGM	0.73	0.84	0.73	0.91	0.73
37750STGM	0.56	0.59	0.56	1.18	0.56
37757STGM	0.16	0.49	0.16	0.89	0.16
37758STGM	0.50	0.59	0.50	0.88	0.50
37759STGM	0.01	0.16	0.01	0.86	0.01
37760STGM	0.01	0.01	0.01	0.86	0.01
406193STGM	0.01	0.01	0.01	1.21	0.01
406197STGM	0.01	1.10	0.01	1.19	0.01
406199STGM	1.20	1.20	1.20	1.22	1.20
406200STGM	1.18	1.18	1.19	0.01	0.01
406201STGM	1.17	1.18	1.18	1.18	1.16
406205STGM	1.17	1.17	1.18	1.11	1.12
406206STGM	1.17	1.19	1.17	1.18	1.14
773049STMN	1.66	1.70	1.66	1.97	1.66
773051STMN	1.54	1.59	1.54	1.75	1.54
773387STMN	1.44	1.54	1.44	1.71	1.44
773391STMN	1.43	1.44	1.43	1.78	1.43
773393STMN	0.48	1.46	0.48	1.74	0.48
773411STMN	0.01	0.55	0.01	0.80	0.01
773413STMN	0.01	0.01	0.01	0.55	0.01
E17THAVE-01	0.92	0.94	0.92	1.18	0.92
E17THAVE-02	0.90	0.92	0.90	1.19	0.90
E17THAVE-03	0.87	0.90	0.87	1.18	0.87
E17THAVE-04	0.84	0.87	0.84	1.22	0.84
E17THAVE-05	0.81	0.84	0.81	1.02	0.81
E17THAVE-06	0.78	0.81	0.78	1.03	0.78
E17THAVE-07	0.74	0.78	0.74	1.03	0.74
E17THAVE-08	0.64	0.74	0.64	1.03	0.64
E17THAVE-09	0.01	0.64	0.01	1.02	0.01
E17THAVE-10	0.01	0.01	0.01	1.03	0.01
E17THAVE-11	0.01	0.01	0.01	1.03	0.01
E17THAVE-12	0.01	0.01	0.01	1.03	0.01
E17THAVE-13	0.01	0.01	0.01	1.03	0.01
E17THAVE-OF	0.01	0.01	0.01	1.02	0.01
37714STGM	0.70	0.76	0.70	1.07	0.70
37715STGM	0.76	0.77	0.76	1.04	0.76
37716STGM	0.77	0.84	0.77	1.18	0.77
37717STGM	1.40	2.14	1.40	2.40	1.40
37721STGM	0.85	1.40	0.85	2.16	0.85
37731STGM	0.85	0.85	1.44	0.01	0.01

Analysis begun on: Thu Mar 17 07:40:56 2022
Analysis ended on: Thu Mar 17 07:40:58 2022
Total elapsed time: 00:00:02

APPENDIX G – MASTER PLAN MAPS AND PROFILES

CLICK HERE TO VIEW FULL-SIZE MAPS

CLICK HERE TO VIEW FULL-SIZE PROFILES

CLICK HERE TO VIEW 11X17 PRINTABLE PLAN & PROFILES

WESTERLY CREEK LOWER OSP

FEBRUARY 2022

Bohannan Huston
www.bhinc.com 800.877.5332

LEGEND

PROPOSED STORM DRAIN

EXISTING CONTOURS

0 175 250 500
1" = 250'

N

Instructions to print an area smaller than the full page to scale:

1. Using the "Snapshot" tool, select the desired area to print.
2. Click File>Print...
3. Select your printer from the printer dropdown menu.
4. Set the desired paper size using the printer "Properties" menu.
5. Choose the "Selected graphic" option under "Print Range".
6. Select "None" from the "Page Scaling" dropdown menu.
7. Unselect "Choose paper source by PDF page size".
8. Click "OK" to print selection.

This drawing is for master planning purposes and represents preliminary and conceptual engineering. Alternatives to this outfall system will be considered by local agencies and the Mile High Flood District provided the alternative offers an equivalent intent of the plan, including hydraulic capacity, water quality, stream stability and natural waterway features. The alternative must comply with all requirements the local jurisdiction and the Mile High Flood District. In addition, there may be state and federal requirements that will need to be considered and met. This drawing does not provide a final design and shall not be used for construction purposes.

Local cities, towns, and counties manage and regulate all land use change, development and redevelopment activities within and adjacent to the 100-year floodplains in order to prevent, to a maximum extent possible, future flood damages to buildings and structures from the 100-year flood and to minimize damages from larger floods. The recommendations of this plan provide a set of options subscribed to by cities, towns and counties in carrying out their floodplain management and regulatory responsibilities and obligations.

Many activities that occur in or affect ditches, drainages, creeks, ponds or wetlands require a Section 404 permit authorization from the US Army Corps of Engineers. During preliminary design, and prior to final design or starting work, contact the Corps' Denver Regulatory Office at 303-979-4120 for appropriate permit authority to avoid compromising and delaying the completion of the project.

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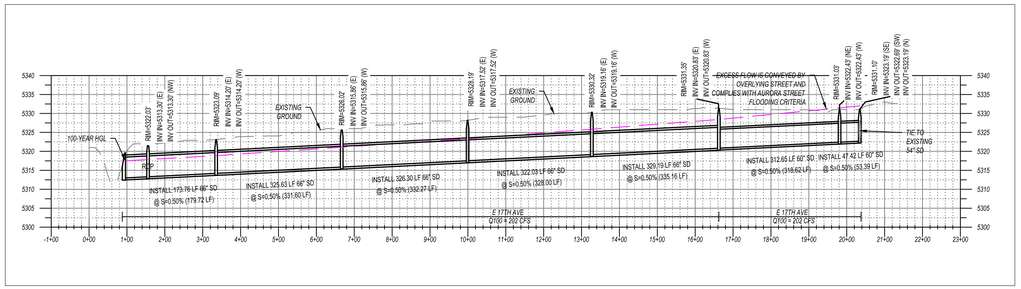
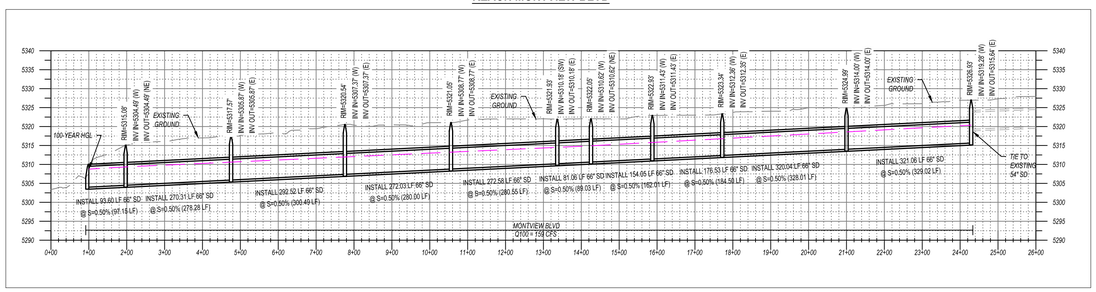
REACH E 17TH (AURORA)



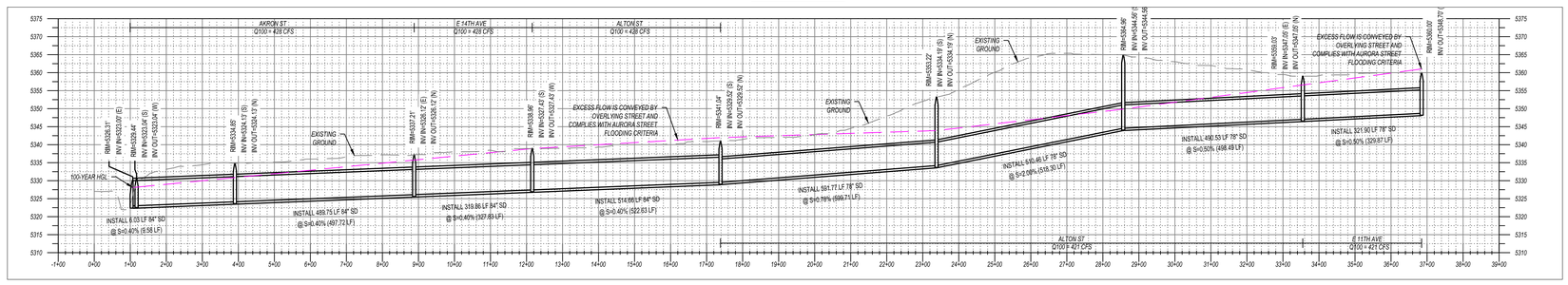
CLICK HERE TO VIEW REACH E 17TH (AURORA) TEXT
CLICK HERE TO VIEW REACH E 17TH (AURORA) MAP

REACH MONTVIEW BLVD



CLICK HERE TO VIEW REACH MONTVIEW BLVD TEXT
CLICK HERE TO VIEW REACH MONTVIEW BLVD MAP

REACH ALTON ST



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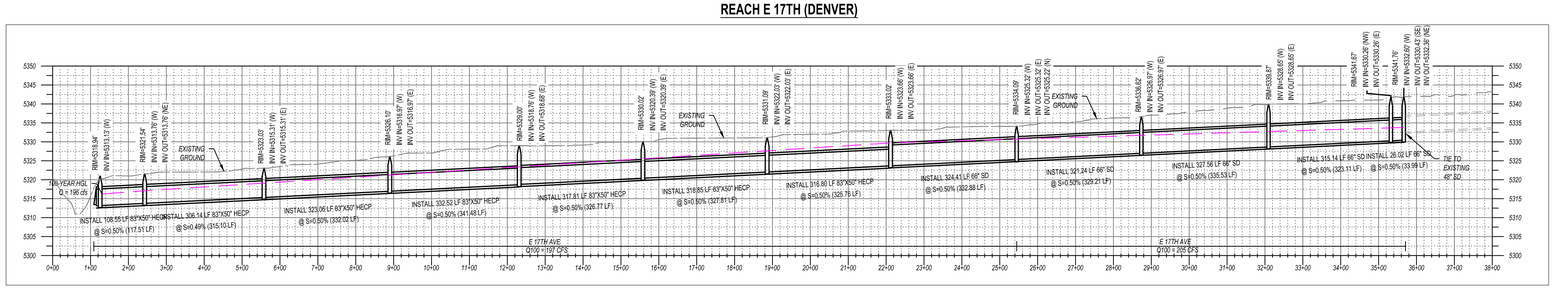
REACH E 17TH (DENVER)



CLICK HERE TO VIEW REACH E 17TH (DENVER) TEXT
CLICK HERE TO VIEW REACH E 17TH (DENVERY) MAP

NOTE: THE E 22ND AVENUE STORM DRAIN, E 23RD AVENUE STORM DRAIN, HAVANA PARK POND & DEL MAR IMPROVEMENTS AND CHESAPEAKE TOWNHOMES POND WERE ALL EITHER UNDER DESIGN OR WERE PREVIOUSLY DESIGNED AT THE TIME OF THIS OSP. THESE IMPROVEMENTS WERE NOT INCLUDED IN THIS PROFILE SET. CLICK THE BELOW LINKS TO VIEW THE REPORT TEXT AND DESIGN SHEETS USED IN THIS OSP.

REACH E 22ND AVENUE

CLICK HERE TO VIEW REACH E 22ND AVENUE TEXT
CLICK HERE TO VIEW REACH E 22ND AVENUE DESIGN SHEETS

REACH E 23RD AVENUE

CLICK HERE TO VIEW REACH E 23RD AVENUE TEXT
CLICK HERE TO VIEW REACH E 23RD AVENUE DESIGN SHEETS

REACH HAVANA PARK & DEL MAR PARKWAY

CLICK HERE TO VIEW REACH HAVANA PARK & DEL MAR PARKWAY TEXT
CLICK HERE TO VIEW REACH HAVANA PARK & DEL MAR PARKWAY DESIGN SHEETS

REACH CHESAPEAKE TOWNHOMES POND

CLICK HERE TO VIEW REACH CHESAPEAKE TOWNHOMES POND TEXT
CLICK HERE TO VIEW REACH CHESAPEAKE TOWNHOMES POND DESIGN SHEETS

WESTERLY CREEK LOWER OSP

FEBRUARY 2022

Bohannan Huston
www.bhinc.com 800.877.5332

LEGEND

EXISTING GROUND

100-YEAR HGL

0 100 200 400
1" = 200'

Instructions to print an area smaller than the full page to scale:

1. Using the "Snapshot" tool, select the desired area to print.
2. Click File>Print...
3. Select your printer from the printer dropdown menu.
4. Set the desired paper size using the printer "Properties" menu.
5. Choose the "Selected graphic" option under "Print Range".
6. Select "None" from the "Page Scaling" dropdown menu.
7. Unselect "Choose paper source by PDF page size".
8. Click "OK" to print selection.

This drawing is for master planning purposes and represents preliminary and conceptual engineering. Alternatives to this outfall system will be considered by local agencies and the Mile High Flood District provided the alternative offers an equivalent intent of the plan, including hydraulic capacity, water quality, stream stability and natural waterway features. The alternative must comply with all requirements the local jurisdiction and the Mile High Flood District. In addition, there may be state and federal requirements that will need to be considered and met. This drawing does not provide a final design and shall not be used for construction purposes.

Local cities, towns, and counties manage and regulate all land use change, development and redevelopment activities within and adjacent to the 100-year floodplains in order to prevent, to a maximum extent possible, future flood damages to buildings and structures from the 100-year flood and to minimize damages from larger floods. The recommendations of this plan provide a set of options subscribed to by cities, towns and counties in carrying out their floodplain management and regulatory responsibilities and obligations.

Many activities that occur in or affect ditches, drainages, creeks, ponds or wetlands require a Section 404 permit authorization from the US Army Corps of Engineers. During preliminary design, and prior to final design or starting work, contact the Corps' Denver Regulatory Office at 303-979-4120 for appropriate permit authority to avoid compromising and delaying the completion of the project.

WESTERLY CREEK
LOWER OSP

FEBRUARY 2022

LEGEND

PROPOSED STORM DRAIN

EXISTING GROUND

1000-YR HGL

This drawing is for master planning purposes and represents preliminary and conceptual engineering. Alternatives to this outfall system will be considered by local agencies and the Mile High Flood District provided the alternative offers an equivalent intent of the plan, including hydraulic capacity, water quality, stream stability and natural waterway features. The alternative must comply with all requirements the local jurisdiction and the Mile High Flood District. In addition, there may be state and federal requirements that will need to be considered and met. This drawing does not provide a final design and shall not be used for construction purposes.

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FEBRUARY 3, 2022 - CONCEPTUAL DESIGN - NOT FOR CONSTRUCTION

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HORIZ. SCALE: VERT. SCALE:

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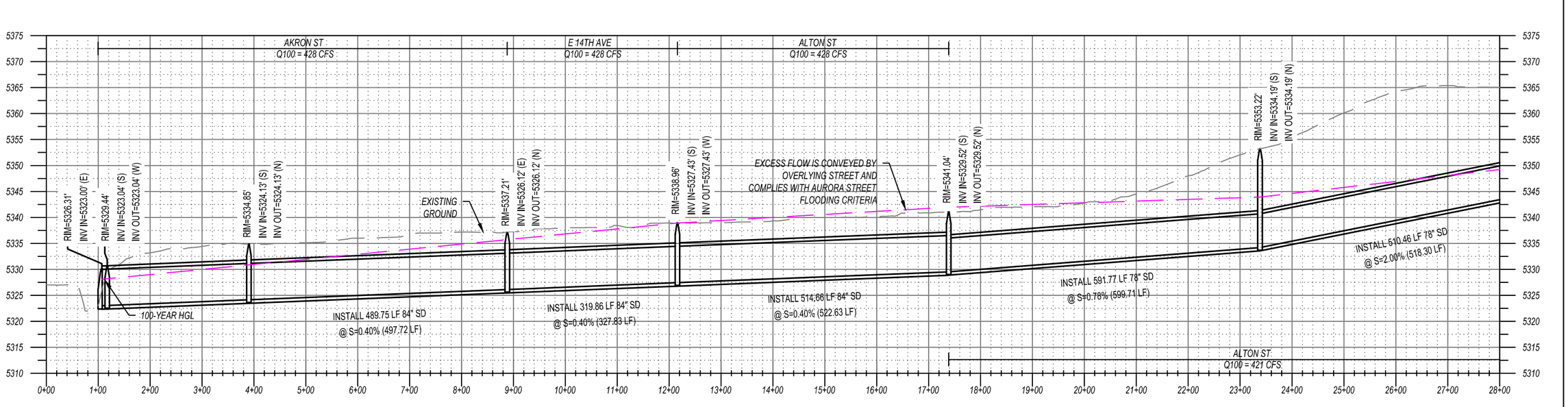
R-X			
R-1			
R-2			
R-3			

AURORA

MHFD MILE HIGH FLOOD DISTRICT

DENVER THE MILE HIGH CITY

AS CONSTRUCTED	WESTERLY CREEK OSP			PROJECT NO./CODE
NO REVISIONS:				20210239
REVISED:	DESIGNER: CJB	STR. NO'S.		
VOID:	DETAILER: NEC			DWG NO. SHEET #
	SUBSET:	SHEETS: OF		



FEBRUARY 3, 2022 - CONCEPTUAL DESIGN - NOT FOR CONSTRUCTION

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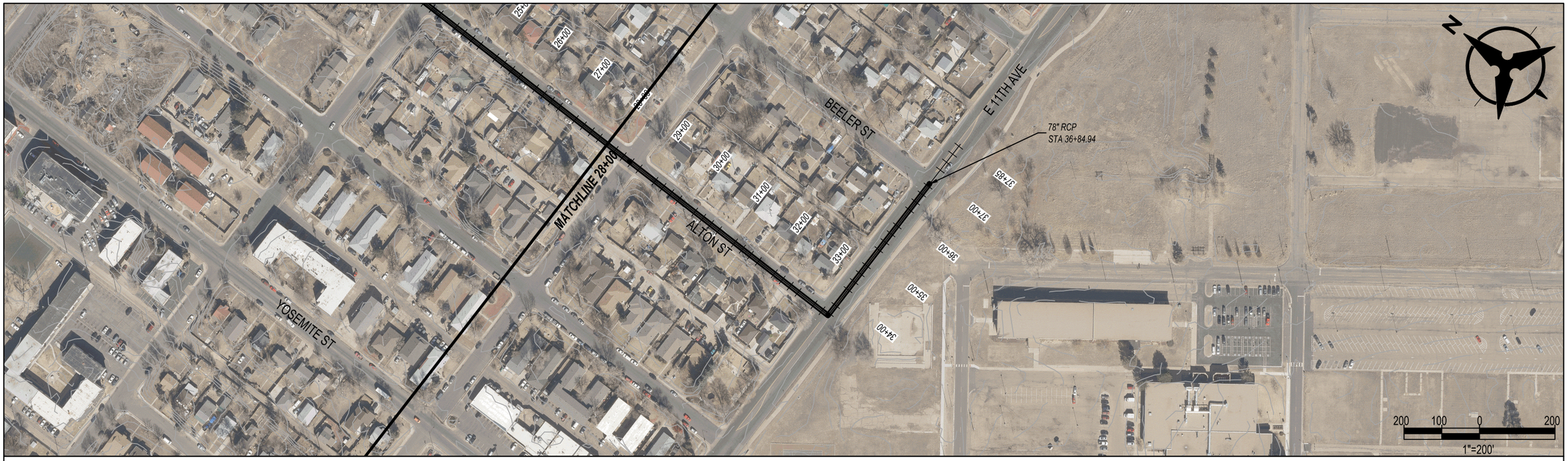
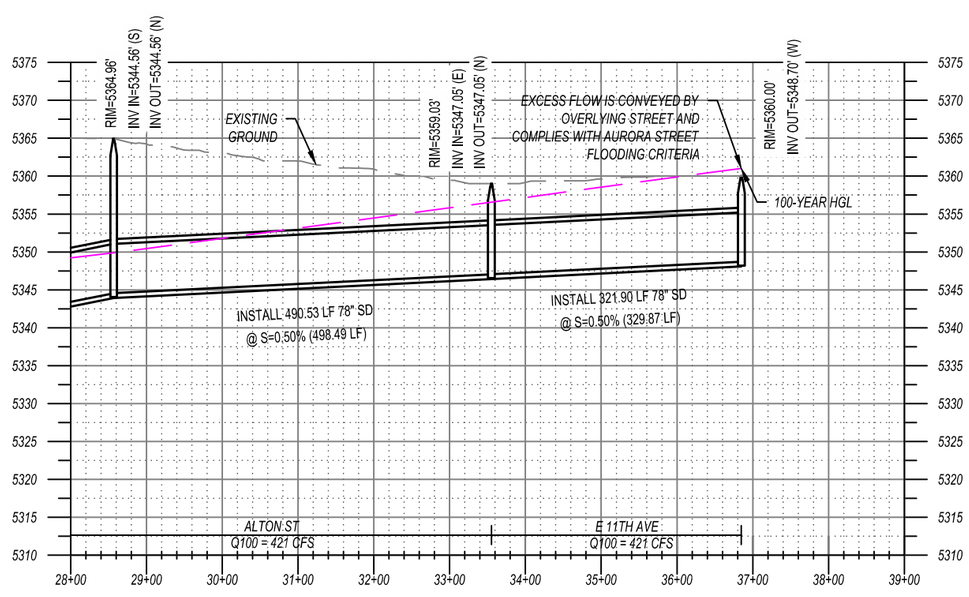
R-3		

MILE HIGH FLOOD DISTRICT
DENVER THE MILE HIGH CITY

AS CONSTRUCTED			
NO REVISIONS:	WESTERLY CREEK OSP ALTON SD PLAN & PROFILE STA. 0+00.00 TO STA. 28+00.00		PROJECT NO./CODE
REVISED:	DESIGNER: CJB	STR. NO'S.	20210239
VOID:	DETAILER: NEC		
	SUBSET:	SHEETS: 2 OF 7	DWG NO. SD1





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R-3		

MHFD MILE HIGH FLOOD DISTRICT
AURORA DENVER THE MILE HIGH CITY

AS CONSTRUCTED
NO REVISIONS:
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WESTERLY CREEK OSP
ALTON SD PLAN & PROFILE
STA. 28+00.00 TO STA. 37+48.94

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DETAILER: NEC
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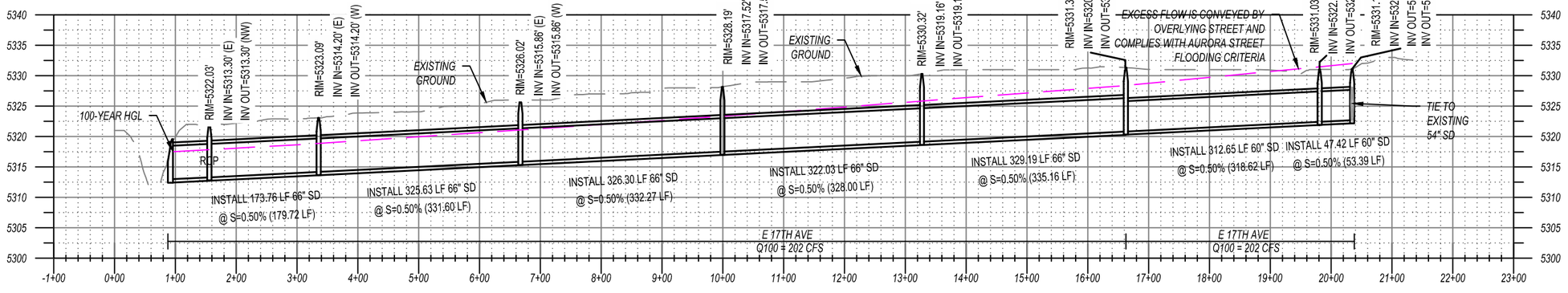
SHEETS: 3 OF 7

PROJECT NO./CODE
20210239

DWG NO. SD2



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AURORA

MHFD
MILE HIGH FLOOD DISTRICT
DENVER
THE MILE HIGH CITY

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WESTERLY CREEK OSP
17TH ST AURORA SD PLAN & PROFILE
STA. 0+00.00 TO STA. 23+00.00

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SHEETS: 4 OF 7

PROJECT NO./CODE
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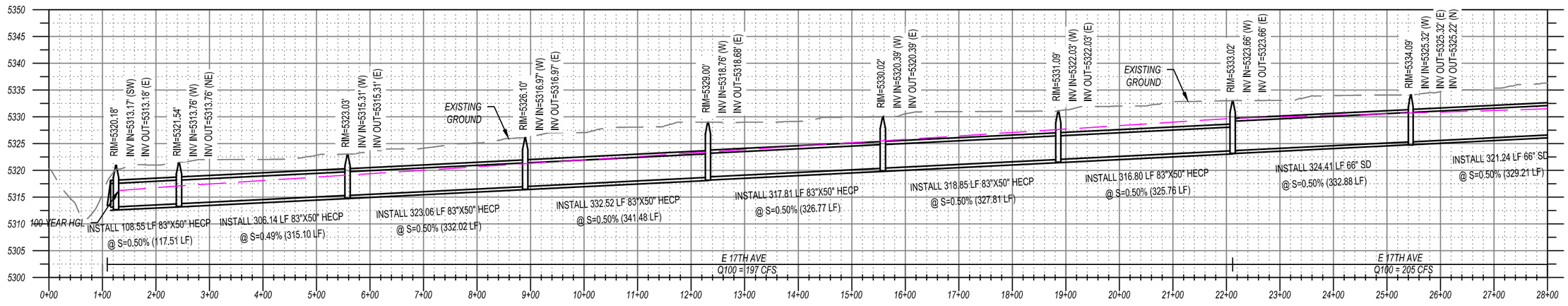

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MHFD MILE HIGH FLOOD DISTRICT
AURORA DENVER THE MILE HIGH CITY

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NO REVISIONS:
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WESTERLY CREEK OSP
17TH ST DENVER SD PLAN & PROFILE
STA. 0+00.00 TO STA. 28+00.00

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SHEETS: 5 OF 7

PROJECT NO./CODE
20210239

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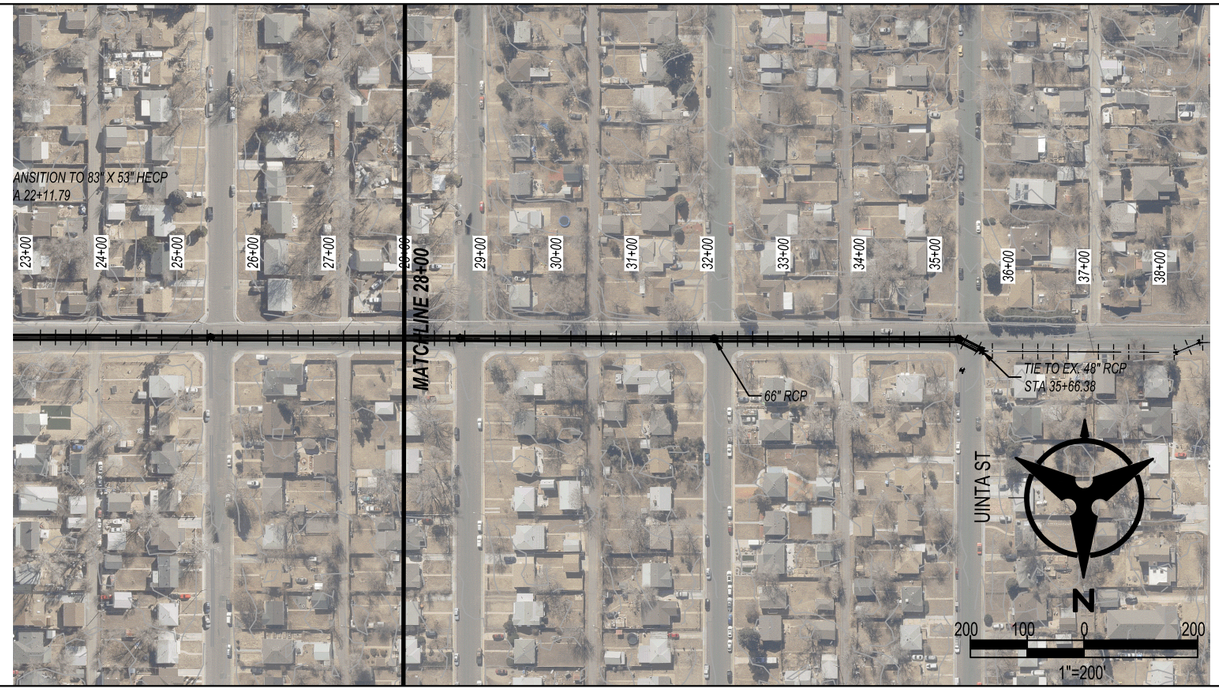

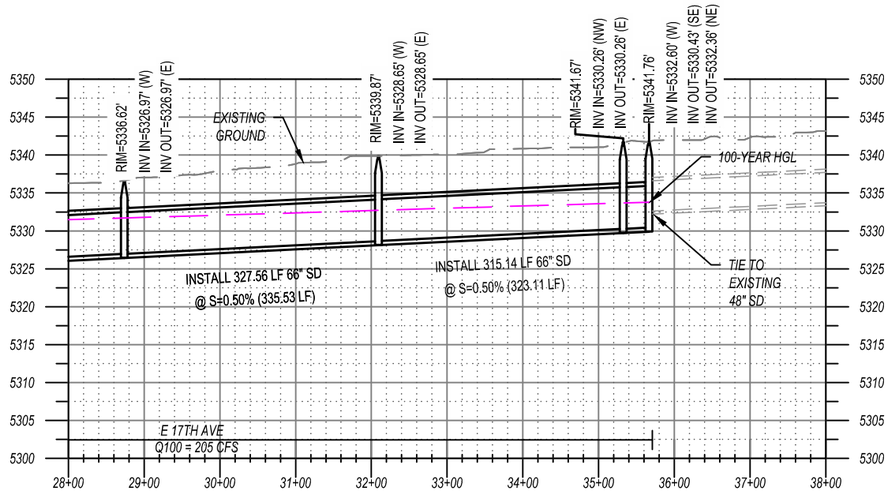

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STA. 28+00.00 TO STA. 38+00.00

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PROJECT NO./CODE
20210239

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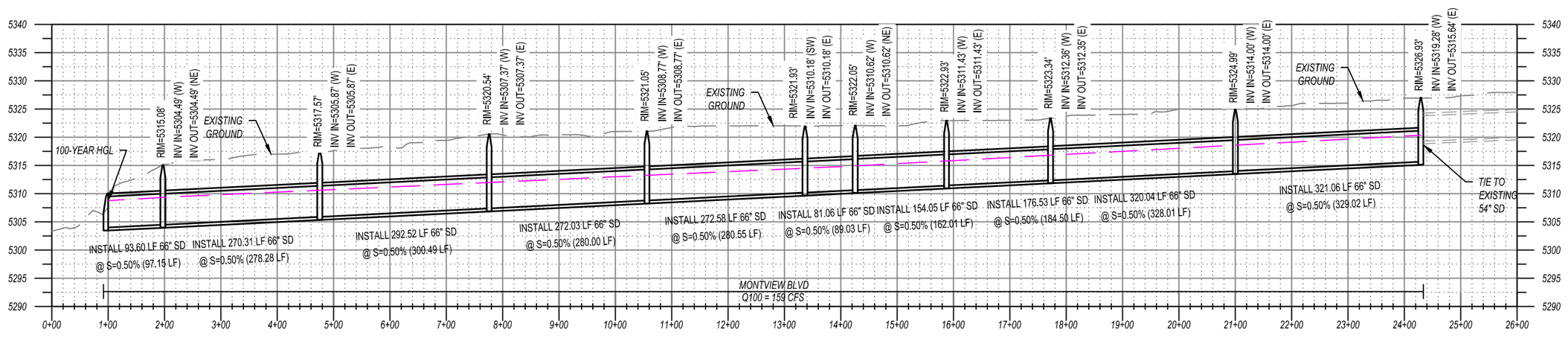

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SHEET REVISIONS			
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R-1			
R-2			
R-3			

AURORA

MHFD
MILE HIGH FLOOD DISTRICT
DENVER
THE MILE HIGH CITY

AS CONSTRUCTED	WESTERLY CREEK OSP MONTVIEW SD PLAN & PROFILE STA. 0+00.00 TO STA. 26+00.00			PROJECT NO./CODE
NO REVISIONS:				20210239
REVISED:	DESIGNER: CJB	STR. NO'S.		
VOID:	DETAILER: NEC			
	SUBSET:	SHEETS: 7 OF 7		DWG NO. SD6

EASTERLY CREEK DETENTION POND HAVANA
AUTOMOTIVE PARK #1B1 AND OLDE TOWNE #2B2 - 90%

CITY OF AURORA
NOVEMBER 2016
PROJECT NO. CPD 127300

REQUIRED NOTES:

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND ELEVATIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
2. ALL ROADWAY CONSTRUCTION SHALL CONFORM TO CITY OF AURORA "ROADWAY DESIGN AND CONSTRUCTION SPECIFICATIONS," LATEST REVISION.
3. ALL WATER DISTRIBUTION, SANITARY SEWER, AND STORM DRAINAGE CONSTRUCTION SHALL CONFORM TO CITY OF AURORA "STANDARDS AND SPECIFICATIONS WATER, SANITARY, SEWER, AND STORM DRAINAGE INFRASTRUCTURE" AND THE DRAINAGE CRITERIA MANUAL, LATEST REVISION.
4.
5. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE CITY. THE CITY RESERVES THE RIGHT TO ACCEPT OR REJECT ANY MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE CITY STANDARDS AND SPECIFICATIONS.
6. THE CONTRACTOR SHALL NOTIFY THE CITY PUBLIC IMPROVEMENT INSPECTIONS DIVISION, 303-739-7420, 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
7. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ACTUAL CONSTRUCTION. FOR INFORMATION, CONTACT UTILITY NOTIFICATION CENTER OF COLORADO, 1-800-922-1987 OR 811.
8. THE CONTRACTOR SHALL HAVE ONE SIGNED COPY OF THE PLANS (APPROVED BY THE CITY OF AURORA), ONE COPY OF THE APPROPRIATE STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, AND A COPY OF ANY PERMITS AND EXTENSION AGREEMENTS NEEDED AT THE JOB SITE AT ALL TIMES.
9. IT IS THE CONSULTANT'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ON-SITE, AND OFF-SITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NEEDED DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS EITHER ON-SITE OR OFF-SITE, WHICH ARISE IN THE FIELD, WILL BE ENTIRELY THE OWNER/DEVELOPER'S RESPONSIBILITY. THE COST TO RECTIFY ANY ADVERSE SITUATION TO MEET THE CITY STANDARDS AND SPECIFICATIONS AND THE CITY CODE SHALL BE BORNE SOLELY BY THE OWNER/DEVELOPER.
10. THE OWNER/DEVELOPER MUST OBTAIN THE WRITTEN PERMISSION OF THE ADJACENT PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE GRADING OR CONSTRUCTION.
11. CONCRETE SHALL NOT BE PLACED UNTIL THE FORMS HAVE BEEN INSPECTED AND A POUR SLIP ISSUED. POUR SLIPS WILL NOT BE ISSUED UNLESS THE CONTRACTOR HAS, AT THE JOB SITE, A COPY OF THE APPROVED PLANS BEARING THE SIGNATURE OF THE CITY ENGINEER.
12. PAVING SHALL NOT START UNTIL A SOIL REPORT AND PAVEMENT DESIGN IS APPROVED BY THE CITY ENGINEER AND SUBGRADE COMPACTION TESTS TAKEN BY THE DEVELOPER'S GEOTECH ARE APPROVED BY PUBLIC IMPROVEMENTS INSPECTIONS.
13. STANDARD CITY OF AURORA CURB RAMPS SHALL BE CONSTRUCTED AT ALL CURB RETURNS, AT ALL "T" INTERSECTIONS AND AT ALL CURBSIDE KIOSKS OR CLUSTERS, UNLESS OTHERWISE MODIFIED BY THESE PLANS.
14. ALL STATIONING IS BASED ON CENTERLINE OF ROADWAY UNLESS OTHERWISE NOTED.
15. ALL ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE NOTED.
16. THE CONTRACTOR/DEVELOPER IS RESPONSIBLE FOR CONTACTING CDOT TO ENSURE THAT ALL WORK ON OR ADJACENT TO STATE HIGHWAYS OR CDOT R.O.W. MEETS CDOT REQUIREMENTS.
17. THE STREETLIGHT INSTALLATION COST IS FUNDED BY THE DEVELOPER/OWNER. COORDINATE THE STREETLIGHT LOCATIONS AND INSTALLATION WITH THE PUBLIC WORKS DEPARTMENT 303-739-7300.
18. THE OWNER/CONTRACTOR MUST OBTAIN A C.D.P.S. STORM WATER DISCHARGE PERMIT FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, IF REQUIRED.
19. THE OWNER/CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE ARMY CORP OF ENGINEERS FOR WETLAND MITIGATION OR WORK WITHIN THE WATERS OF THE U.S., IF REQUIRED. IT IS THE RESPONSIBILITY OF THE OWNER/CONTRACTOR TO INFORM THE CITY OF AURORA OF THE ARMY CORP OF ENGINEER'S REQUIREMENTS. CITY APPROVAL OF THE CONSTRUCTION PLANS IS SUBJECT TO THE OWNER/CONTRACTOR OBTAINING A 404 PERMIT, IF APPLICABLE.

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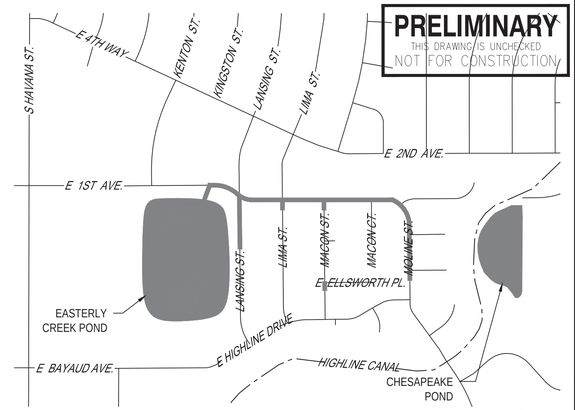
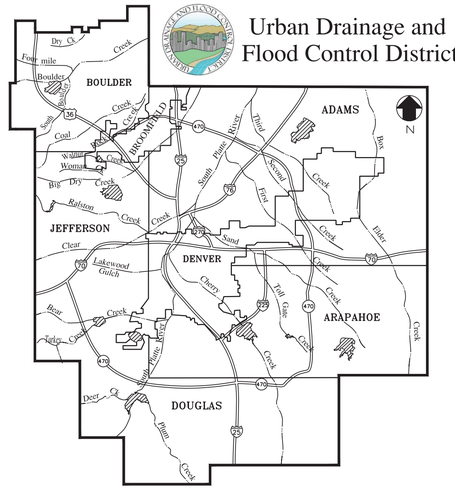
62	C1	SURVEY CONTROL	

* NOT IN CITY OF AURORA SET; BID SET ONLY.



VICINITY MAP
SCALE: 1" = 500'

N



UDFCD
2480 W 26TH AVE #156B
DENVER, CO 80211
303-455-6277
CONTACT: RICHARD BORCHARDT

PAUL HINDMAN — DATE
EXECUTIVE DIRECTOR

DAVE B. BENNETTS — DATE
MANAGER
DESIGN, CONSTRUCTION, AND MAINTENANCE PROGRAM

RICHARD G. BORCHARDT — DATE
PROJECT MANAGER
DESIGN, CONSTRUCTION, AND MAINTENANCE PROGRAM

CITY OF AURORA
15151 EAST ALAMEDA PKWY
AURORA, CO 80012
720-859-4300
CONTACT: CLINTON WEISZ

CLINTON WEISZ — DATE

"I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS FOR EASTERLY CREEK DETENTION POND WERE PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION) IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF AURORA STORM DRAINAGE DESIGN AND TECHNICAL CRITERIA MANUAL."

JESSICA NOLLE, P.E. — DATE
ENGINEER OF RECORD
STATE OF COLORADO NO. 38238

Approved For One Year From This Date

City Engineer	**Date**
Water Department	**Date**
Fire Department	**Date**
Parks, Recreation, and Open Space	**Date**

BENCHMARK: COA BENCHMARK IS A 3" BRASS CAP (STAMPED COA/BM J-012.5) (COA ID 4S6711SW004) LOCATED ON THE TOP OF CURB AT THE NE INTERSECTION OF E 1ST AVE & "FIRST AVENUE" TOWNHOMES ENTRANCE. ELEV=5450.43', NAVD88.

RESPEC
WATER & NATURAL RESOURCES
720 S COLORADO BLVD.
SUITE 410S
DENVER, CO 80246
PHONE (303) 757-3655

REVISION

DESIGNED	THT
DRAWN	ACT
CHECKED	JHN
DATE	9/8/16

STAMP

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CITY OF AURORA
15151 EAST ALAMEDA PKWY
AURORA, COLORADO 80012
303-739-7370

EASTERLY CREEK DETENTION POND
HAVANA
AUTOMOTIVE PARK
#1B1 AND OLDE TOWNE #2B2

COVER SHEET

SHEET NUMBER:
D1
SHEET 1

NAME: Z:\CITY OF AURORA\02823 -EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-COVER.DWG
PLOT DATE: November 4, 2016 11:37 AM, BY: AMY C. TEIGEN

CITY OF AURORA UTILITY NOTES:

1. ALL MATERIALS, WORKMANSHIP, CONSTRUCTION DETAILS, AND TESTING FOR THE WATER LINE CONSTRUCTION SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS REGARDING WATER, SANITARY SEWER AND STORM DRAINAGE INFRASTRUCTURE, LATEST REVISION AS SET FORTH BY THE CITY OF AURORA WATER DEPARTMENT, LATEST REVISION.
2. ALL FIRE HYDRANTS SHALL BE LOCATED NOT LESS THAN THREE FEET-SIX INCHES (3'-6") AND NOT MORE THAN 8 FEET FROM THE BACK OF CURB TO THE CENTER OF THE HYDRANT AND BE UNOBSTRUCTED ON THE STREET SIDE. MINIMUM CLEARANCE ON ALL OTHER SIDES SHALL BE 5 FEET. FIRE HYDRANTS MUST BE GRADE STAKED IN THE FIELD. FIRE HYDRANTS ARE NOT ALLOWED IN SIDEWALKS.
3. ALL FIRE HYDRANTS MUST BE GRADE STAKED IN THE FIELD WHENEVER CURB AND GUTTER HAS NOT BEEN INSTALLED.
4. ALL UTILITY EASEMENTS MUST REMAIN UNOBSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH FOR MAINTENANCE EQUIPMENT.
5. WATER MAIN RESTRAINT SHALL BE IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS REGARDING WATER, SANITARY SEWER AND STORM DRAINAGE INFRASTRUCTURE, LATEST REVISION. MEGALUGS OR UNI-FLANGE MAY BE USED IN PLACE OF RODS AND CLAMPS.
6. WATERLINE VALVES ARE NOT ALLOWED IN CROSS-PANS.
7. ALL WATER METERS, WATER SERVICE LINES AND SANITARY SEWER SERVICE LINES ARE NOT ALLOWED IN OR UNDER DRIVEWAYS.
8. ALL SANITARY SERVICE LINES SHALL BE TEES OFF OF MAINS. WYES SHALL BE USED FOR LOTS AT BACK OF CUL-DE-SACS.
9. WATER PRESSURE ZONE 2 WITH 0 PSI @ ELEVATION 5,630 STATIC. A PRESSURE REDUCING VALVE (PRV) IS REQUIRED WHEN THE PRESSURE AT THE UNIT IS GREATER THAN EIGHTY (80) PSI. PRV'S ARE NOT ALLOWED IN CITY OF AURORA OWNED AND MAINTAINED METER PITS.
10. ADJUST ALL MANHOLES, FIRE HYDRANTS, AND VALVE BOXES TO GRADE PER AURORA WATER STANDARDS AND SPECIFICATIONS REGARDING WATER, SANITARY SEWER AND STORM SEWER INFRASTRUCTURE, LATEST REVISION, AS NECESSARY.
11. ALL FIRE LINES AND COMMERCIAL WATER SERVICE LINES REQUIRE REDUCED PRESSURE BACK FLOW ASSEMBLY OR DOUBLE CHECK VALVES AS REQUIRED BY THE CITY OF AURORA WATER DEPARTMENT. CONTACT THE WATER SERVICES AT (303) 326-8114 OR (303) 326-8129 FOR INSPECTION PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
12. THE CONTRACTOR SHALL CONTACT AURORA WATER ENGINEERING AT (303) 739-7300 FOR INSPECTION OF ANY REQUIRED GREASE TRAPS OR SAND/OIL INTERCEPTORS PRIOR TO THE ISSUANCE OF THE CERTIFICATE OF OCCUPANCY.
13. THE CONTRACTOR SHALL CONTACT THE AURORA WATER INSPECTION LINE AT (303) 739-7385 AT LEAST 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION OF ANY WET UTILITY TO SCHEDULE INSPECTIONS.
14. TOTAL BUILDING SURFACE AREA = 0 S.F. TOTAL HARD SURFACE = X.X S.F. (INCLUDES ALL ROADWAY RESTORATION, SIDEWALK, CURB & GUTTER, AND CULVERT APRONS)
15. EXISTING STORM AND SANITARY SEWERS AND MANHOLES TO BE ABANDONED SHALL BE REMOVED TO WITHIN 2 FEET OF PROPOSED IMPROVEMENT, BACKFILLED WITH NATIVE MATERIALS, AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS. ABANDONMENT OF EXISTING STORM AND SANITARY SEWERS AND MANHOLES THAT ARE 2 FEET OR MORE BELOW PROPOSED IMPROVEMENTS MAY CONSIST OF COMPLETELY FILLING THEM WITH FLOWFILL AND CAPPING THEM, AT CONTRACTOR'S OPTION IN LIEU OF COMPLETE REMOVAL. MULTIPLE POINTS OF INJECTION WILL BE REQUIRED TO ENSURE THAT ALL VOIDS ARE FILLED WITH FLOWFILL. PIPE/STRUCTURE ABANDONMENT COST SHALL BE LUMP SUM PER BID SCHEDULE.
16. STRUCTURE STATION AND OFFSET CALLOUTS ARE FROM CENTER OF STRUCTURE.
17. PIPE LENGTHS ARE PI TO PI OF STORM SEWER ALIGNMENT.
18. CONTRACTOR TO BE RESPONSIBLE FOR ALL UNDERGROUND UTILITIES PER SECTION 6.04 OF THE CITY OF AURORA STANDARDS AND SPECIFICATIONS FOR WATER, SANITARY, AND STORM.
19. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING IN ACCORDANCE WITH STATE LAW AND WITH THE COA STANDARDS AND SPECIFICATIONS FOR WATER, SANITARY SEWER AND STORM DRAINAGE INFRASTRUCTURE. A STATE PERMIT IS REQUIRED.

LEGEND

- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- PROPOSED MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- ALIGNMENT CENTERLINE
- EX BOUNDARY
- EX RIGHT OF WAY
- EX LOT LINE
- EX DRAINAGE EASEMENT
- EX UTILITY EASEMENT
- EX FIRE ACCESS EASEMENT
- HGL
- GRADING LIMITS
- ASPHALT LIMITS
- LIMITS OF WORK
- 100-YR WSEL (PLAN)
- EX PIPE TO BE ABANDONED
- EX STORM TO REMAIN IN SERVICE
- EX STORM
- EX CMP
- EX FIBER OPTIC
- EX WATER
- EX WATER SERVICE
- EX WATER ABANDONED
- EX OVERHEAD ELECTRIC
- EX SANITARY SEWER
- EX GAS
- EX DITCH
- EX FENCE
- EX RIPRAP
- PR RIPRAP
- EX CONCRETE
- PR CONCRETE
- EX HYDRANT
- EX STREET LIGHT
  EX MAILBOX
- EX SIGN
- EX TRAFFIC SIGNAL
- EX WATER METER
  EX SANITARY SEWER MANHOLE
- EX POWER POLE
- EX POWER POLE GUY
- EX STORM MANHOLE
- EX WATER VALVE

ABBREVIATIONS

AC	ASPHALTIC CONCRETE
BM	BENCHMARK
BOW	BOTTOM OF WALL
C&G	CURB AND GUTTER
CBC	CONCRETE BOX CULVERT
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CDPHE	COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
CFS	CUBIC FEET PER SECOND
CL	CENTERLINE
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMPA	CORRUGATED METAL PIPE ARCH
COA	CITY OF AURORA
CONC	CONCRETE
CP	CONTROL POINT
D	DEPTH
DND	DO NOT DISTURB
EA	EACH
ESMT	EASEMENT
EB	EASTBOUND
EL	ELEVATION
ELEV	ELEVATION
EX	EXISTING
E-IN X	EXISTING INLET
E-MH X	EXISTING MANHOLE
FES	FLARED END SECTION
FF	FINISHED FLOOR
FG	FINISHED GRADE
FL	FLOW LINE
FT	FEET
HBP	HOT BITUMINOUS PAVEMENT
HGL	HYDRAULIC GRADE LINE
IN	INCH
INV	INVERT
LF	LINEAL FEET
LT	LEFT
MAX	MAXIMUM
ME	MATCH EXISTING ELEVATION
MH	MANHOLE
MIN	MINIMUM
NB	NORTHBOUND
NTS	NOT TO SCALE
PED	PEDESTAL
PH	POTHOLE
PI	POINT OF INTERSECTION
PP	POWER POLE
P-IN X	PROPOSED INLET
P-JB X	PROPOSED JUNCTION BOX
P-MH X	PROPOSED MANHOLE
PVC	POLYVINYL CHLORIDE PIPE
Q100	100 YEAR PEAK DISCHARGE
RCP	REINFORCED CONCRETE PIPE
RT	RIGHT
ROW	RIGHT-OF-WAY
SB	SOUTHBOUND
STA	STATION
SWMP	STORMWATER MANAGEMENT PLAN
TBC	TOP BACK OF CURB
TBR	TO BE REMOVED
TBR&R	TO BE REMOVED AND RESET
TH	TEST HOLE
TOB	TOP OF BOX
TOW	TOP OF WALL/WINGWALL
TYP	TYPICAL
VCP	VITRIFIED CLAY PIPE
W	WIDTH
WB	WESTBOUND
WSEL	WATER SURFACE ELEVATION
YR	YEAR

CONTACT LIST

COMPANY	ROLE	CONTACT	PHONE NUMBER
CITY OF AURORA	OWNER	CLINTON WEISZ	720-859-4337
RESPEC WATER & NATURAL RESOURCES	DESIGN ENGINEER	JESSICA NOLLE	720-775-6412
SDG INCORPORATED	STRUCTURAL ENGINEER	EUGENE SCHAEFER	303-781-7070
MUNDUS BISHOP	LANDSCAPE ARCHITECT	TINA BISHOP	303-477-5244
HARRIS KOCHER SMITH	SURVEYOR	GEORGE SMITH	303-623-6311

BENCHMARK: COA BENCHMARK IS A 3" BRASS CAP (STAMPED COA(BM J-012.5) (COA ID 45E711SW004) LOCATED ON THE TOP OF CURB AT THE NE INTERSECTION OF E 1ST AVE & "FIRST AVENUE" TOWNHOMES ENTRANCE. ELEV=5450.43', NAVD88.

PRELIMINARY
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WATER & NATURAL RESOURCES
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SUITE 410S
DENVER, CO 80246
PHONE (303) 757-3655

REVISION

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DATE	9/8/16

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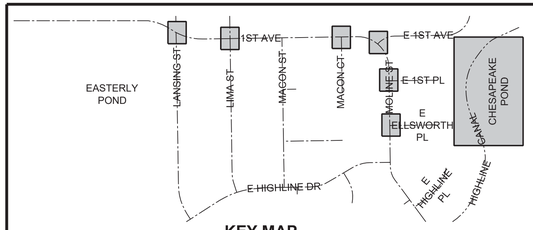
EASTERLY CREEK DETENTION POND
HAVANA AUTOMOTIVE PARK
#1B1 AND OLDE TOWNE #2B2

GENERAL NOTES, LEGEND AND ABBREVIATIONS

SHEET NUMBER:
D2
SHEET 2

NAME: Z:\CITY OF AURORA\02823\ EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-COVER.DWG
PLOT DATE: November 3, 2016 1:33 PM, BY: AMY C. TEIGEN



KEY MAP
1" = 400'

COA REQUIRED NOTES:
1. THE DEVELOPER SHALL HAVE A LICENSED PROFESSIONAL ENGINEER CERTIFY EACH STORMWATER DETENTION POND AND/OR WATER QUALITY BMP IS BUILT ACCORDING TO THE APPROVED PLANS AND SPECIFICATIONS AND THE REQUIRED DETENTION VOLUME, INCLUDING THE WQCV WHEN USED, IS MET. THE CERTIFICATION SHALL ALSO VERIFY ALL PERTINENT DIMENSIONS, ELEVATIONS, REQUIRED OUTLET ORIFICE PLATES FOR DETENTION AND WQCV AND OTHER PERMANENT BMPS REQUIREMENTS ARE INSTALLED PER THE APPROVED PLANS AND SPECIFICATIONS, AND SHALL SHOW THE AS-BUILT VOLUMES FOR THE 100-YEAR, 10-YEAR STORM EVENTS, AND FOR THE WQCV AND OTHER PERTINENT DIMENSIONS, ELEVATIONS AND CAPACITY REQUIREMENTS ASSOCIATED WITH THE WQ BMP USED. THE CERTIFICATION SHALL BE PROVIDED TO THE CITY OF AURORA ENGINEERING CONTROL SECTION SENIOR ENGINEER BEFORE A CERTIFICATE OF OCCUPANCY WILL BE ISSUED.
2. ENSURE THAT THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS ARE UPHELD.

TRICKLE CHANNEL NORTH				
NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	DELTA
L1	42.15'		N66° 38' 09.33"E	
C1	46.50'	60.00'	N44° 26' 08.21"E	44.40°
L2	38.93'		N22° 14' 07.10"E	
C2	33.33'	60.00'	N38° 09' 02.41"E	31.83°
L3	16.88'		N54° 03' 57.71"E	
C3	23.88'	60.00'	N42° 39' 57.71"E	22.80°
L4	11.47'		N31° 15' 57.71"E	

FROM CP 502 158.79' AT A BEARING OF N69°23'34"E TO THE POINT OF BEGINNING STATION 20+00

TRICKLE CHANNEL CENTER				
NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	DELTA
L5	35.47'		N66° 38' 13.77"E	
C4	46.48'	60.00'	N88° 49' 49.15"E	44.39°
L6	36.97'		S68° 58' 35.47"E	
C5	21.72'	60.00'	S79° 20' 57.03"E	20.75°
L7	18.65'		S89° 43' 18.59"E	

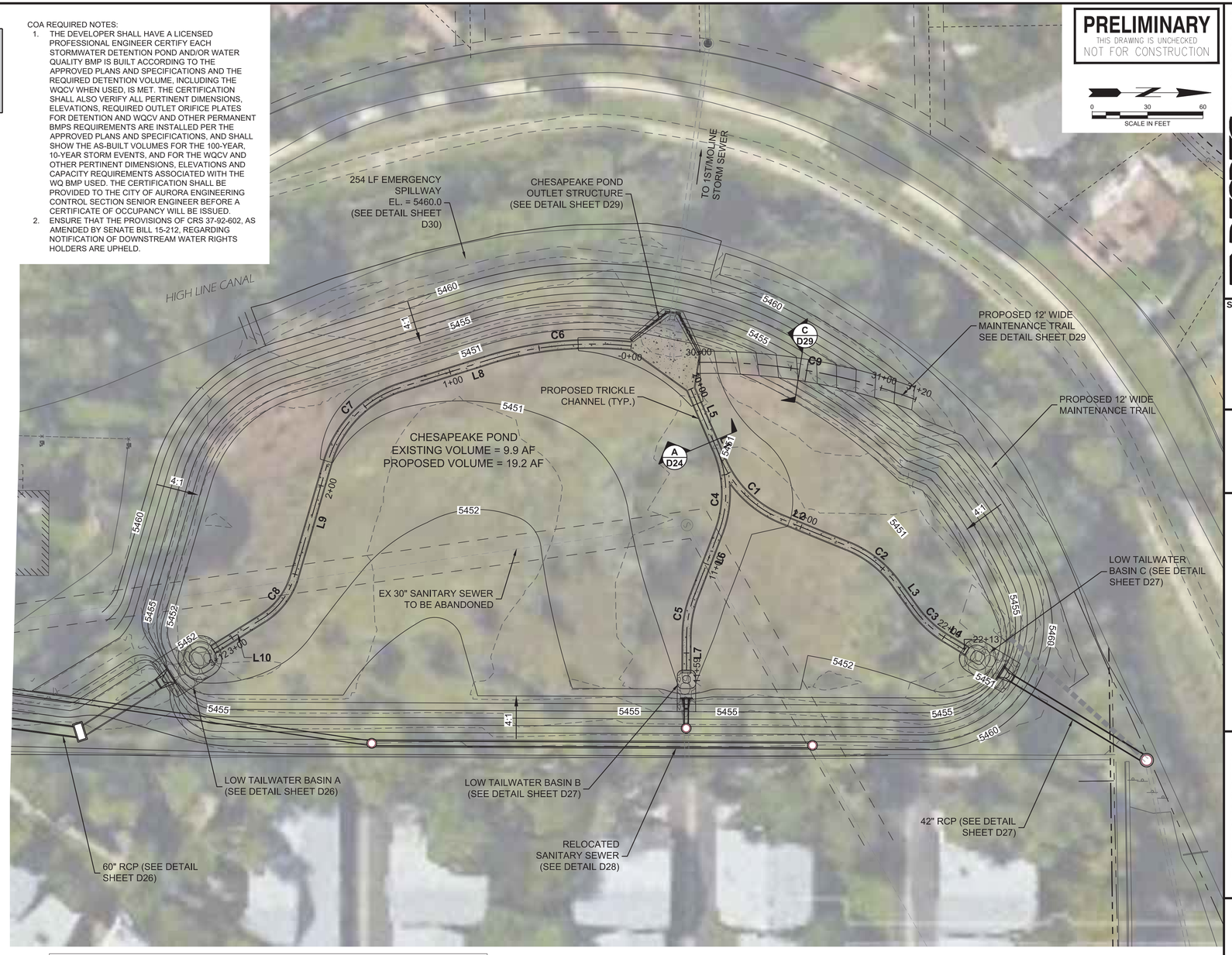
FROM CP 502 158.79' AT A BEARING OF N69°23'34"E TO THE POINT OF BEGINNING STATION 10+00

TRICKLE CHANNEL SOUTH				
NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	DELTA
C6	78.58'	190.50'	S05° 34' 25.22"E	23.63°
L8	49.05'		S17° 23' 25.83"E	
C7	58.98'	60.00'	S45° 33' 03.54"E	56.32°
L9	64.61'		S73° 42' 41.26"E	
C8	29.17'	40.17'	S52° 54' 27.46"E	41.61°
L10	31.71'		S32° 06' 13.66"E	

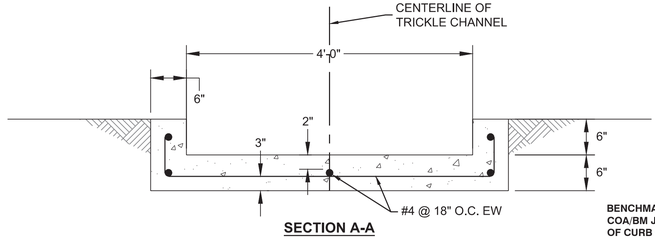
FROM CP 502 127.65' AT A BEARING OF S79°19'18"W TO THE POINT OF BEGINNING STATION 0+00

MAINTENANCE TRAIL TO POND				
NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	DELTA
C9	119.64'	321.50'	N09° 44' 53.95"E	21.32°

FROM CP 502 147.15' AT A BEARING OF S65°49'36"W TO THE POINT OF BEGINNING STATION 30+00



POND DESIGN TABLE					
	VOLUME	OUTFLOW TO STORM SEWER	OVERFLOW TO HLC	INFLOW	WSEL
	(AC-FT)	(CFS)	(CFS)	(CFS)	(FT)
100-YR	19.18	16.77	359.40	771.94	5460.62
5-YR	13.17	15.36	0.0	358.61	5458.27



SECTION A-A
SCALE: 1" = 1'

BENCHMARK: COA BENCHMARK IS A 3" BRASS CAP (STAMPED COA/BM J-012.5) (COA ID 4S6711SW004) LOCATED ON THE TOP OF CURB AT THE NE INTERSECTION OF E 1ST AVE & "FIRST AVENUE" TOWNHOMES ENTRANCE. ELEV=5450.43', NAVD88.

PRELIMINARY
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0 30 60
SCALE IN FEET

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SUITE 410S
DENVER, CO 80246
PHONE (303) 757-3655

REVISION

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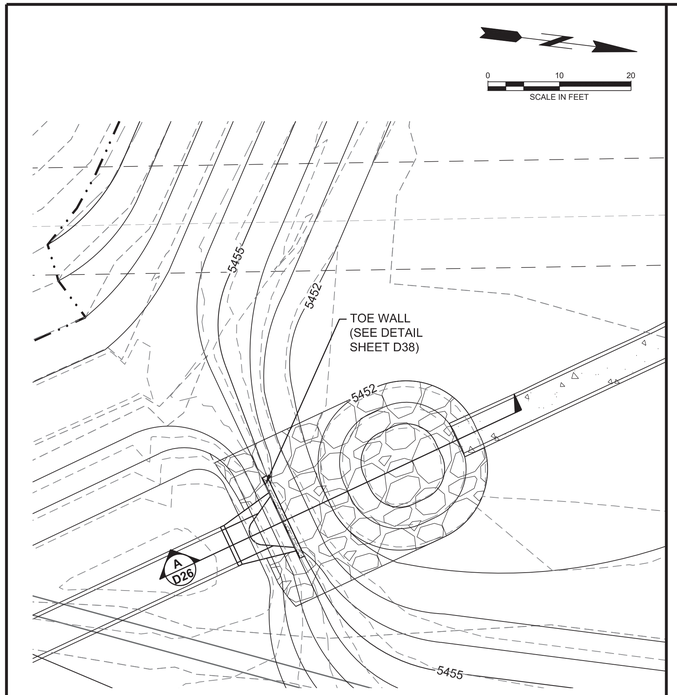
AURORA, COLORADO 80012
303-739-7370

EASTERLY CREEK DETENTION POND
HAVANA AUTOMOTIVE PARK
#1B1 AND OLDE TOWNE #2B2

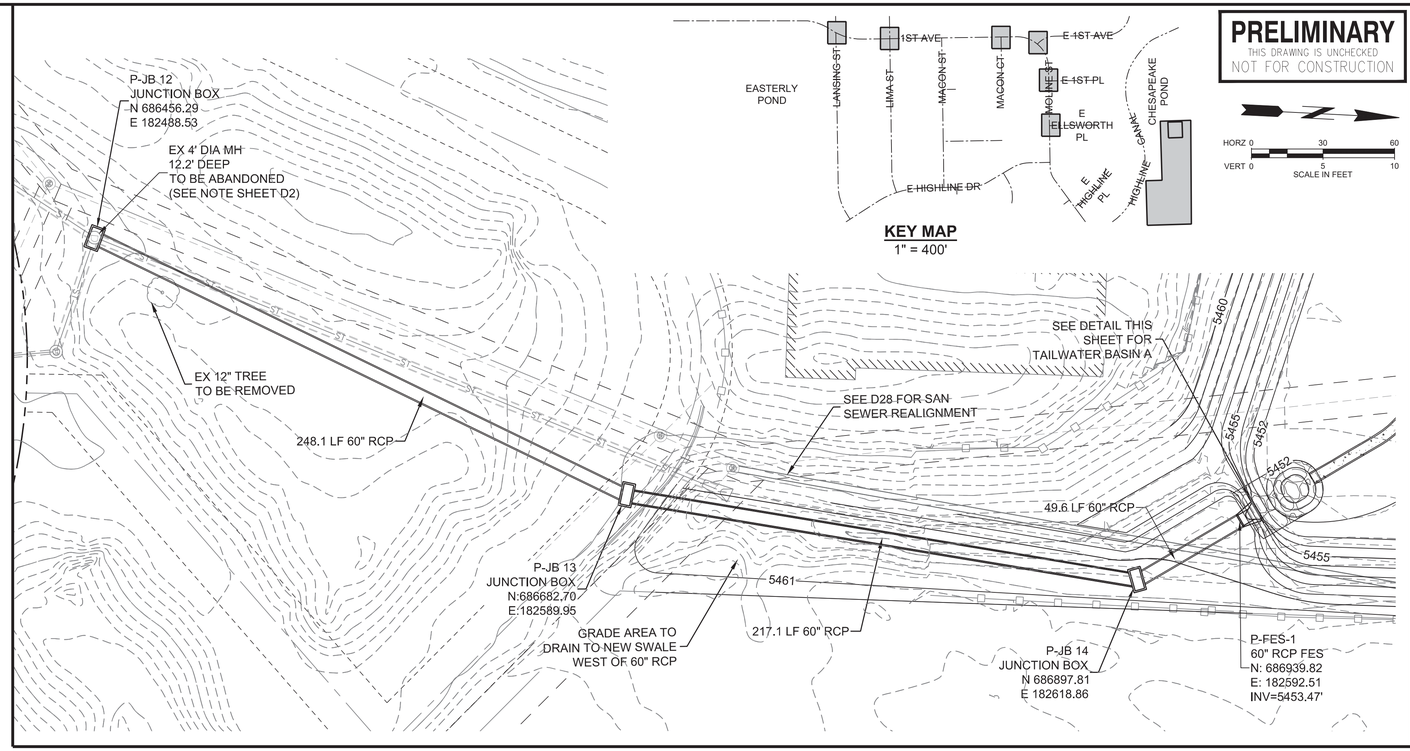
CHESAPEAKE DETENTION POND

SHEET NUMBER:
D25
SHEET 23

NAME: Z:\CITY OF AURORA\02823: EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-CHES-POND.DWG
PLOT DATE: November 3, 2016 4:22 PM, BY: AMY C. TEIGEN



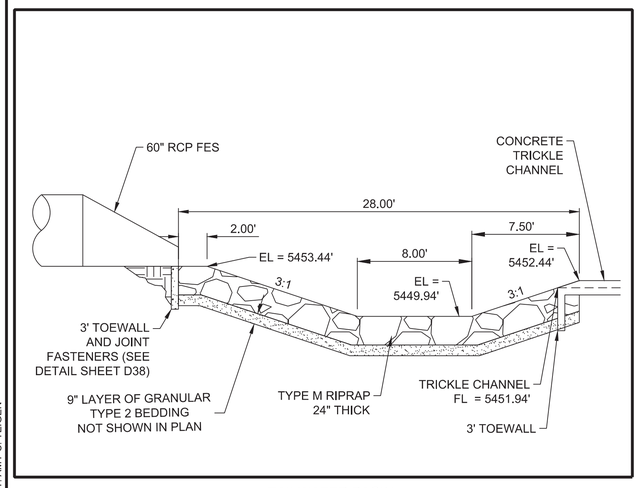
TAILWATER BASIN A



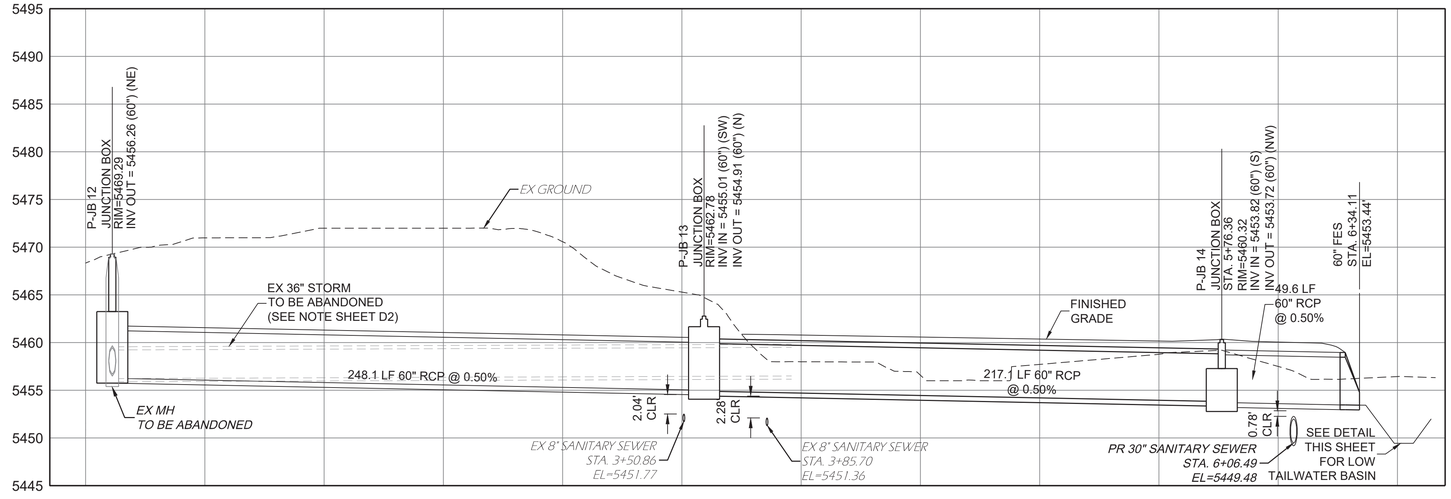
KEY MAP
1" = 400'

PRELIMINARY
THIS DRAWING IS UNCHECKED
NOT FOR CONSTRUCTION

HORZ 0 30 60
VERT 0 5 10
SCALE IN FEET



TAILWATER BASIN
SECION A-A
SCALE: 1"=5'



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REVISION

DESIGNED	THT
DRAWN	ACT
CHECKED	JHN
DATE	9/8/16

STAMP

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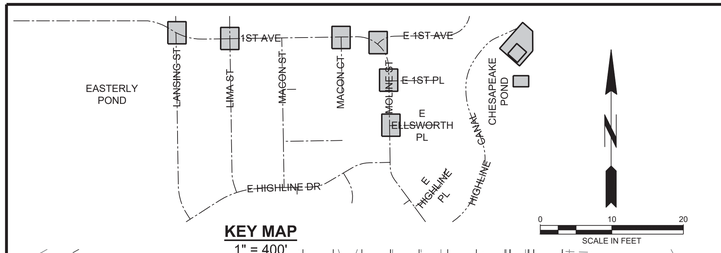
AURORA, COLORADO 80012
303-739-7370

EASTERLY CREEK
DETENTION POND
HAVANA
AUTOMOTIVE PARK
#1B1 AND OLDE
TOWNE #2B2

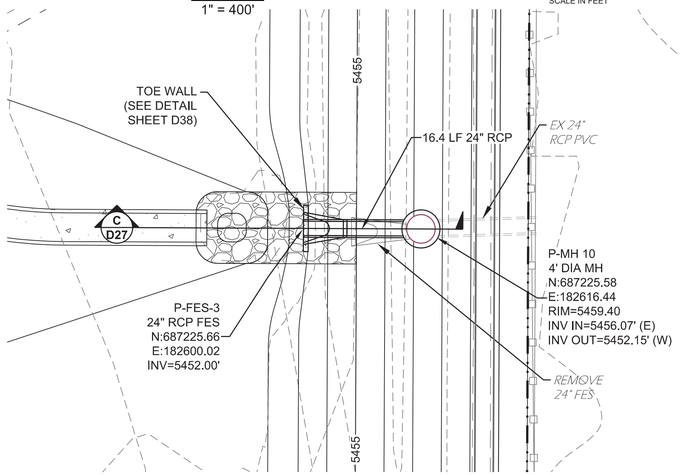
PLAN & PROFILE
60 INCH RCP
STORM SEWER

SHEET NUMBER:
D26
SHEET 24

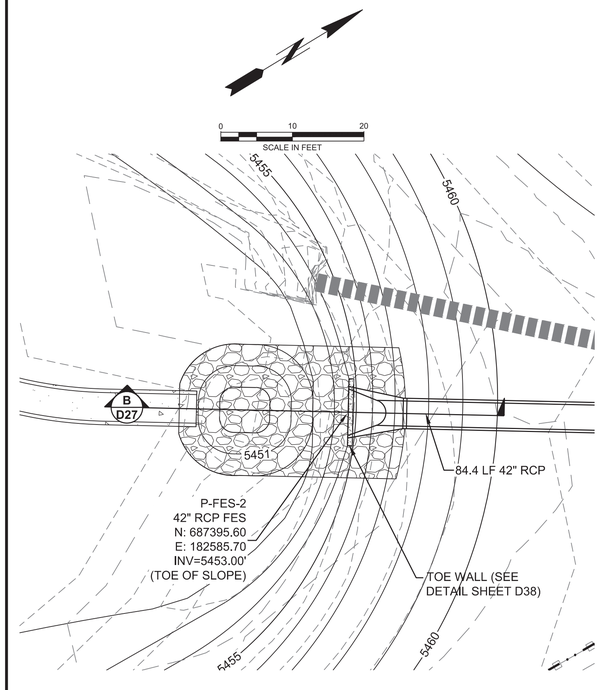
NAME: Z:\CITY OF AURORA\02823 EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-P&P-STM60.DWG
PLOT DATE: November 3, 2016 2:58 PM, BY: AMY C. TEIGEN



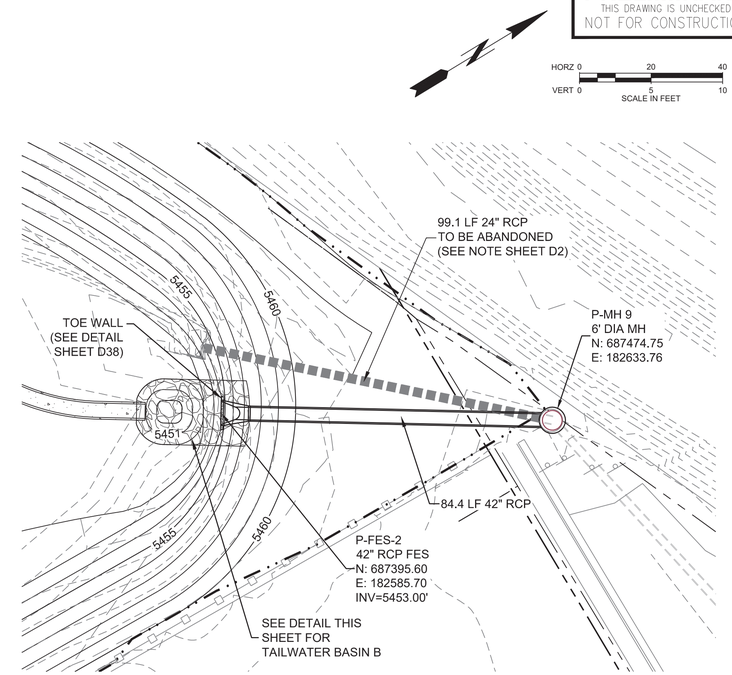
KEY MAP
1" = 400'



TAILWATER BASIN C



TAILWATER BASIN B



PRELIMINARY
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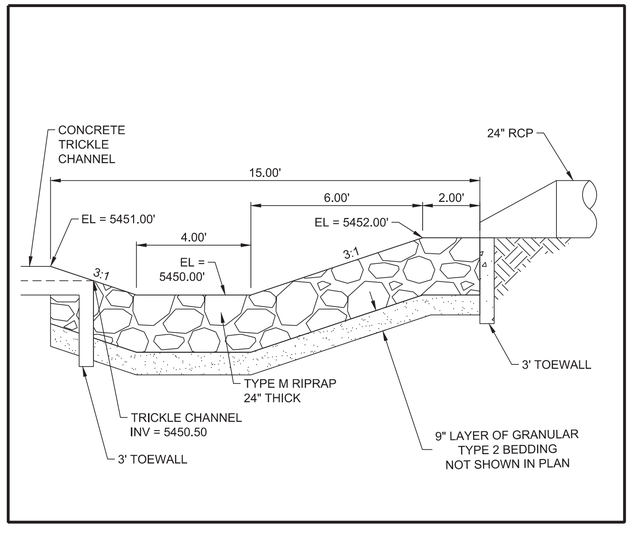
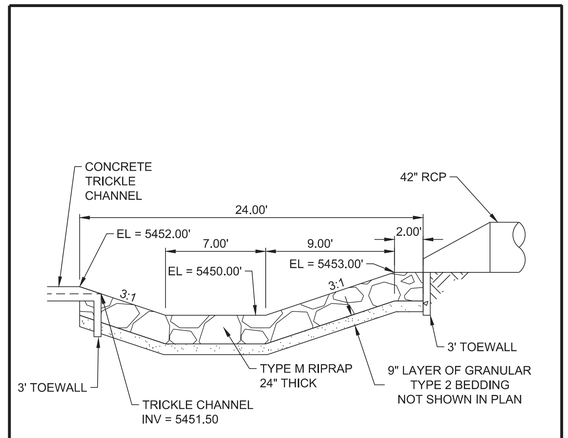
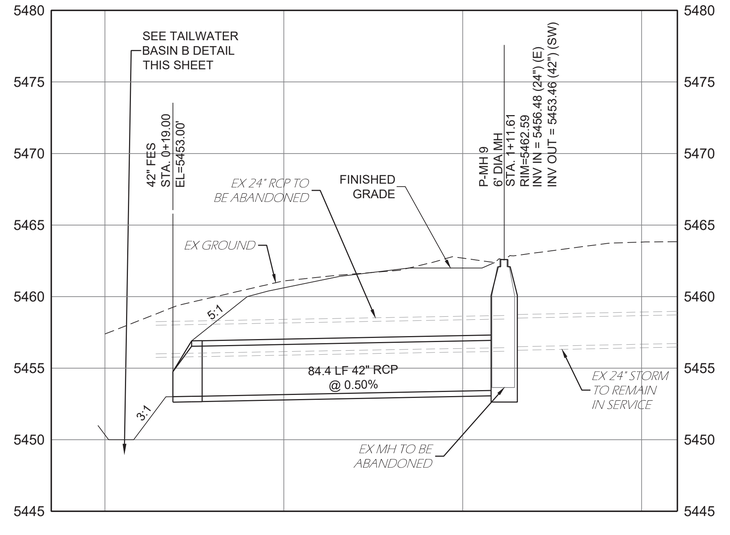


TAILWATER BASIN
SECION C-C
SCALE: 1" = 2.5'



TAILWATER BASIN
SECION B-B
SCALE: 1"=5'



BENCHMARK: COA BENCHMARK IS A 3" BRASS CAP (STAMPED COA/BM J-012.5) (COA ID 4S6711SW004) LOCATED ON THE TOP OF CURB AT THE NE INTERSECTION OF E 1ST AVE & "FIRST AVENUE" TOWNHOMES ENTRANCE. ELEV=5450.43', NAVD88.

RESPEC
WATER & NATURAL RESOURCES
720 S COLORADO BLVD.
SUITE 410S
DENVER, CO 80246
PHONE (303) 757-3655

REVISION

DESIGNED	THT
DRAWN	ACT
CHECKED	JHN
DATE	9/8/16

STAMP

811
Know what's **below.**
Call before you dig.

CITY OF AURORA
15151 EAST ALAMEDA PKWY
AURORA, COLORADO 80012
303-739-7370

EASTERLY CREEK DETENTION POND
HAVANA AUTOMOTIVE PARK
#1B1 AND OLDE TOWNE #2B2

PLAN & PROFILE 42 INCH STORM SEWER

SHEET NUMBER:
D27
SHEET 25

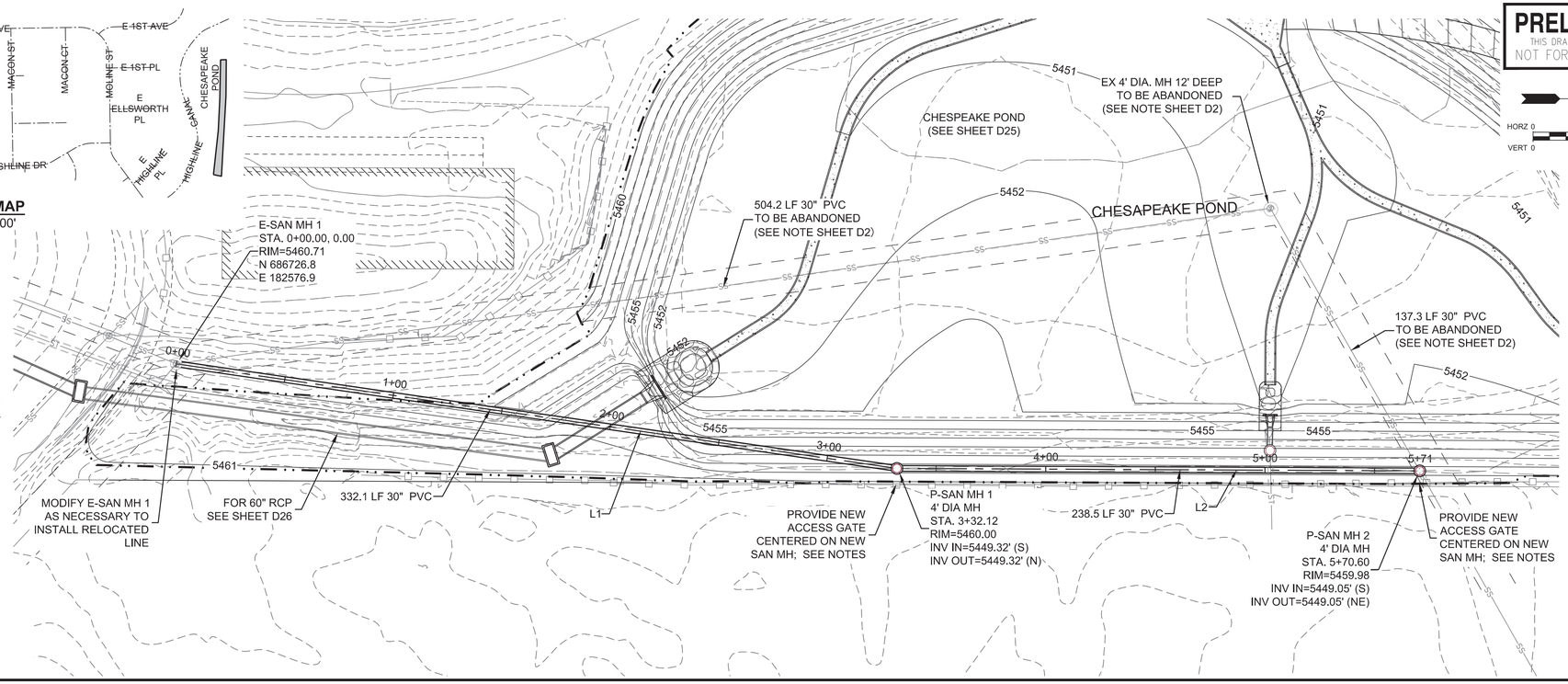
NAME: Z:\CITY OF AURORA\02823 EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-P&P-STM42.DWG
PLOT DATE: November 3, 2016 3:03 PM, BY: AMY C. TEIGEN

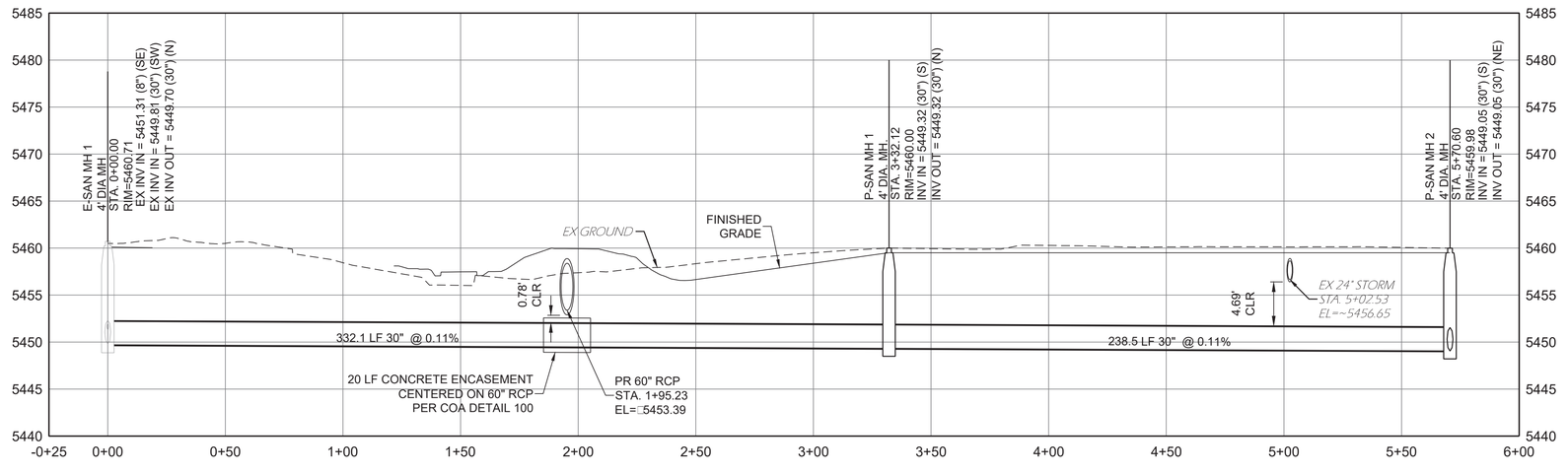
KEY MAP
1" = 400'

NOTE:

1. NEW ACCESS GATES SHALL INCLUDE TWO NEW POSTS AND BE A MIN OF 60" WIDE. ALL NEW MATERIALS SHALL MATCH EX MATERIALS OR BE BETTER QUALITY AND BE AS APPROVED BY THE CITY OF AURORA. POSTS SHALL BE EMBEDDED A MIN OF 24" IN CONCRETE. NEW ACCESS GATES SHALL BE LOCKING.
2. ALL NEW SANITARY SEWER MANHOLES SHALL BE LINED WITH SPECTRASHIELD.
3. CONTRACTOR MUST SUBMIT A SANITARY SEWER BYPASS PLAN TO THE CITY OF AURORA AND RECEIVE APPROVAL PRIOR TO BEGINNING CONSTRUCTION OF THE RELOCATED LINE.

LINE TABLE: ALIGNMENTS		
LINE #	BEARING	LENGTH
L1	N08.151812E	332.12
L2	N00.161282E	238.48





BENCHMARK: COA BENCHMARK IS A 3" BRASS CAP (STAMPED COA/BM J-012.5) (COA ID 4S6711SW004) LOCATED ON THE TOP OF CURB AT THE NE INTERSECTION OF E 1ST AVE & "FIRST AVENUE" TOWNHOMES ENTRANCE. ELEV=5450.43', NAVD88.

PRELIMINARY
THIS DRAWING IS UNCHECKED
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WATER & NATURAL RESOURCES
720 S COLORADO BLVD.
SUITE 410S
DENVER, CO 80246
PHONE (303) 757-3655

REVISION

DESIGNED	THT
DRAWN	ACT
CHECKED	JHN
DATE	9/8/16

STAMP

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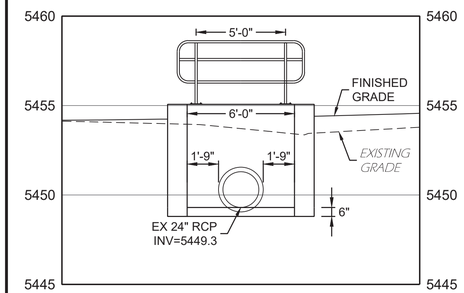
AURORA, COLORADO 80012
303-739-7370

EASTERLY CREEK
DETENTION POND
HAVANA
AUTOMOTIVE PARK
#1B1 AND OLDE
TOWNE #2B2

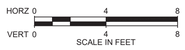
PLAN & PROFILE
SANITARY SEWER
RELOCATION

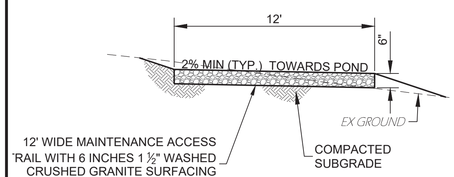
SHEET NUMBER:
D28
SHEET 26

NAME: Z:\CITY OF AURORA\02823 EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-P&P-SS.DWG
PLOT DATE: November 3, 2016 3:07 PM, BY: AMY C. TEIGEN

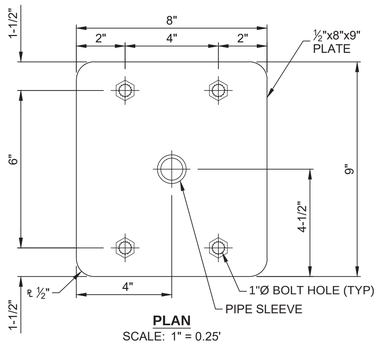


SECTION B-B

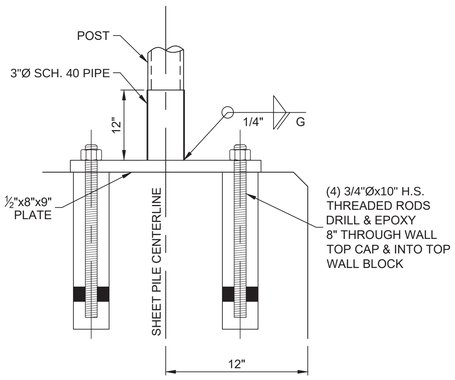




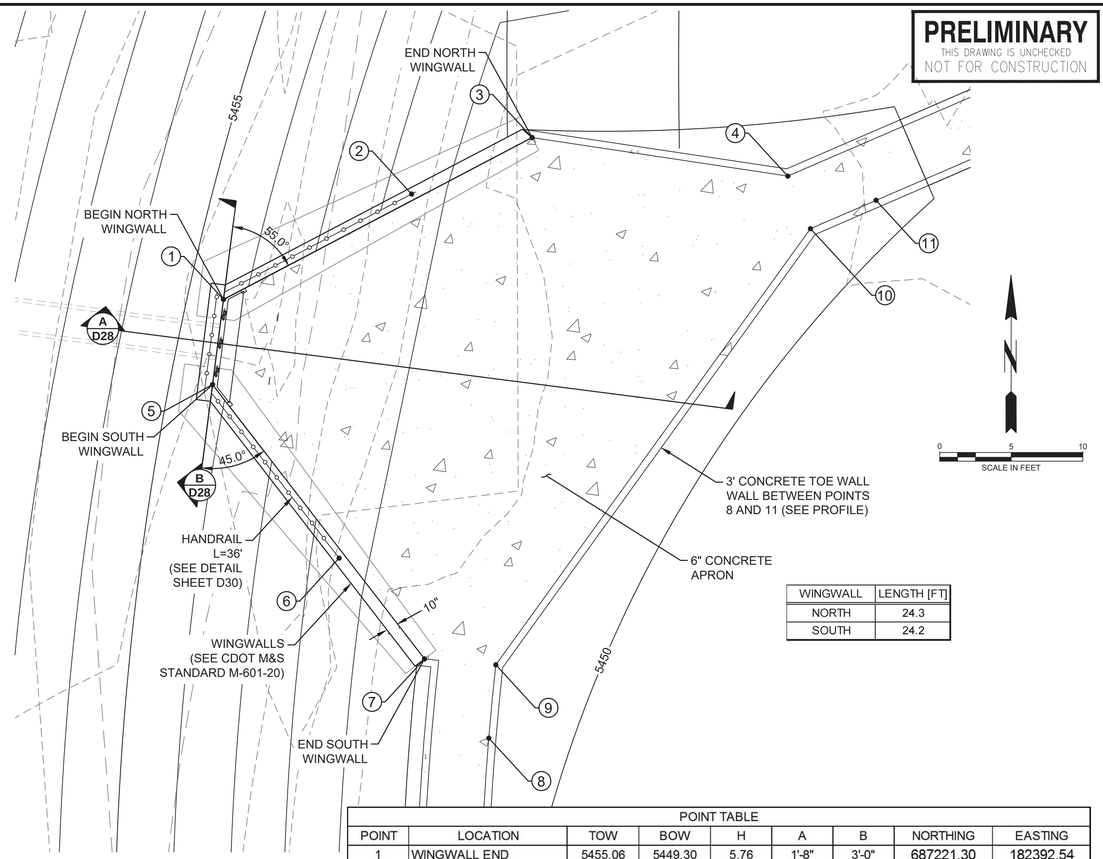
SECTION C-C
NTS



PLAN
SCALE: 1" = 0.25'



RAILING ANCHOR DETAIL
SCALE: 1" = 0.25'

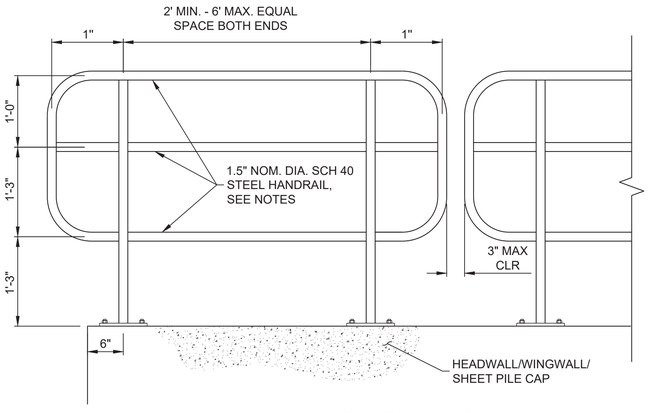


WINGWALL	LENGTH [FT]
NORTH	24.3
SOUTH	24.2

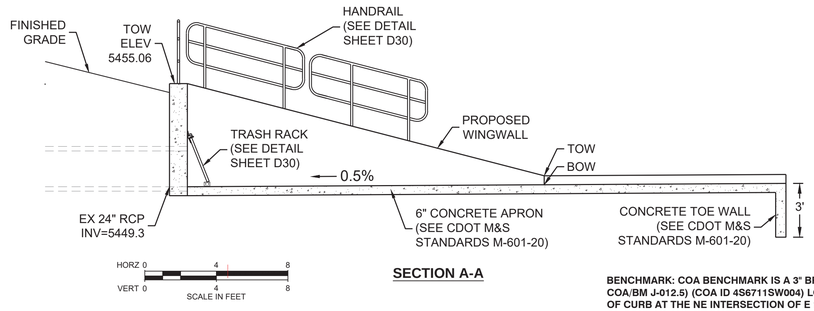
POINT TABLE								
POINT	LOCATION	TOW	BOW	H	A	B	NORTHING	EASTING
1	WINGWALL END	5455.06	5449.30	5.76	1'-8"	3'-0"	687221.30	182392.54
2	HANDRAIL END	5451.86	5449.36	2.50	1'-2"	2'-0"	687228.66	182405.68
3	WINGWALL END	5449.89	5449.39	0.50	1'-0"	1'-8"	687232.61	182414.10
4	TRICKLE CHANNEL END	5449.96	5449.46	0.50	N/A	N/A	687229.92	182431.97
5	WINGWALL END	5455.06	5449.30	5.76	1'-8"	3'-0"	687215.35	182391.77
6	HANDRAIL END	5451.88	5449.38	2.50	1'-2"	2'-0"	687203.22	182400.61
7	WINGWALL END	5449.93	5449.43	0.50	1'-0"	1'-8"	687196.18	182406.58
8	TOEWALL WALL END	5449.97	5449.47	0.50	N/A	N/A	687190.64	182411.07
9	TRICKLE CHANNEL END	5449.95	5449.45	0.50	N/A	N/A	687195.76	182411.57
10	TRICKLE CHANNEL END	5449.95	5449.45	0.50	N/A	N/A	687226.24	182433.55
11	TOEWALL WALL END	5449.98	5449.48	0.50	N/A	N/A	687228.23	182438.13

NOTE:
1. VARIABLES ARE DEFINED FOR TYPICAL WINGWALL SECTION SHOWN ON CDOT M&S STANDARD M-601-20, INCLUDED AT THE END OF THE PLAN SET.
2. POINT CALLOUT IS AT FRONT FACE OF HEADWALL AND WINGWALL.
3. REINFORCING AND JOINTS SHALL BE PER CDOT M&S STANDARD M-601-20.

NOTES:
1. RAILING SHALL BE PROVIDED IN REMOVABLE SECTIONS NOT TO EXCEED 10 FEET.
2. RAILING SHALL BE INSTALLED ON HEADWALLS AND WINGWALLS WHERE SPECIFIED IN THE PLANS.
3. LENGTH OF RAILING IS MEASURED BETWEEN CENTER OF END VERTICAL SUPPORTS.
4. RAILING FABRICATION TO BE BASED ON FIELD MEASUREMENTS. RAILING SHALL BE EXACTLY CENTERED ON THE WALL AND SHALL FOLLOW THE GRADE BRAKES AND LENGTHS OF THE CONSTRUCTED WALL.
5. CONTRACTOR TO PROVIDE SHOP DRAWINGS TO ENGINEER.
6. ALL POSTS SHALL BE VERTICAL AND PLUMB AND RAILS PARALLEL TO GRADE.
7. RAILING SHALL BE GALVANIZED STANDARD STEEL WITH POWDER COATING COLORED CARDINAL T009-BG16 (DESIGNER BEIGE 90% GLOSS) OR APPROVED EQUIVALENT.
8. ALL METAL INCLUDING HARDWARE TO BE POWDER COATED OR PAINTED TO MATCH RAILING COLOR.
9. SPACING BETWEEN RAILING SEGMENTS SHALL BE 3" EXCEPT WHERE NOTED OR FOR SIGN PLACEMENT.



RAILING ELEVATION
SCALE: 1" = 1'



SECTION A-A

BENCHMARK: COA BENCHMARK IS A 3" BRASS CAP (STAMPED COA/BM J-012.5) (COA ID 4S6711SW004) LOCATED ON THE TOP OF CURB AT THE NE INTERSECTION OF E 1ST AVE & "FIRST AVENUE" TOWNHOMES ENTRANCE. ELEV=5450.43', NAVD88.

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DRAWN	ACT	
CHECKED	JHN	
DATE	9/8/16	

STAMP

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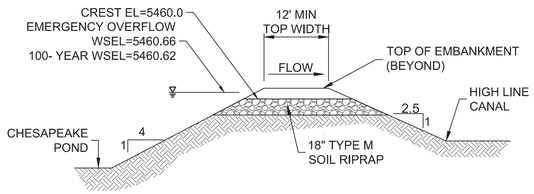
AURORA, COLORADO 80012
303-739-7370

EASTERLY CREEK DETENTION POND
HAVANA AUTOMOTIVE PARK
#1B1 AND OLDE TOWNE #2B2

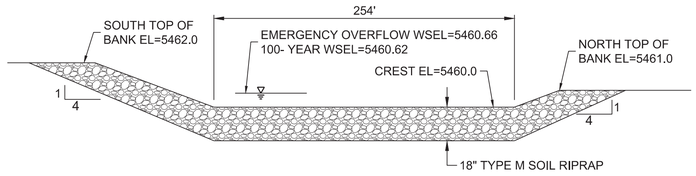
CHESAPEAKE POND DETAILS (1 OF 2)

SHEET NUMBER:
D29
SHEET 27

NAME: Z:\CITY OF AURORA\02823 - EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-CHES-DETAILS.DWG
PLOT DATE: November 3, 2016 3:11 PM, BY: AMY C. TEIGEN



CHESAPEAKE POND SPILLWAY PROFILE
SCALE: NONE



CHESAPEAKE POND SPILLWAY SECTION
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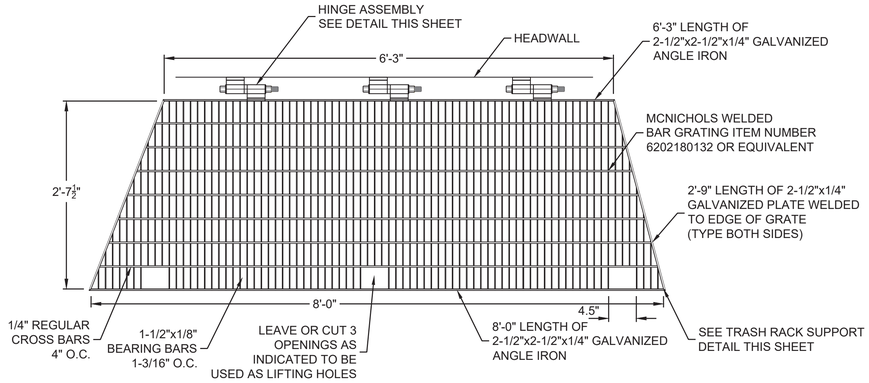
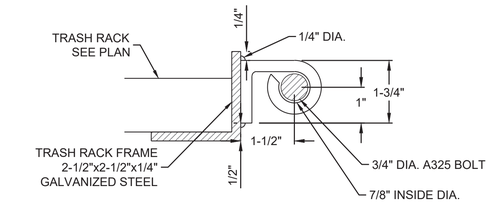
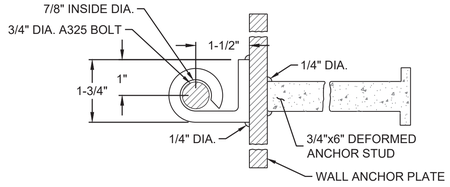


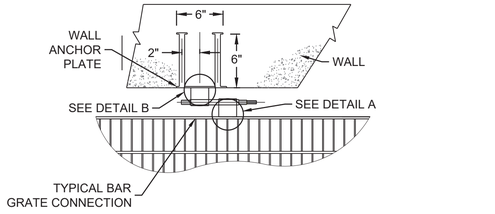
TRASH RACK PLAN
SCALE: 1" = 1'



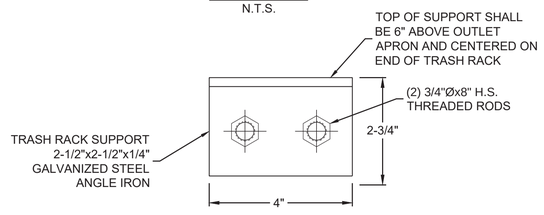
DETAIL A
N.T.S.



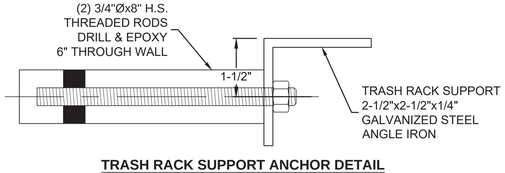
DETAIL B
N.T.S.



HINGE DETAIL
N.T.S.



TRASH RACK SUPPORT DETAIL
N.T.S.



TRASH RACK SUPPORT ANCHOR DETAIL
N.T.S.

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REVISION

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DRAWN	ACT
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DATE	9/8/16

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DETENTION POND
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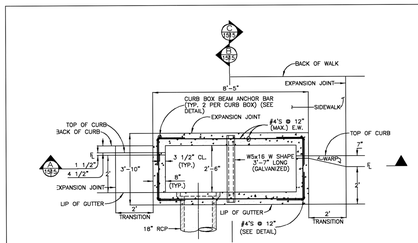
#1B1 AND OLDE
TOWNE #2B2

CHESAPEAKE POND
DETAILS (2 OF 2)

SHEET NUMBER:
D30
SHEET 28

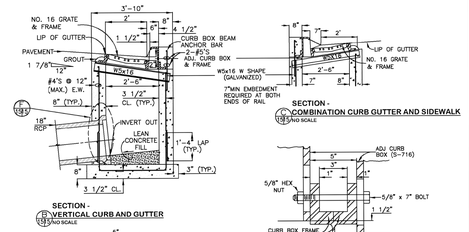
NAME: Z:\CITY OF AURORA\02823 -EASTERLY CREEK DETENTION POND\CAD\SHEETS\02823-S-CHES-DETAILS.DWG
PLOT DATE: November 3, 2016 3:12 PM, BY: AMY C. TEIGEN



6" VERTICAL CURB AND GUTTER | COMBINATION CURB GUTTER AND SIDEWALK

PLAN
NO SCALE

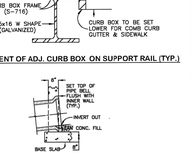
"I" = THROAT OPENING
"I" = 6" FOR 6" VERTICAL CURB & GUTTER
"I" = 5" FOR COMBINATION CURB GUTTER & SIDEWALK
DROP FROM GUTTER ℄ ELEVATION TO GRATE ℄ ELEVATION (TRANSITION) IS 2".



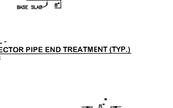
SECTION - A VERTICAL CURB AND GUTTER (S-716) NO SCALE

SECTION - B COMBINATION CURB GUTTER AND SIDEWALK NO SCALE

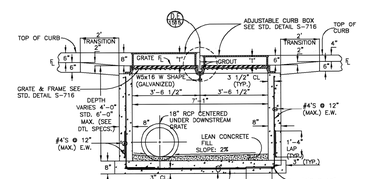
DETAIL - D PLACEMENT OF ADJ. CURB BOX ON SUPPORT RAIL (TYP.) NO SCALE



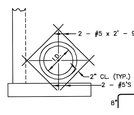
DETAIL - E FRAME PLACEMENT ON SUPPORT RAIL (TYP.) NO SCALE



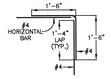
DETAIL - F CONNECTOR PIPE END TREATMENT (TYP.) NO SCALE



SECTION - A VERTICAL CURB AND GUTTER NO SCALE



DETAIL - REBAR PLACEMENT INLET WALL PENETRATION (TYP.) NO SCALE



DETAIL - TYPICAL CORNER REBAR PLACEMENT NO SCALE

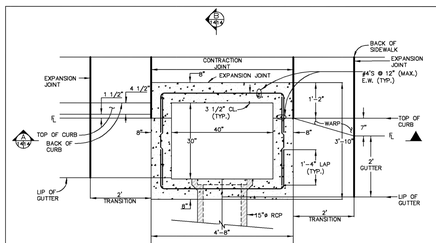
DETAIL - CURB BOX BEAM ANCHOR BAR (TYP.) NO SCALE

NOTES:
1. SEE DETAIL SPECIFICATIONS SECTION 11.05 STORM INLETS FOR MORE INFORMATION. USE OF THIS DETAIL WITHOUT SPECIFICATIONS SHALL BE CONSIDERED NON-COMPLIANT.
2. ALSO SEE GENERAL NOTES ON S-616.1.

STANDARD DETAILS
DOUBLE NUMBER 16 INLET
S-616.2

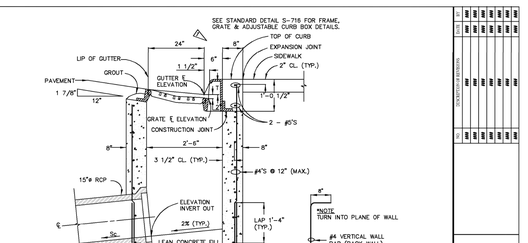
CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECTS MANAGEMENT
2000 W. 3RD AVE. DENVER, CO 80223
TEL: (303) 446-3617 FAX: (303) 446-3647

NO.	REVISION	BY	DATE
-	####		
-	####		
-	####		
-	SHEET DELETED		
-	15		



PLAN VIEW
NO SCALE

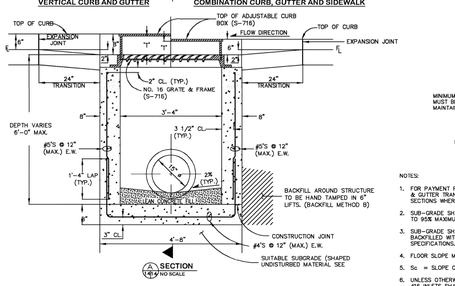
"I" = THROAT OPENING
"I" = 6" FOR 6" VERTICAL CURB & GUTTER
"I" = 5" FOR COMBINATION CURB GUTTER & SIDEWALK DROP FROM GUTTER ℄ ELEVATION TO GRATE ℄ ELEVATION (TRANSITION) IS 2".



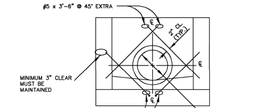
SECTION
NO SCALE

NOTE:
SEE DETAIL SPECIFICATIONS SECTION 11.04 STORM INLETS FOR MORE INFORMATION. USE OF THIS DETAIL WITHOUT SPECIFICATIONS SHALL BE CONSIDERED NON-COMPLIANT.

VERTICAL CURB AND GUTTER | COMBINATION CURB, GUTTER AND SIDEWALK



A SECTION
NO SCALE

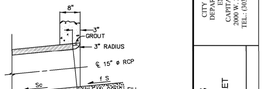


-DETAIL-
REBAR PLACEMENT AROUND CONNECTOR
NO SCALE

NOTES:
1. FOR PAYMENT PURPOSES, INLET STRUCTURES SHALL ALSO INCLUDE 2'-0" CURB & GUTTER TRANSITION SECTION AT EACH END OF INLET PLUS SIDEWALK SECTIONS WHERE REQUIRED BEHIND INLET STRUCTURE AND TRANSITION SECTIONS.
2. SUB-GRADE SHALL BE A GRADATION EQUAL TO CLASS B BEDDING COMPACTED TO 95% MAXIMUM DRY DENSITY, AASHTO DESIGNATION T-180.
3. SUB-GRADE SHALL BE SHAPED UNDISTURBED MATERIAL OR OVEREXCAVATED AND BACKFILLED WITH CLASS B BEDDING MATERIAL, COMPACTED PER MMD SPECIFICATIONS.
4. FLOOR SLOPE MAY BE POURED MONOLITHIC WITH BASE.
5. Sc = SLOPE OF CONNECTOR = 2% MIN.
6. UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS OR OTHERWISE APPROVED, ALL #16 INLETS SHALL BE CONSTRUCTED WITH AN ADJUSTABLE C.I. CURB BOX (S-716).
7. DESIGN CONDITIONS FOR INLET ALLOWS DEPTHS OF 5' (MAX.) FOR INLETS MORE THAN 6 FEET IN DEPTH, SHOP DRAWINGS AND DESIGN ANALYSIS SHALL BE SUBMITTED FOR APPROVAL.

NOTES (CONT.):
8. ALL REINFORCING STEEL SHALL BE ASTM, A-615, GRADE 60 DEFORMED BARS. DIAMETER OF BEND MEASURED ON THE INSIDE OF THE BAR SHALL BE A MINIMUM OF 6 BAR DIAMETER.
9. ALL WORK SHALL CONFORM TO AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", FIFTEENTH EDITION, 1992.
10. NO FORMWORK SHALL REMAIN INSIDE STRUCTURE WHEN COMPLETE.
11. CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 4500 PSI.
12. SPLICING OF REINFORCING STEEL SHALL BE PERMITTED ONLY WHERE DETAILED IN DRAWINGS.
13. INLET WALLS SHALL BE FORMED BOTH INSIDE AND OUTSIDE. CASTING OF SIDEWALLS AGAINST EARTH IS NOT PERMITTED.
14. LEAN CONCRETE FILL TO BE f'c = 2000 PSI.
15. FOR THROUGH STRUCTURES, BENCHES MUST COME TO TOP OF PIPE.
16. NO CORNER PENETRATIONS ON STRUCTURE.

-DETAIL-
CONNECTOR OUTLET
NO SCALE



STANDARD DETAILS
SINGLE NUMBER 16 INLET
S-616.1

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECTS MANAGEMENT
2000 W. 3RD AVE. DENVER, CO 80223
TEL: (303) 446-3617 FAX: (303) 446-3647

NO.	REVISION	BY	DATE
-	####		
-	####		
-	####		
-	SHEET DELETED		
-	14		

NO.	PHASING PLAN	BY	DATE
7		RCK	07/02/21 MMT
6	22ND AVE. STORM REVS	RCK	05/26/21 MMT
5	CD. APPROVAL SET	RCK	09/08/20 MMT
4	CD. SUBMITTAL #3	RCK	08/10/20 MMT
3	CD. SUBMITTAL #2	RCK	05/22/20 MMT
2	CD. SUBMITTAL #1	RCK	04/03/20 MMT
1	CD. PRESUBMITTAL	RCK	03/25/20 MMT

Kimley»Horn
KIMLEY-HORN AND ASSOCIATES, INC.
1125 17th Street, Suite 1400
Denver, Colorado 80202 (303) 228-2300

DESIGNED BY: DTD
DRAWN BY: RCK
CHECKED BY: MMT
DATE: 05/01/21

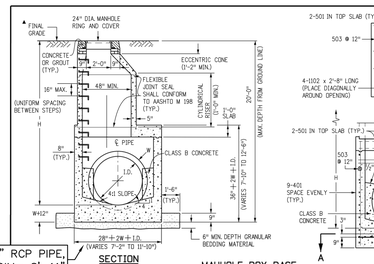
CLINTON STREET SUBDIVISION FILING NO. 1
CITY OF AURORA, STATE OF COLORADO
CONSTRUCTION DOCUMENTS
INLET DETAILS

FACSIMILE
This electronic plan is a facsimile of the signed and sealed pdf set
(Meaghan M. Turner)

PROJECT NO.
096253018

DRAWING NAME

29



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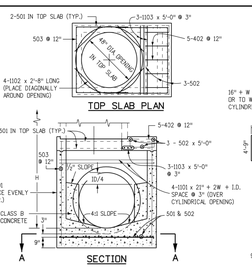
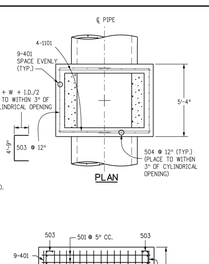
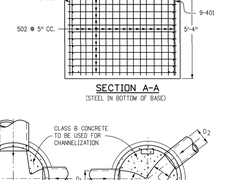






FOR 66" RCP PIPE, DIM= 8'-11"

MAHHOLE BOX BASE

MARK	SIZE	TYPE	WT./FT.	BARS	I.D. 54"	60"	66"	72"	84"	96"	FORMULAS
401	4	I	0.668	(NO. REQ'D.) (LENGTH) WEIGHT *	18 8'-0" 97.2	18 8'-8" 104.2	18 9'-3" 111.2	18 9'-10" 118.2	18 11'-0" 132.3	18 12'-3" 146.3	401 BAR LENGTH = 32" + 2W + I.D.
402	4	III	0.668	(NO. REQ'D. (LENGTH WEIGHT *	2 5'-0" 18.1	2 5'-0" 20.0	2 5'-0" 22.0	2 5'-0" 23.9	2 5'-4" 27.8	2 5'-9" 31.7	402 BAR LENGTH = I.D. + 2W
501	5	I	1.043	(NO. REQ'D. (LENGTH WEIGHT *	17 7'-0" 131.5	17 8'-0" 141.8	17 8'-7" 152.2	17 9'-2" 162.5	17 10'-4" 183.2	17 11'-9" 203.9	501 BAR LENGTH = 24" + I.D. + 2W
502	5	I	1.043	(NO. REQ'D. (LENGTH WEIGHT *	22 5'-0" 114.7	23 5'-0" 119.9	25 5'-0" 130.4	26 5'-0" 135.6	29 5'-0" 151.2	32 5'-0" 166.9	502 NUMBER BARS REQ'D. = 3 + $\left(\frac{24+I.D.+2W}{5}+1\right)$
503	5	II	1.043	(NO. REQ'D. (LENGTH WEIGHT *	16 12'-05 214.2	16 13'-5 223.9	18 14'-0 262.5	18 14'-7 273.8	20 15'-9 328.5	24 16'-11 423.5	503 NUMBER BARS REQ'D. = 2 $\left(\frac{134+I.D.+2W}{12}+1\right)$ BAR LENGTH = 4'-9"+2(16"+I.D./2)
504	5	I	1.043	(NO. REQ'D. (LENGTH WEIGHT *	12 8'-8" 100.2	14 8'-8" 126.6	14 9'-3" 135.1	16 9'-10" 164.1	18 11'-0" 206.5	18 12'-2" 253.5	504 NUMBER BARS REQ'D. = $2\left(\frac{2W+I.D.+4}{12}+1\right)$ BAR LENGTH = 32"+2W+I.D.
1101	11	I	5.313	(NO. REQ'D. (LENGTH WEIGHT *	4 7'-2" 152.3	4 8'-0" 164.7	4 8'-9" 177.1	4 9'-5" 189.5	4 10'-9" 214.3	4 12'-1" 239.1	1101 BAR LENGTH = 21" + I.D. + 2W
1102	11	I	5.313	(NO. REQ'D. (LENGTH WEIGHT *	4 2'-8" 56.7	4 2'-8" 56.7	4 2'-8" 56.7	4 2'-8" 56.7	4 2'-8" 56.7	4 2'-8" 56.7	BENDING TYPE I STRAIGHT
1103	11	I	5.313	(NO. REQ'D. (LENGTH WEIGHT *	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	TYPE II 4'-9" 16"+W+I.D./2
* REINFORCING STEEL TOTAL					965.6	1,037.5	1,127.2	1,204.0	1,380.2	1,601.6	TYPE III 12" 27" I.D.+2W-38"
CONCRETE - CUBIC YARDS - TOTAL					6.0	6.6	7.3	8.0	9.5	11.1	

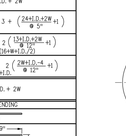
NOTE: QUANTITIES ARE BASED ON SAME SIZE PIPE ENTRANCE TO AND EXIT FROM BASE AND A 4 FT. MANHOLE ENTRANCE INTO TOP SLAB OF BASE.

QUANTITIES FOR CONCRETE MANHOLE BOX BASE

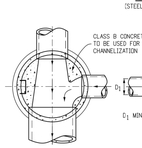
GENERAL NOTES

1. SINCE ALL PIPE ENTRIES INTO THE BASE ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK.
2. THE PRECAST FLAT TOP MAY BE USED ON ANY MANHOLE. THE ECCENTRIC CONE MAY BE USED WHEN THE MANHOLE "H" HEIGHT IS AT LEAST 8 FT.
3. THE MANHOLE RING FRAME SHALL BE SET IN A BED OF GROUT. THE FRAME SHALL BE SURROUNDED WITH A CEMENT GROUT IN UNPAVED AREA, OR A CONCRETE COLLAR IN PAVED AREA. SEE DETAILS ON SHEETS 2 AND 3.
4. DESIGN OF BOX BASE IS BASED ON STRAIGHT RUNS OF PIPE OR CHANGE IN DIRECTION OF LESS THAN 45°. SPECIAL DESIGN IS REQUIRED FOR 45° OR GREATER.
5. PRECAST MANHOLES AND REINFORCEMENT SHALL CONFORM TO AASHTO M 199 (ASTM C 478).
6. CAST-IN-PLACE MANHOLES SHALL BE CLASS B CONCRETE.
7. STEPS SHALL BE REQUIRED WHEN THE MANHOLE DEPTH EXCEEDS 3 FT-6 IN. AND SHALL CONFORM TO AASHTO M 199.
8. ALL REINFORCING STEEL SHALL BE GRADE 60 AND EPOXY COATED. VERTICAL STEEL SHALL BE PLACED AT CENTERLINE OF WALL. ALL BARS SHALL HAVE A 2 IN. MINIMUM CLEARANCE.
9. ALL PIPE ENTRIES INTO THE BASE OF MANHOLE SHALL BE CONNECTED BY OPEN CHANNELIZATION ADJUSTED FOR PIPE SIZE, SHAPE, SLOPE, AND DIRECTION OF FLOW. DETAILS SHOWN ARE TYPICAL FOR INSTALLATIONS WITH ALL INVERTS OF SAME RELATIVE ELEVATION. FOR EXCESSIVE ELEVATION DIFFERENCE BETWEEN INVERTS, SPECIAL BASE/CHANNEL DETAILS WILL BE SHOWN ON THE PLANS.
10. FLOW CHANNELS AND INVERTS SHALL BE FORMED BY SHAPING WITH CLASS B CONCRETE OR APPROVED GROUT.
11. STUB-OUTS SHALL EXTEND 2 FT. MINIMUM BEYOND OUTSIDE WALL SURFACE OF MANHOLE AND BE SATISFACTORILY PLUGGED.
12. THE SLOPE OF THE MANHOLE COVER SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.

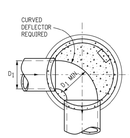
▲ WHEN FINAL GRADE IS PAVEMENT SURFACE, RECESS MANHOLE RING AND COVER ¼" MIN. TO ½" MAX.



THROUGH PIPE
ONE LATERAL



ANGLED LATERALS



SHARP ANGLE

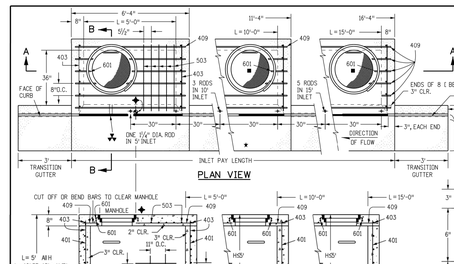
TYPICAL CHANNELIZATION DETAILS

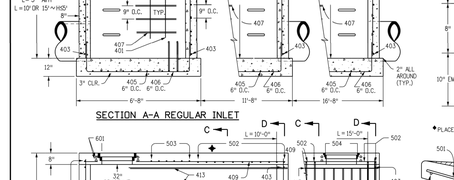
Computer File Information		Sheet Revisions		Colorado Department of Transportation	STANDARD PLAN NO.
Creation Date: 07/31/19		Date	Comments	2829 West Howard Place	M-604-20
Designer Initials: JBK				CDOT HQ, 3rd Floor	Standard Sheet No. 1 of 3
Last Modification Date: 07/31/19				Denver, CO 80204	
Detailer Initials: LTA				Phone: 303-757-9021 FAX: 303-757-9868	
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English				Project Development Branch JBK	Project Sheet Number:

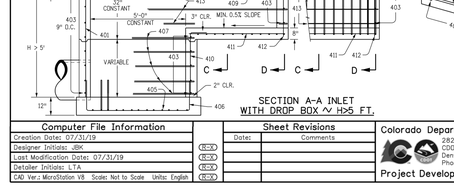
MANHOLES

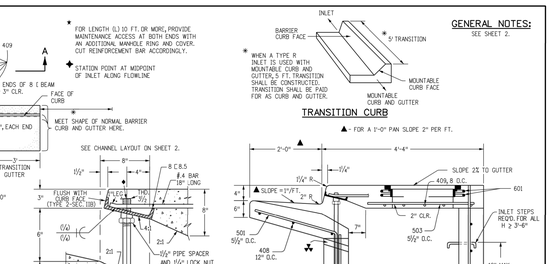
Issued by the Project Development Branch: July 31, 2019

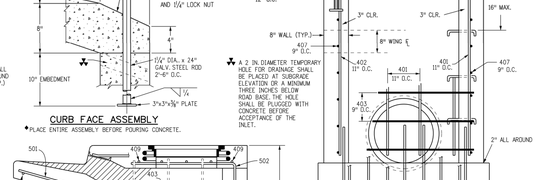
6



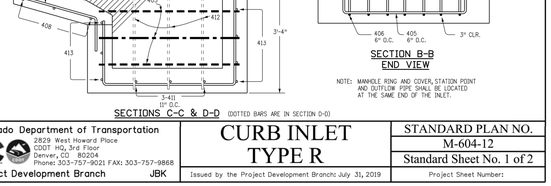








NOTE: MANHOLE RING AND COVER, STATION POINT AND OUTFLOW PIPE SHALL BE LOCATED AT THE SAME END OF THE INLET.



GENERAL NOTES:
SEE SHEET 2.

Computer File Information		Sheet Revisions		Colorado Department of Transportation	STANDARD PLAN NO.
Creation Date: 07/31/19		Date	Comments	2829 West Howard Place	M-604-12
Designer Initials: JBK				CDOT HQ, 3rd Floor	Standard Sheet No. 1 of 2
Last Modification Date: 07/31/19				Denver, CO 80204	
Detailer Initials: LTA				Phone: 303-757-9021 FAX: 303-757-9868	
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English				Project Development Branch JBK	Project Sheet Number:

CURB INLET
TYPE R

Issued by the Project Development Branch: July 31, 2019

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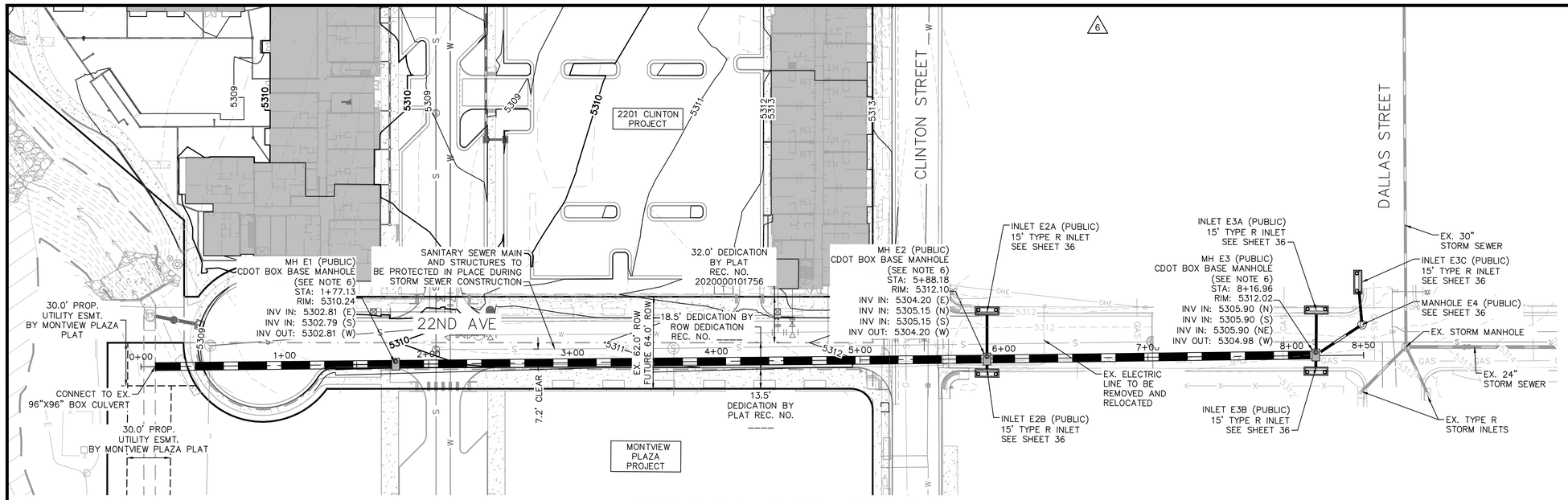
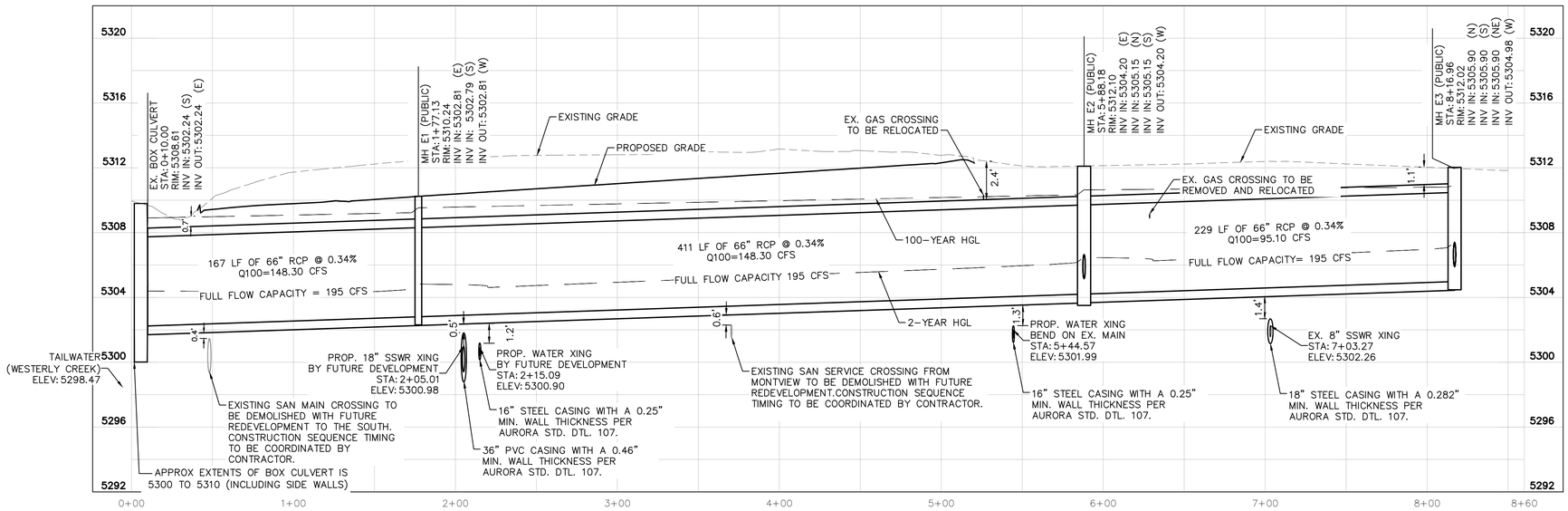


22ND AVENUE STORM TRUNK PLAN (PUBLIC)



22ND AVENUE STORM TRUNK PROFILE (PUBLIC)

NOTES

1. POTHOLING INFORMATION WAS OBTAINED 07/29/2020 BY D&M UTILITY SERVICES FOR THE 2201 CLINTON PROJECT. CONTRACTOR TO ALSO FIELD VERIFY INVERT ELEVATION OF EXISTING UTILITIES AT POINT OF CONNECTION PRIOR TO CONSTRUCTION OF PROPOSED LINES AND NOTIFY ENGINEER OF RECORD OF ANY DISCREPANCIES.
2. ELEVATIONS SHOWN AT INLET FLOWLINES DO NOT REFLECT LOCALIZED DEPRESSIONS. REVIEW INLET DETAILS FOR DEPRESSIONS FROM FLOWLINE ELEVATIONS.
3. ALL PROPOSED STORM SEWER, INLETS, AND STRUCTURES ON THIS SHEET ARE PUBLIC. STORM INFRASTRUCTURE IS SIZED TO INTERCEPT 195 CFS OF REGIONAL FLOW.
4. ALL BEDDING SHALL BE COA ALT B. ALL RCP PIPE TO BE CLASS III RCP UNLESS OTHERWISE NOTED.
5. STORM SEWER WILL ROUTE TO THE EXISTING REINFORCED CONCRETE BOX CULVERT LEADING INTO WESTERLY CREEK.
6. PER AURORA STORM DRAINAGE DESIGN & TECHNICAL CRITERIA MANUAL, MANHOLES WITH PIPES LARGER THAN 48" SHALL REQUIRE SPECIAL VAULT DESIGN. REFER TO DETAIL ON SHEET 29.

BENCHMARK AND DATUM

TIED TO C.O.A. BENCHMARK NO. 3S6734NW001, 3 INCH BRASS CAP STAMPED "COA BM 3S6734NW001, 2015" ON THE NORTH SIDE OF A 15-FOOT-WIDE TYPE R INLET AT THE NORTHEAST CORNER OF WESTERLY CREEK AND MONTVIEW BOULEVARD. CITY OF AURORA DATUM = 5315.50 FEET (NAVD 88).

NORTH

VERTICAL 8 4 2 0

GRAPHIC SCALE IN FEET
0 20 40 80
HORIZONTAL

NO.	REVISION	BY	DATE	APPR
7	PHASING PLAN	RCK	07/02/21	MMT
6	22ND AVE STORM REVS	RCK	05/26/21	MMT
5	CD APPROVAL SET	RCK	09/08/20	MMT
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1	CD PRESUBMITTAL	RCK	03/25/20	MMT

Kimley»Horn
KIMLEY-HORN AND ASSOCIATES, INC.
1125 17th Street, Suite 1400
Denver, Colorado 80202 (303) 228-2300

DESIGNED BY: DTD
DRAWN BY: RCK
CHECKED BY: MMT
DATE: 05/01/21

CLINTON STREET SUBDIVISION FILING NO. 1
CITY OF AURORA, STATE OF COLORADO
CONSTRUCTION DOCUMENTS
22ND AVENUE STORM SEWER PLAN AND PROFILE

FACSIMILE
This electronic plan is a facsimile of the signed and sealed pdf set
(Meaghan M. Turner)

PROJECT NO.
096253018

DRAWING NAME
096253018_ST

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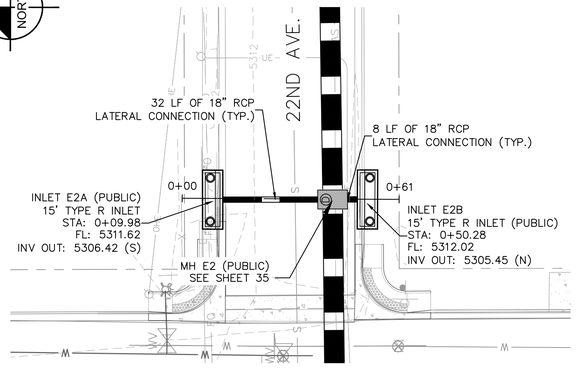
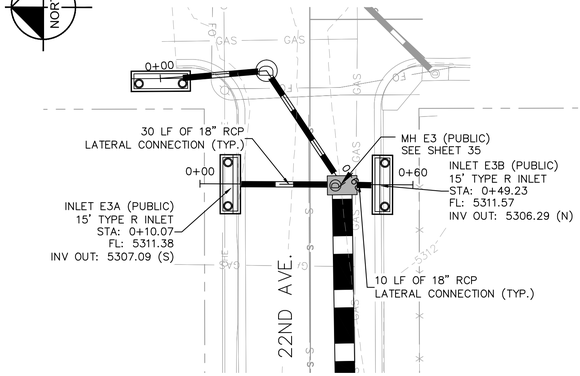
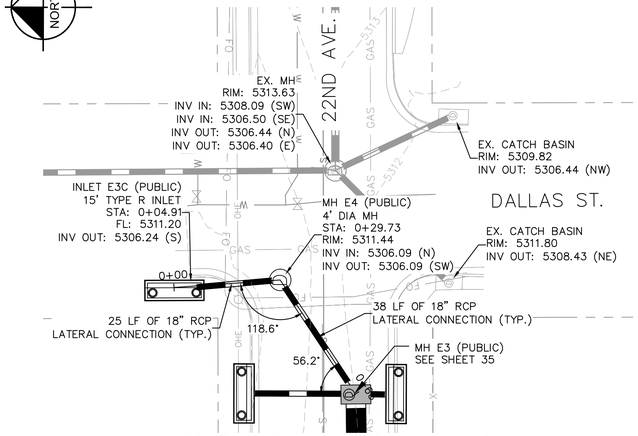


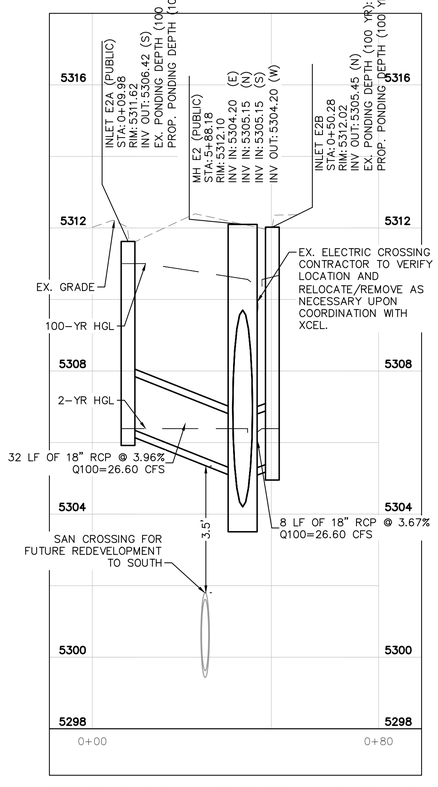
22ND AVENUE STORM LATERAL 1
PLAN (PUBLIC)



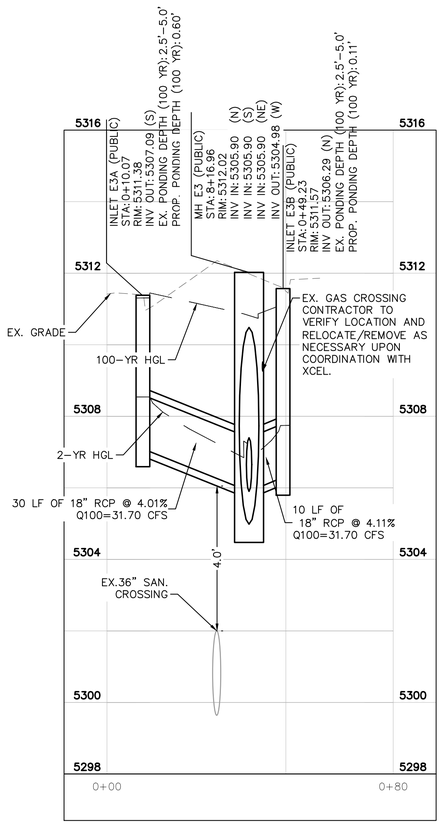
22ND AVENUE STORM LATERAL 2
PLAN (PUBLIC)



22ND AVENUE STORM LATERAL 3
PLAN (PUBLIC)



22ND AVENUE STORM LATERAL 1
PROFILE (PUBLIC)



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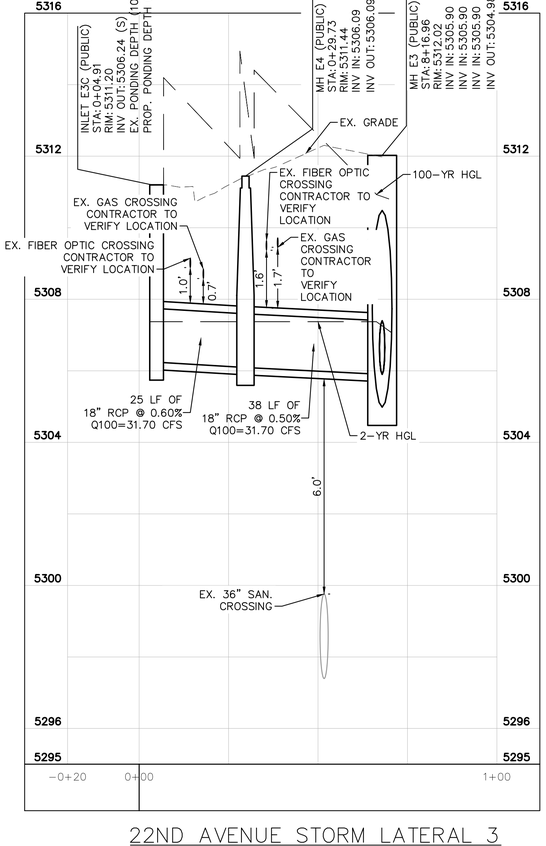
PROFILE (PUBLIC)



22ND AVENUE STORM LATERAL 3
PROFILE (PUBLIC)

NOTES

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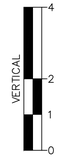
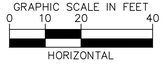
3. ALL PROPOSED STORM SEWER, INLETS, AND STRUCTURES ON THIS SHEET ARE PUBLIC. STORM INFRASTRUCTURE IS SIZED TO INTERCEPT 195 CFS OF REGIONAL FLOW.
4. ALL BEDDING SHALL BE COA ALT B. ALL RCP PIPE TO BE CLASS III RCP UNLESS OTHERWISE NOTED.
5. STORM SEWER WILL ROUTE TO THE EXISTING REINFORCED CONCRETE BOX CULVERT LEADING INTO WESTERLY CREEK.
6. PER AURORA STORM DRAINAGE DESIGN & TECHNICAL CRITERIA MANUAL, MANHOLES WITH PIPES LARGER THAN 48" SHALL REQUIRE SPECIAL VAULT DESIGN.

BENCHMARK AND DATUM

TIED TO C.O.A. BENCHMARK NO. 3S6734NW001, 3 INCH BRASS CAP STAMPED "COA BM 3S6734NW001, 2015" ON THE NORTH SIDE OF A 15-FOOT-WIDE TYPE R INLET AT THE NORTHEAST CORNER OF WESTERLY CREEK AND MONTVIEW BOULEVARD. CITY OF AURORA DATUM = 5315.50 FEET (NAVD 88).





NO.	PHASING PLAN	BY	DATE	APPR
7	REVISION	RCK	07/02/21	MMT
6	22ND AVE. STORM REVS	RCK	05/26/21	MMT
5	CD APPROVAL SET	RCK	09/08/20	MMT
4	CD SUBMITTAL #3	RCK	08/10/20	MMT
3	CD SUBMITTAL #2	RCK	05/22/20	MMT
2	CD SUBMITTAL #1	RCK	04/03/20	MMT
1	CD PRESUBMITTAL	RCK	03/25/20	MMT

Kimley»Horn
KIMLEY-HORN AND ASSOCIATES, INC.
1125 17th Street, Suite 1400
Denver, Colorado 80202 (303) 228-2300

DESIGNED BY: DTD
DRAWN BY: RCK
CHECKED BY: MMT
DATE: 05/01/21

CLINTON STREET SUBDIVISION FILING NO. 1

CITY OF AURORA, STATE OF COLORADO
CONSTRUCTION DOCUMENTS
22ND AVENUE STORM SEWER PLAN AND PROFILE

FACSIMILE
This electronic plan is a facsimile of the signed and sealed pdf set
(Meaghan M. Turner)

PROJECT NO.
096253018

DRAWING NAME
096253018_ST

K:\den_civil\096253018\CADD\plansheets\Construction Documents\096253018CD_ST-22nd.dwg Keatley, Rachel 7/23/2021 4:40 PM

CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT

LEGEND:

	PROPERTY LINE		EXISTING FIRE HYDRANT
	UTILITY CROSSING	G	EXISTING GAS LINE
	PROPOSED STORM LINE	T	EXISTING TELEPHONE LINE
	EXISTING STORM LINE	E	EXISTING ELECTRIC LINE
	PROPOSED STORM INLET	CATV	EXISTING CABLE TV LINE
	EXISTING STORM INLET	OH	EXISTING OVERHEAD LINE
	PROPOSED SANITARY SEWER W/ MANHOLE	FO	EXISTING FIBER OPTIC LINE
S	EXISTING SANITARY SEWER W/ MANHOLE	I	EXISTING IRRIGATION LINE
	PROPOSED WATERLINE & VALVE	SC	EXISTING SPRINKLER CONTROL
	PROPOSED FIRE HYDRANT ASSEMBLY		EXISTING LIGHT POLE
	PROPOSED WATER METER		
WM	EXISTING WATERLINE & VALVE		

WM

0 15 30 60

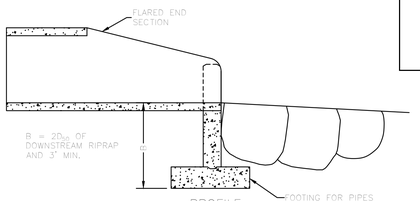
SCALE: 1" = 30'
ORIGINAL GRAPHIC SCALE

NOTES:

1. CONTRACTOR TO VERIFY ALL DEPTHS OF EXISTING UTILITIES SHOWN. IF ANY DISCREPANCIES ARE DISCOVERED CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO INSTALLATION.
2. PIPE BEDDING & TRENCHING PER COA STD. DET. 100
3. ALL STORM SEWER SYSTEM IS PRIVATE, IS DESIGNED FOR THE 100-YEAR STORM, AND IS TO BE MAINTAINED BY OWNER UNLESS OTHERWISE NOTED.
4. MINIMUM CLASS B BEDDING FOR PIPES PER SECTION 9.00 PER COA, "WATER, SANITARY SEWER AND STORM INFRASTRUCTURE" OR APPROVED EQUAL.
5. MINIMUM CLASS B ALTERNATE BEDDING FOR FLEXIBLE PIPES PER SECTION 9.05.3 PER COA, "WATER, SANITARY SEWER AND STORM INFRASTRUCTURE" OR APPROVED EQUAL.
6. CONCRETE FOR RCP SHALL BE CLASS III UNLESS OTHERWISE NOTED.
7. THE MILE HIGH FLOOD DISTRICT WILL CONDUCT SITE VISITS DURING THE PROJECT CONSTRUCTION WITHIN OR NEAR THE CHANNEL TO OBSERVE CONSTRUCTION FOR CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS. PLEASE CONTACT MHFD (303-455-6277) TO SCHEDULE A PRECONSTRUCTION MEETING. ALL STRUCTURAL AND GROUTED BOULDER WORK REQUIRE 48-HOURS PRIOR NOTICE TO ANY CONSTRUCTION OR CONCRETE PLACEMENT. STANDARDS AND SPECIFICATIONS FOR ALL OUTFALL AND CHANNEL WORK CAN BE ACCESSED AS WWW.MHFD.ORG UNDER THE REFERENCES SECTION. FAILURE TO NOTIFY MAY RESULTS IN PROJECT INELIGIBILITY.

BENCHMARK

COA BENCHMARK 3S6734NW001 BEING A 3 INCH DIAMETER BRASS CAP STAMPED (COA BM, 3S6734NW001, 2015), W/DIVOT, ON THE NORTH SIDE OF A 15 FOOT WIDE TYPE R INLET, NORTHEAST CORNER OF WESTERLY CREEK AND MONTVIEW BOULEVARD. ELEV = 5,315.50 (NAVD88)



PROFILE

TOEWALL DESIGN TABLE

PIPE SIZE	LENGTH, MIN.
18"	7'-0"
24"	8'-0"
30"	10'-0"
36"	12'-0"
42"	12'-6"
48"	13'-0"
54"	13'-6"
60"	14'-0"
66"	14'-6"
72"	15'-0"

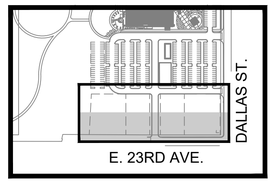
FLARED END SECTION (FES) HEADWALL DETAIL (WITH BOULDERS)

FACSIMILE

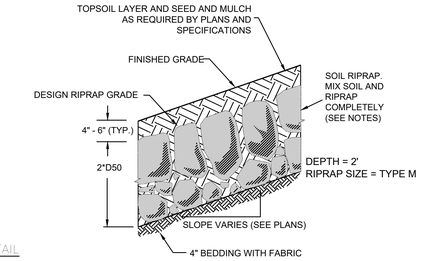
This electronic plan is a facsimile of the signed and sealed pdf set

Signature

09/08/2021
Date

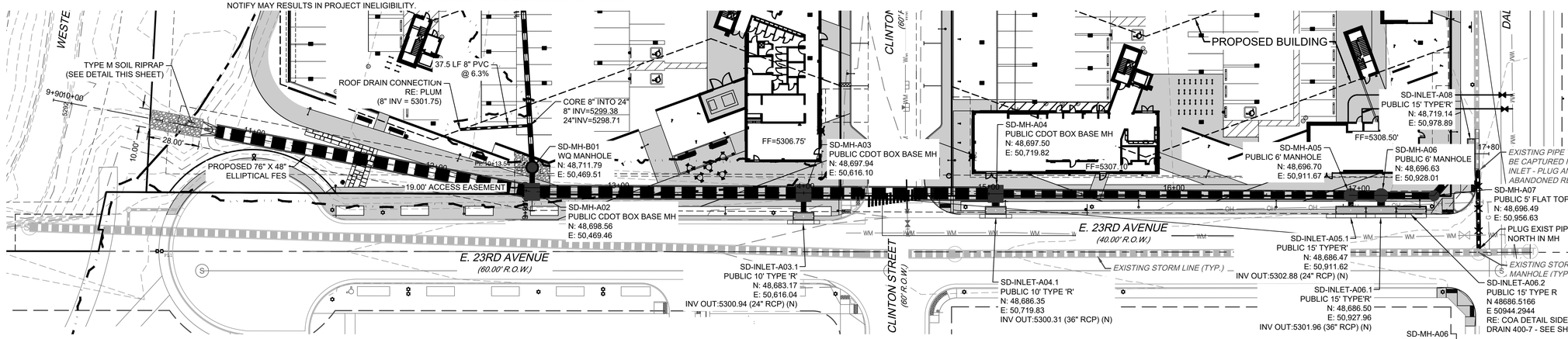


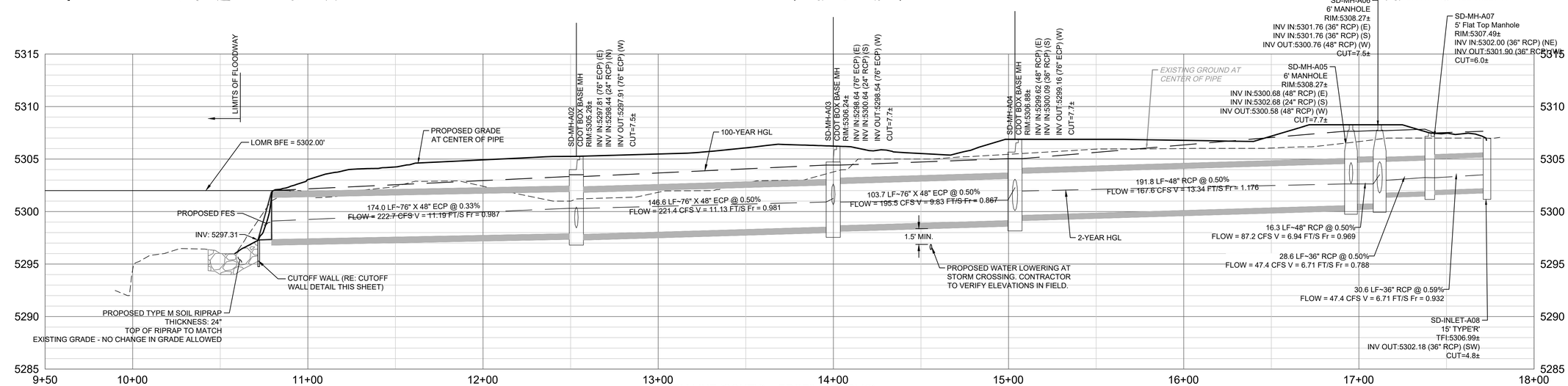
KEY MAP
SCALE: 1" = 200'



NOTES:
1. SOIL RIPRAP DETAILS ARE APPLICABLE TO SLOPED AREAS. REFER TO THE SITE PLAN ACTUAL LOCATION AND LIMITS.
2. MIX UNIFORM ALLY 65% RIPRAP BY VOLUME WITH 35% OF APPROVED SOIL BY VOLUME PRIOR TO PLACEMENT.
3. PLACE STONE-SOIL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE DESIGN RIPRAP TOP GRADE.
4. CRIMP OR TACKIFY MULCH OR USE APPROVED HYDROMULCH AS CALLED FOR IN THE PLANS AND SPECIFICATIONS.

TYPE 'L' BURIED RIPRAP DETAIL
N.T.S.





STORM LINE (SOUTH) - PROFILE (PUBLIC)

SCALE:
HORIZ: 1"=30'
VERT: 1"=5'

WARE MALCOMB
CIVIL ENGINEERING & SURVEYING
990 south broadway
suite 230
denver, co 80209
p 303.561.3333
waremalcomb.com

FOR AND ON BEHALF OF WARE MALCOMB

STANLEY MARKET PLACE SUBDIVISION
LOT 2&3, BLOCK1, F1 AMENDMENT NO. 1
STANLEY RESIDENTIAL
STORM PLAN & PROFILE

NO.	DATE	REMARKS
1	04.22.21	RESPONSE TO COMMENTS
2	08.14.21	ISSUED FOR APPROVAL
3	09.08.21	ISSUED FOR APPROVAL

JOB NO.:	16103
PA / PM:	CS
DRAWN BY:	ANM
DATE:	09.08.2021

SHEET
C6.1-11

ANM C:\Users\sjursnick\Documents\STANLEY AVIATION_sjursnick.rvt

CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT

FACSIMILE

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Signature

09/08/2021
Date

LEGEND:

	PROPERTY LINE		EXISTING FIRE HYDRANT
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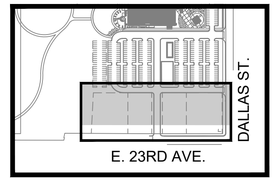
	PROPOSED FIRE HYDRANT ASSEMBLY		EXISTING LIGHT POLE
	PROPOSED WATER METER		
WM	EXISTING WATERLINE & VALVE		



KEY MAP
SCALE: 1" = 200'

NOTES:

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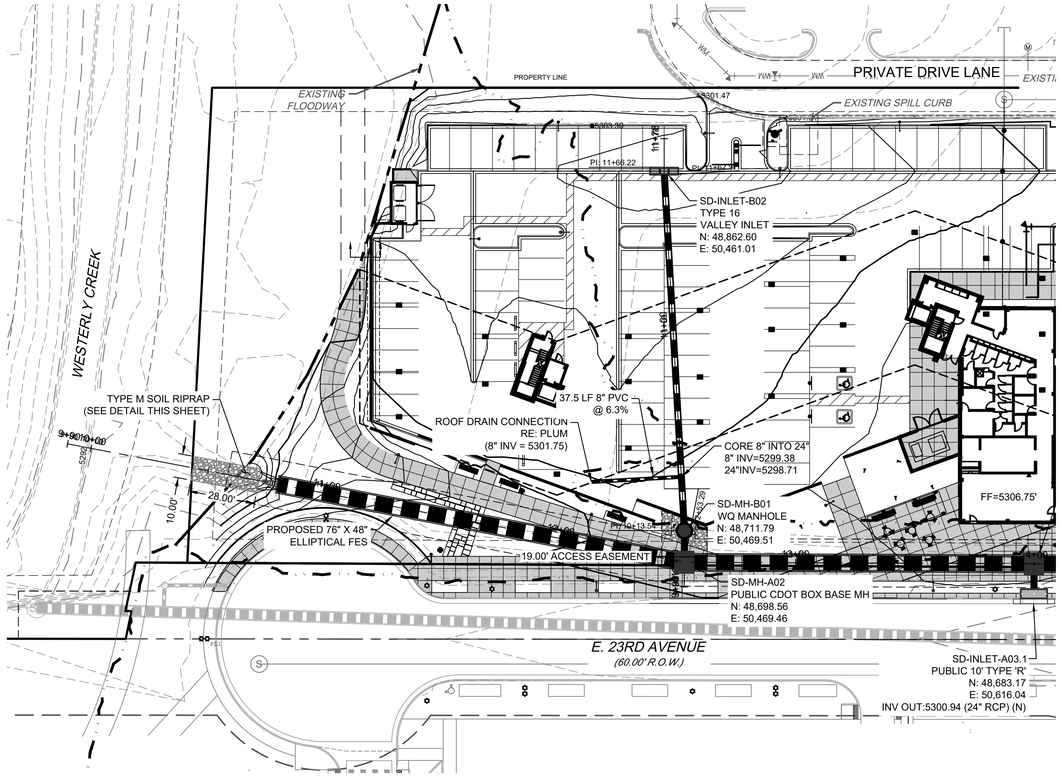
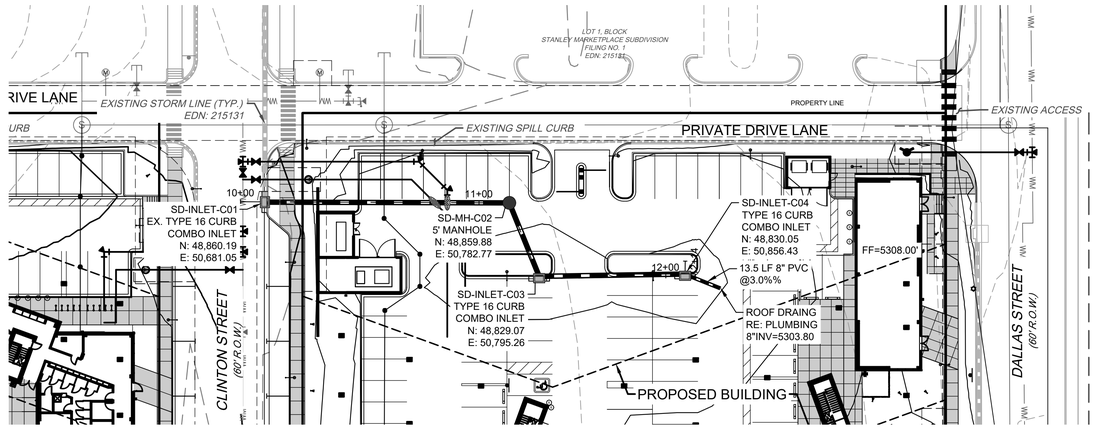
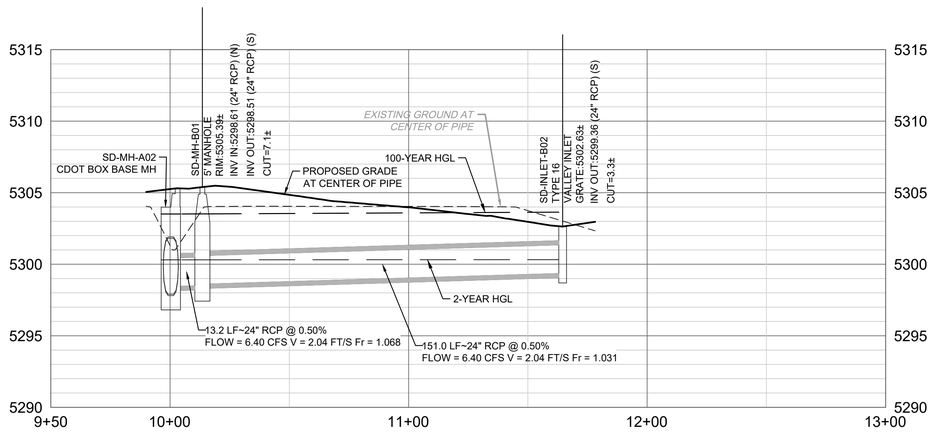
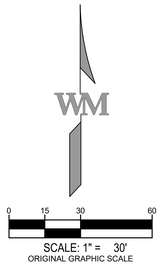


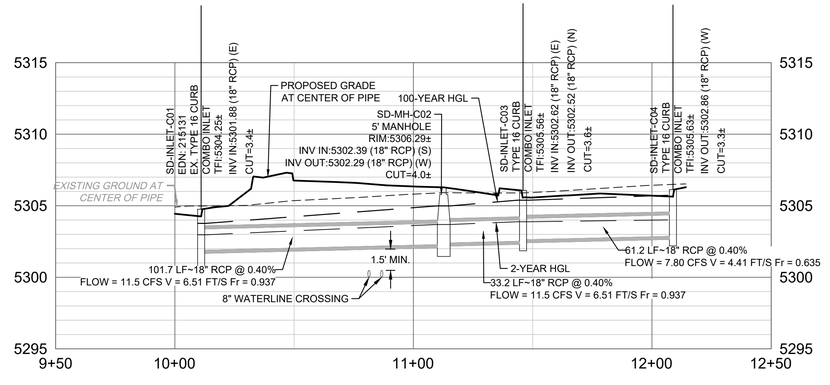




STORM LINE (WEST) - PROFILE (PRIVATE)

SCALE:
HORIZ: 1"=30'
VERT: 1"=5'





STORM LINE (EAST) - PROFILE (PRIVATE)

SCALE:
HORIZ: 1"=30'
VERT: 1"=5'

WARE MALCOMB
CIVIL ENGINEERING & SURVEYING
990 south broadway
suite 230
denver, co 80209
p 303.561.3333
waremalcomb.com

FOR AND ON BEHALF OF WARE MALCOMB

STANLEY MARKET PLACE SUBDIVISION
LOT 2&3, BLOCK1, F1 AMENDMENT NO. 1
STANLEY RESIDENTIAL
STORM PLAN & PROFILE

NO.	DATE	REMARKS
1	04.22.21	RESPONSE TO COMMENTS
2	08.14.21	ISSUED FOR APPROVAL
3	09.08.21	ISSUED FOR APPROVAL

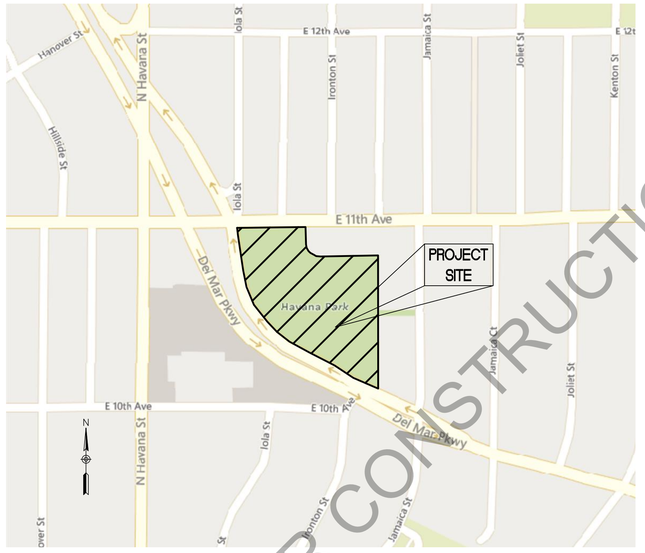
JOB NO.:	16103
PA / PM:	CS
DRAWN BY:	ANM
DATE:	09.08.2021

SHEET
C6.2-12

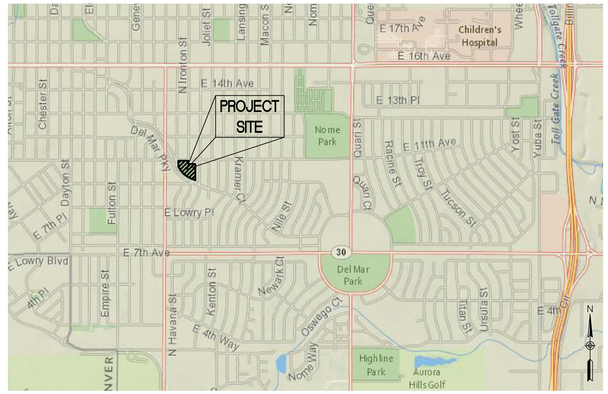
C:\Users\sjursnick\Documents\STANLEY AVIATION_sjursnick.rvt

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

HAVANA PARK #01 SUBDIVISION
LOCATED IN THE SW 1/4 OF SECTION 2, TOWNSHIP 4 SOUTH, RANGE 67 WEST OF THE 6TH P.M.
CITY OF AURORA, COUNTY OF ARAPAHOE, STATE OF COLORADO



KEY MAP
SCALE: 1"=250'



VICINITY MAP
SCALE: 1"=2000'

SHEET INDEX

SHEET NO.		TITLE
1	C1	COVER SHEET/GENERAL NOTES
2	C2	DEMOLITION PLAN & SOIL BORING INFORMATION
3	C3	POND PLAN VIEW & DETAILS
4	C4	STORMLINE A PLAN/PROFILE
5	C5	STORMLINE B,C,D PLAN/PROFILE
6	C6	POND CROSS SECTIONS
7	C7	FOREBAY GRADING PLAN & DETAILS
8	C8	FOREBAY LAYOUT PLAN & DETAILS
9	C9	MICROPOOL LAYOUT PLAN & DETAILS
10	C10	BIOSWALE PLAN VIEW & DETAILS
11	S1	POND OUTLET STRUCTURES A3 & B1
12	S2	POND OUTLET STRUCTURES A3 & B1
13	S3	POND OUTLET STRUCTURE A3
14	S4	POND OUTLET STRUCTURE A3
15	S5	POND OUTLET STRUCTURE B1
16	S6	POND OUTLET STRUCTURE B1
17	SUE1	SUE UTILITY MAP TITLE SHEET
18	SUE2	SUE UTILITY MAP GENERAL NOTES AND MAP KEY
19	SUE3	SUE UTILITY MAP SHEET LAYOUT
20	SUE4	SUE UTILITY MAP PLAN UTILITY DRAWINGS
21	SUE5	SUE UTILITY MAP PLAN UTILITY DRAWINGS
22	SUE6	SUE UTILITY MAP PLAN UTILITY DRAWINGS
23	SUE7	SUE UTILITY MAP PLAN UTILITY DRAWINGS
24	SUE8	SUE UTILITY MAP PLAN UTILITY DRAWINGS
25	SUE9	SUE UTILITY MAP PLAN UTILITY DRAWINGS
26	SWMP 1	STORMWATER MANAGEMENT PLAN COVER SHEET
27	SWMP 2	HAVANA PARK POND INITIAL STORMWATER MANAGEMENT PLAN
28	SWMP 3	HAVANA PARK POND INTERIM STORMWATER MANAGEMENT PLAN
29	SWMP 4	HAVANA PARK POND FINAL STORMWATER MANAGEMENT PLAN
30	L1	REVEGETATION PLAN
31	L2	REVEGETATION SCHEDULE NOTES & DETAILS
32	I1	IRRIGATION PLAN
33	I2	IRRIGATION SCHEDULE
34	SURVEY	SURVEY CONTROL SHEET

REQUIRED NOTES:

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND ELEVATIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
2. ALL ROADWAY CONSTRUCTION SHALL CONFORM TO CITY OF AURORA "ROADWAY DESIGN & CONSTRUCTION SPECIFICATIONS," LATEST EDITION.
3. ALL WATER DISTRIBUTION, SANITARY SEWER, AND STORM DRAINAGE CONSTRUCTION SHALL CONFORM TO CITY OF AURORA "STANDARDS AND SPECIFICATIONS REGARDING WATER, SANITARY SEWER AND STORM DRAINAGE INFRASTRUCTURE," LATEST REVISION.
4. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE CITY. THE CITY RESERVES THE RIGHT TO ACCEPT OR REJECT ANY MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE CITY STANDARDS AND SPECIFICATIONS.
5. THE CONTRACTOR SHALL NOTIFY THE CITY PUBLIC IMPROVEMENT INSPECTIONS DIVISION, 303-739-7420, 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
6. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ACTUAL CONSTRUCTION. FOR INFORMATION, CONTACT UTILITY NOTIFICATION CENTER OF COLORADO, 1-800-922-1987 OR 811.
7. THE CONTRACTOR SHALL HAVE ONE SIGNED COPY OF THE PLANS (APPROVED BY THE CITY OF AURORA), ONE COPY OF THE APPROPRIATE STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, AND A COPY OF ANY PERMITS AND EXTENSION AGREEMENTS NEEDED AT THE JOB SITE AT ALL TIMES.
8. IT IS THE CONSULTANTS RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ON-SITE, AND OFF-SITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NEEDED DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS EITHER ON-SITE OR OFF-SITE, WHICH ARISE IN THE FIELD, WILL BE ENTIRELY THE DEVELOPERS RESPONSIBILITY. THE COST TO RECTIFY ANY ADVERSE SITUATION TO MEET THE CITY STANDARD AND SPECIFICATIONS AND THE CITY CODE SHALL BE BORNE SOLELY BY THE DEVELOPER.
9. THE OWNER/DEVELOPER MUST OBTAIN THE WRITTEN PERMISSION OF THE ADJACENT PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE GRADING OR CONSTRUCTION.
10. CONCRETE SHALL NOT BE PLACED UNTIL THE FORMS HAVE BEEN INSPECTED BY PUBLIC IMPROVEMENTS INSPECTION.
11. PAVING OF PUBLIC STREETS SHALL NOT START UNTIL A SOIL REPORT AND PAVEMENT DESIGN IS APPROVED BY THE CITY ENGINEER, PROOF ROLLING, AND SUBGRADE AND TRENCH COMPACTION TESTS TAKEN BY THE DEVELOPER'S GEOTECH ARE APPROVED BY PUBLIC IMPROVEMENTS INSPECTIONS/MATERIALS LAB.
12. STANDARD CITY OF AURORA CURB RAMPS SHALL BE CONSTRUCTED AT ALL CURB RETURNS, AT ALL "T" INTERSECTIONS AND AT ALL CURBSIDE KIOSKS OR CLUSTERS, UNLESS OTHERWISE MODIFIED BY THESE PLANS.
13. ALL STATIONING IS BASED ON CENTERLINE OF ROADWAYS UNLESS OTHERWISE NOTED.
14. ALL ELEVATIONS ARE TO FLOW LINE UNLESS OTHERWISE NOTED.
15. THE CITY OF AURORA IS LIABLE FOR THE MAINTENANCE OF HAVANA PARK POND. THESE FACILITIES MEET CITY STANDARDS AND SHALL REMAIN IN PUBLIC MAINTENANCE BY THE CITY OF AURORA IN PERPETUITY. THESE PRIVATE FACILITIES INCLUDE, IF PROVIDED, THE PRIVATE UNDERDRAIN SYSTEM PLACED WITHIN THE PUBLIC RIGHT-OF-WAY.
16. THE CONTRACTOR/DEVELOPER IS RESPONSIBLE FOR CONTACTING CDOT TO ENSURE ALL WORK ON OR ADJACENT TO STATE HIGHWAYS OR CDOT R.O.W. MEETS CDOT REQUIREMENTS.
17. THE STREETLIGHT INSTALLATION OR PEDESTRIAN LIGHT INSTALLATION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE DESIGNED, FUNDED, AND CONSTRUCTED BY THE DEVELOPER/OWNER. OWNERSHIP AND MAINTENANCE OF THE STREET/PEDESTRIAN LIGHTS SHALL BE THE RESPONSIBILITY OF THE CITY OF AURORA ONCE THEY HAVE BEEN ACCEPTED. STREET LIGHT AND/OR PEDESTRIAN LIGHTING PLANS SHALL BE PREPARED AND SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL SHALL BECOME A PART OF THE APPROVED CIVIL CONSTRUCTION PLANS FOR THE PROJECT. THE OWNER IS RESPONSIBLE FOR OBTAINING AN ADDRESS FOR THE METER(S) FROM THE PLANNING DEPARTMENT. A BUILDING PERMIT FOR THE METER AND A PUBLIC INSPECTIONS PERMIT FOR THE STREET LIGHTS ARE REQUIRED. CERTIFICATE OF OCCUPANCIES WILL NOT BE ISSUED UNTIL THE STREET AND/OR PEDESTRIAN LIGHTING PLANS ARE APPROVED, CONSTRUCTED, AND INITIALLY ACCEPTED.
18. THE OWNER/CONTRACTOR MUST OBTAIN A C.D.P.S. STORM WATER DISCHARGE PERMIT FROM THE COLORADO DEPARTMENT OF PUBLIC HEATH AND ENVIRONMENT, IF REQUIRED.
19. THE OWNER/CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE ARMY CORPS OF ENGINEERS FOR WETLAND MITIGATION OR WORK WITHIN THE WATERS OF THE U.S., IF REQUIRED. IT IS THE RESPONSIBILITY OF THE OWNER/CONTRACTOR TO PROVIDE A COPY OF THE ARMY CORP OF ENGINEER'S REQUIREMENTS TO THE CITY OF AURORA. IF THERE ARE NO REQUIREMENTS BY THE ARMY CORP OF ENGINEERS, THAN WRITTEN NOTIFICATIONS FROM THE ARMY CORP OF ENGINEERS SHALL BE SUBMITTED TO THE CITY OF AURORA STATING SUCH. CITY APPROVAL OF THE CONSTRUCTION PLANS IS SUBJECT TO THE OWNER/CONTRACTOR OBTAINING A 404 PERMIT, IF APPLICABLE. A COPY OF THIS PERMIT SHALL BE SUBMITTED TO THE CITY OF AURORA PRIOR TO ANY PERMITS BEING ISSUED.
20. ALL SIGNAGE AND STRIPING SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, UNLESS OTHERWISE NOTED BY THE CITY OF AURORA.
21. PRIVATE UNDERDRAIN SYSTEMS FOR GROUNDWATER DISCHARGES FROM FOUNDATION DRAINS SHALL BE OWNED AND MAINTAINED BY THE METRO DISTRICT.
22. PROJECT SHALL COMPLY WITH SUBSURFACE UTILITY ENGINEERING REQUIREMENTS PER CRS 9-1.5 WHEN PROJECT INCLUDES EXCAVATION, INCLUDING BUT NOT LIMITED TO ELECTRONICALLY TRACEABLE MARKERS OR TRACING WIRE PER AURORA WATER STANDARDS AND SPECIFICATIONS FOR ALL SUBSURFACE UTILITIES. BY STAMPING THE PLAN THE ENGINEER OF RECORD IS CERTIFYING THE PLAN MEETS THE STANDARDS ESTABLISHED BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE 38-02) FOR DEFINING THE ACCURACY OF AN UNDERGROUND FACILITY.

AURORA WATER STANDARD NOTES:

1. ALL MATERIALS, WORKMANSHIP, CONSTRUCTION DETAILS, AND TESTING FOR THE WATER LINE CONSTRUCTION SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS REGARDING WATER, SANITARY SEWER AND STORM DRAINAGE INFRASTRUCTURE, LATEST REVISION AS SET FORTH BY THE CITY OF AURORA WATER DEPARTMENT, LATEST REVISION.
2. ALL FIRE HYDRANTS SHALL BE LOCATED LESS THAN THREE FEET-SIX INCHES (3'-6") AND NOT MORE THAN 8 FEET FROM THE BACK OF CURB TO THE CENTER OF THE HYDRANT AND BE UNOBSTRUCTED ON THE STREET SIDE. MINIMUM CLEARANCE ON ALL OTHER SIDES SHALL BE 5 FEET. FIRE HYDRANTS MUST BE GRADE STAKED IN THE FIELD. FIRE HYDRANTS ARE NOT ALLOWED IN SIDEWALKS.
3. ALL FIRE HYDRANTS MUST BE GRADE STAKED IN THE FIELD WHENEVER CURB AND GUTTER HAS NOT BEEN INSTALLED.
4. ALL UTILITY EASEMENTS MUST REMAIN UNOBSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH FOR MAINTENANCE EQUIPMENT.
5. WATER MAIN RESTRAINT SHALL BE IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS REGARDING WATER, SANITARY SEWER AND STORM DRAINAGE INFRASTRUCTURE, LATEST REVISION, MEGALUGS OR UNI-FLANGE MAY BE USED IN PLACE OF RODS AND CLAMPS.
6. WATERLINE VALVES ARE NOT ALLOWED IN CROSS-PANS.
7. ALL WATER METERS, WATER SERVICE LINES AND SANITARY SEWER SERVICE LINES ARE NOT ALLOWED IN OR UNDER DRIVEWAYS.
8. ALL SANITARY SERVICE LINES SHALL BE TEES OFF OF MAINS. WYES SHALL BE USED FOR LOTS AT BACK OF CUL-DE-SACS.
9. WATER PRESSURE ZONE TBD WITH 0 PSI @ ELEVATIONS TBD STATIC. A PRESSURE REDUCING VALVE (PRV) IS REQUIRED WHEN THE PRESSURE AT THE UNIT IS GREATER THAN EIGHTY (80) PSI. PRV'S ARE NOT ALLOWED IN THE CITY OF AURORA OWNED AND MAINTAINED METER PITS.
10. ADJUST ALL MANHOLES, FIRE HYDRANTS, AND VALVE BOXES TO GRADE PER AURORA WATER STANDARDS AND SPECIFICATIONS REGARDING WATER, SANITARY SEWER AND STORM SEWER INFRASTRUCTURE, LATEST REVISION, AS NECESSARY.
11. ALL FIRE LINES AND COMMERCIAL WATER SERVICE LINES REQUIRE REDUCED PRESSURE BACK FLOW ASSEMBLY OR DOUBLE CHECK VALVES AS REQUIRED BY THE CITY OF AURORA WATER DEPARTMENT. CONTACT THE WATER SERVICES AT (303) 326-8114 OR (303) 326-8129 FOR INSPECTION PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
12. THE CONTRACTOR SHALL CONTACT AURORA WATER ENGINEERING AT (303) 739-7300 FOR INSPECTION OF ANY REQUIRED GREASE TRAPS OR SAND/OIL INTERCEPTORS PRIOR TO THE ISSUANCE OF THE CERTIFICATE OF OCCUPANCY.
13. THE CONTRACTOR SHALL CONTACT THE AURORA WATER INSPECTION LINE AT (303) 739-7385 AT LEAST 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION OF ANY WET UTILITY TO SCHEDULE INSPECTIONS.
14. TOTAL BUILDING SURFACE AREA=N.A. TOTAL HARD SURFACE=N.A.
15. THE SOILS RESISTIVITY TEST WAS PERFORMED AND THE RESISTIVITY IS N/A OHM-CENTIMETER.

GENERAL UTILITY NOTES:

1. EXISTING STORM AND SANITARY SEWERS AND MANHOLES TO BE ABANDONED SHALL BE REMOVED TO WITHIN 2 FEET OF PROPOSED IMPROVEMENT, BACKFILLED WITH NATIVE MATERIALS, AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS. ABANDONMENT OF EXISTING STORM AND SANITARY SEWERS AND MANHOLES THAT ARE 2 FEET OR MORE BELOW PROPOSED IMPROVEMENTS MAY CONSIST OF COMPLETELY FILLING THEM WITH FLOWFILL AND CAPPING THEM, AT CONTRACTOR'S OPTION IN LIEU OF COMPLETE REMOVAL. MULTIPLE POINTS OF INJECTION WILL BE REQUIRED TO ENSURE THAT ALL VOIDS ARE FILLED WITH FLOWFILL. PIPE/STRUCTURE ABANDONMENT COST SHALL BE LUMP SUM PER BID SCHEDULE.
2. PIPE LENGTHS ARE PI TO PI OF STORM SEWER ALIGNMENT.
3. CONTRACTOR TO BE RESPONSIBLE FOR ALL UNDERGROUND UTILITIES PER SECTION 6.04 OF THE CITY OF AURORA STANDARDS AND SPECIFICATIONS FOR WATER, SANITARY, AND STORM.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING IN ACCORDANCE WITH STATE LAW AND WITH THE COA STANDARDS AND SPECIFICATIONS FOR WATER, SANITARY SEWER AND STORM DRAINAGE INFRASTRUCTURE. A STATE PERMIT IS REQUIRED.
5. CONTRACTOR SHALL CONTACT UTILITY COMPANIES 3 DAYS PRIOR TO WORK THAT WILL CROSS EXISTING UTILITIES SO THAT UTILITY COMPANIES MAY PLAN FOR AND RELOCATE UTILITIES AS NECESSARY ONCE THE CONTRACTOR EXCAVATES THE ROADWAY.
6. A SIGN WITH A MINIMUM AREA OF 0.75 SQUARE FEET SHALL BE ATTACHED TO THE DETENTION POND OUTLET OR POSTED NEARBY WITH THE FOLLOWING MESSAGE: "WARNING UNAUTHORIZED MODIFICATION OF THIS OUTLET IS A ZONING CODE VIOLATION." THE SPECIFIC POSTING LOCATION OF THE SIGN SHALL BE DETERMINED BY THE CITY OF AURORA.
7. ALL STORM DRAINAGE FACILITIES ARE PUBLIC UNLESS OTHERWISE NOTED ON PLANS.

SURVEY NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
2. HORIZONTAL CONTROL IS BASED ON A MODIFIED NAD 83-COLORADO STATE PLANE CENTRAL DATUM. DRAWING COORDINATES ARE SCALED TO GROUND BY A SCALE FACTOR OF 1.0002574504 UTILIZING THE FOLLOWING LOCATION AS THE POINT OF ORIGIN (AKA #1):
   LATITUDE: N39°43'56.33914"
   LONGITUDE: W104°51'49.68589"
   ELLIPSOID HEIGHT=5322.37"
3. VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.

DRAFT NOT FOR CONSTRUCTION

Designed By:

Donald J. Jacobs, P.E.
Licensed Professional Engineer
State of Colorado
No.: 33840

Date

Approved One Year From This Date

City Engineer	Date
Water Department	Date
Fire Department	Date
Traffic Manager	Date

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Donald J. Jacobs, P.E.

Date

NO.	DESCRIPTION OF REVISIONS	DATE	BY

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MHFD MILE HIGH FLOOD DISTRICT

AURORA

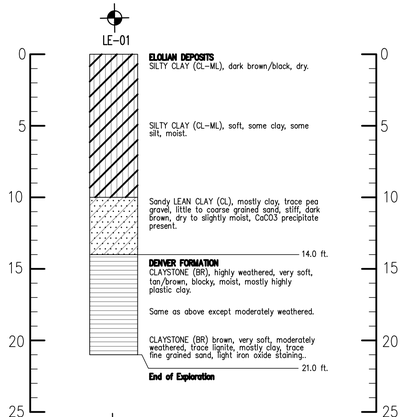
Enginuity ENGINUITY ENGINEERING SOLUTIONS 6300 S. SYRACUSE WAY, SUITE 215 LITTLETON, COLORADO 80127 PH: 303-872-0112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

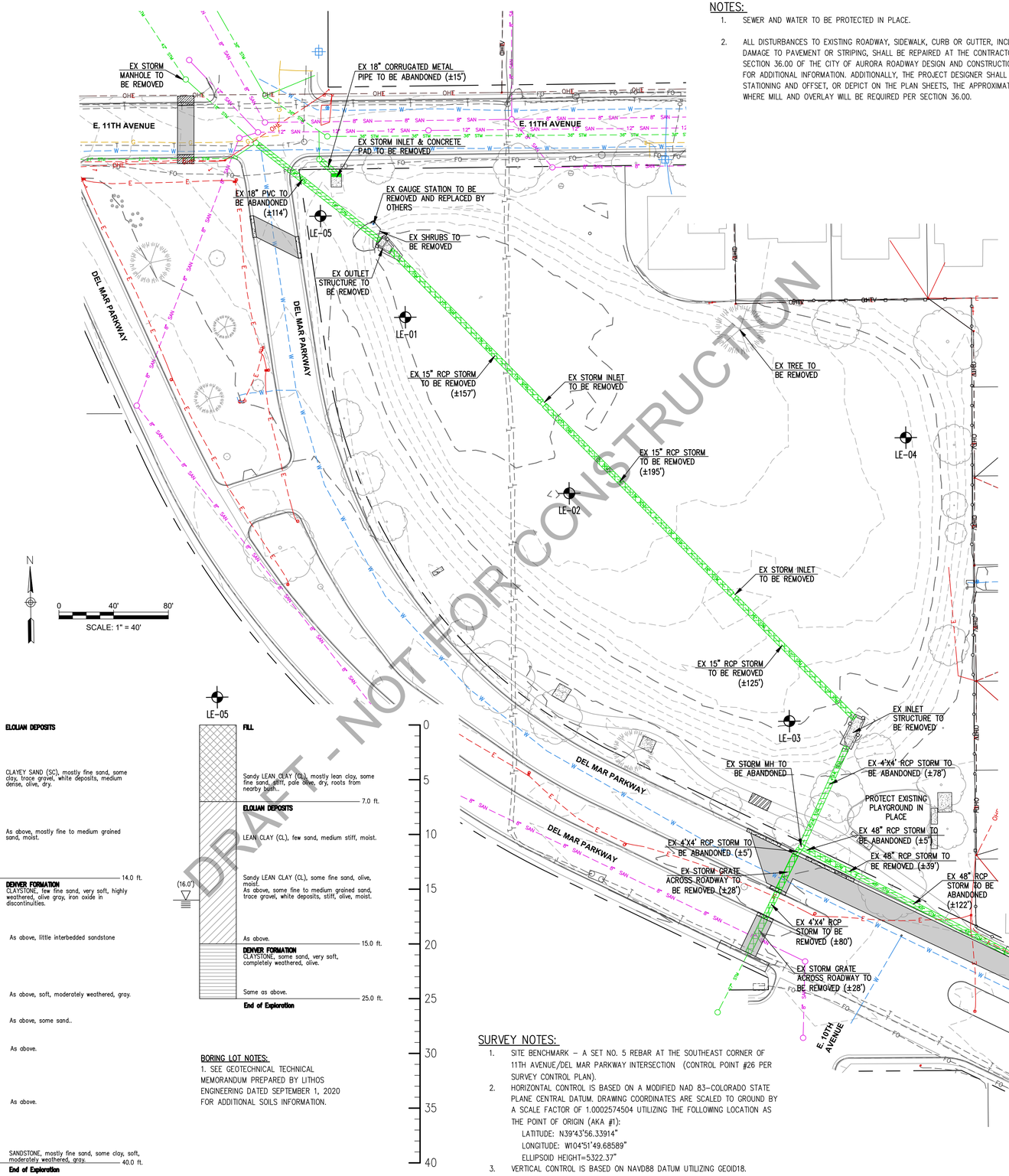
COVER SHEET/GENERAL NOTES

DRAWN BY: JWR
DESIGNED BY: JWR
APPROVED BY: DJJ
DATE: 1/25/2022
SHEET NO.: C1
SHEET 1

SOIL BORING LOGS

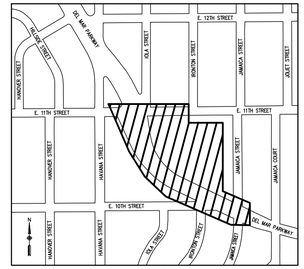


BORING LOT NOTES:
1. SEE GEOTECHNICAL TECHNICAL MEMORANDUM PREPARED BY LITHOS ENGINEERING DATED SEPTEMBER 1, 2020 FOR ADDITIONAL SOILS INFORMATION.



DRAFT - NOT FOR CONSTRUCTION

NOTES:
1. SEWER AND WATER TO BE PROTECTED IN PLACE.
2. ALL DISTURBANCES TO EXISTING ROADWAY, SIDEWALK, CURB OR GUTTER, INCLUDING SURFACE DAMAGE TO PAVEMENT OR STRIPING, SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE. SEE SECTION 36.00 OF THE CITY OF AURORA ROADWAY DESIGN AND CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL INFORMATION. ADDITIONALLY, THE PROJECT DESIGNER SHALL ASS A NOTE WITH STATIONING AND OFFSET, OR DEPICT ON THE PLAN SHEETS, THE APPROXIMATE LIMITS OF WHERE MILL AND OVERLAY WILL BE REQUIRED PER SECTION 36.00.



KEY MAP
SCALE: 1"=500'

EXISTING FEATURES LEGEND

- EXISTING STREET LIGHT
- EXISTING UTILITY/POWER POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING WATER MH
- SOIL BORING LOCATION/NUMBER (SEE BORING LOGS THIS SHEET) LE-02
- EXISTING WATER METER
- EXISTING GAS MANHOLE
- EXISTING STORM INLET
- EXISTING STREET SIGN
- EXISTING TELEPHONE MH
- EXISTING SHRUB
- EXISTING TREE
- EXISTING TREE
- EXISTING CONCRETE

- EXISTING ROW
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING STORM LINE W/MANHOLE
- EXISTING SANITARY LINE W/MANHOLE
- EXISTING UNDERGROUND TELEPHONE LINE
- EXISTING OVERHEAD TELEPHONE LINE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING FENCE WOOD
- EXISTING FENCE METAL
- EXISTING FENCE BARBED WIRE
- EXISTING CURB AND GUTTER
- EXISTING MAJOR CONTOUR 5370
- EXISTING MINOR CONTOUR 5371

DEMOLITION LEGEND

- ABANDON EXISTING STORM SEWER
- REMOVE EXISTING STORM SEWER
- REMOVE AND REPLACE EXISTING CURB AND GUTTER
- REMOVE AND REPLACE EXISTING COMBINED CURB, GUTTER, & SIDEWALK
- REMOVE AND REPLACE EXISTING CONCRETE MEDIAN COLLAR
- REMOVE AND REPLACE EXISTING SIDEWALK
- REMOVE AND REPLACE EXISTING ASPHALT PER CITY OF AURORA DETAIL S10.1 (ASPHALT TRENCH PATCHING)

SURVEY NOTES:
1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
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   ELLIPSOID HEIGHT=5322.37"
3. VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.

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Donald J. Jacobs, P.E.
Date

NO.	DESCRIPTION OF REVISIONS	DATE	BY

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MHFD MILE HIGH FLOOD DISTRICT

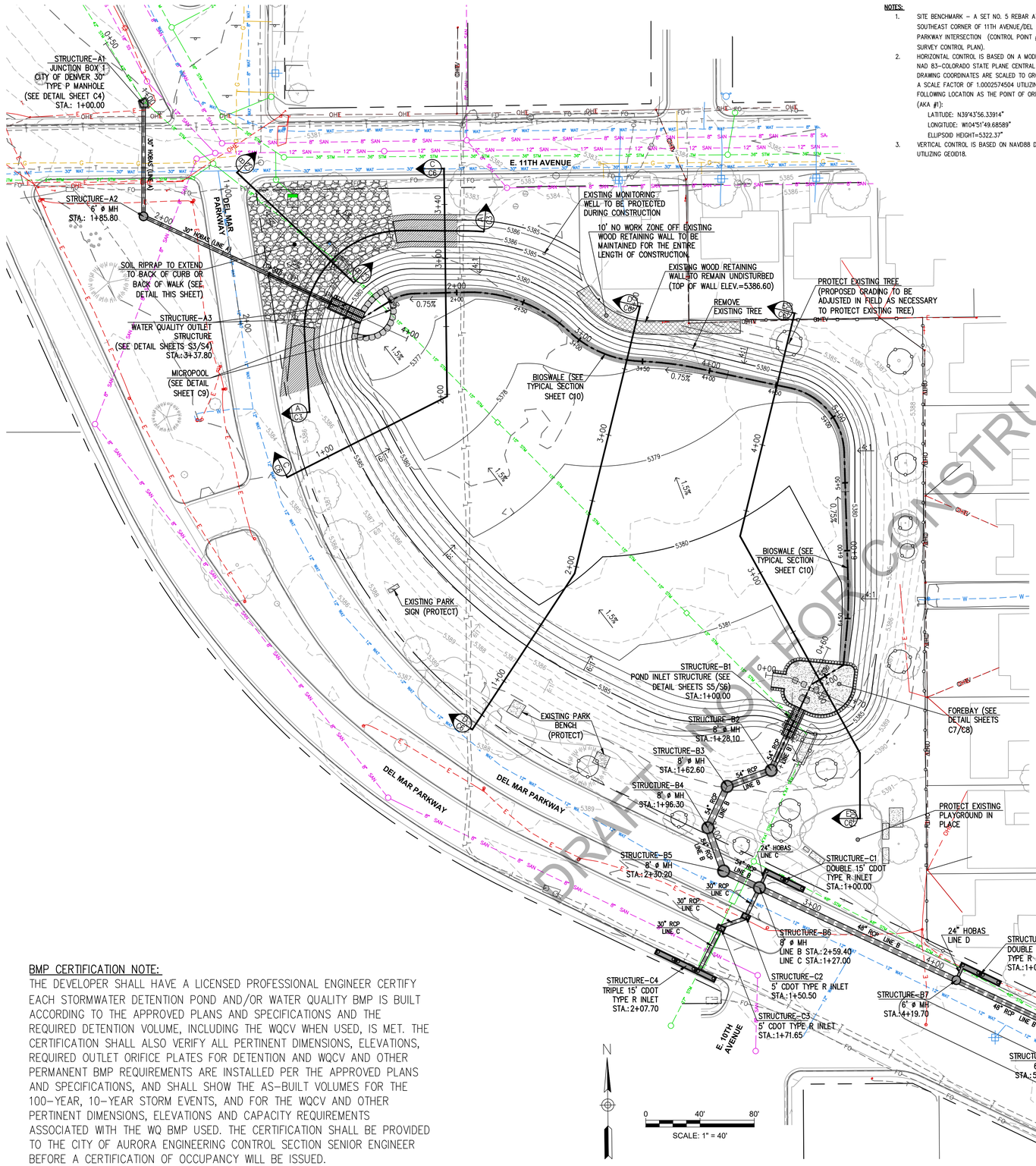
AURORA

Enginuity
ENGINUITY ENGINEERING SOLUTIONS
8400 E. PRENTICE AVENUE, SUITE 215
LITTLETON, COLORADO 80127
PH: 303-972-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

DEMOLITION PLAN

DRAWN BY: JWR
DESIGNED BY: JWR
APPROVED BY: DJJ
DATE: 1/25/2022
SHEET NO.: C2
SHEET 2



DRAFT NOT FOR CONSTRUCTION

NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
2. HORIZONTAL CONTROL IS BASED ON A MODIFIED NAD 83–COLORADO STATE PLANE CENTRAL DATUM. DRAWING COORDINATES ARE SCALED TO GROUND BY A SCALE FACTOR OF 1.00025745O4 UTILIZING THE FOLLOWING LOCATION AS THE POINT OF ORIGIN (AKA #1):
   LATITUDE: N39°43'56.33914"
   LONGITUDE: W104°51'49.68589"
   ELLIPSOID HEIGHT=5322.37"
3. VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.

EXISTING FEATURES LEGEND

- EXISTING STREET LIGHT
- EXISTING UTILITY/POWER POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING WATER MH
- EXISTING CONCRETE
- EXISTING WATER METER
- EXISTING GAS MANHOLE
- EXISTING STORM INLET
- EXISTING STREET SIGN
- EXISTING TELEPHONE MH
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- EXISTING TREE
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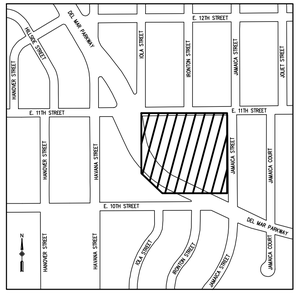
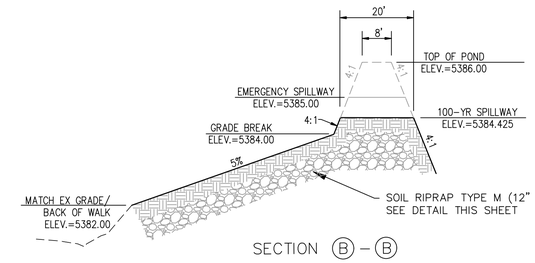
EXISTING FENCE METAL
EXISTING FENCE BARBED WIRE
EXISTING CURB AND GUTTER
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR



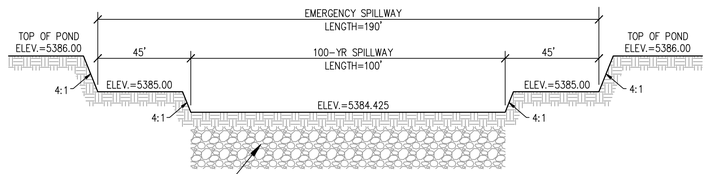
KEY MAP
SCALE: 1"=500'

PROPOSED FEATURES LEGEND

- PROPOSED STORM INLET
- PROPOSED STORM SEWER W/MANHOLE
- PROPOSED MAJOR CONTOUR 5370
- PROPOSED MINOR CONTOUR 5371
- PROPOSED 100-YR SPILLWAY/ SOIL RIPRAP
- PROPOSED EMERGENCY SPILLWAY
- TREE PROTECTION (REFER TO AURORA DETAILS PROS TP-1.0,2.0,2.1,3.0,3.1,3.2)

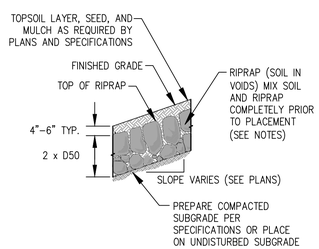


SECTION (B) – (B)



SECTION (A) – (A)

SPILLWAY DETAIL
NOT TO SCALE



NOTES:

1. SOIL RIPRAP DETAILS ARE APPLICABLE TO SLOPED AREAS. REFER TO THE SITE PLAN ACTUAL LOCATION AND LIMITS.
2. MIX UNIFORMLY 65% RIPRAP BY VOLUME WITH 35% OF APPROVED SOIL BY VOLUME PRIOR TO PLACEMENT.
3. PLACE STONE–SOIL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE DESIGN RIPRAP TOP GRADE.
4. CRIMP OR TACKIFY MULCH OR USE APPROVED HYDROMULCH AS CALLED FOR IN THE PLANS AND SPECIFICATIONS.
5. BLANKET SLOPES IN EXCESS OF 4:1.

SOIL RIPRAP DETAIL
NOT TO SCALE

BMP CERTIFICATION NOTE:

THE DEVELOPER SHALL HAVE A LICENSED PROFESSIONAL ENGINEER CERTIFY EACH STORMWATER DETENTION POND AND/OR WATER QUALITY BMP IS BUILT ACCORDING TO THE APPROVED PLANS AND SPECIFICATIONS AND THE REQUIRED DETENTION VOLUME, INCLUDING THE WQCV WHEN USED, IS MET. THE CERTIFICATION SHALL ALSO VERIFY ALL PERTINENT DIMENSIONS, ELEVATIONS, REQUIRED OUTLET ORIFICE PLATES FOR DETENTION AND WQCV AND OTHER PERMANENT BMP REQUIREMENTS ARE INSTALLED PER THE APPROVED PLANS AND SPECIFICATIONS, AND SHALL SHOW THE AS–BUILT VOLUMES FOR THE 100–YEAR, 10–YEAR STORM EVENTS, AND FOR THE WQCV AND OTHER PERTINENT DIMENSIONS, ELEVATIONS AND CAPACITY REQUIREMENTS ASSOCIATED WITH THE WQ BMP USED. THE CERTIFICATION SHALL BE PROVIDED TO THE CITY OF AURORA ENGINEERING CONTROL SECTION SENIOR ENGINEER BEFORE A CERTIFICATION OF OCCUPANCY WILL BE ISSUED.

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Donald J. Jacobs, P.E.

Date

NO.	DESCRIPTION OF REVISIONS	DATE	BY

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MHFD MILE HIGH FLOOD DISTRICT

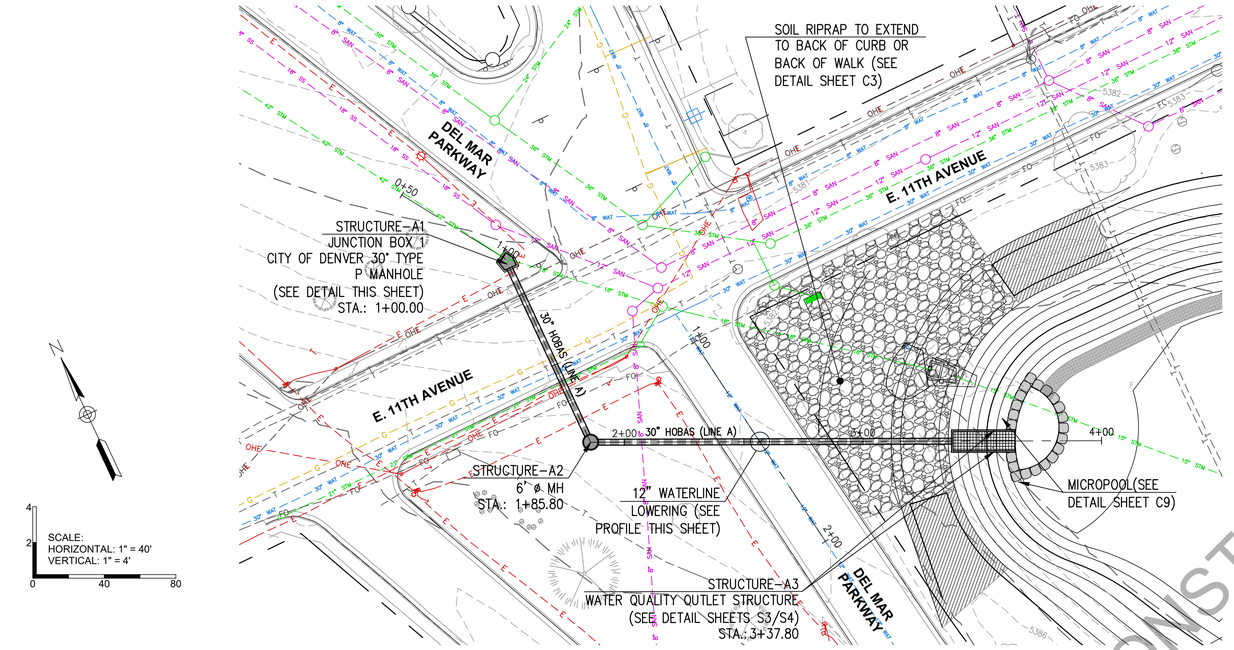
AURORA

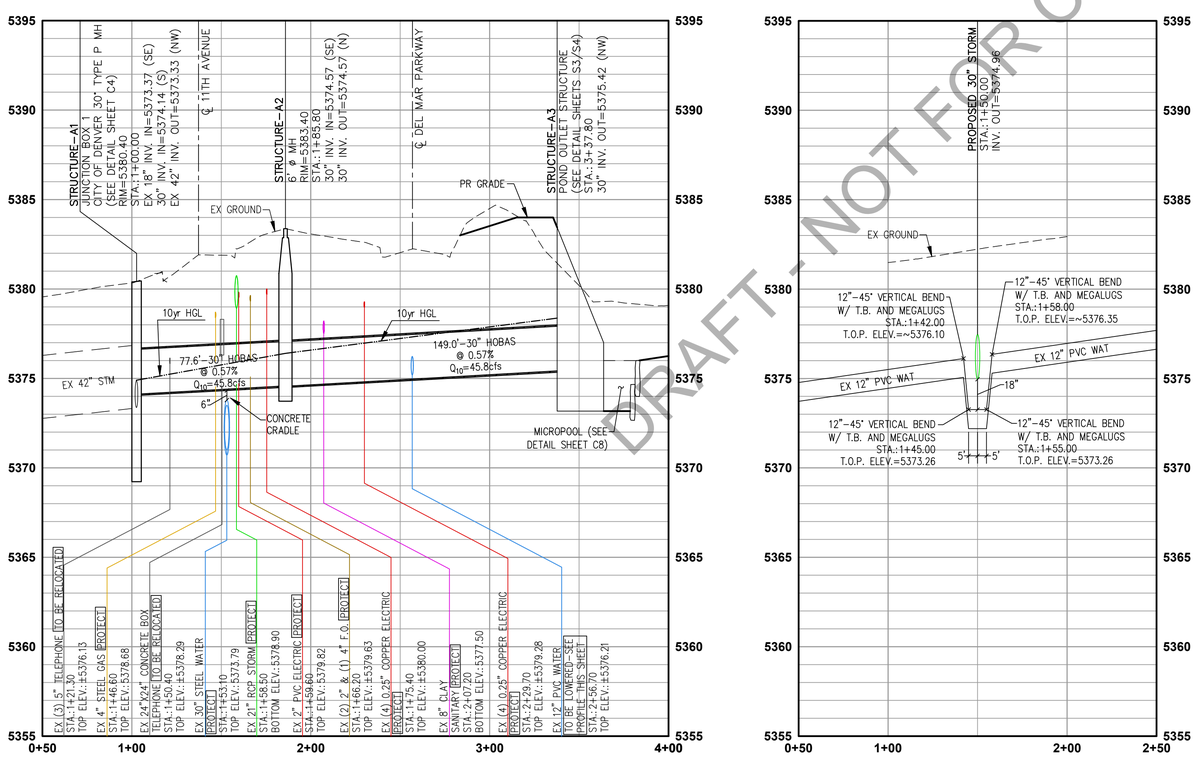
Enginuity ENGINUITY ENGINEERING SOLUTIONS 15303 DUE WEST AVE, SUITE 215 LITTLETON, COLORADO 80127 PH: 303-972-4912

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

POND PLAN VIEW & DETAILS

DRAWN BY: JWR
DESIGNED BY: JWR
APPROVED BY: DJJ
DATE: 1/25/2022
SHEET NO.: C3
SHEET 3





STORMLINE A

12" WATERLINE LOWERING

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EXISTING FEATURES LEGEND

- EXISTING STREET LIGHT
- EXISTING UTILITY/POWER POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
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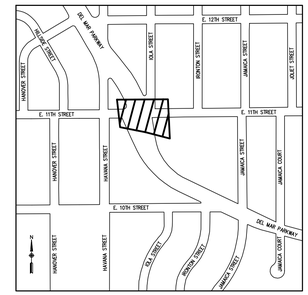

KEY MAP
SCALE: 1"=500'

PROPOSED FEATURES LEGEND

- PROPOSED STORM INLET
- PROPOSED STORM SEWER W/MANHOLE
- PROPOSED MAJOR CONTOUR (5370)
- PROPOSED MINOR CONTOUR (5371)
- PROPOSED 100–YR SPILLWAY/ SOIL RIPRAP
- PROPOSED EMERGENCY SPILLWAY
- TREE PROTECTION (REFER TO AURORA DETAILS PROS TP–1.0,2.0,2.1,3.0,3.1,3.2)

STRUCTURE–A1
JUNCTION BOX 1
CITY OF DENVER 30" TYPE P MH
SCALE: 1"=2'

NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
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Donald J. Jacobs, P.E.

Date

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MHFD
MILE HIGH FLOOD DISTRICT

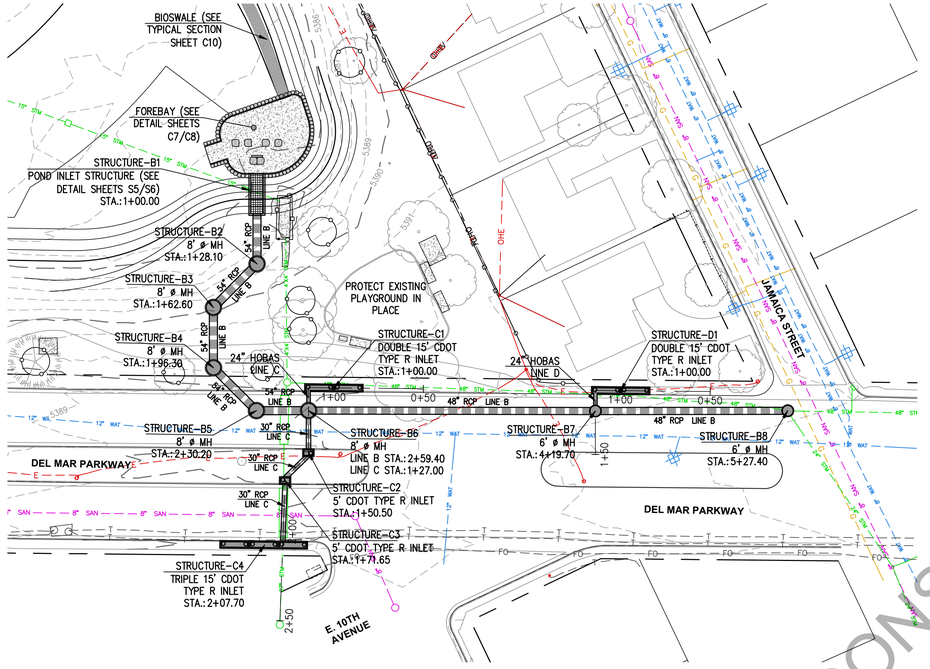
AURORA

Enginuity
ENGINUITY ENGINEERING SOLUTIONS
8787 TAHOE BLVD., SUITE 215
LITTLETON, COLORADO 80127
PH: 303-972-9172

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

STORMLINE A PLAN/PROFILE

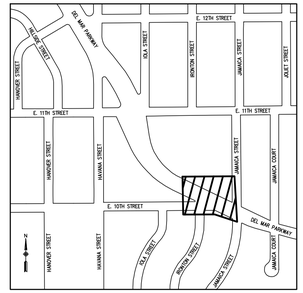
DRAWN BY: JWR
DESIGNED BY: JWR
APPROVED BY: DJJ
DATE: 1/25/2022
SHEET NO.: C4
SHEET 4



EXISTING FEATURES LEGEND

- EXISTING STREET LIGHT
- EXISTING UTILITY/POWER POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING WATER MH
- EXISTING CONCRETE
- EXISTING WATER METER
- EXISTING GAS MANHOLE
- EXISTING STORM INLET
- EXISTING STREET SIGN
- EXISTING TELEPHONE MH
- EXISTING SHRUB
- EXISTING TREE
- EXISTING TREE

EXISTING ROW
EXISTING WATER LINE
EXISTING GAS LINE
EXISTING STORM LINE W/MANHOLE
EXISTING SANITARY LINE W/MANHOLE
EXISTING UNDERGROUND TELEPHONE LINE
EXISTING OVERHEAD TELEPHONE LINE
EXISTING UNDERGROUND FIBER OPTIC
EXISTING UNDERGROUND ELECTRIC
EXISTING OVERHEAD ELECTRIC
EXISTING FENCE WOOD
EXISTING FENCE METAL
EXISTING FENCE BARBED WIRE
EXISTING CURB AND GUTTER
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR

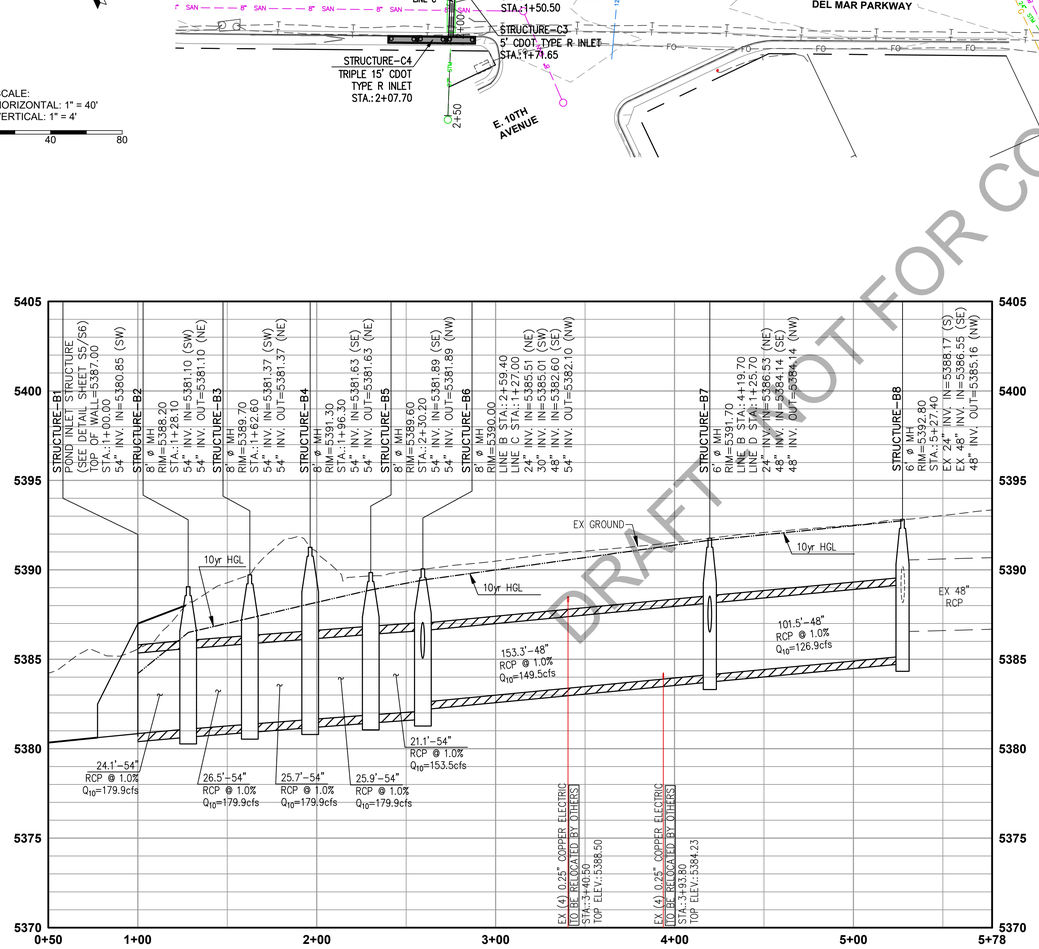


KEY MAP
SCALE: 1"=500'

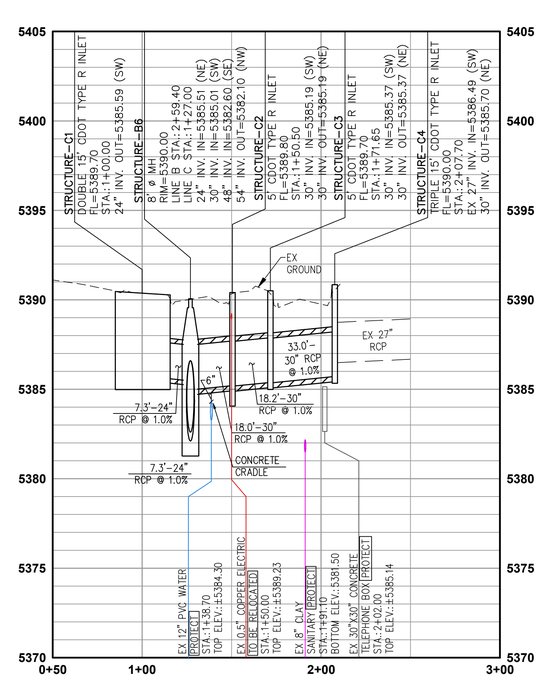
PROPOSED FEATURES LEGEND

- PROPOSED STORM INLET
- PROPOSED STORM SEWER W/MANHOLE
- PROPOSED MAJOR CONTOUR 5370
- PROPOSED MINOR CONTOUR 5371
- PROPOSED 100-YR SPILLWAY/ SOIL RIPRAP
- PROPOSED EMERGENCY SPILLWAY
- TREE PROTECTION (REFER TO AURORA DETAILS PROS TP-1.0,2.0,2.1,3.0,3.1,3.2)

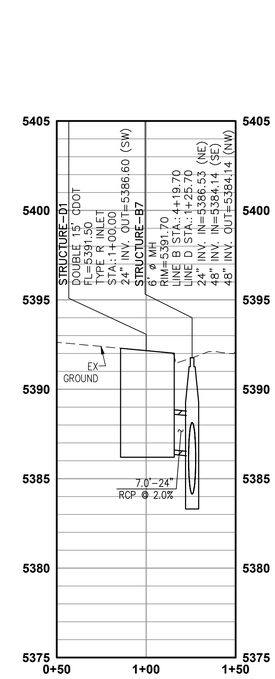
DRAFT NOT FOR CONSTRUCTION



STORMLINE B



STORMLINE C



STORMLINE D

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MILE HIGH FLOOD DISTRICT

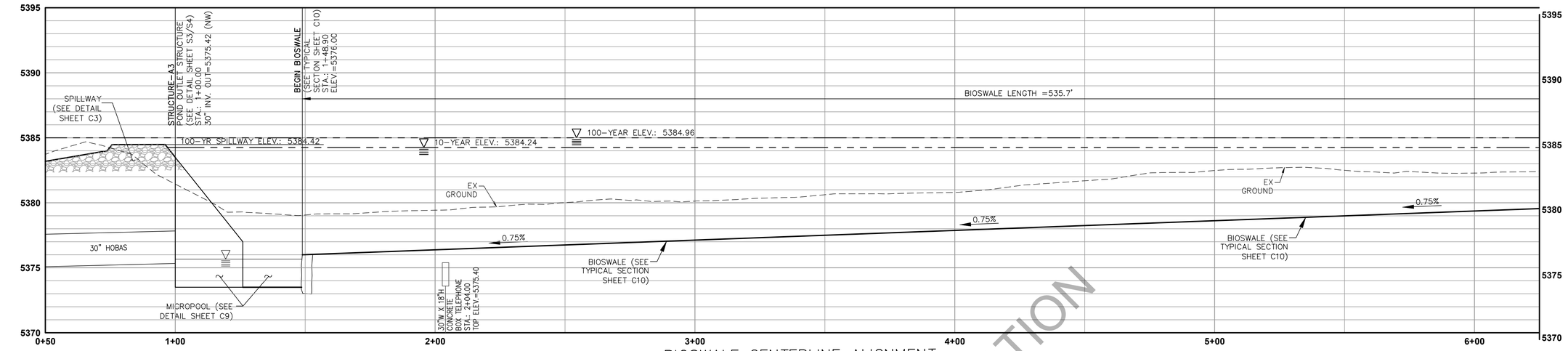
AURORA

Enginuity
ENGINUITY ENGINEERING SOLUTIONS
8400 E. PRENTICE AVENUE, SUITE 215
LITTLETON, COLORADO 80127
PH: 303-872-4112

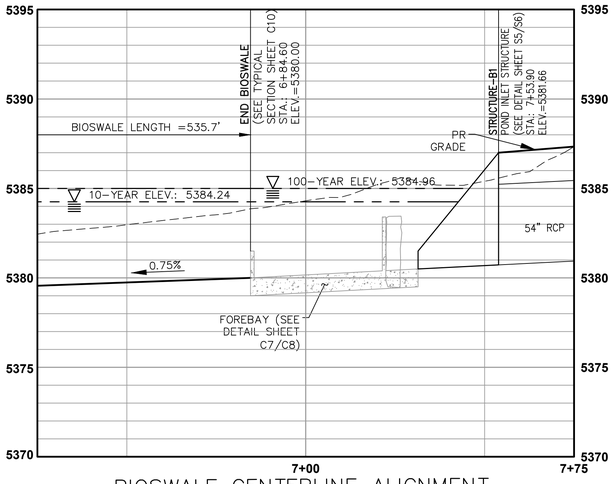
HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

STORMLINE B,C,D PLAN/PROFILES

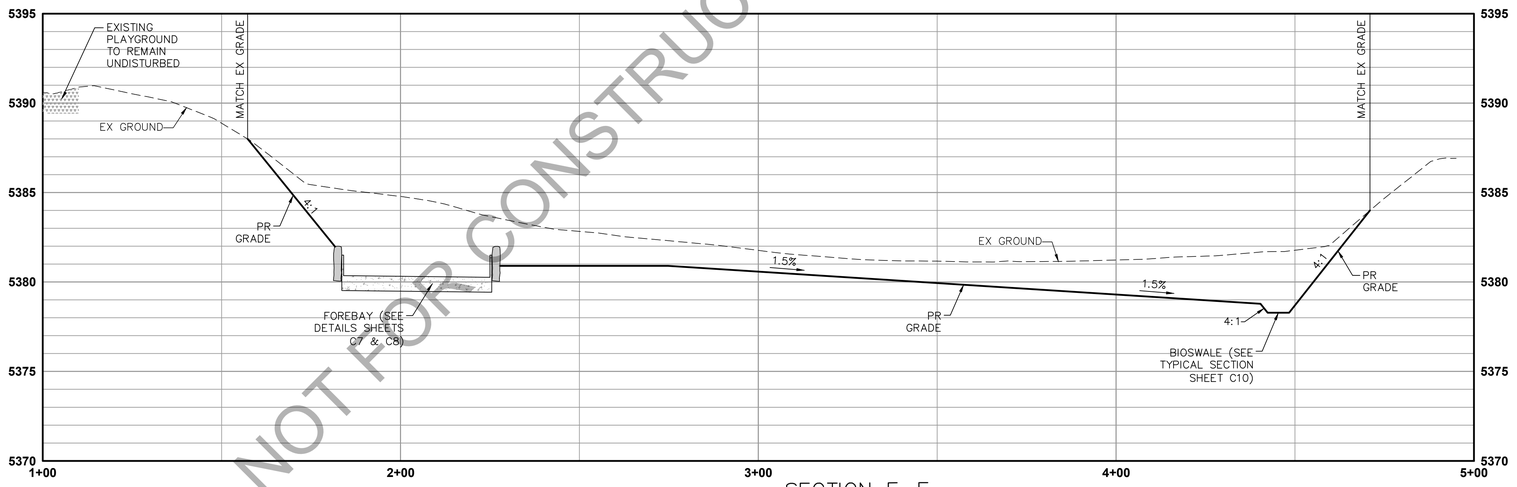
DRAWN BY: JWR
DESIGNED BY: JWR
APPROVED BY: DJJ
DATE: 1/25/2022
SHEET NO.: C5
SHEET 5



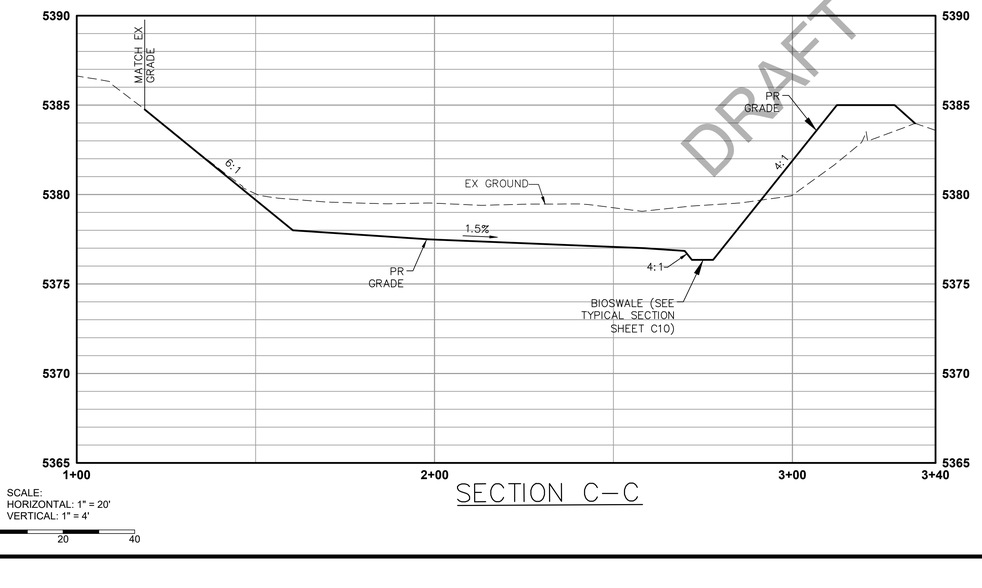
BIOSWALE CENTERLINE ALIGNMENT



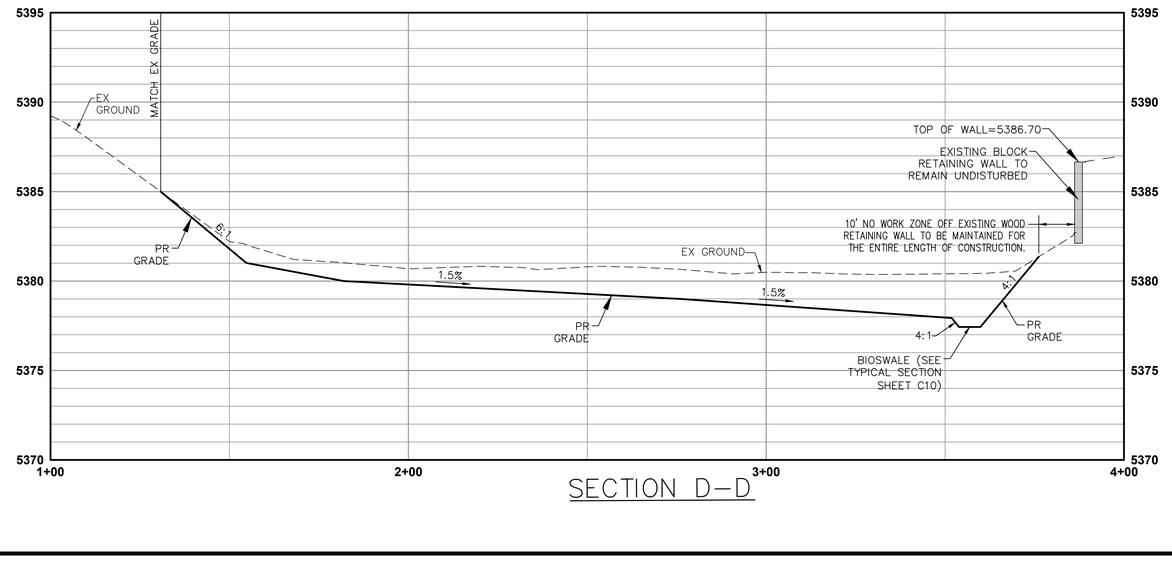
BIOSWALE CENTERLINE ALIGNMENT



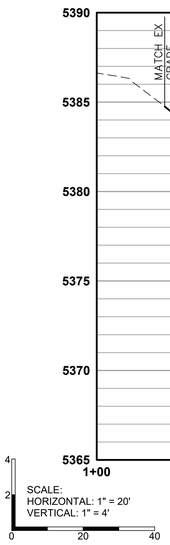
SECTION E-E



SECTION C-C



SECTION D-D



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PH: 303-972-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

POND CROSS SECTIONS

DRAWN BY: JWR

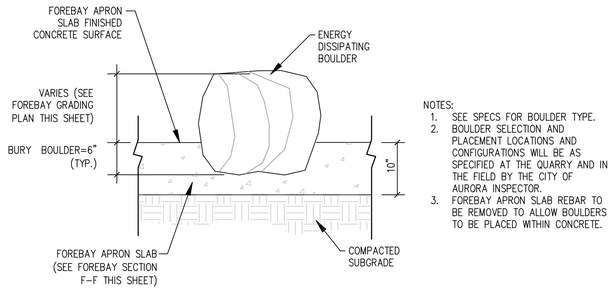
DESIGNED BY: JWR

APPROVED BY: DJJ

DATE: 1/25/2022

SHEET NO.: C6

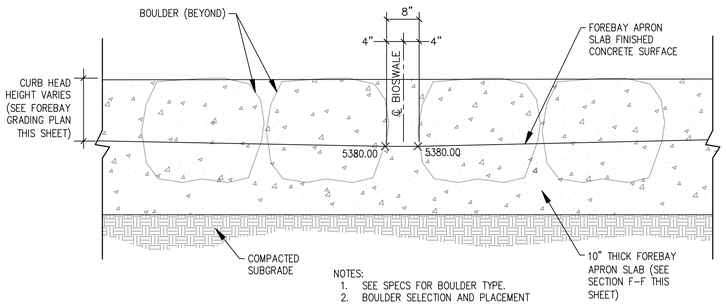
SHEET 6



NOTES:
1. SEE SPECS FOR BOULDER TYPE.
2. BOULDER SELECTION AND PLACEMENT LOCATIONS AND CONFIGURATIONS WILL BE AS SPECIFIED AT THE QUARRY AND IN THE FIELD BY THE CITY OF AURORA INSPECTOR.
3. FOREBAY APRON SLAB REBAR TO BE REMOVED TO ALLOW BOULDERS TO BE PLACED WITHIN CONCRETE.

ENERGY DISSIPATING BOULDER DETAIL

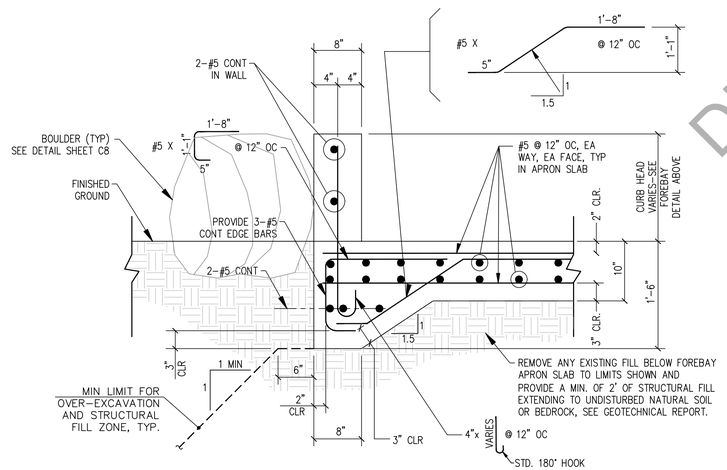
NOT TO SCALE



NOTES:
1. SEE SPECS FOR BOULDER TYPE.
2. BOULDER SELECTION AND PLACEMENT LOCATIONS AND CONFIGURATIONS WILL BE AS SPECIFIED AT THE QUARRY AND IN THE FIELD BY THE CITY OF AURORA INSPECTOR.

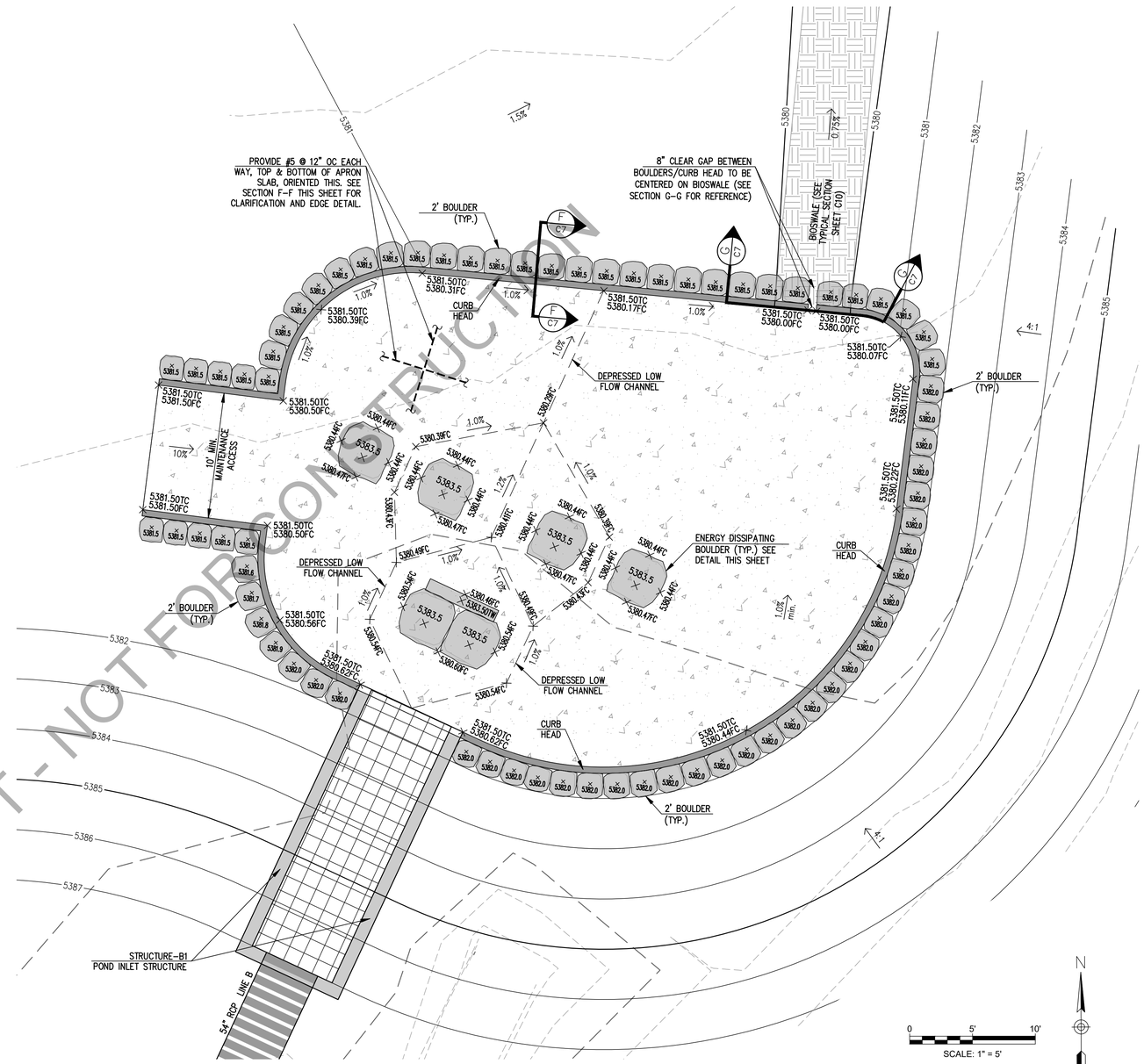
FOREBAY SECTION G-G

NOT TO SCALE



FOREBAY SECTION F-F

NOT TO SCALE



FOREBAY GRADING PLAN

SCALE: 1"=5'

LEGEND

TC	TOP OF CURB
FC	FINISHED CONCRETE
	BIOSWALE (SEE TYPICAL SECTION SHEET C10)
	SOIL RIPRAP TYPE L (9" D50) SEE DETAIL SHEET C3

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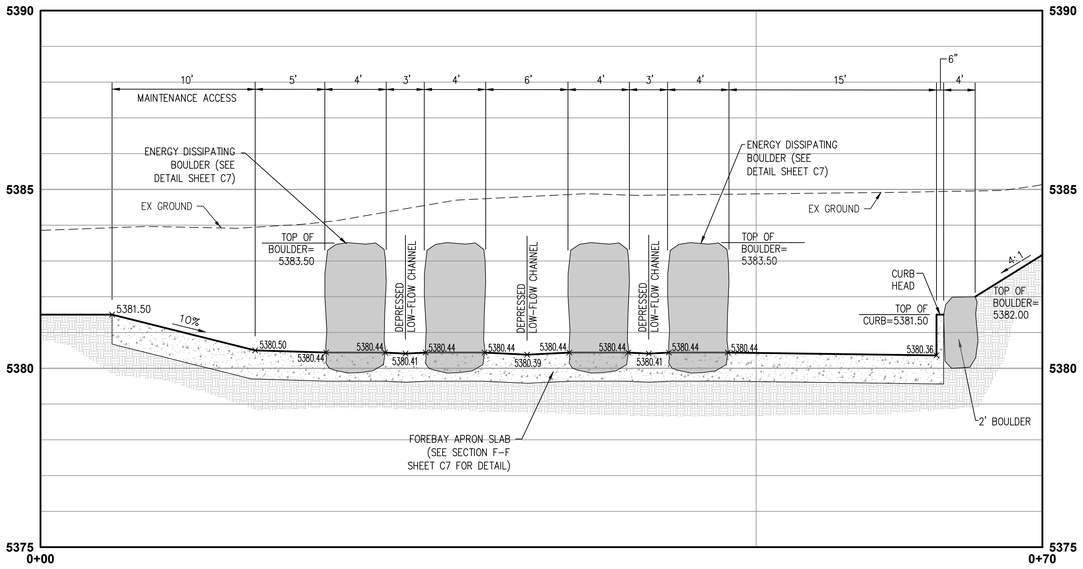
LITTLETON, COLORADO 80127
PH: 303-872-4912

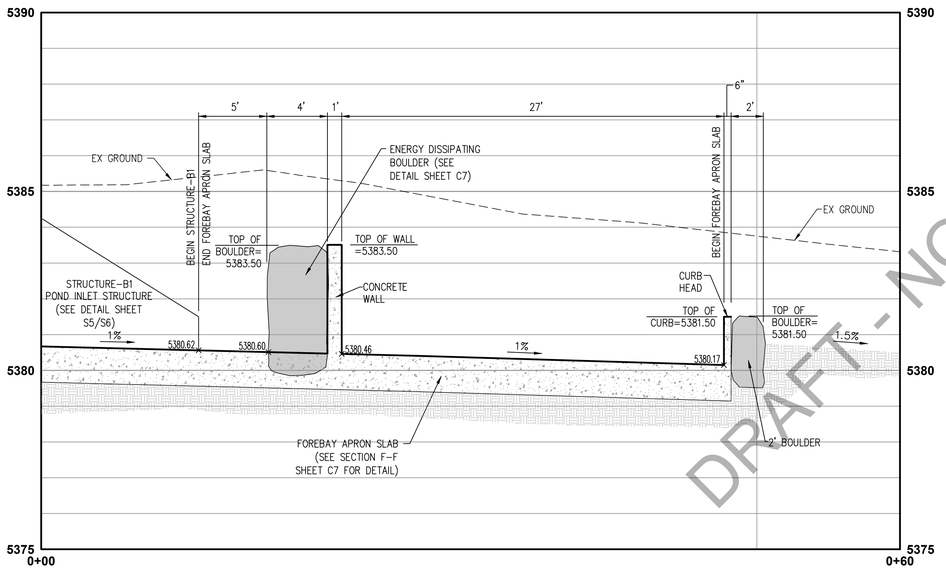
HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

FOREBAY GRADING PLAN

DRAWN BY:	JWR
DESIGNED BY:	JWR
APPROVED BY:	DJJ
DATE:	1/25/2022
SHEET NO.:	C7
	SHEET 7

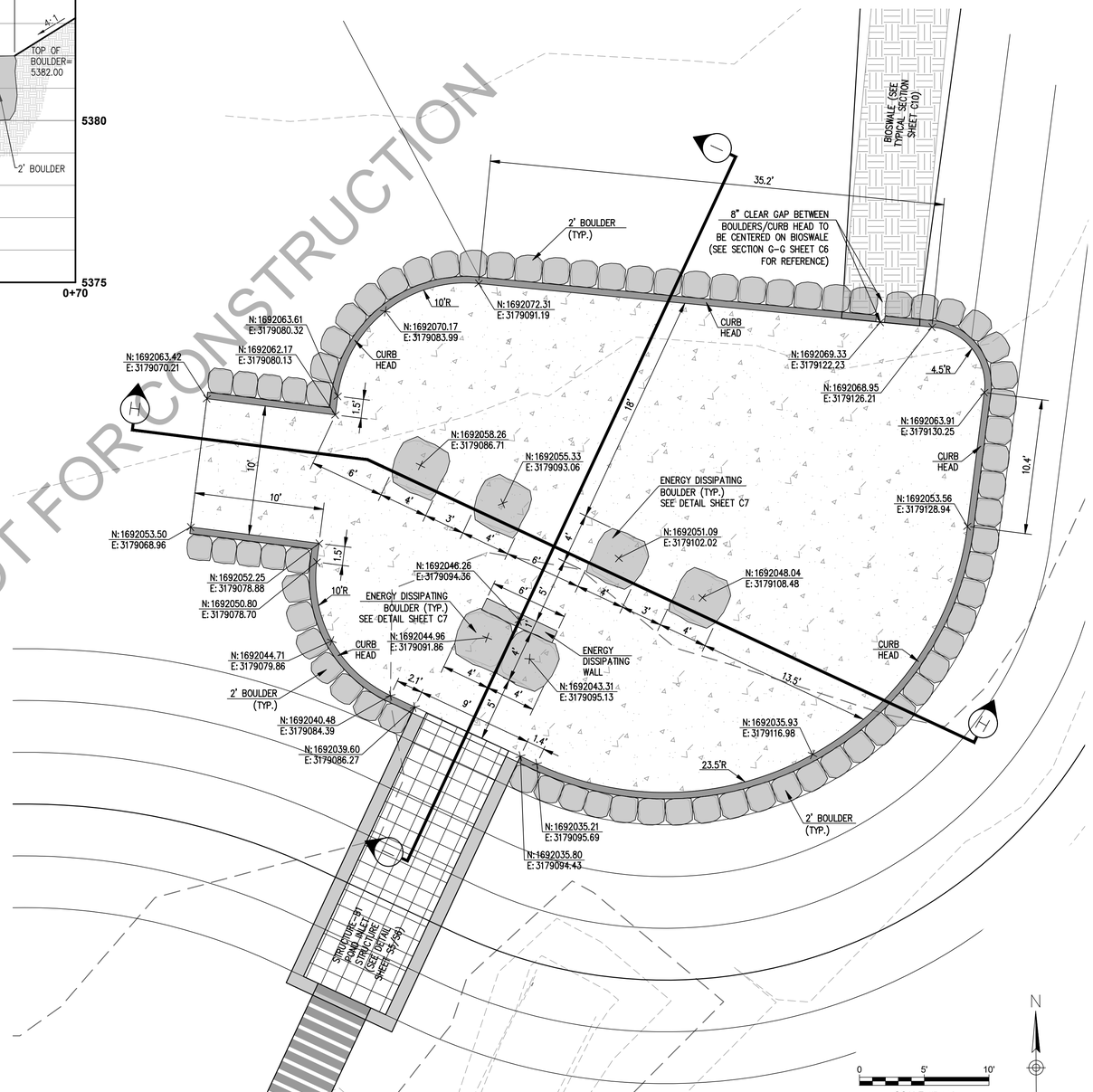


SECTION H–H



SECTION I–I

SCALE:
HORIZONTAL: 1" = 5'
VERTICAL: 1" = 2'



FOREBAY LAYOUT PLAN

SCALE: 1"=5'

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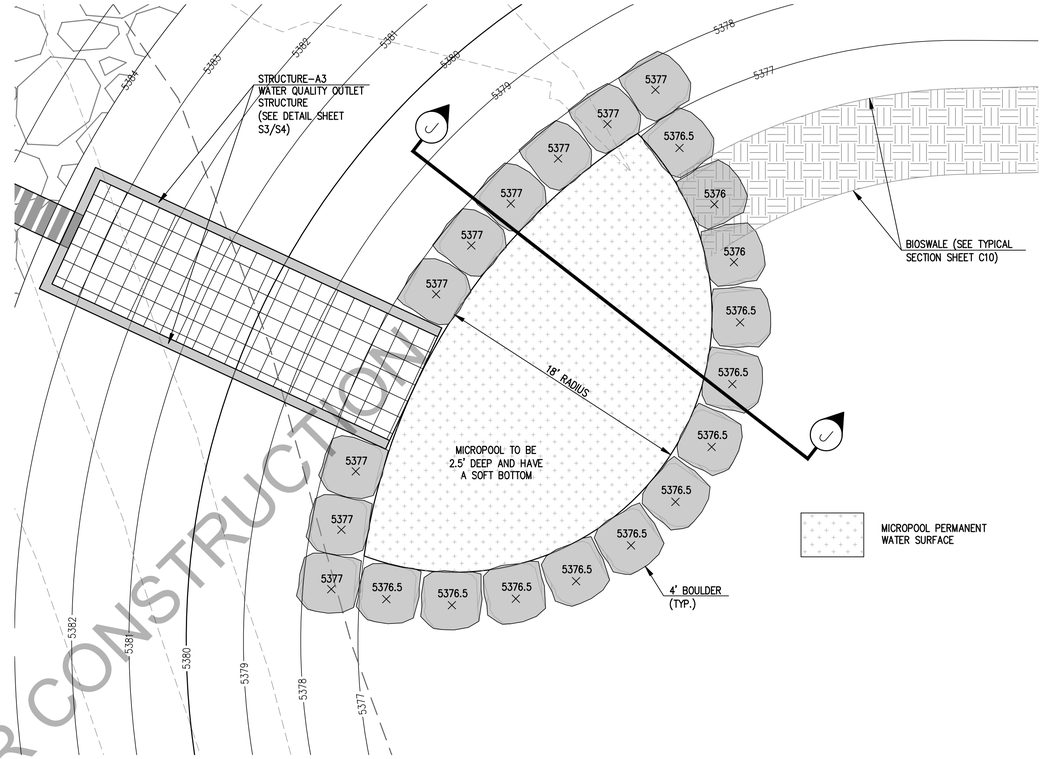
ENGINUITY ENGINEERING SOLUTIONS
9085 E. MINERAL CIRCLE, SUITE 215
LITTLETON, COLORADO 80127
PH: 1-303-872-2912

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

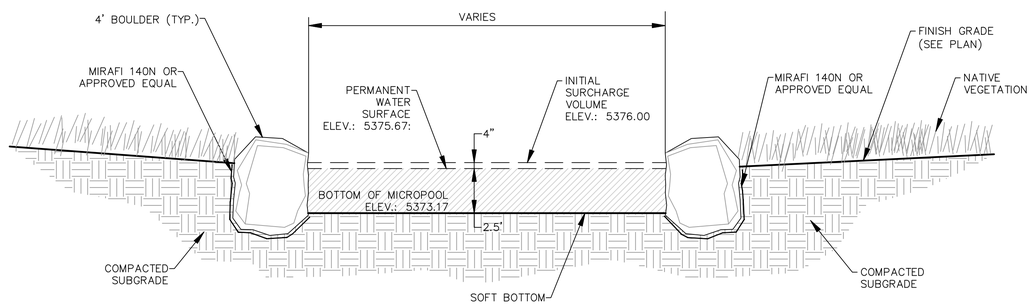
FOREBAY LAYOUT PLAN

DRAWN BY:	JWR
DESIGNED BY:	JWR
APPROVED BY:	DJJ
DATE:	1/25/2022
SHEET NO.:	C8
	SHEET 8



MICROPOOL LAYOUT PLAN

SCALE: 1"=5'



MICROPOOL SECTION J-J

NOT TO SCALE

DRAFT - NOT FOR CONSTRUCTION

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LITTLETON, COLORADO 80127
PH: 303-672-6912

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

MICROPOOL DETAILS

DRAWN BY: JWR

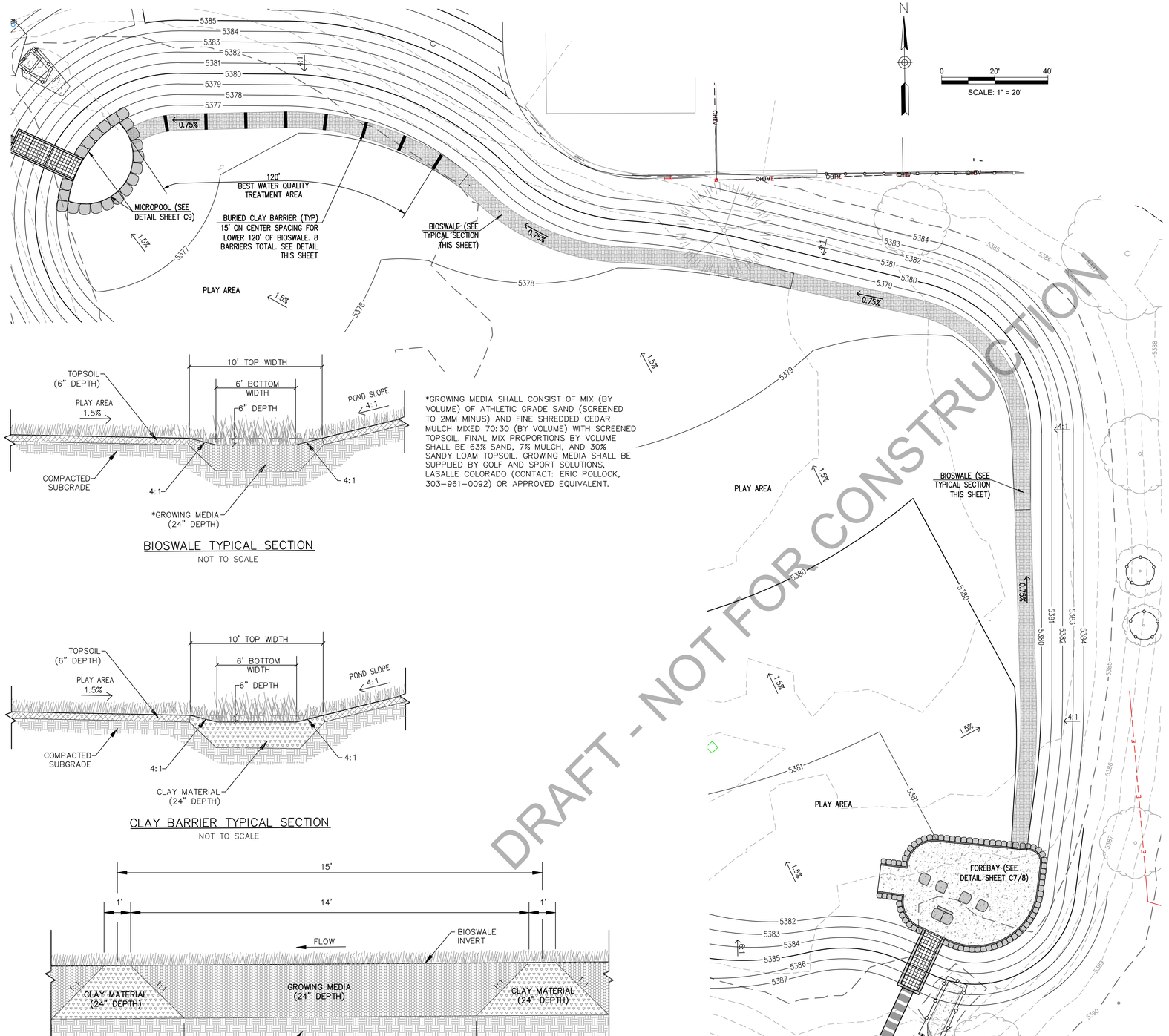
DESIGNED BY: JWR

APPROVED BY: DJJ

DATE: 1/25/2022

SHEET NO.: C9

SHEET 9



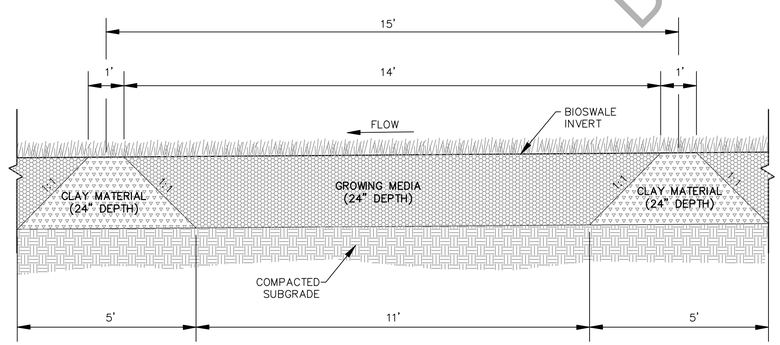
BIOSWALE TYPICAL SECTION

NOT TO SCALE

*GROWING MEDIA SHALL CONSIST OF MIX (BY VOLUME) OF ATHLETIC GRADE SAND (SCREENED TO 2MM MINUS) AND FINE SHREDDED CEDAR MULCH MIXED 70:30 (BY VOLUME) WITH SCREENED TOPSOIL. FINAL MIX PROPORTIONS BY VOLUME SHALL BE 63% SAND, 7% MULCH, AND 30% SANDY LOAM TOPSOIL. GROWING MEDIA SHALL BE SUPPLIED BY GOLF AND SPORT SOLUTIONS, LASALLE COLORADO (CONTACT: ERIC POLLOCK, 303-961-0092) OR APPROVED EQUIVALENT.

CLAY BARRIER TYPICAL SECTION

NOT TO SCALE

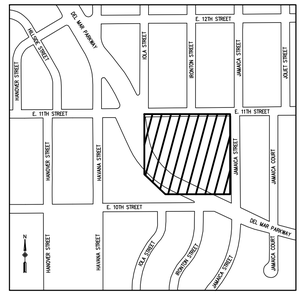


CLAY BARRIER DETAIL

NOT TO SCALE

NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
2. HORIZONTAL CONTROL IS BASED ON A MODIFIED NAD 83–COLORADO STATE PLANE CENTRAL DATUM. DRAWING COORDINATES ARE SCALED TO GROUND BY A SCALE FACTOR OF 1.0002574504 UTILIZING THE FOLLOWING LOCATION AS THE POINT OF ORIGIN (AKA #1):
   LATITUDE: N39°43'56.33914"
   LONGITUDE: W104°51'49.68588"
   ELLIPSOID HEIGHT=5322.37'
3. VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.



KEY MAP

SCALE: 1"=500'

EXISTING FEATURES LEGEND

- EXISTING STREET LIGHT
- EXISTING UTILITY/POWER POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING WATER MH
- EXISTING CONCRETE
- EXISTING WATER METER
- EXISTING GAS MANHOLE
- EXISTING STORM INLET
- EXISTING STREET SIGN
- EXISTING TELEPHONE MH
- EXISTING SHRUB
- EXISTING TREE
- EXISTING TREE
- EXISTING ROW
- EXISTING WATER LINE (W)
- EXISTING GAS LINE (G)
- EXISTING STORM LINE W/MANHOLE (STM)
- EXISTING SANITARY LINE W/MANHOLE (SAN)
- EXISTING UNDERGROUND TELEPHONE LINE (T)
- EXISTING OVERHEAD TELEPHONE LINE (OHT)
- EXISTING UNDERGROUND FIBER OPTIC (FO)
- EXISTING UNDERGROUND ELECTRIC (E)
- EXISTING OVERHEAD ELECTRIC (OHE)
- EXISTING FENCE WOOD
- EXISTING FENCE METAL
- EXISTING FENCE BARBED WIRE (X)
- EXISTING CURB AND GUTTER
- EXISTING MAJOR CONTOUR (5370)
- EXISTING MINOR CONTOUR (5371)

PROPOSED FEATURES LEGEND

- PROPOSED STORM INLET
- PROPOSED STORM SEWER W/MANHOLE
- PROPOSED MAJOR CONTOUR (5370)
- PROPOSED MINOR CONTOUR (5371)
- PROPOSED 100-YR SPILLWAY/ SOIL RIPRAP
- PROPOSED EMERGENCY SPILLWAY

TREE PROTECTION (SEE SHEET C16 FOR TREE PROTECTION NOTES AND DETAILS)

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AURORA

Enginuity

ENGINUITY ENGINEERING SOLUTIONS
5251 DTC PARKWAY, SUITE 215
LITTLETON, COLORADO 80127
PH: 303-872-4104
FX: 303-872-4104

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

BIOSWALE PLAN VIEW & DETAILS

DRAWN BY: JWR

DESIGNED BY: JWR

APPROVED BY: DJJ

DATE: 1/25/2021

SHEET NO.: C10

SHEET 10

GENERAL NOTES

ALL WORK SHALL BE DONE IN CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA AND CONSTRUCTION SPECIFICATIONS.

EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH M-206-2.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE NON-EPOXY COATED UNLESS OTHERWISE NOTED.

(E) DENOTES EPOXY COATED REINFORCING STEEL.

THE FOLLOWING TABLE GIVES THE MINIMUM CLASS B (STAGGERED) LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER, INCREASED BY 40% FOR HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE BELOW (TOP BARS), AND INCREASED BY 75% IF BOTH CONDITIONS EXIST. THE INCREASES ABOVE FOR #6 THRU #11 BARS MAY BE 25%, 13%, AND 42% RESPECTIVELY.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-9"	2'-3"	2'-8"	3'-10"	4'-5"	5'-0"	5'-11"	7'-3"

WHEN THE CONTRACTOR ELECTS TO SUBSTITUTE EPOXY COATED REINFORCEMENT FOR BLACK REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE AS DESCRIBED ABOVE.

THE FOLLOWING TABLE GIVES THE MINIMUM CLASS B (STAGGERED) LAP SPLICE LENGTH FOR BLACK REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER, INCREASED BY 40% FOR HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE B ELOW (TOP BARS), AND INCREASED BY 75% IF BOTH CONDITIONS EXIST.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-2"	1'-6"	1'-9"	2'-7"	2'-11"	3'-4"	3'-11"	4'-10"

THE ABOVE SPLICE LENGTHS SHALL BE INCREASED BY 30 PERCENT FOR NON-STAGGERED SPLICES.

THE ABOVE SPLICE LENGTHS SHALL BE INCREASED BY 20 PERCENT FOR 3 BAR BUNDLES AND 33 PERCENT FOR 4 BAR BUNDLES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

E.F. =	EACH FACE	O.F. =	OUTSIDE FACE
F.F. =	FAR FACE	T.&B. =	TOP AND BOTTOM
N.F. =	NEAR FACE	T.F. =	TOP FACE
I.F. =	INSIDE FACE	B.F. =	BOTTOM FACE

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

ALL CAST-IN-PLACE CONCRETE SHALL BE CLASS D UNLESS NOTED OTHERWISE.

DESIGN DATA

IBC 2018

LATERAL EARTH PRESSURE: 75 P.C.F (AT-REST E.F.P.)

ALLOWABLE BEARING PRESSURE = 2500 PSF (PER GEOTECH)

FRAMING / GRATING LOADING = 100 PSF OR 200 LB POINT LOAD

REINFORCED CONCRETE:
CLASS D CONCRETE: f'c = 4,500 psi
REINFORCING STEEL: f'y = 60,000 psi

ADDITIONAL REQUIREMENTS

1. ALL STRUCTURES SHALL BEAR ON PROPERLY COMPACTED SELECT FILL OR CDOT CLASS 1 STRUCTURE BACKFILL.
2. THE FOLLOWING COVER SHALL BE PROVIDED FOR REINFORCEMENT (UNLESS OTHERWISE NOTED)

   CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"

   ALL OTHER CONCRETE LOCATIONS: 2"
3. REFER TO GEOTECHNICAL REPORT PROJECT NO. 19132 BY LITHOS ENGINEERING FOR ADDITIONAL REQUIREMENTS REGARDING EXCAVATION, AND BACKFILLING.

STRUCTURE DESCRIPTION

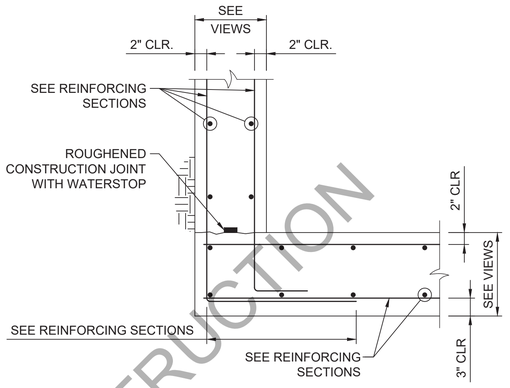
CAST-IN-PLACE REINFORCED CONCRETE OUTLET STRUCTURES

STRUCTURE DRAWING INDEX

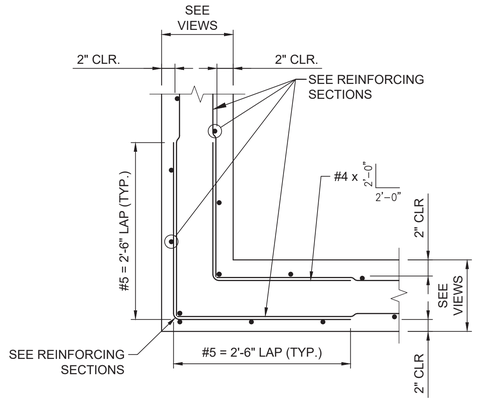
S1 GENERAL NOTES & TYPICAL DETAILS
S2 STRUCTURES #A3 & #B1 GRATING
S3 STRUCTURE #A3
S4 STRUCTURE #A3 REINFORCING
S5 STRUCTURE #B1
S6 STRUCTURE #B1 REINFORCING

SAFETY RACK NOTES

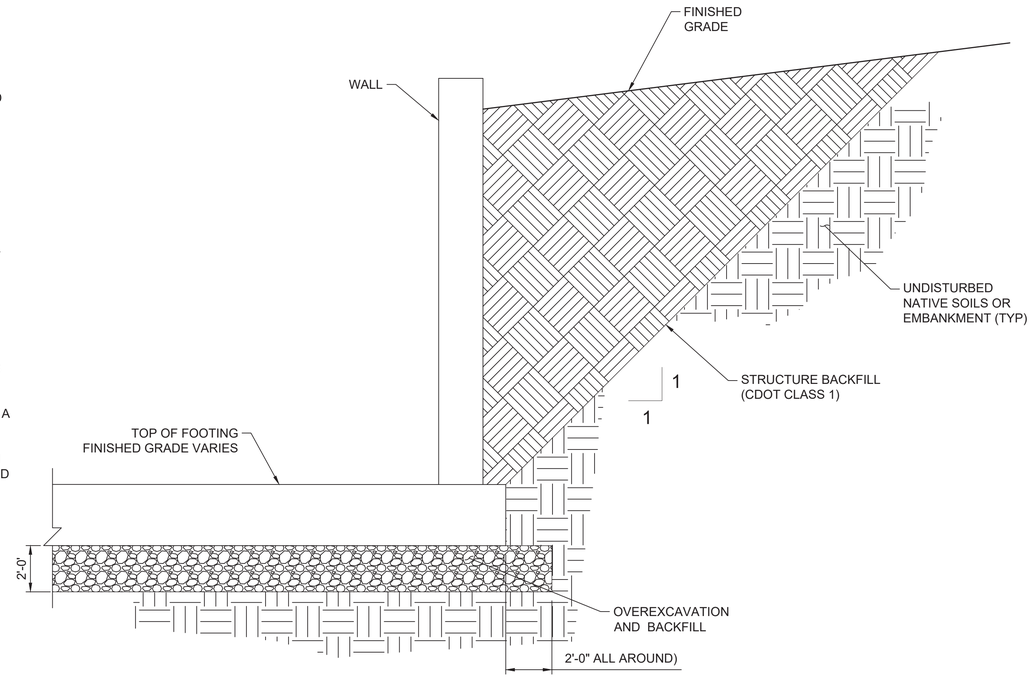
1. CONTRACTOR SHALL VERIFY ALL CONCRETE DIMENSIONS, LOCATIONS, AND ELEVATIONS PRIOR TO START OF RACK FABRICATION.
2. SHOP DRAWINGS FOR ALL STRUCTURAL STEEL FRAMING, GRATING, AND ATTACHMENTS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO START OF FABRICATION.
3. THE SAFETY GRATES AND SECURE CONNECTION ASSEMBLY SHALL BE HOT DIPPED GALVANIZED FOLLOWING FABRICATION.
4. STRUCTURAL STEEL L SHAPES (ANGLES), AND STRUCTURAL PLATES, SHALL CONFORM TO ASTM A36.
5. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION.
6. POST-INSTALLED ANCHORS SHALL BE HILTI HIT-HY-200 ADHESIVE ANCHORS WITH HILTI HAS THREADED RODS AS MANUFACTURED BY HILTI NORTH AMERICA. ANCHORS IN EXTERIOR LOCATIONS SHALL BE STAINLESS STEEL HILTI HAS THREADED RODS. ADHESIVE ANCHORS SHALL BE FURNISHED AS A COMPLETE ASSEMBLY WITH ROD, NUTS, AND WASHERS. EMBEDMENT OF ADHESIVE ANCHORS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION FOR MINIMUM EMBEDMENT FOR ROD DIAMETER SHOWN ON DRAWINGS, UNLESS OTHERWISE SPECIFIED. ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. OBSERVE MANUFACTURER RECOMMENDATIONS WITH RESPECT TO INSTALLATION TEMPERATURES FOR CARTRIDGE INJECTION ADHESIVE ANCHORS.



1 - TYPICAL BOTTOM OF WALL DETAIL



2 - TYPICAL WALL CORNER DETAIL



3 - BACKFILL REQUIREMENTS DETAIL

A / XX — SECTION OR DETAIL IDENTIFICATION; CROSS-REFERENCE SHEET NUMBER (-- = SAME SHEET)

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John J. Migliaccio, P.E.

Date

NO.	DESCRIPTION OF REVISIONS	DATE	BY

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AURORA

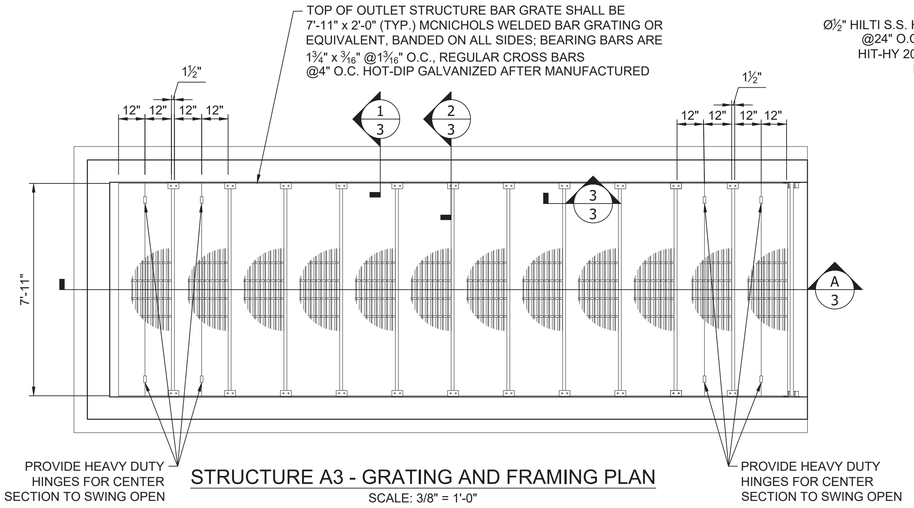
Enginuity
ENGINUITY ENGINEERING SOLUTIONS
12596 W. BAYAUD AVENUE, SUITE 215
LITTLETON, COLORADO 80127
PH: 303-872-4912

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

GENERAL NOTES & TYPICAL DETAILS

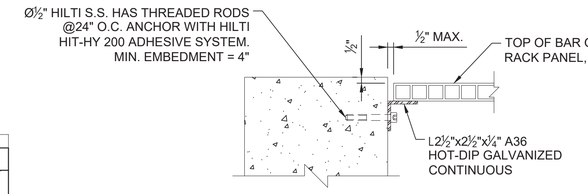
DRAWN BY: MDP
DESIGNED BY: KSP
APPROVED BY: JKH
DATE: 01/06/2022
SHEET NO.: S1
SHEET 11

San Engineering LLC
Civil and Structural Engineering



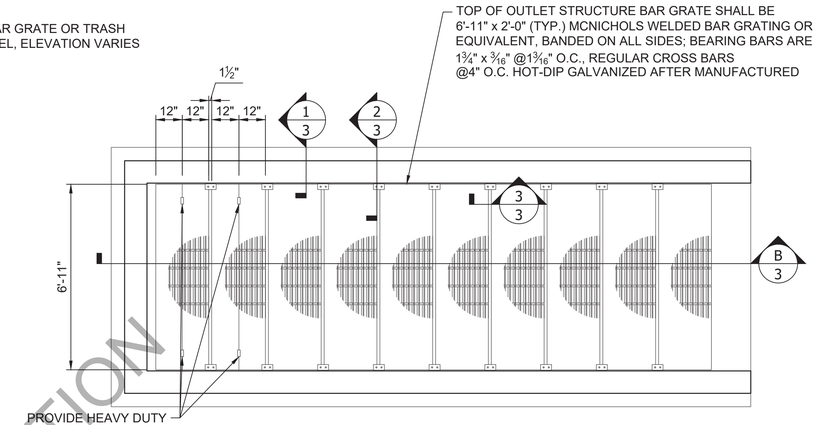
STRUCTURE A3 - GRATING AND FRAMING PLAN

SCALE: 3/8" = 1'-0"



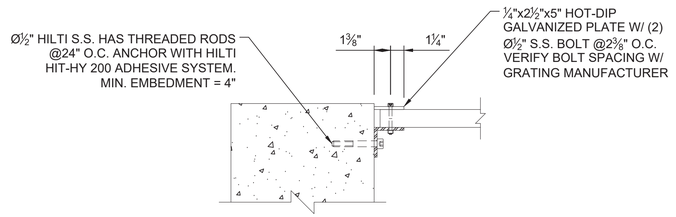
SECTION 1 - BAR GRATING SUPPORT

SCALE: 2" = 1'-0"



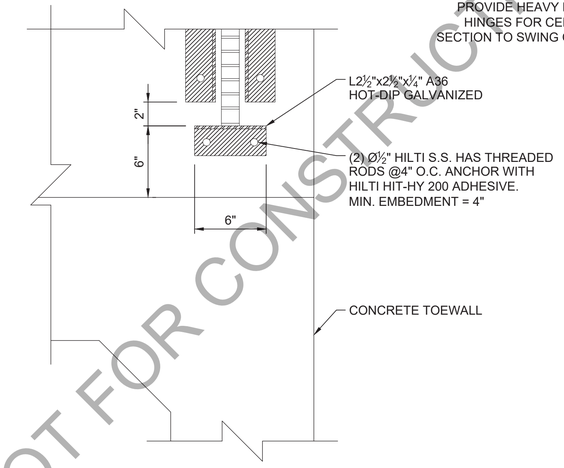
STRUCTURE B1 - GRATING AND FRAMING PLAN

SCALE: 3/8" = 1'-0"



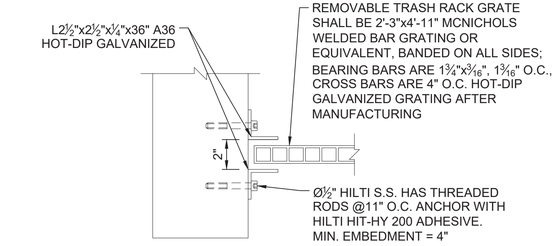
SECTION 2 - ANCHOR PLATE

SCALE: 2" = 1'-0"



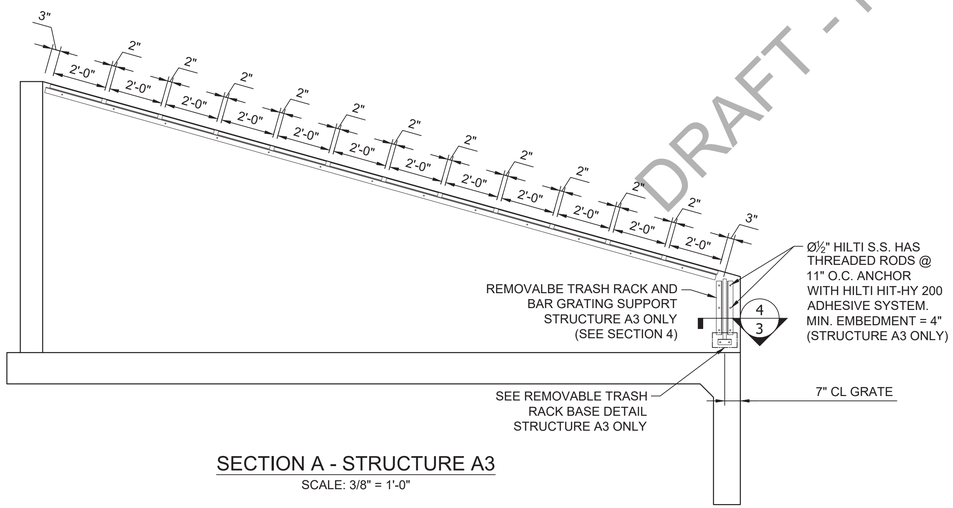
REMOVABLE TRASH RACK BASE DETAIL - TYP. BOTH SIDES

SCALE: 2" = 1'-0"
(STRUCTURE A3 ONLY)



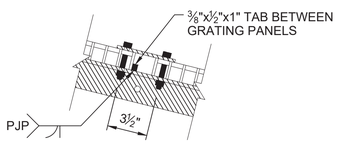
SECTION 4 - REMOVABLE TRASH RACK DETAIL

SCALE: 2" = 1'-0" (TYP. BOTH SIDES)
(STRUCTURE A3 ONLY)



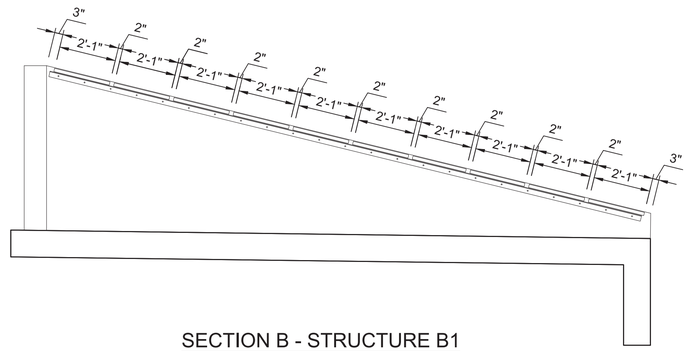
SECTION A - STRUCTURE A3

SCALE: 3/8" = 1'-0"



SECTION 3

SCALE: 2" = 1'-0"



SECTION B - STRUCTURE B1

SCALE: 3/8" = 1'-0"

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AURORA

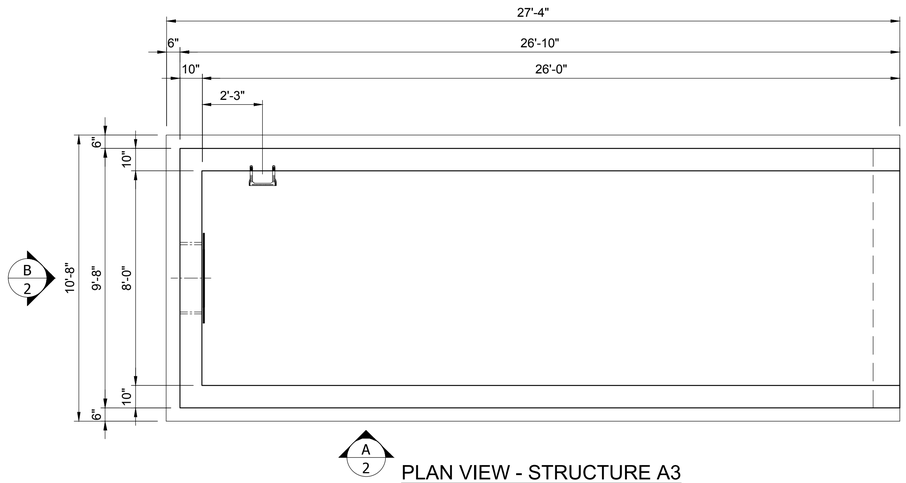
ENGINUITY ENGINEERING SOLUTIONS
5251 W. SOUTH JAMAICA WAY, SUITE 215
LITTLETON, COLORADO 80127
PH: 303-972-9912

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

STRUCTURES A3 & B1 GRATING

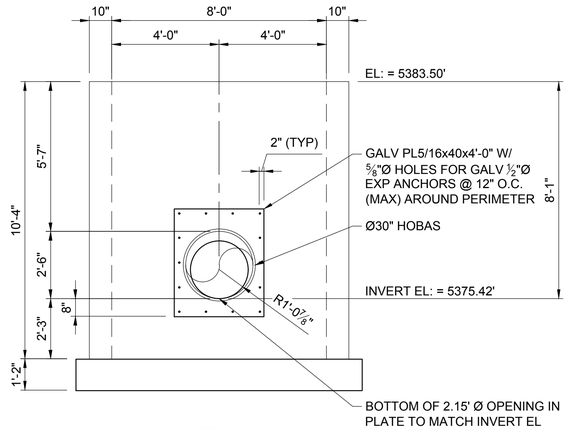
DRAWN BY: MDP
DESIGNED BY: KSP
APPROVED BY: JKH
DATE: 01/06/2022
SHEET NO.: S2
SHEET 12

San Engineering LLC
Civil and Structural Engineering



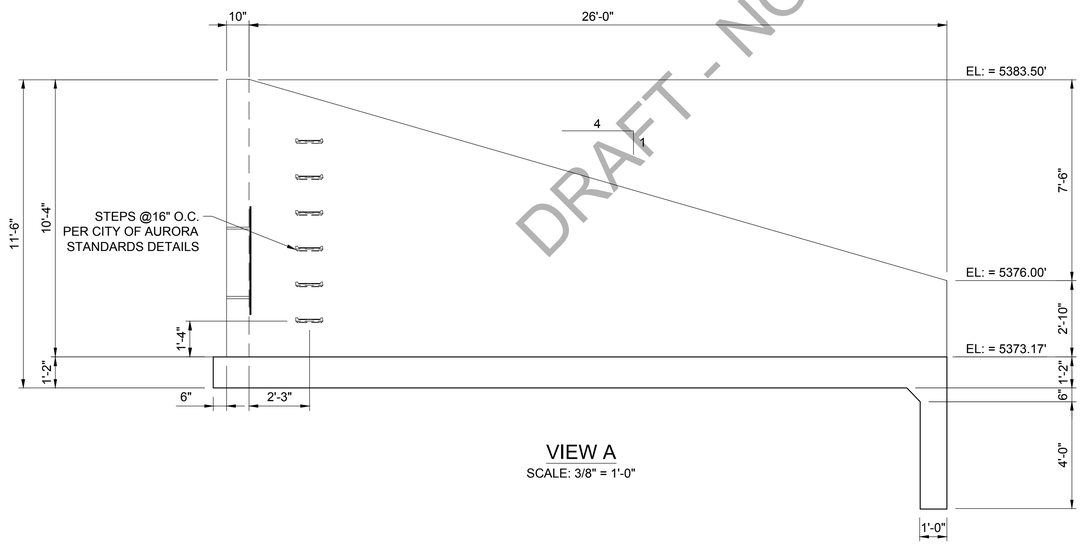
PLAN VIEW - STRUCTURE A3

SCALE: 3/8" = 1'-0"



VIEW B

SCALE: 3/8" = 1'-0"



VIEW A

SCALE: 3/8" = 1'-0"

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10106 WEST SAN JUAN WAY, SUITE 215
LITTLETON, COLORADO 80127
PH : 303-872-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

STRUCTURE A3

DRAWN BY: MDP

DESIGNED BY: KSP

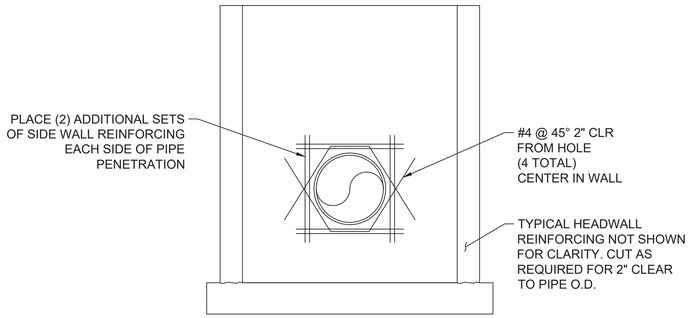
APPROVED BY: JKH

DATE: 01/26/2022

SHEET NO.: S3

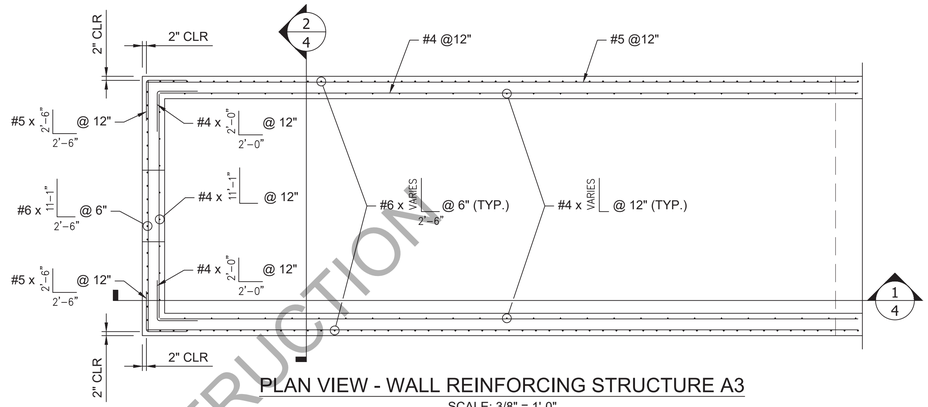
SHEET 13

San Engineering LLC
Civil and Structural Engineering



ADDITIONAL HEADWALL REINFORCING

SCALE: 3/8" = 1'-0"



PLAN VIEW - WALL REINFORCING STRUCTURE A3

SCALE: 3/8" = 1'-0"

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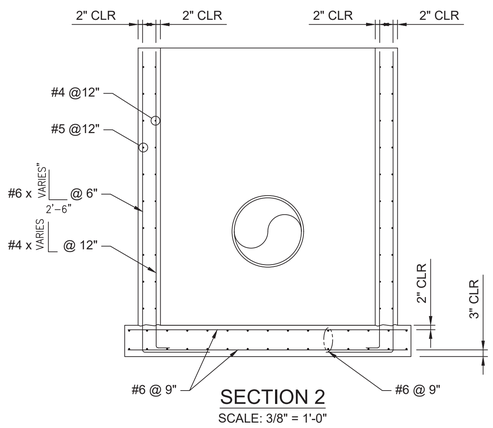
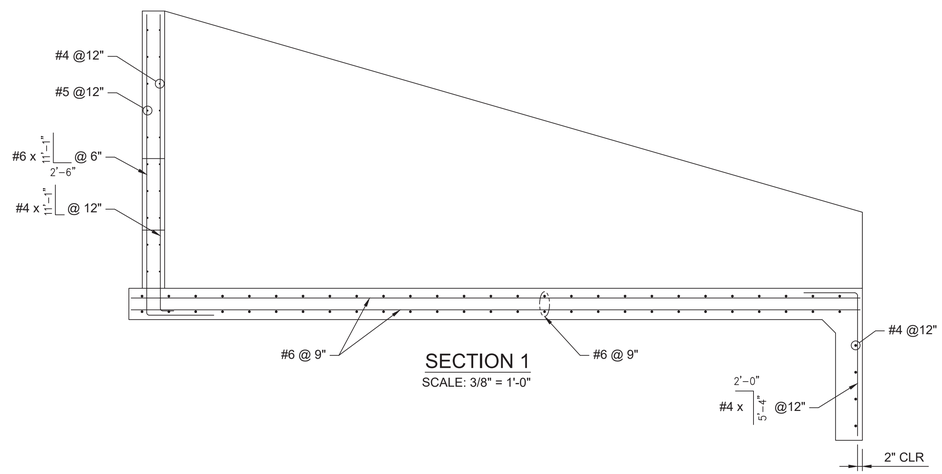


SECTION 2

SCALE: 3/8" = 1'-0"



SECTION 1

SCALE: 3/8" = 1'-0"

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Civil and Structural Engineering

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LITTLETON, COLORADO 80127
PH : 303-872-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

STRUCTURE A3 REINFORCING

DRAWN BY: MDP

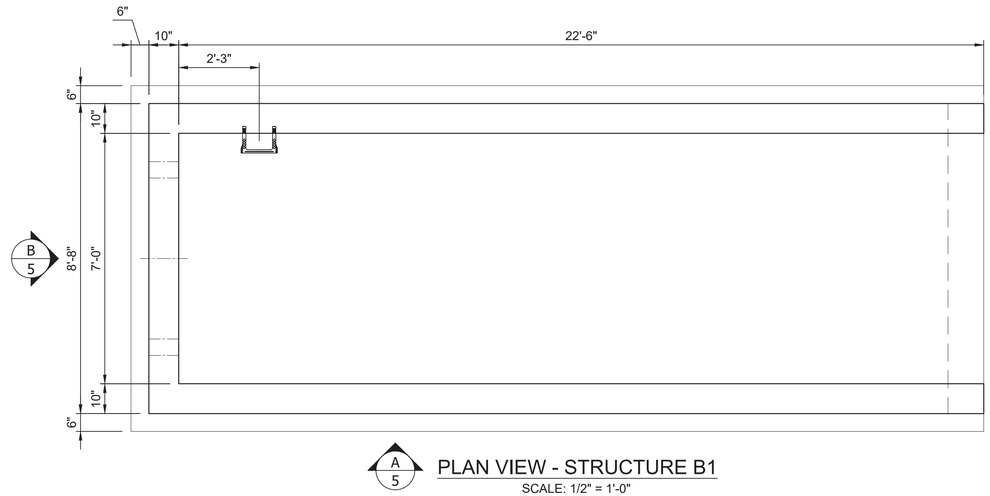
DESIGNED BY: KSP

APPROVED BY: JKH

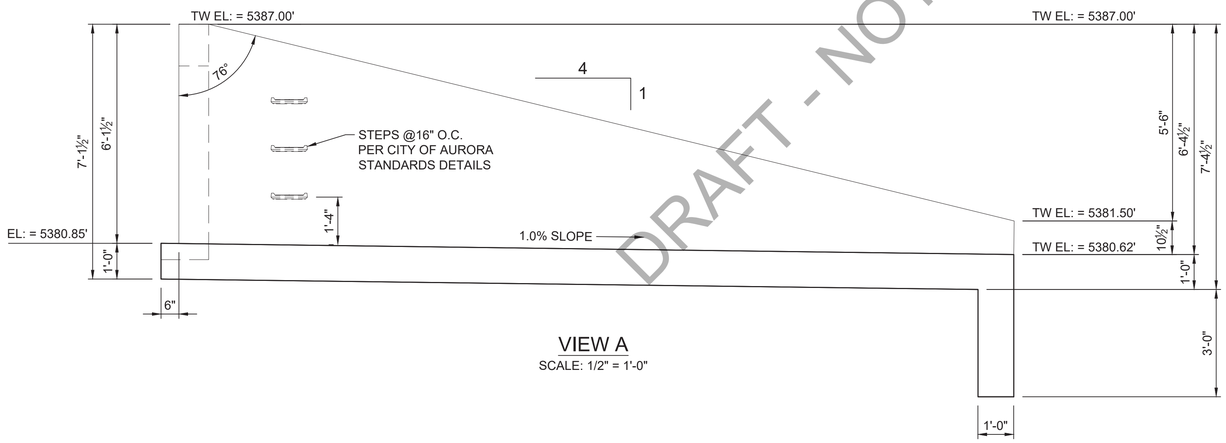
DATE 01/06/2022

SHEET NO.: S4

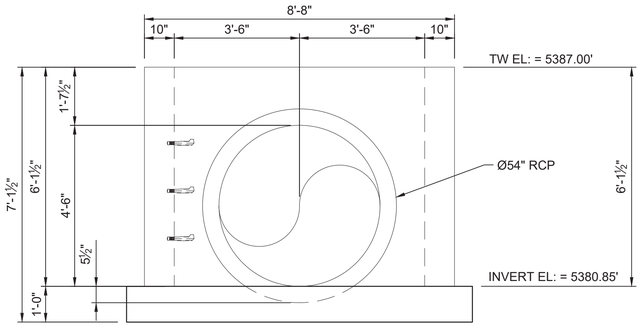
SHEET 14



A
5
PLAN VIEW - STRUCTURE B1
SCALE: 1/2" = 1'-0"



VIEW A
SCALE: 1/2" = 1'-0"



VIEW B
SCALE: 1/2" = 1'-0"

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Civil and Structural Engineering

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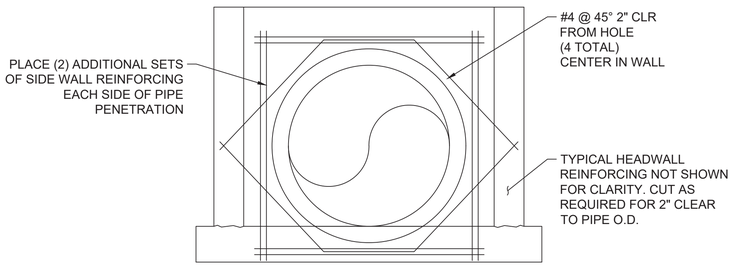
10106 WEST SAN JUAN WAY, SUITE 215
LITTLETON, COLORADO 80127
PH : 303-872-9112

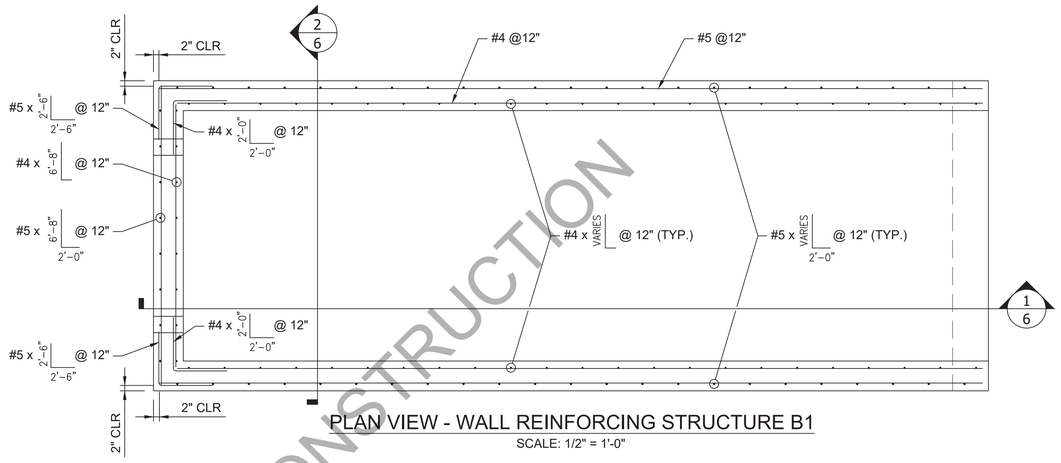
HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

STRUCTURE B1

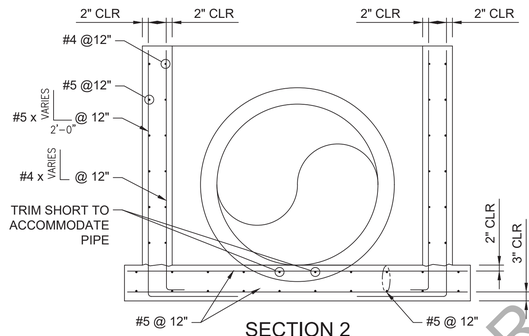
DRAWN BY: MDP
DESIGNED BY: KSP
APPROVED BY: JKH
DATE 01/06/2022
SHEET NO.: S5
SHEET 15



ADDITIONAL HEADWALL REINFORCING
SCALE: 1/2" = 1'-0"



PLAN VIEW - WALL REINFORCING STRUCTURE B1
SCALE: 1/2" = 1'-0"



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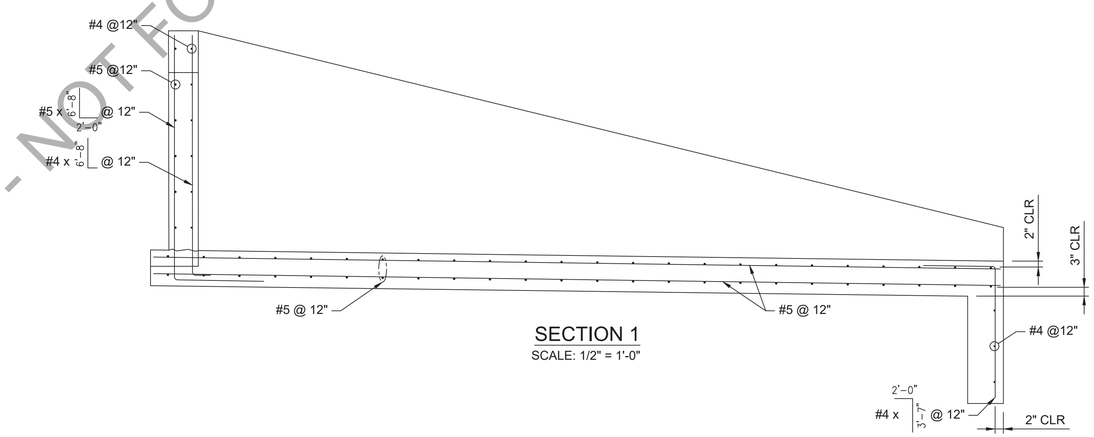

SECTION 1
SCALE: 1/2" = 1'-0"

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LITTLETON, COLORADO 80127
PH : 303-872-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

STRUCTURE B1 REINFORCING

DRAWN BY: MDP
DESIGNED BY: KSP
APPROVED BY: JKH
DATE 01/06/2022
SHEET NO.: S6
SHEET 16

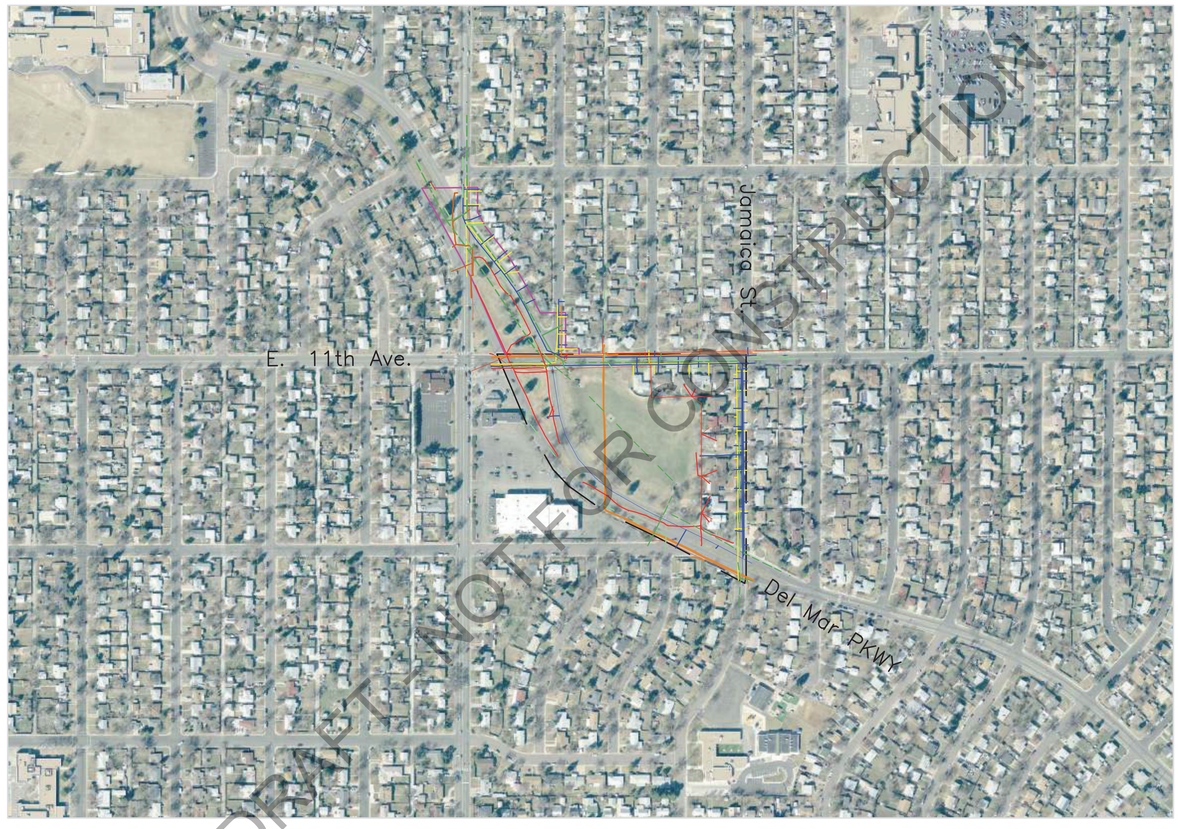
San Engineering LLC
Civil and Structural Engineering

Havana Park Pond & Del Mar Parkway Improvements

SUE Utility Investigation – Original Phase 1, Extension Phase 1, and Phase 2

Aurora, Colorado

SHEET NO.	INDEX OF SHEETS
1	TITLE SHEET
2	GENERAL NOTES AND MAP KEY
3	SHEET LAYOUT
4-9	PLAN UTILITY DRAWINGS



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0 500 1000 Feet

N

COLORADO LICENSED
PHILIP J. MEIS
37934
08OCT2021
PROFESSIONAL ENGINEER

Print Date: 10/06/21	Sheet Revisions		
File Name: Havana Park Pond & Del Mar Parkway Improvements EXUTIL.dwg	Date:	Comments	Init.
Horiz. Scale: 1"=500' Vert. Scale:	8/6/20	Original	TS
City Project Manager: Clint Weisz	9/22/21	Extension	ABRH
	10/06/21	Phase 2	ABRH

DEPARTMENT OF PUBLIC WORKS
15151 E. Alameda Pkwy
Aurora, CO 80012
PHONE: (303) 739-7300

As Constructed	
No Revisions:	
Revised:	
Void:	

UTILITY MAPPING SERVICES
15065 W. 44th Ave.
Golden, CO 80403
(720)230-0780

Designer: Zackary Winfield		Structure Numbers	
Detailer:			
Sheet Subset: UTIL		Subset Sheets:	

Project Number

SUE1

SHEET 17

Survey Information:

This plan set shows subsurface and aerial utilities for the original Phase 1 field investigation (June 2020), the Phase 1 extension effort (July/August 2021), and the Phase 2 investigation (September 2021) and are subject to increasing change with time. The engineering survey of the surface features and field delineated buried utilities was completed by UMS, Inc personnel. City of Aurora approved survey control was used to tie all survey data to the project coordinate system. Control points CP1, CP25, CP26, and CP27 were used for site calibrations. The transcription of survey data to the CAD plans was completed by UMS, Inc.

Subsurface Utility Engineering (SUE) Notes:

For this project, UMS Inc. was responsible for the investigation and documentation of the existing buried utilities to the extent practical and as detailed in the authorized scope of work for this project. Users of this data set must understand and adhere to the limitations associated with the achieved Quality Levels assigned to the depicted facilities. UMS, Inc. recommends that vacuum excavations or other nondestructive methods are used to obtain 3D data on utilities in potential conflict with proposed design and construction. UMS, Inc. strongly recommends users of this data become orientated with the ASCE/CI 38-02 standard guidelines and the corresponding data limitations inferred by the documented Quality Levels prior to employing the data set for design purposes. In addition, the SUE report(s) for this project must always accompany the existing utility reference CAD file to ensure proper interpretation and usage of the data set.

SUE Quality Levels:

SUE Phase I (Designating) and Phase II (Locating) activities provide data that facilitate the professional's judgment in the assignment of ASCE/CI 38-02 "Quality Levels" to the depicted underground utilities. The following four Quality Levels are used to identify the degree of reliability to which the utilities are depicted:

- **Quality Level (QL) A:** These observations provide discrete and precise horizontal and vertical coordinates by the actual exposure and subsequent measurement of the subsurface utility at a specific point. Vacuum excavation equipment is typically used to minimize the potential for utility damage.
- **QL B:** Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. QL B observations should be reproducible by surface geophysics at any point along the corresponding depiction. This information is tied to the project survey control points to tolerances defined by the work scope and reduced onto plan documents.
- **QL C:** Information obtained by surveying and plotting visible above ground utility features and by using professional judgment in correlating this information to QL D data. Use of this information alone may result in 15 - 30% of underground utilities omitted or mapped with more than two feet of error, according to FHWA studies.
- **QL D:** Information derived from existing records and/or oral recollections. This information is adequate for rudimentary planning or background purposes only.

Note - Although reproducible, QL B positions can be influenced by physical factors that distort geophysical observations and the resulting interpreted location. For example, with inductive electromagnetic methods, adjacent conductors may create secondary magnetic fields that superposition with the primary field, causing the resulting apparent position to be slightly different from the actual position.

Disclaimer:

A possibility exists that abandoned, forgotten, non-detectable, undocumented or newly installed utilities may be overlooked using standard Investigative procedures. This information is for design purposes only; markings placed on the ground or depictions developed by UMS are not intended to be used in lieu of Call 811 for excavation purposes. The use of this information by others does not relieve a contractor from the duty to comply with applicable utility prevention damage laws and regulations, including but not limited to, giving notifications to utility owners or "One Call/ Call Before You Dig (811)" prior to excavation.

Refer to ASCE/CI 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data and the ASCE Subsurface Utility Engineering for Municipalities for more information.

* All UMS survey information obtained during the SUE investigation is based on an Engineering Survey.

** Unless otherwise noted, all aerial installation depictions are based on surveyed pole locations and apparent cable/conductor connectivity as observed and logged by UMS field crews.

*** Aerial background Imagery is for general reference only.

*** All natural gas and water service lines depicted on the existing utility file have been designated as QL B unless noted otherwise. Record information did not provide size and material information.

UTILITY CONTACTS

Utility	Utility Type	Contact Information	Utility Records or Correspondence Provided
Lumen (CenturyLink)	Telephone, Fiber	Christopher Stuck christopher.stuck@lumen.com	NDS Map Key.pdf E 11th Ave and Del Mar Pkwy in Aurora, CO.pdf Utility Map.pdf
City of Aurora	Electric, Fiber	Nicholas Andrus nandrus@auroragov.org	PublicWorksDataRequest.kmz
City of Aurora	Irrigation	Dan Payson 303-326-8174 dpayson@auroragov.org	Irrigation.pdf
City of Aurora	Sanitary Sewer, Storm Drain	Online GIS System	https://auroraco.maps.arcgis.com/apps/webappviewer/index.html
City of Aurora	Water	GIS Department 303-739-7244 waterengrgis@auroragov.org	Fitting_Water.kmz Pipe_Water.kmz Valve_Water.kmz
Comcast	Fiber, CATV	Artjahmel Davis 303-603-2682 artjahmel_davis@comcast.com	**Comcast did not provide record information or respond to UMS requests for records at either project location.** **UMS received record information from outside sources.** **Screenshot (59).png, Screenshot (60).png** **Screenshot (61).png**
MCI/Verizon	Fiber	Lane Grady 303-214-7115 lane.grady@verizon.com	FIM 09-12-2018 Legend.docx Havana Park.png
Unite Private Networks	Fiber	GIS Department upngis@upnfiber.com	UnitePrivateNetworks.pdf
Xcel Energy (XCEL)	Gas, Electric	geospatialrequests@xcelenergy.com 303-571-3263	Xcel_Energy_Smallworld_Electric_Distribution_Sheet_Nov 2016.pdf Xcel_Energy_Smallworld_Gas_Distribution_Sheet_Nov 2016.pdf Xcel_Energy_Smallworld_Gas_Transmission_Sheet_Nov 2016.pdf XCEL_ENERGY_A013504440_HAVANA PARK_ELE.pdf XCEL_ENERGY_A013504440_HAVANA PARK_GAS.pdf XCEL_ENERGY_B107601252_E 11TH AVE_ELE.pdf XCEL_ENERGY_B107601252_E 11TH AVE_GAS.pdf
Zayo	Fiber	Robert Williams 303-632-0017 robertd.williams@zayo.com	Havana Park Zayo.JPG Zayo.JPG

LEGEND

- EXISTING BURIED FIBER OPTIC LINE
- EXISTING BURIED NATURAL GAS LINE
- EXISTING BURIED PHONE LINE
- EXISTING BURIED POWER LINE
- EXISTING BURIED SANITARY SEWER LINE
- EXISTING BURIED STORM SEWER LINE
- EXISTING BURIED STREET LIGHTING LINE
- EXISTING BURIED WATER LINE
- EXISTING AERIAL CABLE TV LINE
- EXISTING AERIAL FIBER OPTIC LINE
- EXISTING AERIAL PHONE LINE
- EXISTING AERIAL POWER LINE
- EXISTING AERIAL TRAFFIC POWER LINE
- ORIGINAL PROJECT BOUNDARY
- EXTENSION PROJECT BOUNDARY
- FIBER OPTIC HANDHOLE
- TELEPHONE MANHOLE
- GUY ANCHOR
- POWER HANDHOLE
- POWER JUNCTION BOX
- POWER POLE
- GAS VALVE
- STORM DRAIN INLET
- STORM DRAIN MANHOLE
- SANITARY SEWER MANHOLE
- WATER CURBSTOP
- FIRE HYDRANT
- SPRINKLER VALVE BOX
- WATER MANHOLE
- WATER METER
- WATER VALVE
- WATER WELL
- STREET LIGHT POLE
- TEST HOLE

EQUIPMENT USED

Radiodetection RD8000 Cable Locator
Trimble TSC7 Data Collector
Trimble R10 GNSS System
Duct Rodder

DRAFT - NOT FOR CONSTRUCTION

Print Date: 10/06/21
File Name: Havana Park Pond & Del Mar Parkway Improvements EXUTIL.dwg
Horiz. Scale: Vert. Scale:
City Project Manager: Clint Weisz

Sheet Revisions

Date:	Comments	Init.
8/6/20	Original	TS
9/22/21	Extension	ABRH
10/06/21	Phase 2	ABRH

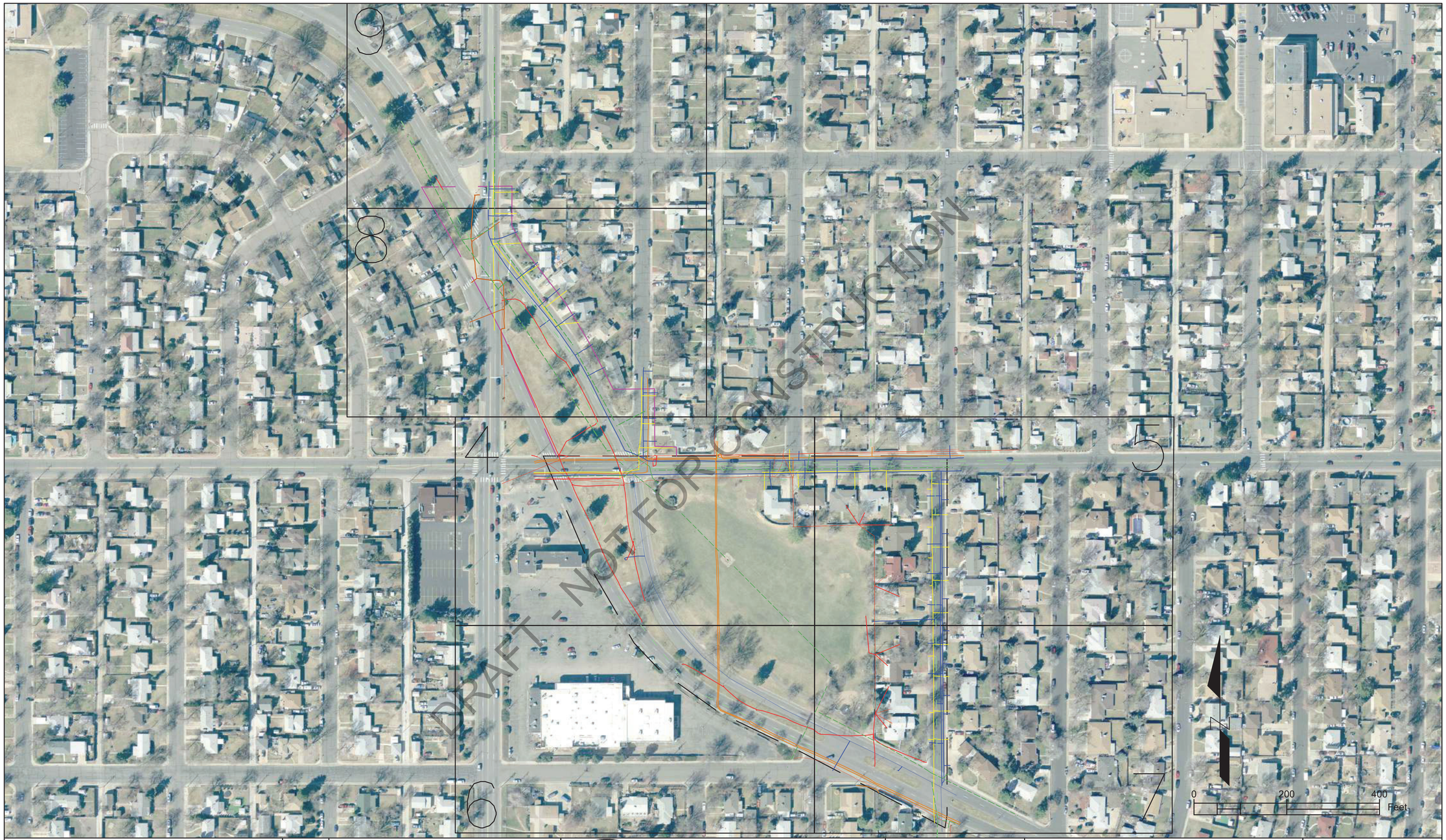
DEPARTMENT OF PUBLIC WORKS
15151 E. Alameda Pkwy
Aurora, CO 80012
PHONE: (303) 739-7300

As Constructed
No Revisions:
Revised:
Void:

UMS INC
UTILITY MAPPING SERVICES
15065 W. 44th Ave.
Golden, CO 80403
(720)230-0780

Designer: Zackary Winfield
Detailer:
Sheet Subset: UTIL
Structure Numbers
Subset Sheets:

Project Number
SUE2
SHEET 18



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Horiz. Scale: 1"=200' Vert. Scale:	8/6/20	Original	TS
City Project Manager: Clint Weisz	9/22/21	Extension	ABRH
	10/06/21	Phase 2	ABRH

DEPARTMENT OF PUBLIC WORKS
15151 E. Alameda Pkwy
Aurora, CO 80012
PHONE: (303) 739-7300

As Constructed	
No Revisions:	
Revised:	
Void:	

UTILITY MAPPING SERVICES
15065 W. 44th Ave.
Golden, CO 80403
(720)230-0780

Designer: Zackary Winfield		Project Number	
Detailer:	Structure Numbers		SUE3
Sheet Subset: UTIL	Subset Sheets:		SHEET 19

Print Date: 10/06/21	Sheet Revisions		
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Horiz. Scale: 1"=50' Vert. Scale:	8/6/20	Original	TS
City Project Manager: Clint Weisz	9/22/21	Extension	ABRH
	10/06/21	Phase 2	ABRH

DEPARTMENT OF PUBLIC WORKS
15151 E. Alameda Pkwy
Aurora, CO 80012
PHONE: (303) 739-7300

As Constructed
No Revisions:
Revised:
Void:

UTILITY MAPPING SERVICES
15065 W. 44th Ave.
Golden, CO 80403
(720)230-0780

Designer: Zackary Winfield
Detailer:
Sheet Subset: UTIL
Structure Numbers
Subset Sheets:

Project Number
SUE4
SHEET 20

Print Date: 10/06/21		Sheet Revisions			DEPARTMENT OF PUBLIC WORKS	As Constructed	UTILITY MAPPING SERVICES 15065 W. 44th Ave. Golden, CO 80403 (720)230-0780	Project Number
File Name: Havana Park Pond & Del Mar Parkway Improvements EXUTIL.dwg		Date:	Comments	Init.	15151 E. Alameda Pkwy Aurora, CO 80012 PHONE: (303) 739-7300	No Revisions:		
Horiz. Scale: 1"=50' Vert. Scale:		8/6/20	Original	TS		Revised:	Designer: Zackary Winfield	SUE5
City Project Manager: Clint Weisz		9/22/21	Extension	ABRH			Detailer: Structure Numbers	
		10/06/21	Phase 2	ABRH		Void:	Sheet Subset: UTIL Subset Sheets:	SHEET 21

Print Date: 10/06/21	Sheet Revisions		
File Name: Havana Park Pond & Del Mar Parkway Improvements EXUTIL.dwg	Date:	Comments	Init.
Horiz. Scale: 1"=50' Vert. Scale:	8/6/20	Original	TS
City Project Manager: Clint Weisz	9/22/21	Extension	ABRH
	10/06/21	Phase 2	ABRH

DEPARTMENT OF PUBLIC WORKS
15151 E. Alameda Pkwy
Aurora, CO 80012
PHONE: (303) 739-7300

As Constructed	
No Revisions:	
Revised:	
Void:	

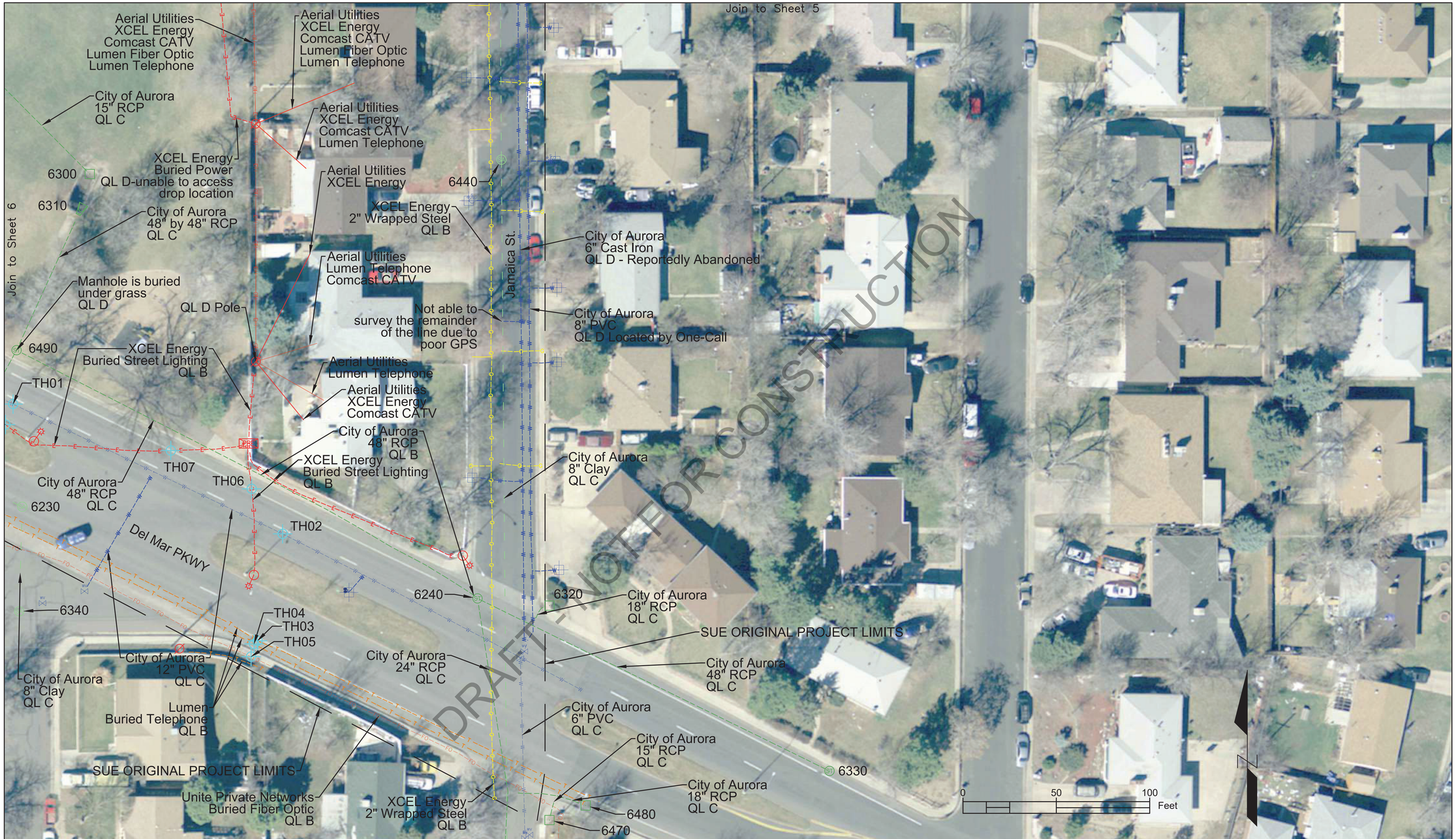
UTILITY MAPPING SERVICES
15065 W. 44th Ave.
Golden, CO 80403
(720)230-0780

Designer: Zackary Winfield	Structure Numbers	
Detailer:		
Sheet Subset: UTIL	Subset Sheets:	

Project Number

SUE6

SHEET 22



Print Date: 10/06/21	Sheet Revisions	DEPARTMENT OF PUBLIC WORKS	As Constructed
File Name: Havana Park Pond & Del Mar Parkway Improvements EXUTIL.dwg	Date: 8/6/20 Comments: Original Init.: TS	15151 E. Alameda Pkwy Aurora, CO 80012 PHONE: (303) 739-7300	No Revisions:
Horiz. Scale: 1"=50' Vert. Scale:	9/22/21 Extension ABRH		Revised:
City Project Manager: Clint Weisz	10/06/21 Phase 2 ABRH		Void:

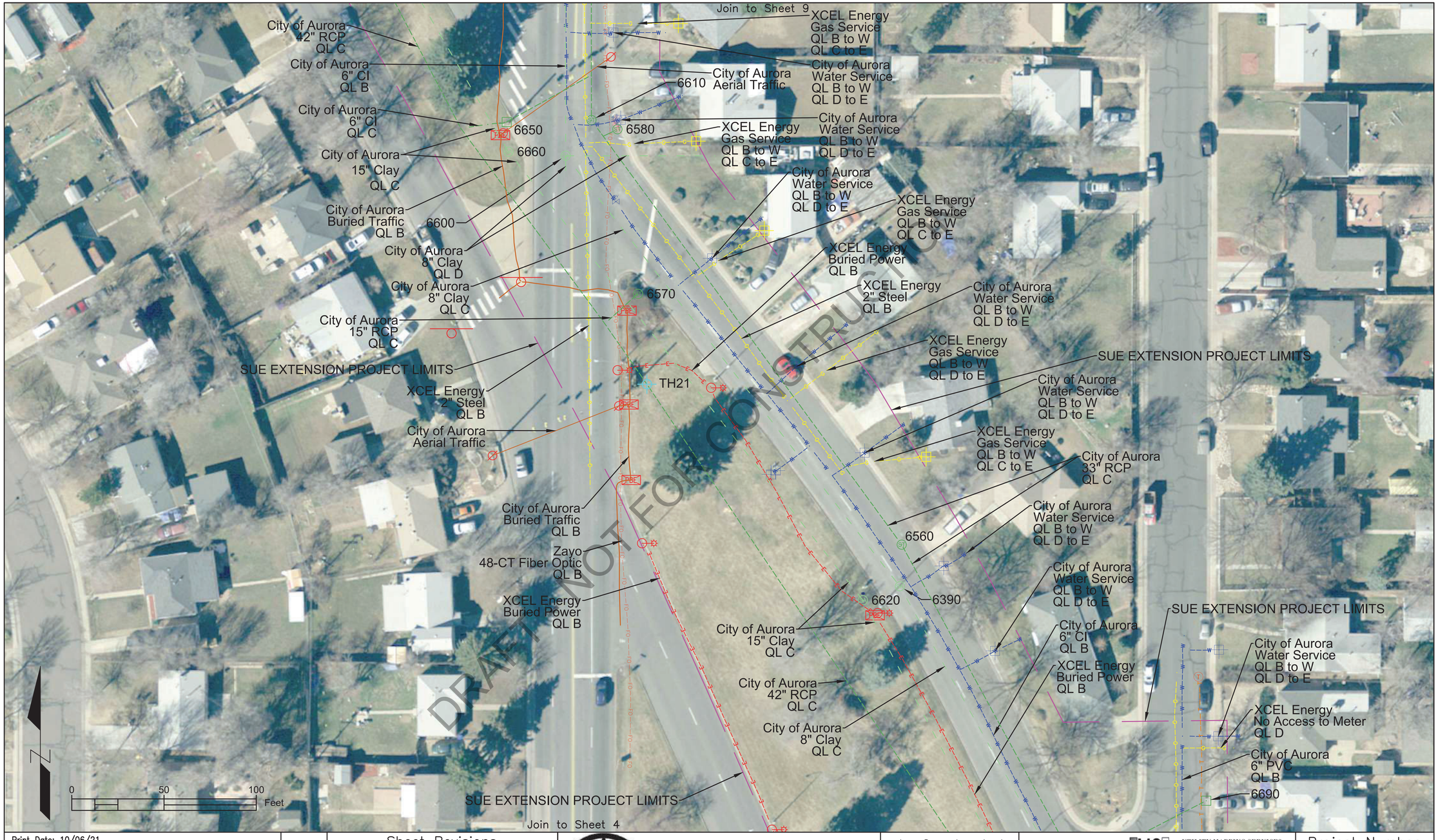
UTILITY MAPPING SERVICES
15065 W. 44th Ave.
Golden, CO 80403
(720)230-0780

Designer: Zackary Winfield
Detailer:
Sheet Subset: UTIL
Structure Numbers
Subset Sheets:

Project Number

SUE7

SHEET 23



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File Name: Havana Park Pond & Del Mar Parkway Improvements EXUTIL.dwg	Date:	Comments	Init.
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City Project Manager: Clint Weisz	9/22/21	Extension	ABRH
	10/06/21	Phase 2	ABRH

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As Constructed
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Revised:
Void:

UTILITY MAPPING SERVICES
15065 W. 44th Ave.
Golden, CO 80403
(720)230-0780

Designer: Zackary Winfield
Detailer:
Sheet Subset: UTIL
Structure Numbers
Subset Sheets:

Project Number

SUE8

SHEET 24

Print Date: 10/06/21		Sheet Revisions			DEPARTMENT OF PUBLIC WORKS	As Constructed
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Horiz. Scale: 1"=50' Vert. Scale:		8/6/20	Original	TS	15151 E. Alameda Pkwy Aurora, CO 80012 PHONE: (303) 739-7300	Revised:
City Project Manager: Clint Weisz		9/22/21	Extension	ABRH		Void:
		10/06/21	Phase 2	ABRH		

UTILITY MAPPING SERVICES 15065 W. 44th Ave. Golden, CO 80403 (720)230-0780			Project Number
Designer: Zackary Winfield	Structure Numbers		SUE9
Detailer:			SHEET 25
Sheet Subset: UTIL	Subset Sheets:		

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS STORMWATER MANAGEMENT PLANS

COA SWMP STANDARD NOTES

PURSUANT TO SECTIONS 138-440 AND 138-442 OF THE AURORA MUNICIPAL CODE, THE PERMITTEE SHALL LOCATE, INSTALL, AND MAINTAIN ALL BEST MANAGEMENT PRACTICES, INCLUDING BUT NOT LIMITED TO, EROSION CONTROLS, SEDIMENT CONTROLS, DRAINAGE CONTROLS, AND WATER QUALITY BMP'S AS INDICATED IN THE APPROVED STORMWATER MANAGEMENT PLAN (SWMP). THE FOLLOWING NOTES ARE A REQUIREMENT AND SHALL BE INCLUDED ON THE SWMP DESIGN DRAWINGS DEVELOPED FOR THIS PROJECT AND SUBMITTED FOR APPROVAL BY THE CITY. BMP INSTALLATIONS SHALL BE INSTALLED PER THE COA STANDARD DETAIL IN EFFECT AT THE TIME OF INSTALLATION OR PER THE APPROVED SWMP DESIGN DRAWING, A COA APPROVED VARIANCE, OR A COA APPROVED DESIGN DRAWING PLAN AMENDMENT.

1. THE PERMITTEE SHALL BE RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, STORM SEWERS, STORM WATER APPURTENANCES, OTHER PROPERTIES, ETC., RESULTING FROM WORK DONE AS PART OF THIS PROJECT.

2. ADDITIONAL EROSION AND SEDIMENT CONTROL BMP'S MAY BE REQUIRED DURING AND AFTER CONSTRUCTION AND SHALL BE EXECUTED AND COMPLETED BY THE PERMITTEE. THE PERMITTEE SHALL PLAN, INSTALL, AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING DRAINAGE AND WATER QUALITY BMP'S AS INDICATED ON THIS PLAN AND AS NECESSARY TO REDUCE THE DISCHARGE OF POLLUTANTS TO THE MAXIMUM EXTENT PRACTICABLE ADVERSE IMPACTS, EROSION AND SEDIMENT DEPOSITION ONTO PAVED SECTIONS, INTO STORM SEWERS, STORM SEWER APPURTENANCES, RECEIVING WATERS, OR OFF THE PROJECT SITE.

3. THE PERMITTEE SHALL TAKE APPROPRIATE MEASURES TO MINIMIZE TO THE MAXIMUM EXTENT PRACTICABLE DIRT AND MUD FROM BEING TRACKED OR DEPOSITED ONTO PAVED SECTIONS VIA MULTIPLE BMP'S. SEDIMENT, MUD, AND CONSTRUCTION DEBRIS THAT MAY BE TRACKED, DEPOSITED, OR ACCUMULATED ON PAVED SECTIONS, IN THE FLOW LINES, PRIVATE PROPERTY, AND/OR PUBLIC RIGHT-OF-WAY OF THE CITY AS A RESULT OF THIS CONSTRUCTION PROJECT SHALL BE CLEANED UP.

4. AREAS REACHING SUBSTANTIAL COMPLETION OF GRADING AND TOPSOIL PLACEMENT OPERATIONS MUST BE DRILL SEEDED AND CRIMP MULCHED WITHIN 14 DAYS OF SUBSTANTIAL COMPLETION OF GRADING AND TOPSOIL OPERATIONS. IF AN INCOMPLETE AREA IS TO REMAIN INACTIVE FOR LONGER THAN 30 DAYS, IT MUST BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE LANDSCAPED WITHIN 14 DAYS FROM THE SUSPENSION OR COMPLETION OF LAND DISTURBANCE ACTIVITIES.

5. THIS APPROVED SWMP DESIGN DRAWING, THE ASSOCIATED APPROVED SWMP NARRATIVE, A COPY OF THE STORMWATER QUALITY DISCHARGE PERMIT, AND THE RULES AND REGULATIONS REGARDING STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES MANUAL SHALL BE KEPT ON SITE AT ALL TIMES.

6. ACCUMULATED SEDIMENT AND DEBRIS SHALL BE REMOVED FROM A BMP (MAINTENANCE) WHEN THE SEDIMENT LEVEL OR DEBRIS ADVERSELY IMPACTS THE FUNCTIONING OF THE BMP OR AS DEFINED WITHIN THE RULES AND REGULATIONS REGARDING STORMWATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITIES MANUAL, WHICHEVER IS MORE RESTRICTIVE. IF MAINTENANCE OF THE BMP DOES NOT RESTORE THE INTENDED FUNCTION, THEN THE BMP MUST BE REPLACED.

7. THE DISCHARGING OF CEMENT, CONCRETE, OR MORTAR FROM READY MIX DELIVERY TRUCKS, PUMP TRUCKS, BATCH PLANTS OR SMALL MECHANICAL MIXERS DIRECTLY ONTO PAVED SURFACES OR DISTURBED GROUND HAVING NO CONTAINMENT IS PROHIBITED. THE DISPOSAL OF ANY LIQUID WASTES OR WASH WATER FROM ANY OPERATIONS SUCH AS PAINTING, DRYWALL, OR TILE INSTALLATION DIRECTLY ONTO PAVED SURFACES OR THE GROUND WITHOUT CONTAINMENT IS PROHIBITED. THE PERMITTEE SHALL PROTECT ALL CURB FLOW LINES, ADJACENT WATERWAYS, WETLANDS, STORM SEWERS, STORM SEWER APPURTENANCES, OTHER PROPERTIES, ETC., ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE.

8. IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO RESOLVE CONSTRUCTION PROBLEMS DUE TO CHANGING CONDITIONS OR DESIGN ERRORS THEY MAY ENCOUNTER DURING THE PROCESS OF ANY PORTION OF THE WORK. IF CONDITIONS IN THE FIELD REQUIRE CHANGES AND THE PROPOSED MODIFICATIONS TO THE APPROVED PLANS INVOLVE SIGNIFICANT CHANGES TO THE CHARACTER OF THE WORK OR TO FUTURE CONTIGUOUS PUBLIC OR PRIVATE IMPROVEMENTS, THE CONTRACTOR, THROUGH THE ENGINEER OF RECORD, SHALL BE RESPONSIBLE TO REVISE PLANS AND SUBMIT THEM TO THE CITY OF AURORA FOR APPROVAL PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE WORK. ANY CONTROLS, FEATURES OR IMPROVEMENTS NOT CONSTRUCTED IN ACCORDANCE WITH THE APPROVED SWMP, CITY OF AURORA STANDARD DETAIL DESIGNS, CITY OF AURORA APPROVED VARIANCES, OR AN APPROVED DESIGN DRAWING AMENDMENT SHALL BE REMOVED AND THE CONTROLS, FEATURES AND/OR IMPROVEMENTS SHALL BE RECONSTRUCTED.

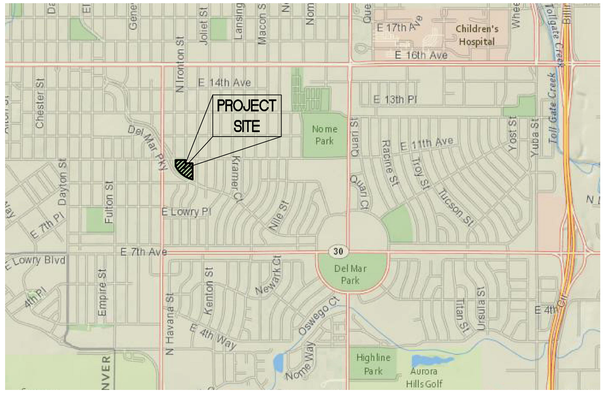
9. SECONDARY CONTAINMENT FEATURES SHALL BE IN PLACE FOR ANY BULK FUEL STORAGE, MIXERS, GENERATORS, OR ANY OTHER SPILL OR LEAK SOURCE THAT REMAINS ONSITE FOR A PERIOD LONGER THAN 7 CALENDAR DAYS. A RECOVERY OR SALVAGE DRUM SHALL BE KEPT ON-SITE FOR STORAGE OR CONTAMINATED SOILS.

10. STRAW BALES AND RECYCLED ASPHALT OR CONCRETE ARE NOT ACCEPTABLE FOR THE CONSTRUCTION OF BMP'S WITHIN THE CITY OF AURORA AND MAY NOT BE USED.

BMP LEGEND

CD	CHECK DAM
CF	CONSTRUCTION FENCE
CFB	COMPOST FILTER BERM
CB	COMPOST BLANKET
CS	CURB SOCK
CW	CONCRETE WASHOUT
CWS	SMALL SITE CONCRETE/LIQUID WASTE WASHOUT
DC	DIVERSION CHANNEL
DD	TEMPORARY DIVERSION DIKE/ DITCH/BERM
DW	DEWATERING
ECB	EROSION CONTROL BLANKET OVER SEEDING (STRAW/COCONUT)
ECB	EROSION CONTROL BLANKET OVER SEEDING (COIR)
EEL	EROSION EEL
IPA	AREA INLET PROTECTION
IPC	CULVERT INLET PROTECTION
IPI	INTERIM INLET PROTECTION
IPO	ON-GRADE INLET PROTECTION
IPS	SUMP INLET PROTECTION
JB	JERSEY BARRIER (CONCRETE BARRIER) FOR EROSION CONTROL
LC	SINGLE FAMILY LOT EROSION CONTROL BMPS
LOC	LIMITS OF CONSTRUCTION
OP	TEMPORARY OUTLET PROTECTION
RCD	REINFORCED CHECK DAM
RCS	ROUGH CUT STREET CONTROL
RS	ROCK SOCKS/WATTLES
RSF	REINFORCED SILT FENCE
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
SF	SILT FENCE
S	SEEDING
SM	SEEDING AND MULCHING
SOD	SOD
SR	SURFACE ROUGHENING
SSA	CONTRACTOR STAGING/STORAGE & VEHICLE FUELING/MAINTENANCE AREA
STA	STREET STAGING AREA
TP	TREE PROTECTION
TSC	TEMPORARY STREAM CROSSING
TSD	TEMPORARY SLOPE DRAIN
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH

DRAFT - NOT FOR CONSTRUCTION



N

VICINITY MAP

0 2000' 4000'

SCALE: 1" = 2000'

SHEET INDEX

SHEET NO.		TITLE
26	SWMP 1	STORMWATER MANAGEMENT PLAN COVER SHEET
27	SWMP 2	HAVANA PARK POND INITIAL STORMWATER MANAGEMENT PLAN
28	SWMP 3	HAVANA PARK POND INTERIM STORMWATER MANAGEMENT PLAN
29	SWMP 4	HAVANA PARK POND FINAL STORMWATER MANAGEMENT PLAN

PROJECT OWNER/DEVELOPER SIGNATURE BLOCK

I HAVE REVIEWED THE INFORMATION CONTAINED WITHIN THE STORMWATER MANAGEMENT PLAN AND ACCEPT RESPONSIBILITY FOR THE REQUIREMENTS SET FORTH.

PERMITEE/AFFILIATION
CLINTON WEISZ

DATE

PLAN PREPARER SIGNATURE BLOCK

I ACKNOWLEDGE MY RESPONSIBILITY FOR THE PREPARATION OF THE STORMWATER MANAGEMENT PLAN.

Donald J. Jacobs, P.E.
Licensed Professional Engineer
State of Colorado No. 33840

DATE

"I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS FOR HAVANA PARK POND AND DEL MAR PARKWAY WERE PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION) IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF AURORA STORM DRAINAGE DESIGN AND TECHNICAL MANUAL."

Donald J. Jacobs, P.E.
Licensed Professional Engineer
State of Colorado No. 33840

Date

SURVEY NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
2. HORIZONTAL CONTROL IS BASED ON A MODIFIED NAD 83-COLORADO STATE PLANE CENTRAL DATUM. DRAWING COORDINATES ARE SCALED TO GROUND BY A SCALE FACTOR OF 1.0002574504 UTILIZING THE FOLLOWING LOCATION AS THE POINT OF ORIGIN (AKA #1):
   - LATITUDE: N39°43'56.33914"
   - LONGITUDE: W104°51'49.68589"
   - ELLIPSOID HEIGHT=5322.37"
3. VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.

FACSIMILE

This electronic plan is a facsimile of the signed and sealed pdf set.

Donald J. Jacobs, P.E.

Date

NO.	DESCRIPTION OF REVISIONS	DATE	BY

811 Know what's below. Call before you dig.

MHFD MILE HIGH FLOOD DISTRICT

AURORA

ENGINUITY ENGINEERING SOLUTIONS
5290 DTC PKWY, SUITE 215
LITTLETON, COLORADO 80127
PH: 303-872-9972

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

COVER SHEET/GENERAL NOTES

DRAWN BY: JWR

DESIGNED BY: JWR

APPROVED BY: DJJ

DATE 1/25/2022

SHEET NO.: SWMP 1

SHEET 26

SURVEY NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
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   LONGITUDE: W104°51'49.68589"
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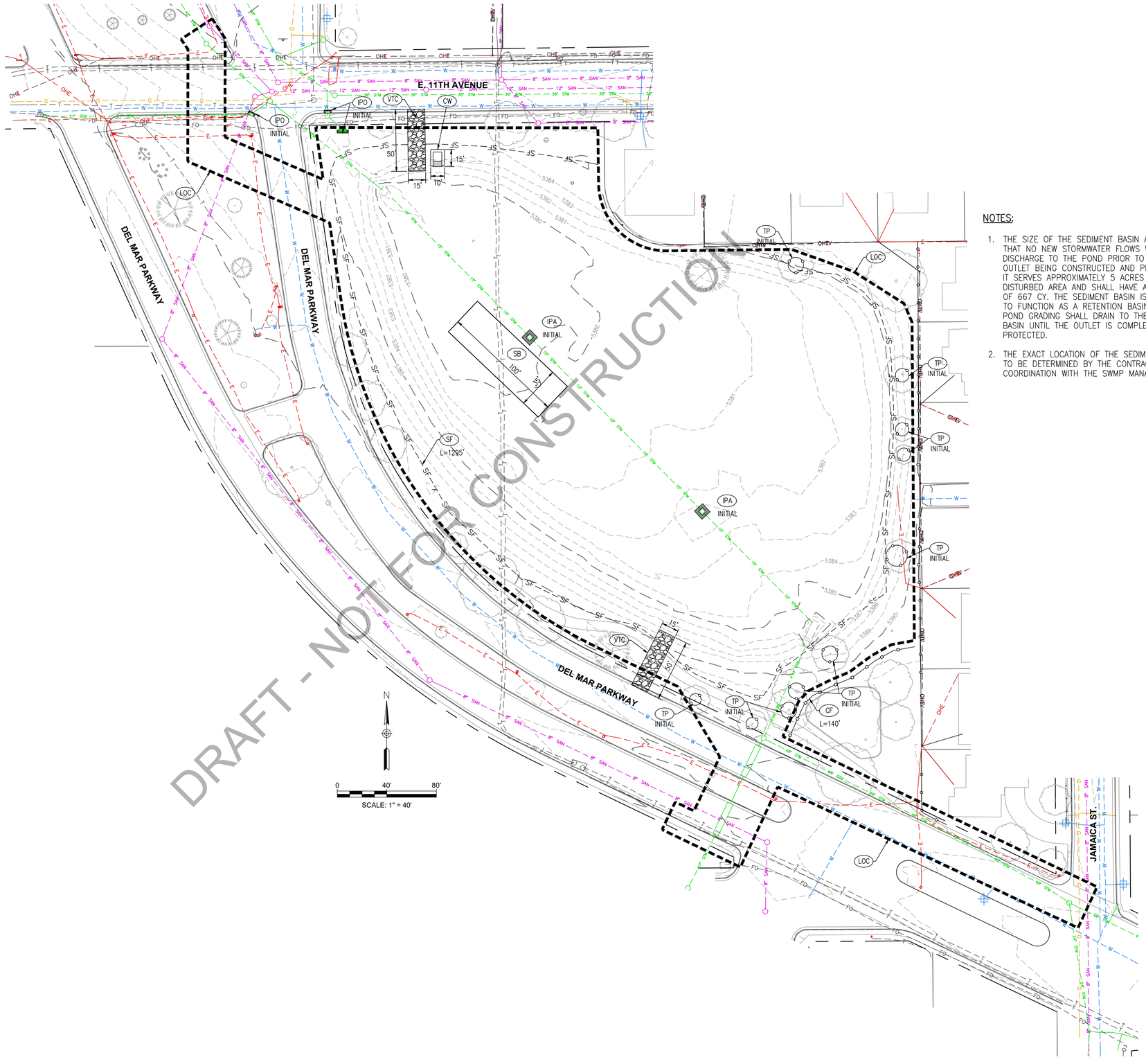

DRAFT - NOT FOR CONSTRUCTION

NOTES:

1. THE SIZE OF THE SEDIMENT BASIN ASSUMES THAT NO NEW STORMWATER FLOWS WILL DISCHARGE TO THE POND PRIOR TO THE OUTLET BEING CONSTRUCTED AND PROTECTED. IT SERVES APPROXIMATELY 5 ACRES OF DISTURBED AREA AND SHALL HAVE A CAPACITY OF 667 CY. THE SEDIMENT BASIN IS INTENDED TO FUNCTION AS A RETENTION BASIN. INTERIM POND GRADING SHALL DRAIN TO THE SEDIMENT BASIN UNTIL THE OUTLET IS COMPLETED AND PROTECTED.
2. THE EXACT LOCATION OF THE SEDIMENT BASIN TO BE DETERMINED BY THE CONTRACTOR IN COORDINATION WITH THE SWMP MANAGER.

FACSIMILE

This electronic plan is a facsimile of the signed and sealed pdf set.

Donald J. Jacobs, P.E.

Date _____

NO.	DESCRIPTION OF REVISIONS	DATE	BY

811 Know what's below. Call before you dig.

MHFD MILE HIGH FLOOD DISTRICT

AURORA

Enginuity
ENGINUITY ENGINEERING SOLUTIONS
10106 WEST SAN JUAN WAY, SUITE 215
LITTLETON, COLORADO 80127
PH : 303-872-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

INITIAL SWMP

DRAWN BY: JWR
DESIGNED BY: JWR
APPROVED BY: DJJ
DATE 1/25/2022
SHEET NO.: SWMP 2
SHEET 27

SURVEY NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
2. HORIZONTAL CONTROL IS BASED ON A MODIFIED NAD 83–COLORADO STATE PLANE CENTRAL DATUM. DRAWING COORDINATES ARE SCALED TO GROUND BY A SCALE FACTOR OF 1.0002574504 UTILIZING THE FOLLOWING LOCATION AS THE POINT OF ORIGIN (AKA #1):
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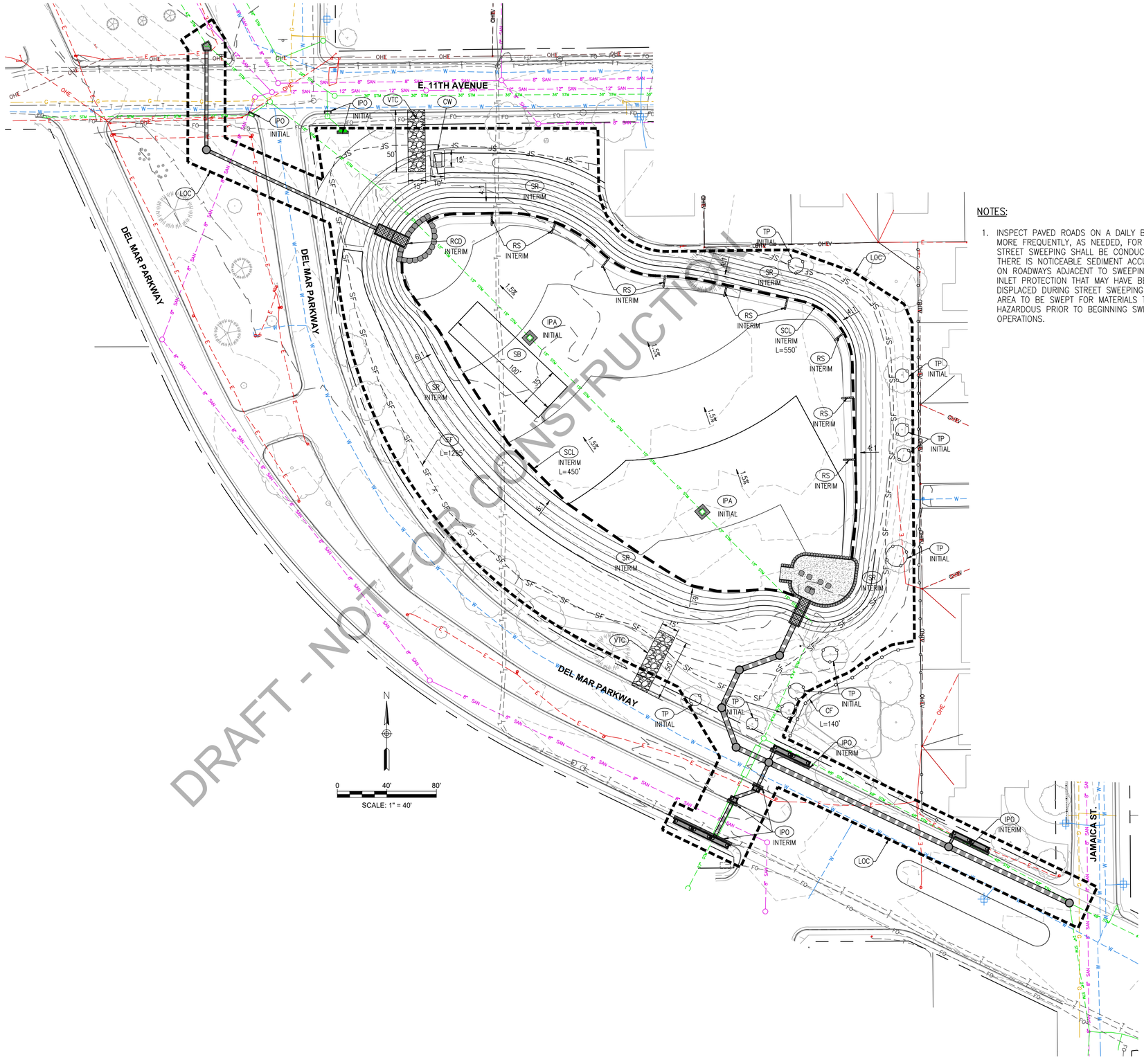
   ELLIPSOID HEIGHT=5322.37"
3. VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.



DRAFT - NOT FOR CONSTRUCTION

NOTES:

1. INSPECT PAVED ROADS ON A DAILY BASIS AND MORE FREQUENTLY, AS NEEDED, FOR SEDIMENT. STREET SWEEPING SHALL BE CONDUCTED WHEN THERE IS NOTICEABLE SEDIMENT ACCUMULATION ON ROADWAYS ADJACENT TO SWEEPING. CHECK INLET PROTECTION THAT MAY HAVE BEEN DISPLACED DURING STREET SWEEPING. INSPECT AREA TO BE SWEPT FOR MATERIALS THAT MY BE HAZARDOUS PRIOR TO BEGINNING SWEEPING OPERATIONS.

FACSIMILE

This electronic plan is a facsimile of the signed and sealed pdf set.

Donald J. Jacobs, P.E.

Date _____

NO.	DESCRIPTION OF REVISIONS	DATE	BY

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MHFD MILE HIGH FLOOD DISTRICT

AURORA

Enginuity

ENGINUITY ENGINEERING SOLUTIONS
10106 WEST SAN JUAN WAY, SUITE 215
LITTLETON, COLORADO 80127
PH : 303-872-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

INTERIM SWMP

DRAWN BY: JWR

DESIGNED BY: JWR

APPROVED BY: DJJ

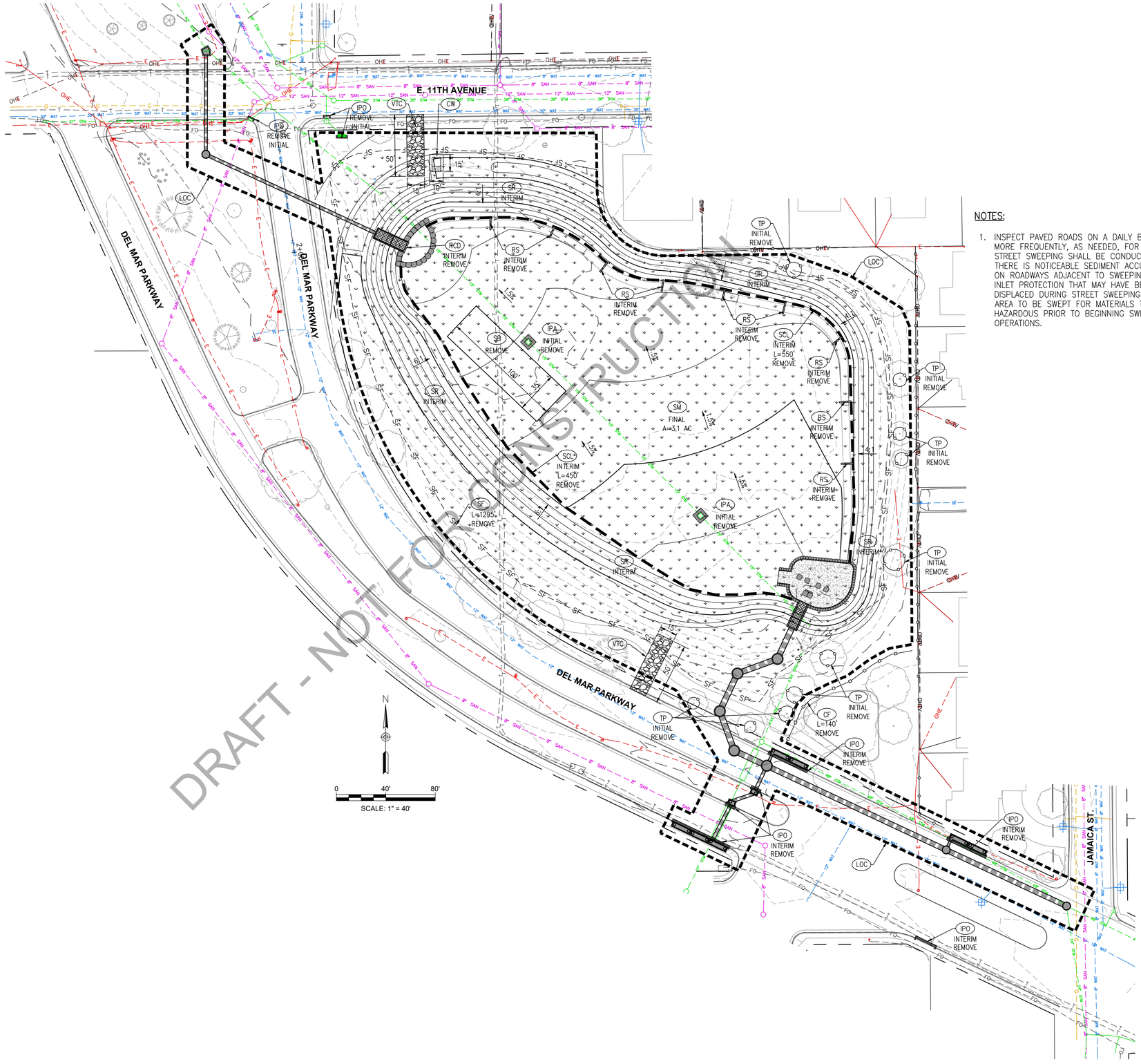
DATE 1/25/2022

SHEET NO.: SWMP 3

SHEET 28

SURVEY NOTES:

1. SITE BENCHMARK – A SET NO. 5 REBAR AT THE SOUTHEAST CORNER OF 11TH AVENUE/DEL MAR PARKWAY INTERSECTION (CONTROL POINT #26 PER SURVEY CONTROL PLAN).
2. HORIZONTAL CONTROL IS BASED ON A MODIFIED NAD 83–COLORADO STATE PLANE CENTRAL DATUM. DRAWING COORDINATES ARE SCALED TO GROUND BY A SCALE FACTOR OF 1.0002574504 UTILIZING THE FOLLOWING LOCATION AS THE POINT OF ORIGIN (AKA #1):
   LATITUDE: N39°43'56.33914"
   LONGITUDE: W104°51'49.68589"
   ELLIPSOID HEIGHT=5322.37"
3. VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.



DRAFT - NOT FOR CONSTRUCTION

NOTES:

1. INSPECT PAVED ROADS ON A DAILY BASIS AND MORE FREQUENTLY, AS NEEDED, FOR SEDIMENT. STREET SWEEPING SHALL BE CONDUCTED WHEN THERE IS NOTICEABLE SEDIMENT ACCUMULATION ON ROADWAYS ADJACENT TO SWEEPING. CHECK INLET PROTECTION THAT MAY HAVE BEEN DISPLACED DURING STREET SWEEPING. INSPECT AREA TO BE SWEPT FOR MATERIALS THAT MY BE HAZARDOUS PRIOR TO BEGINNING SWEEPING OPERATIONS.

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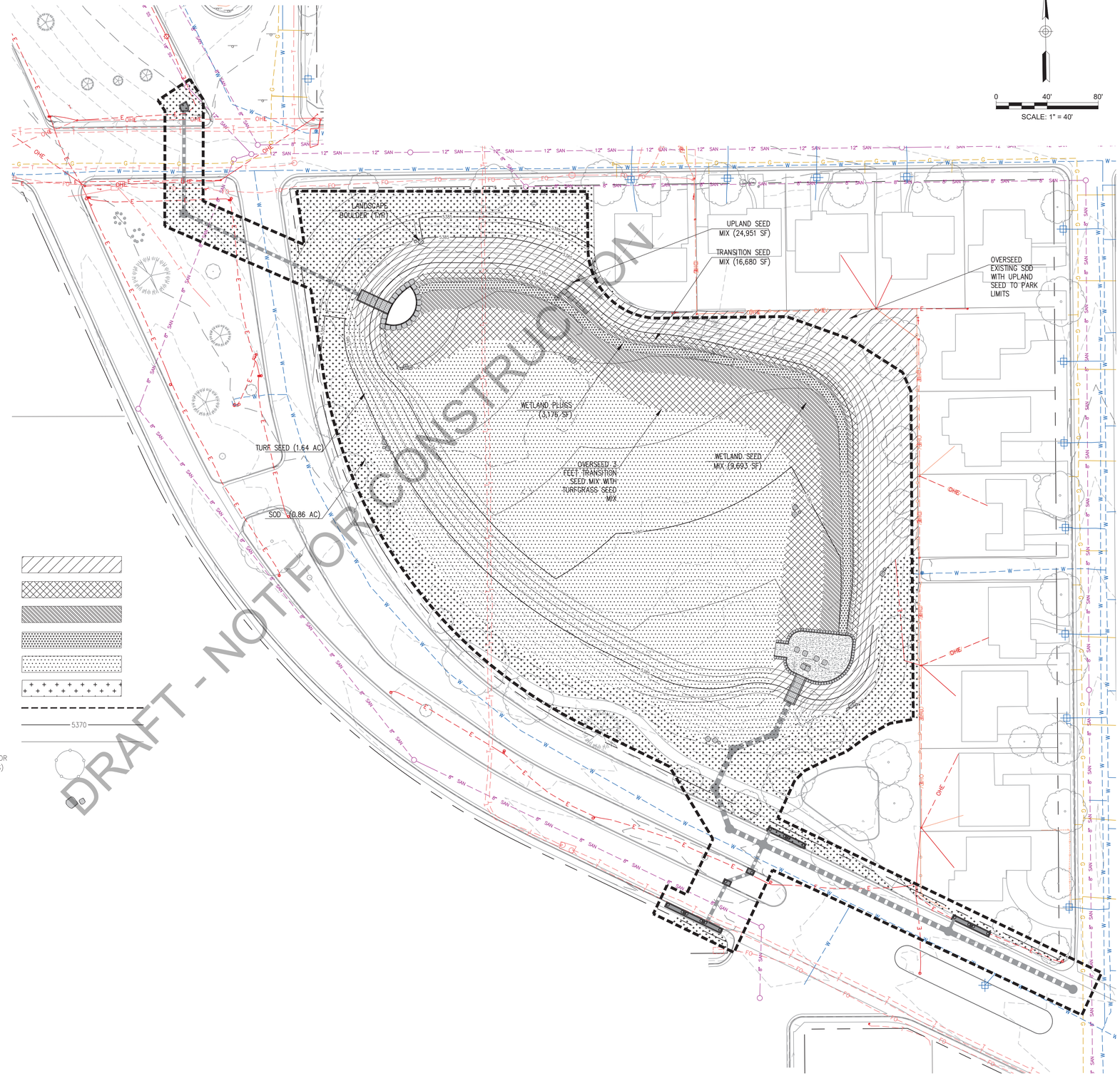
LITTLETON, COLORADO 80127
PH : 303-872-9112

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

FINAL SWMP

DRAWN BY: JWR
DESIGNED BY: JWR
APPROVED BY: DJJ
DATE 1/25/2022
SHEET NO.: SWMP 4
SHEET 29



EXISTING FEATURES LEGEND

- EXISTING STREET LIGHT
- EXISTING UTILITY/POWER POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING WATER MH
- EXISTING CONCRETE
- EXISTING WATER METER
- EXISTING GAS MANHOLE
- EXISTING STORM INLET
- EXISTING STREET SIGN
- EXISTING TELEPHONE MH
- EXISTING SHRUB
- EXISTING TREE
- EXISTING TREE

EXISTING ROW
EXISTING WATER LINE
EXISTING GAS LINE
EXISTING STORM LINE W/MANHOLE
EXISTING SANITARY LINE W/MANHOLE
EXISTING UNDERGROUND TELEPHONE LINE
EXISTING OVERHEAD TELEPHONE LINE
EXISTING UNDERGROUND FIBER OPTIC
EXISTING UNDERGROUND ELECTRIC
EXISTING OVERHEAD ELECTRIC
EXISTING FENCE WOOD
EXISTING FENCE METAL
EXISTING FENCE BARBED WIRE
EXISTING CURB AND GUTTER
EXISTING MAJOR CONTOUR 5370
EXISTING MINOR CONTOUR 5371

PROPOSED FEATURES LEGEND

- WET MEADOW SEED MIX
- TRANSITION SEED MIX
- UPLAND SEED MIX
- WETLAND/RIPARIAN PLUGS
- TURF SEED MIX
- SOD
- LIMITS OF CONSTRUCTION
- PROPOSED MAJOR CONTOUR 5370
- PROPOSED MINOR CONTOUR
- TREE PROTECTION (SEE SHEET C16 FOR TREE PROTECTION NOTES AND DETAILS)
- LANDSCAPE BOULDER

NOTES:

1. TBD

GREATecology
ENVIRONMENT + DESIGN

90% DESIGN - NOT FOR CONSTRUCTION

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LITTLETON, COLORADO 80127
PH : 303-872-9112
FX : 303-872-9104

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

REVEGETATION PLAN

DRAWN BY: EEG
DESIGNED BY: EEG
APPROVED BY: JE
DATE: 01/06/2022
SHEET NO.: L1
SHEET 30

PLANT SCHEDULE

Wetland / Depression Mix						
Scientific Name	**Variety**	**Common Name**	**PLS lbs/ac**	**% of Seed Mix by Wgt**	**PLS/sq ft**	**% of PLS/sq ft**
Graminoids						
Beckmannia syzigachne	vns.	American sloughgrass	0.40	3	11	11
Juncus balticus	vns.	baltic rush	0.05	0	13	13
Carex nebrascensis	vns.	Nebraska sedge	0.90	7	11	11
Distichlis spicata	vns.	inland saltgrass	0.90	7	11	11
Eleocharis palustris	vns.	common spikerush	0.80	6	11	11
Panicum virgatum	Blackwell	Switchgrass	1.90	15	11	11
Glyceria striata	vns.	fowl mannagrass	2.70	21	11	11
Elymus lanceolatus psammophilus	Sodar	streambank wheatgrass	3.00	24	11	11
Schoenoplectus pungens	vns.	common threesquare	2.10	16	10	10
		Graminoid Total	12.75	100	100	100
***var. = variety; vns. = variety not specified**						

Riparian / Transition Zone Mix						
Scientific Name	**Variety**	**Common Name**	**PLS lbs/ac**	**% of Seed Mix by Wgt**	**PLS/sq ft**	**% of PLS/sq ft**
Graminoids						
Panicum virgatum	Blackwell	Switchgrass	1.70	8	10	10
Distichlis spicata	vns.	inland saltgrass	0.80	4	10	10
Elymus canadensis	vns.	Canada wildrye	4.50	21	12	12
Elymus lanceolatus psammophilus	Sodar	streambank wheatgrass	3.70	17	13	13
Elymus trachycaulus ssp. trachycaulus	San Luis	slender wheatgrass	3.50	16	11	11
Pascopyron smithii	Rosana	western wheatgrass	4.10	19	11	11
Poa palustris	vns.	fowl bluegrass	0.50	2	11	11
Spartina pectinata	Red River	prairie cordgrass	2.50	12	11	11
Sporobolus cryptandrus	vns.	sand dropseed	0.10	0	12	12
		Graminoid Total	21.40	100	100	100
***var. = variety; vns. = variety not specified**						

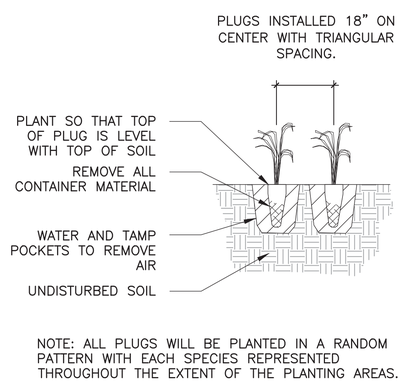
Upland Mix						
Scientific Name	**Variety**	**Common Name**	**PLS lbs/ac**	**% of Seed Mix by Wgt**	**PLS/sq ft**	**% of PLS/sq ft**
Graminoids						
Achnatherum hymenoides	Paloma	Indian ricegrass	4.50	28	15	15
Bouteloua curtipendula	Butte or	sideoats grama	1.80	11	8	8
Bouteloua dactyloides	vns.	buffalo grass	6.00	38	8	8
Bouteloua gracilis	CO	blue grama	0.40	3	8	8
Distichlis spicata	vns.	inland saltgrass	0.65	4	8	8
Festuca rubra	vns.	red fescue	1.40	9	15	15
Koeleria macrantha	vns.	prairie junegrass	0.25	2	13	13
Poa secunda	High Plains	sandberg bluegrass	0.70	4	14	14
Sporobolus cryptandrus	vns.	sand dropseed	0.10	1	12	12
		Graminoid Total	15.80	100	100	100
***var. = variety; vns. = variety not specified**						

Wetland Plugs		
Scientific Name	**Common Name**	**Quantity**
Juncus torreyi	Torrey's rush	408
Bolboschoenus maritimus	Alkali bulrush	408
Carex nebrascensis	Nebraska sedge	408
Carex pellita	Woolly sedge	408
Total		**1,632**

LANDSCAPE NOTES:

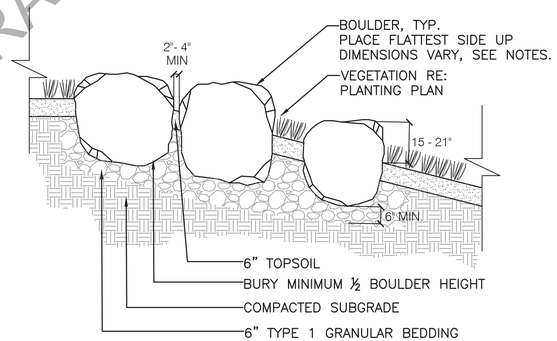
1. TBD

1. TURFGRASS SEED MIX TO BE XX.
2. SOD TO BE XX.

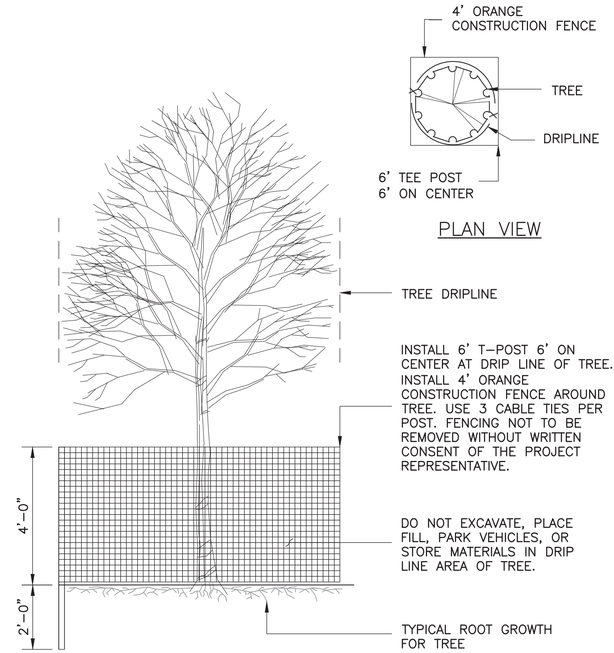


NOTE: ALL PLUGS WILL BE PLANTED IN A RANDOM PATTERN WITH EACH SPECIES REPRESENTED THROUGHOUT THE EXTENT OF THE PLANTING AREAS.

1 L2 PLUG PLANTING



2 L2 LANDSCAPE BOULDERS



3 L2 TREE PROTECTION

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ENVIRONMENT + DESIGN

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Donald J. Jacobs, P.E.
Date

NO.	DESCRIPTION OF REVISIONS	DATE	BY

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MILE HIGH FLOOD DISTRICT

AURORA

Enginuity
ENGINUITY ENGINEERING SOLUTIONS
9200 W. CROSS DRIVE, SUITE 215
LITTLETON, COLORADO 80127
PH: 303-972-9104
FX: 303-972-9104

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

REVEG SCHEDULE, NOTES & DETAILS

DRAWN BY: EEG
DESIGNED BY: EEG
APPROVED BY: JE
DATE: 01/06/2022
SHEET NO.: L2
SHEET 31

EXISTING FEATURES LEGEND

- EXISTING STREET LIGHT
- EXISTING UTILITY/POWER POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING WATER MH
- EXISTING CONCRETE
- EXISTING WATER METER
- EXISTING GAS MANHOLE
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EXISTING FENCE BARBED WIRE
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EXISTING MAJOR CONTOUR 5370
EXISTING MINOR CONTOUR 5371

NOTES:

1. TBD

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GREATecology
ENVIRONMENT + DESIGN

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ENGINUITY ENGINEERING SOLUTIONS
10106 WEST SAN JUAN WAY, SUITE 215
LITTLETON, COLORADO 80127
PH : 303-872-9112
FX : 303-872-9104

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

IRRIGATION PLAN

DRAWN BY: EEG
DESIGNED BY: EEG
APPROVED BY: EEG
DATE: 01/06/2022
SHEET NO.: I1
SHEET 32

IRRIGATION SCHEDULE

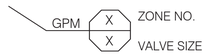
SYMBOL	MANUFACTURER	MODEL NO.	DESCRIPTION	DETAIL NO.
■ ◣ ◓ ◪	RAINBIRD	R-VAN14	SPRAY HEAD	X
● ◔ ◓	RAINBIRD	R-VAN18	SPRAY HEAD	X
◆ ◇	RAINBIRD	R-VAN24	SPRAY HEAD	X
▼ ▽ ▼	RAINBIRD	5000-MPR-25	GEAR DRIVEN ROTOR	X
▲ ◬ △	RAINBIRD	5000-MPR-35	GEAR DRIVEN ROTOR	X
6	RAINBIRD	6504 (#4 NOZZLE)	GEAR DRIVEN ROTOR	X
6	RAINBIRD	6504 (#6 NOZZLE)	GEAR DRIVEN ROTOR	X
	RAINBIRD	PESB SERIES W/PRS-D	ELECTRIC CONTROL VALVE	X
	MATCO-NORCA	10-RT SERIES	GATE VALVE	X
	FEBCO	860 SERIES - 3"	BACKFLOW PREVENTER	X
QC	RAINBIRD	5-LRC W/ 2049 Key	QUICK COUPLING VALVE	X
R	RAINBIRD		RAIN SENSOR	X
A	X		2-WIRE CONTROLLER	X
M			3" WATER METER	
P			3" SERVICE LINE	
------- -------		CLASS 200	SLEEVING	
— • —		K COPPER LINE	MAINLINE	
——		CLASS 200 SOLVENT WELD OR 100 PSI NSF	LATERAL	

CITY OF AURORA IRRIGATION NOTES

1. AN IRRIGATION AND SOIL PERMIT IS REQUIRED. PLEASE CALL WATER CONSERVATION AT 720-859-4364 TO OBTAIN YOUR PERMIT.
2. THE IRRIGATION SYSTEM DESIGN ANTICIPATES THE AVAILABLE WATER PRESSURE AT THE SITE AT 67 PSI.

IRRIGATION NOTES

3. REFER TO TECHNICAL SPECIFICATIONS AND CONSTRUCTION DETAILS FOR INSTALLATION PROCEDURES.
4. CONTRACTOR SHALL OBTAIN AND COMPLY WITH ANY NECESSARY PERMITS ASSOCIATED WITH COMPLETING THE WORK.
5. CONTRACTOR SHALL FIELD VERIFY PRESSURE AT BACKFLOW PREVENTER LOCATION FOR TAP PRIOR TO ORDERING MATERIALS OR STARTING ANY IRRIGATION INSTALLATION AND NOTIFY THE LANDSCAPE ARCHITECT OF ANY DIFFERENCES FROM STATED PRESSURE. IF CONTRACTOR FAILS TO NOTIFY THE LANDSCAPE ARCHITECT, THE CONTRACTOR WILL ASSUME FULL RESPONSIBILITY FOR ANY SYSTEM ALTERATIONS.
6. ZONE CALLOUTS SHALL BE READ AS FOLLOWS:



7. MATERIAL OR PROCESSES OTHER THAN THOSE INDICATED HEREIN MAY BE USED IF SUFFICIENT DATA IS PRESENTED TO SHOW THAT THE MATERIAL OR PROCESS IS EQUIVALENT OR BETTER IN PERFORMANCE AND INTENT, AND MEETS OR EXCEEDS ALL DESIGN AND PERFORMANCE TESTS WITH ALL EQUIVALENT FEATURES.
8. TEMPORARY SYSTEMS SHALL OPERATE FOR A PERIOD SUFFICIENT TO ESTABLISH PLANT MATERIAL AND TO PROVIDE VEGETATIVE COVER THAT PREVENTS SOIL EROSION. THE AMOUNT OF IRRIGATION MAY BE ADJUSTED WHEN WARRANTED BY SITE CONDITIONS.
9. ALL ON-GRADE LINES SHALL BE SECURED TO SLOPES EVERY 10 FEET. THE ENDS OF ALL LATERALS SHALL ALSO BE STAKED.
10. ALL SLEEVING IS BY CONTRACTOR UNLESS OTHERWISE NOTED. INSTALL SLEEVING LOCATION AND SIZE AS NOTED ON PLANS. EACH LENGTH OF SLEEVED PIPE SHOWN SHALL BE ROUTED THROUGH SEPARATE SLEEVES. IRRIGATION WIRE BUNDLE SHALL BE ROUTED IN SEPARATE SLEEVE/CONDUIT WITHOUT IRRIGATION PIPING.
11. IRRIGATION TO BE INSTALLED PRIOR TO LANDSCAPE.
12. IRRIGATION PLANS ARE DIAGRAMMATIC. IRRIGATION SYSTEM SHALL IRRIGATE UPLAND, TRANSITION AND THE UPPER 50 HORIZONTAL FEET OF HIGH MARSH HABITATS. LOCATIONS OF IRRIGATION IMPROVEMENTS ARE SUBJECT TO THE LANDSCAPE ARCHITECT'S APPROVAL PRIOR TO INSTALLATION. REFER TO PLANTING PLAN FOR HABITAT LOCATIONS. IRRIGATION LINES LOCATIONS SHOWN ARE APPROXIMATE AND ZONES SHOULD BE DESIGNATED BY HABITAT TYPE: UPLAND/TRANSITION AND HIGH MARSH.
13. CONTRACTOR SHALL LOCATE AND PROTECT FROM DAMAGE ALL EXISTING UTILITIES, SURFACES, SITE FURNISHINGS, AND OTHER SITE ELEMENTS. CONTRACTOR SHALL REPAIR OR REPLACE ANY EXISTING IRRIGATION EQUIPMENT, TURF, PLANT MATERIAL OR SITE FEATURES DAMAGED DURING NEW INSTALLATION. REPLACEMENT OR REPAIR OF DAMAGED EQUIPMENT OR MATERIAL SHALL BE DETERMINED BY THE OWNER AND THE LANDSCAPE ARCHITECT.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING PLANT MATERIAL IN GREEN, VIABLE CONDITION DURING THE CONSTRUCTION PERIOD. THIS SHALL INCLUDE WATERING PLANTING MATERIAL UNTIL THE IRRIGATION SYSTEM IS OPERATIONAL, AS NECESSARY.
15. VALVE BOXES SHALL BE LOCATED 36" MINIMUM FROM CENTERLINE OF ALL SWALES, 24" MINIMUM FROM EDGES OF ALL WALKS, CURBS, DRIVES AND OTHER HARD SURFACE AREAS.
16. LATERAL PIPING DIAMETERS SHALL INCLUDE 1", 1.5", 2", 2.5", AND 3". .75" AND 1.25" DIAMETER LATERAL PIPE IS NOT ACCEPTABLE.
17. TWO-WIRE CABLE SHALL BE CALSENSE CS3-2W-S/CS3-GR-KIT/COMM 5YR-2/CS-2W-2ST(41)/CS-2W-POC(1)/FM 1.25 B. SEE NOTES ON PLAN FOR INSTALLATION REQUIREMENTS.
18. FOR ALL CONTROLLER INSTALLATIONS CONTRACTOR SHALL CONTACT CALSENSE REPRESENTATIVE FOR FREQUENCY TESTING, EARTH GROUND TESTING AND OTHER CONTROLLER OPTIMIZATION ITEMS.
19. COORDINATE MAINLINE LOCATION TO ACCOMMODATE EXISTING UTILITY EASEMENTS.
20. THE IRRIGATION SYSTEM AND CORRESPONDING HABITAT/PLANTINGS INCLUDE AREAS BOTH WITHIN THE POND 20 PROJECT BOUNDARY AND ON ADJACENT PROPERTY TO THE NORTH. CONTRACTOR SHALL COORDINATE ALL WORK WITH PROJECT MANAGER.

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Date

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AURORA

ENGINUITY ENGINEERING SOLUTIONS
10506 W. CENTRAL AVENUE
LITTLETON, COLORADO 80127
PH: 303-972-4904
FX: 303-972-4904
SUITE 215

HAVANA PARK POND AND DEL MAR PARKWAY IMPROVEMENT PLANS

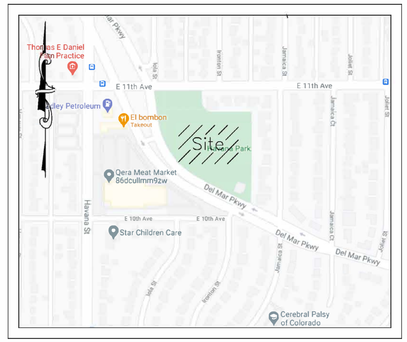
IRRIGATION SCHEDULE

DRAWN BY: EEG
DESIGNED BY: EEG
APPROVED BY: EEG
DATE: 01/06/2022
SHEET NO.: I2
SHEET 33

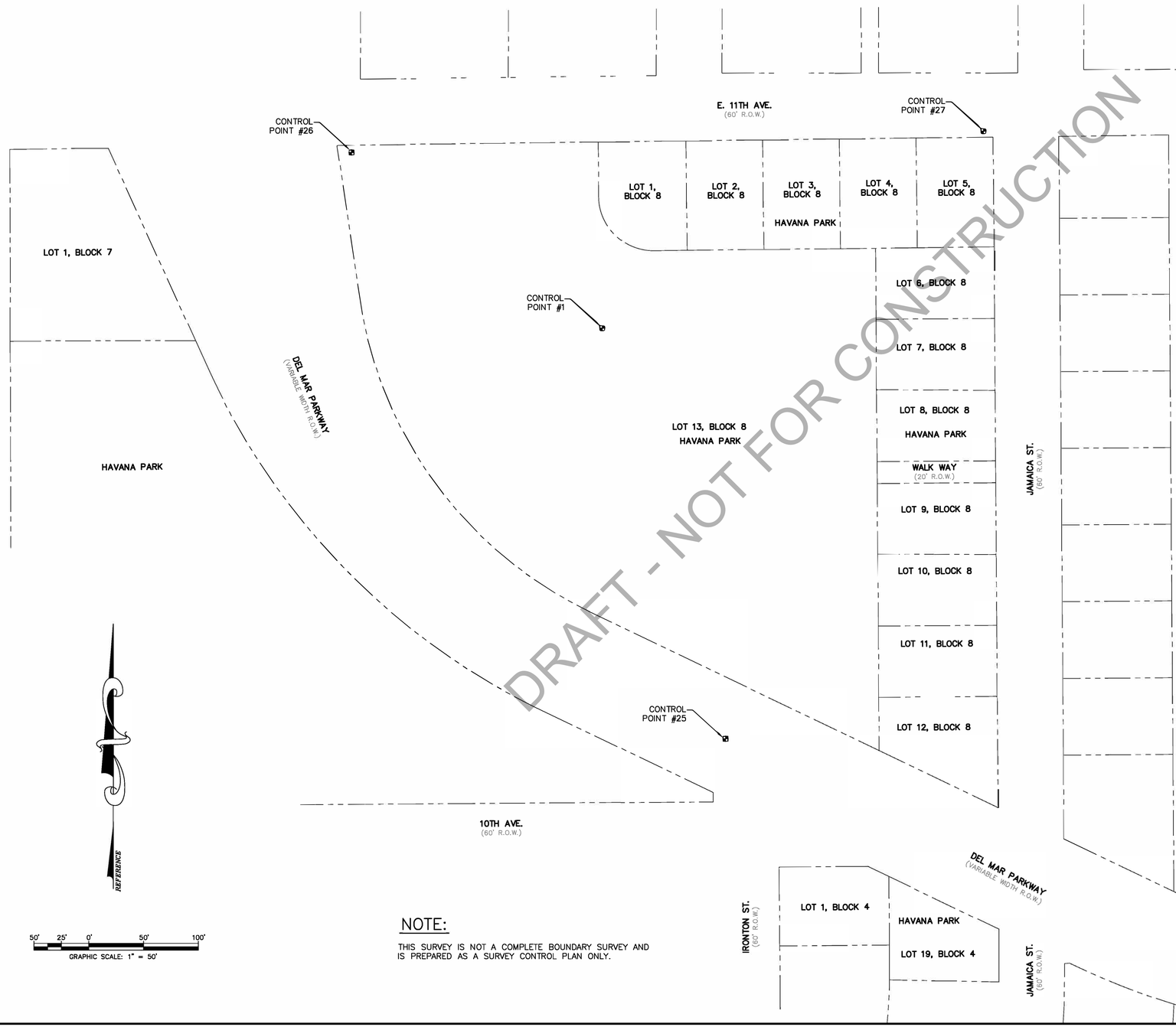
HAVANA PARK POND

A PARCEL LOCATED IN THE SW1/4 OF SECTION 2, TOWNSHIP 4 SOUTH, RANGE 67 WEST OF THE 6TH P.M. COUNTY OF ARAPAHOE, STATE OF COLORADO

SURVEY CONTROL PLAN



VICINITY MAP
N.T.S.



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SURVEY CONTROL INFORMATION - HAVANA PARK POND

1.) HORIZONTAL CONTROL IS BASED ON A MODIFIED NAD 83–COLORADO STATE PLANE CENTRAL DATUM. DRAWING COORDINATES ARE SCALED TO GROUND BY A SCALE FACTOR OF 1.0002574504 UTILIZING THE FOLLOWING LOCATION AS THE POINT OF ORIGIN (AKA #1):
LATITUDE=N39°43'56.33914"
LONGITUDE=W104°51'49.68589"
ELLIPSOID HEIGHT=5322.37'

2.) VERTICAL CONTROL IS BASED ON NAVD88 DATUM UTILIZING GEOID18.

SURVEY POINTS				
POINT # ●	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1692252.410	3178931.202	5379.95	SET NO. 5 REBAR W/RED PLASTIC CAP "PSM CONTROL"
25	1691877.658	3179043.759	5390.61	SET NO. 5 REBAR
26	1692413.002	3178702.394	5382.80	SET NO. 5 REBAR
27	1692432.463	3179279.330	5387.06	SET NO. 5 REBAR

NOTICE:

ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS AFTER THE DATE OF THE CERTIFICATION SHOWN HEREON.

SURVEYOR'S CERTIFICATION

I, THE UNDERSIGNED, A REGISTERED LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY STATE THAT THIS SURVEY WAS PREPARED BY ME, OR UNDER MY SUPERVISION AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

COLORADO REGISTERED CHRISTOPHER P. JULIAN LICENSE NUMBER 31158 PROFESSIONAL LAND SURVEYOR

9/24/20
CHRISTOPHER P. JULIAN, P.L.S. # 31158 — DATE
FOR AND ON BEHALF OF PRECISION SURVEY & MAPPING, INC.

NOTE:

THIS SURVEY IS NOT A COMPLETE BOUNDARY SURVEY AND IS PREPARED AS A SURVEY CONTROL PLAN ONLY.

NO.	DATE	DESCRIPTION	BY

PRECISION SURVEY & MAPPING
PROFESSIONAL LAND SURVEYING CONSULTANTS
9025 E. Kenyon Ave., Suite 150, Denver, CO 80237
Tel:(303) 753-9799

DRAWN:	CHKD.:	JOB NO.:	DATE:	ACAD FILE:
JN	JL	R1.3039	SEPTEMBER 24, 2020	R1.3039-HAVANA PARK POND.dwg