Drainage Investigation and Flooding Analysis for Prescott Hall

City of Newport Department of Utilities
Department of Utilities

Prescott Hall Drainage Study
December 2022

Drainage Investigation and Flooding Analysis for Prescott Hall

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Executive Summary

The purpose of the Drainage Investigation and Flooding Analysis for Prescott Hall is to update previous studies to analyze historic flooding events, determine the root causes of recent flooding, and identify potential mitigation measures to alleviate flooding in Prescott Hall. This report summarizes the approach for the drainage study, modeling results and recommendations from the study.

The Prescott Hall neighborhood sits in the Elizabeth Brook watershed, which is a 586-acre area that lies within the 100-year and 500-year Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) flood zones, in the northern portion of Newport, Rhode Island. The area is known to flood several times a year and, in some events, street flooding has reached depths of over 2 feet. Stormwater infrastructure in the study area is owned by the City of Newport, RI (the City), the Rhode Island Department of Transportation (RIDOT), and other private entities.

RIDOT is in the process of constructing the Pell Bridge Interchange Improvement Project (the Pell Bridge Project), which is immediately downstream of the Prescott Hall neighborhood. As a part of this study, the impacts to flooding in the watershed from the existing and proposed Pell Bridge infrastructure are examined.

A 2D hydraulic model of the study area was developed and verified using observations from recent storm events. The 2D model simulates the performance of the stormwater pipes, culverts, and ditches that act as its primary drainage system for the watershed. It also simulates the large volumes of overland flow and surface ponding observed during recent storm events. Three model scenarios were developed.

1. The Existing Conditions model represents the system prior to the construction of the Pell Bridge Project.
2. The Baseline Conditions model builds upon the Existing Conditions model and includes changes that are expected from the Pell Bridge Project based on site plans provided by RIDOT, including updated topography and modifications to the existing drainage system.
3. The Proposed Conditions model builds upon the Baseline Conditions model and includes the mitigation measures necessary to reduce flooding in the Prescott Hall study area.

Twenty potential mitigation measures were identified for consideration. Following engineering considerations and input from stakeholders, thirteen mitigation measures were selected for further evaluation. The selected mitigation measures included three stormwater detention areas and ten conveyance alternatives. Benefits of the proposed improvements were evaluated for a 10-year, 24-hour design storm.

Figure ES-1 depicts the mitigation measures recommended for additional study, and an associated key is presented in Table ES-1.

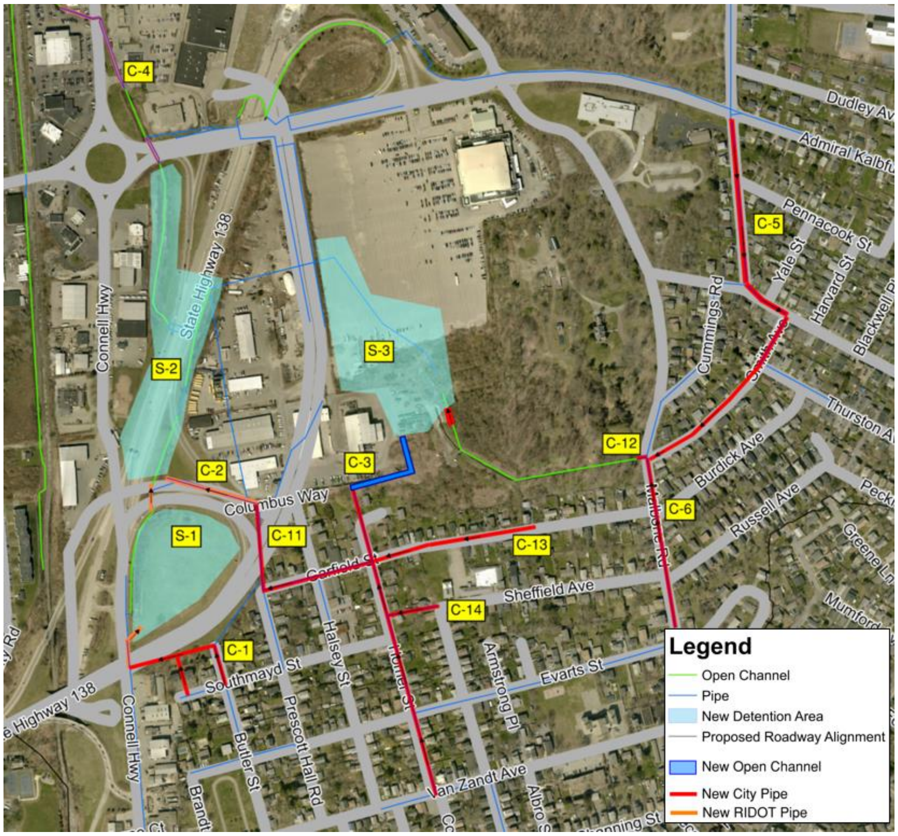

Figure ES-1. Recommended Mitigation Concepts Sketch

Table ES-1. Recommended Mitigation Concepts Sketch Key and Phasing

ID	Alternative	Recommended Phase
S-1	Detention Area 1	**Phase 1**
S-2	Detention Area 2	
C-1	Drainage Improvements on Butler/Southmayd and redirect flow to RIDOT's drain on JT Connell Hwy	
C-2	Redirect Outlet from Prescott Hall to New Detention Area (S-2)	
C-11	Line 42-inch Outlet Pipe from Prescott Hall	
C-13	Drainage Improvements on Garfield	
C-14	Drainage Improvements on Homer/Sheffield	
S-3	Detention Area 3	**Phase 2**
C-3	New Pipe/Channel from Garfield to New Detention Area (S-3)	
C-4	Upgrade RIDOT's Existing Twin 5-ft Culverts to Twin 8-ft Culverts	
C-5	Drainage Improvements on Hillside/Smith	
C-6	Drainage Improvements on Malbone	
C-12	Malbone Channel Box Culvert	

A phased implementation plan was developed to align short-term mitigation measures with the schedule for the Pell Bridge Project (Phase 1) and provide additional time for the necessary coordination with affected property owners, acquiring permits, and dispersing costs based on funding limitations (Phase 2). The mitigation measures included in Phase 1 include detention areas 1 and 2, as well as the drainage improvements in the Prescott Hall subwatershed (i.e., projects S-1, S-2, C-1, C-2, C-11, C-13, and C-14 in Table ES-1).

The Phase 2 mitigation measures include the alternatives proposed in areas upstream of the Prescott Hall neighborhood and measures that require more extensive coordination and time to acquire necessary permits and easements. The mitigation measures included in Phase 2 include detention area 3 and the new pipe and drainage channel redirecting flow from Garfield Street to detention area 3, as well as drainage improvements in the Malbone subwatershed (i.e., projects S-3, C-3, C-4, C-5, C-6, and C-12 in Table ES-1).

Table ES-2 summarizes the flood volumes and depth of flooding at a known problem area in the study area for the simulated model scenarios. Through the hydraulic modeling analysis, it was estimated that construction of the Pell Bridge Project would increase flooding in the overall watershed by approximately 8%, while the mitigation measures presented in Phases 1 and 2 are expected to reduce flooding from existing conditions by approximately 72%.

Total preliminary conceptual construction costs for the identified mitigation measures in each phase of the implementation plan are included in Table ES-3.

Table ES-2. 10-year, 24-hour Design Storm Modeling Results

Model Run	Total Flood Volume (MG)	Prescott Hall Neighborhood Flood Volume (MG)	Depth of Flooding at Prescott Hall Rd and Garfield St (ft)
Existing Conditions	31.8	3.92	2.95
Baseline Conditions	34.6	4.67	3.72
Proposed Conditions - Phase 1	15.5	3.65	2.59
Proposed Conditions - Phase 2	9.0	0.87	0.73

Table ES-3. Conceptual Construction Cost Estimates

	Phase 1	Phase 2
Subtotal Construction Costs	**$14.6 M**	**$19.9 M**
Contingency (30%)	$4.39 M	$5.96 M
Escalation Multiplier[1]	$1.19 M	$5.27 M
Total Estimated Construction Cost	**$20.2 M**	**$31.1 M**

[1]Phase 1 escalated to 2024 (8.2% multiplier); Phase 2 escalated to year 2028 (26.7% multiplier)

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Acronyms and Abbreviations

AACE	Association for the Advancement of Cost Engineering
CAD	Computer-Aided Design
DEM	Digital Elevation Model
FEMA	Federal Emergency Management Agency
FHWA	The Federal Highway Administration
FIS	Flood Insurance Study
GIS	Geographic Information System
H/H Model	Hydrologic and Hydraulic Model
HEC-HMS	Hydrologic Engineering Center Hydraulic Modeling System
HEC-RAS	Hydrologic Engineering Center River Analysis System
IDF	Intensity-Duration-Frequency
LiDAR	Light Detection and Ranging
MODA	Multi-Objectional Decision Analysis
MSL	Mean Sea Level
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRSS	Northeast Regional Climate Center
PFDS	Precipitation Frequency Data Server
RIDOT	Rhode Island Department of Transportation
RIGIS	Rhode Island Geographic Information System
RISDISM	Rhode Island Stormwater Design and Installation Standards Manual
SCS	Soil Conservation Service
SWMM	Stormwater Management Model
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
WSS	Web Soil Survey

1. Introduction

Neighborhood-scale flooding has been a historic problem in the Elizabeth Brook watershed, a 586-acre area in the northern portion of Newport, RI. The flooding problems have increased in recent years with the recurrence of multiple high-intensity, short-duration rainfall events. Significant street flooding and private property flooding during large precipitation events have specifically impacted the Prescott Hall and Malbone neighborhoods. During flood events, large volumes of stormwater travel overland along streets and through private property and cause localized street flooding. In 2012, a series of drainage studies were initiated in this watershed. Following those studies, the City implemented some improvements, however, flooding remains an issue in the Prescott Hall neighborhood. The Prescott Hall neighborhood was also significantly impacted by Tropical Storm Ida in 2021, where many residents reported over 2 feet of flooding. There are several ongoing and planned improvement projects that will impact critical components of the drainage system downstream of Prescott Hall. In response, the City initiated this drainage study to identify improvements required to mitigate flooding and improve drainage system performance.

The scope of the drainage study included initial data collection and review, field investigations, stakeholder coordination, including a public involvement program, development and application of an updated hydraulic model, and development of conceptual mitigation measures and planning-level construction cost estimates. The study was completed over an 8-month period starting in February 2022. This report includes a summary of each phase of the process as well as the results and recommendations.

2. Background Information

The Prescott Hall neighborhood is in the northern portion of the City just south of the City Yard on Halsey Street, bordered on the west by JT Connell Highway, on the east by Malbone Road, and on the south by Warner Street. This neighborhood sits at a low spot in the watershed, which contributes to the flooding issues. This section provides an overview of the watershed characteristics, existing drainage infrastructure, past and ongoing projects, and past drainage studies in the area.

2.1 Elizabeth Brook Watershed Overview

A map of the watershed is provided in Figure 2-1. The Elizabeth Brook watershed consists of three subwatersheds.

1. The Malbone subwatershed collects runoff northeast of Malbone Road, primarily along Hillside Avenue and Bedlow Avenue. Runoff from the Malbone subwatershed is conveyed through the Malbone Channel, beginning at the intersection of Malbone Road and Smith Street and flows northwest to the storm drain system that runs west under the City Yard. For high intensity events, overland flow from the Malbone subwatershed south of the channel can be conveyed directly to the Prescott Hall neighborhood.

2. The Prescott Hall subwatershed is located southwest of the Malbone Channel and collects runoff from the southern portion of the watershed. Runoff from the Prescott Hall subwatershed is conveyed through the existing storm drain system, north under the City Yard.

3. The Malbone and Prescott Hall subwatersheds both drain to the Downstream subwatershed. The Downstream subwatershed collects runoff from the remainder of the watershed, and conveys flow through a series of culverts, open channels, and storm drains under State Road (S.R.) 138/238, Admiral Kalbfus Road, and JT Connell Highway before discharging into Newport Harbor approximately 0.5-miles northwest of the City Yard.

The Elizabeth Brook watershed is approximately 586-acres and is approximately 50% impervious area. The maximum and minimum elevations within the watershed area are 157.8 feet and 0.8 feet (NAVD88), respectively, and there is an average slope of 6% across the watershed. The soil in the area is primarily silty loam and sandy loam, and overall, the groundwater table is relatively shallow. Further, the watershed lies within the FEMA 100-year and 500-year flood zones as shown in Figure 2-2.

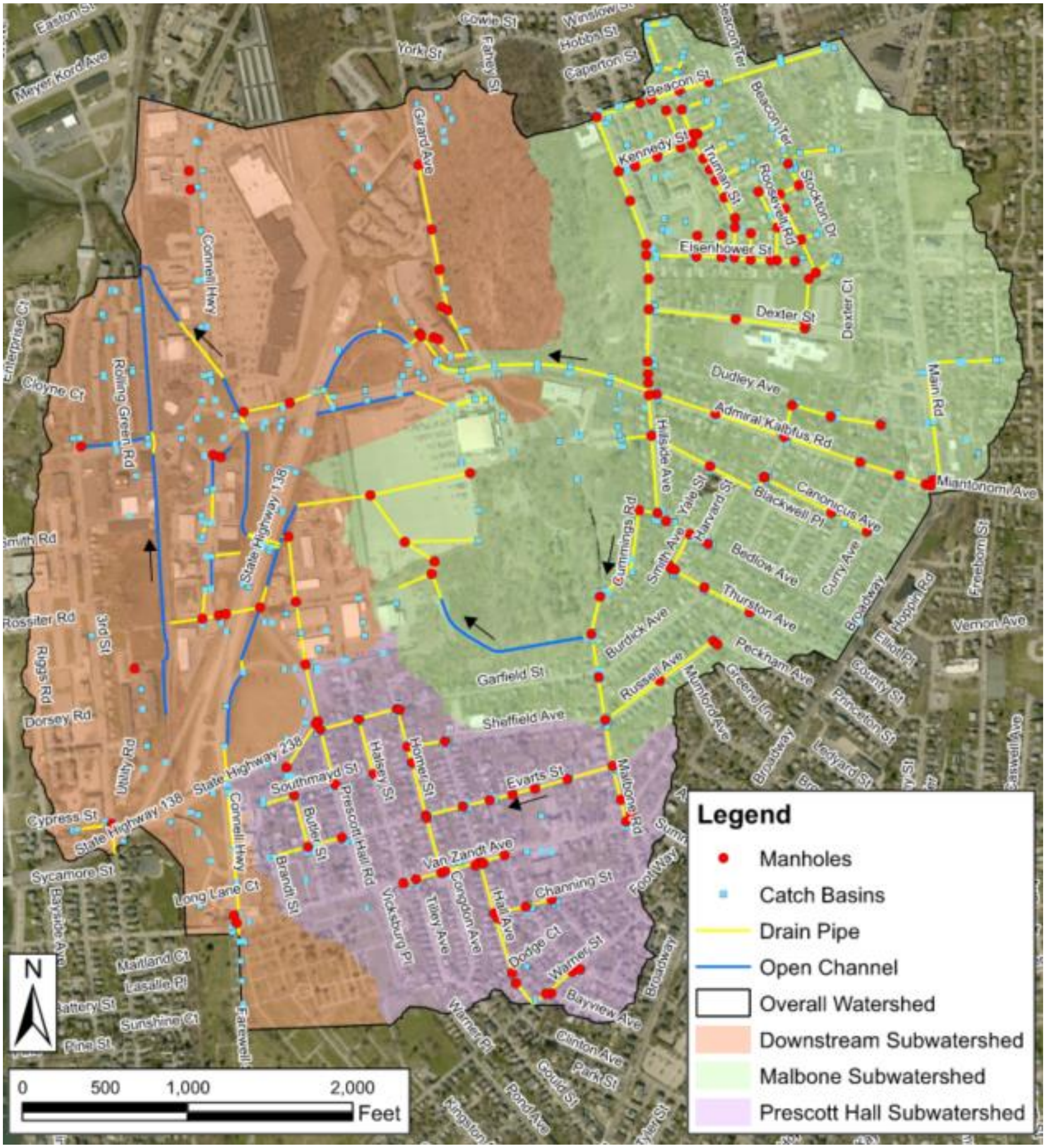

Figure 2-1. Elizabeth Brook Watershed Map

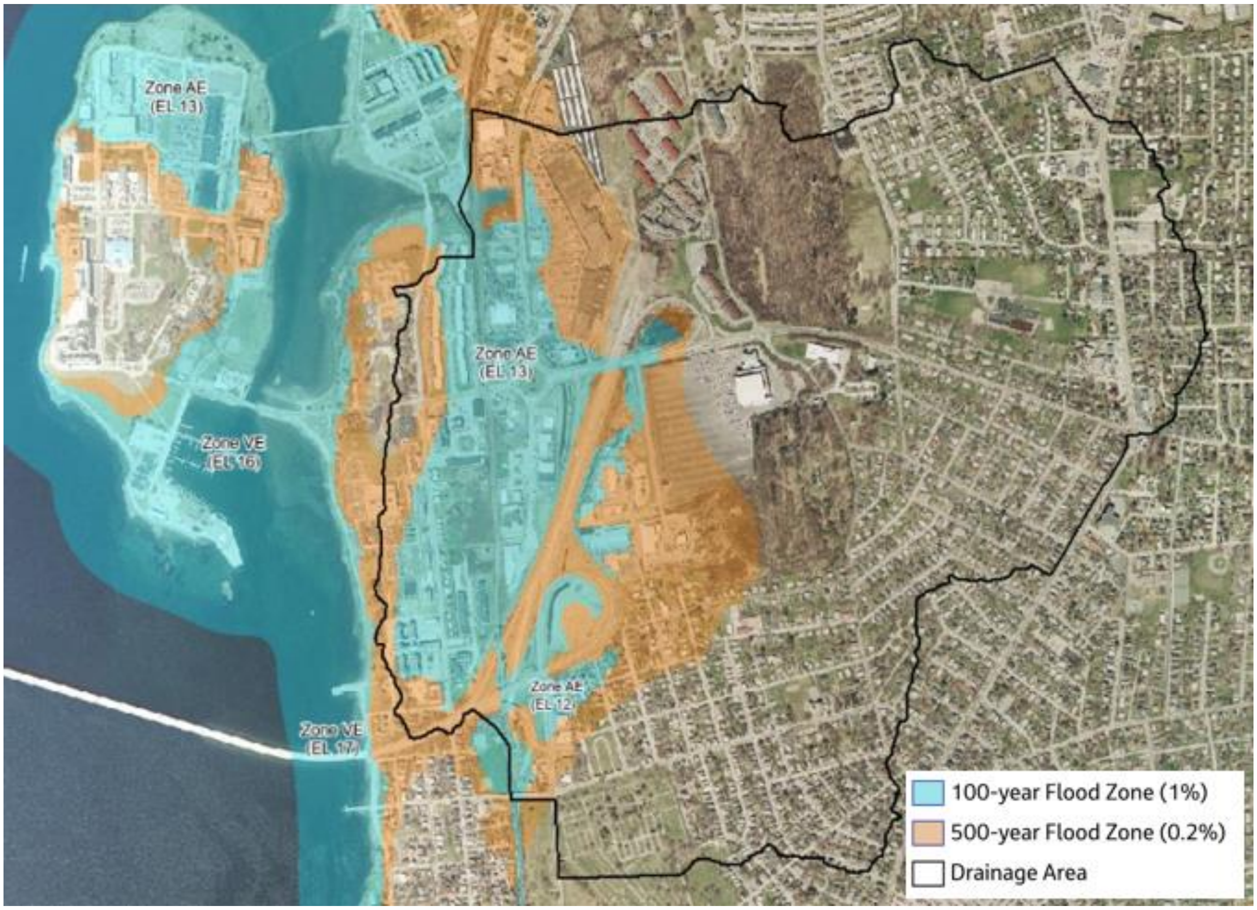

Figure 2-2. FEMA Flood Zone Boundaries

2.2 History of Studies in the Watershed

During the summer of 2012 a series of intense thunderstorms occurred on July 28th, August 10th, and August 15th. During these events, the Malbone and Prescott Hall neighborhoods experienced significant flooding. In response, the City's Department of Utilities initiated several drainage studies over a 2-year period.

The initial study focused on the Malbone subwatershed, and the results were documented in the technical memorandum: *Drainage Investigation and Flooding Analysis for Malbone Road* (CH2M HILL, June 2013). An additional study was performed on the Prescott Hall subwatershed in 2014 and flood mitigation alternatives were detailed in the draft technical memorandum: *Drainage Investigation and Flooding Analysis for Prescott Hall* (CH2M HILL, July 2014), provided in **Appendix A**. Lastly, a supplemental evaluation of mitigation alternatives was conducted and documented in a technical memorandum titled *Additional Stormwater Management Options for the Malbone Watershed* (CH2M HILL, September 2014). The various studies revealed potential causes of flooding within the watershed, as well as potential mitigation alternatives to reduce frequency and depth of flooding.

Investigation of the drainage infrastructure downstream of Prescott Hall in the 2014 study indicated that the size and condition of the culverts and open channels contributed to the observed backwater conditions. Photographs taken during field investigations in 2014 are provided in Figure 2-3.

Figure 2-3. RIDOT Open Channels and Culverts Along JT Connell Highway ***(photos taken in January 2014)***

Mitigation alternatives identified in the 2014 study upstream of Prescott Hall included:

- Implementation green infrastructure
- Increasing the size of and adding new storm drains
- Implementation of stormwater detention facilities

Mitigation alternatives identified in the 2014 study downstream of Prescott Hall included:

- Removing sediments and debris from downstream channels
- Increasing the size of some open channels
- Increasing the size of existing culverts
- Coordination with RIDOT and the Navy for potential improvements to non-City owned infrastructure

Since 2014, several maintenance activities and infrastructure improvements have been completed and additional improvements are planned. The City inspected and cleaned the Malbone Channel and the associated storm drains. Further, RIDOT initiated design and construction of the Pell Bridge Project. The Pell Bridge Project includes improvements that will impact critical components of the drainage system downstream of the Prescott Hall and Malbone subwatersheds. The Prescott Hall neighborhood also lies directly adjacent to the new roadway alignment being constructed in the Pell Bridge Project, which is planned to extend along Halsey Street from the existing S.R. 238 to Admiral Kalbfus Road.

While several improvements have been performed since 2014, flooding remains an issue in the Prescott Hall neighborhood. In response, the City commissioned this study to update previous studies with system maintenance and improvement projects completed since 2014, including the Pell Bridge Project, and to identify additional measures required to improve drainage system performance.

2.3 Existing Stormwater Infrastructure

The stormwater infrastructure within the watershed consists of approximately 8.5 miles of storm drains and 1.5 miles of open conveyance channels, owned by the City, the State, and private entities. Figure 2-4 displays the current drainage infrastructure in the watershed, color-coded by ownership.

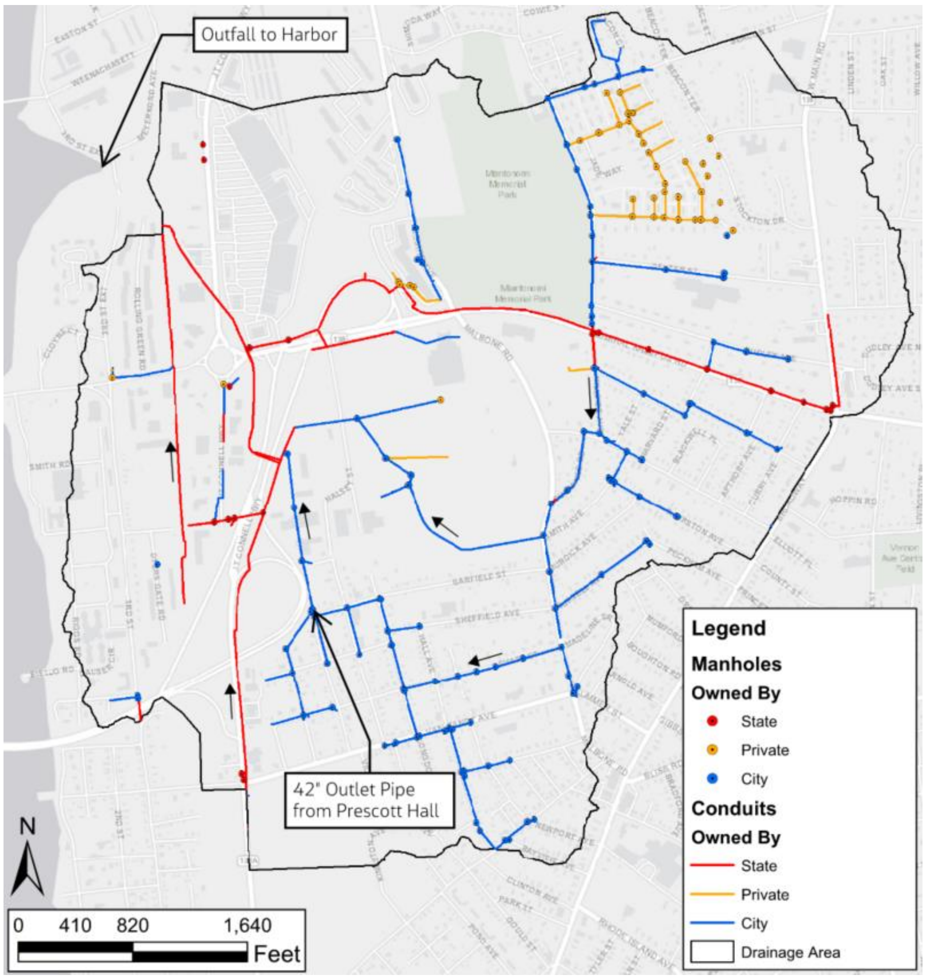

Figure 2-4. Elizabeth Brook Watershed Drainage Infrastructure by Ownership

The existing storm drains within the watershed range in diameter from 8-inches to 60-inches and vary in material between Cast Iron, Clay, Concrete, Ductile Iron, HDPE, PVC, among others. Currently, stormwater exits the Prescott Hall neighborhood through a single 42-inch concrete pipe, which conveys flow to a series of open channels and culverts owned by RIDOT that eventually outfall to Newport Harbor. Most of the City's storm drainage infrastructure in the watershed was designed more than 50 years ago. Due to increased populations, urbanization, and climate change, the existing infrastructure is generally undersized for current conditions.

The City owns and maintains one drainage channel in the watershed, the Malbone Channel (see Figure 2-5). The channel is approximately 1,000 feet long with a bottom width of 6-feet and 1:1 side slope.

Figure 2-5. City-Owned and Maintained Malbone Channel ***(photo taken in February 2022)***

The remaining channels in the watershed are grass-lined and are owned and maintained by RIDOT. A description of the channels and associated culverts follows.

- Channels extend along the existing S.R. 238, JT Connell Highway, and the east side of the railroad
- Total length of approximately 6,540-feet
- Bottom widths range from 6-feet to 25-feet
- Typical 3:1 side slope
- Channels are connected by culverts ranging in diameters from 2-feet to 5-feet at all road and railroad crossings

Downstream of the watershed, west of the railroad, all flow combines to a single drainage channel that outfalls to Newport Harbor. The section of the channel between the railroad and the harbor is owned and maintained by the Navy. The outfall, in its current condition is located below Mean Sea Level (MSL) and does not have a tide gate.

3. Data Collection and Field Investigations

The first step in the study was to collect all required relevant information, primarily data related to the existing drainage system and past flooding events. This data was provided by the City and supported by data collected in the field. Supporting data was also collected from key stakeholders as discussed in Section 4.

3.1 Initial Data Collection and Review

Data from the 2014 drainage study, including the 1D hydraulic model of the watershed, was reviewed in depth. Critical information related to the existing collection system was provided by the City, including GIS records for the storm drain system and sanitary sewer systems. Record drawings for recent City stormwater capital improvement projects in the study area were also reviewed to confirm GIS records were up to date. Critical information on the stormwater drainage system, such as pipe diameter, pipe material, invert elevation, and channel dimensions were all reviewed and compared between the hydraulic model and City GIS. Data gaps were identified and flagged for further field investigation. Data related to the State's storm drainage system was also collected and reviewed.

Rainfall data was collected for Tropical Storm Ida for use in the hydraulic evaluations. 15-minute precipitation data was provided by the City for the rain gage located at the Water Pollution Control Plant (WPCP) for September 1-4, 2021.

Flow data collected by a level sensor located in sanitary sewer manhole SMH-044-32 located at the intersection of Southmayd Street and Butler Street was also provided by the City. Level sensor data was reviewed to confirm that the flooding problem in Prescott Hall is isolated to drainage system deficiencies and not sanitary sewer backups. Review of the level sensor data information between 12/21/2021 and 4/26/2022 indicated that no sanitary sewer overflows (SSOs) occurred at this location since the meter was installed.

3.2 Field Investigations

To verify the current state and condition of the storm drain system, a field investigation was performed on February 24, 2022. The field investigation included a walking survey primarily focused on documentation of the items below.

- Gutter conditions in locations where significant bypass flows have been observed during past events, including the intersection of Bedlow Avenue at Cummings Road and Smith Avenue, and the intersection of Malbone Road at Burdick Avenue, Russell Avenue, Garfield Street, Sheffield Street, and Evarts Street.
- Current condition (i.e., vegetation and sediment depths) of open channels and culverts from Malbone Road to JT Connell Highway and to the system discharge point at the harbor, as permitted by property owners.
- Verification of 2014 study assumptions related to drainage area subcatchments and overland flow paths.
- Verification of City GIS data, at discreet locations, including storm drainage system locations and components.

Field observations were utilized to confirm and update previous assumptions from the 2014 study related to overland flow paths, subcatchment boundaries, and drainage system components. Further, condition assessments of the open channels and culverts, including approximate measurement of vegetation and sediment accumulation, were used to update roughness coefficients and simulate culvert sediment depth in the hydraulic model.

Figure 3-1 includes photographs of the RIDOT drainage channels and culverts downstream of the Prescott Hall neighborhood taken during the field reconnaissance in February 2022. Similar to findings in the 2014 study, the existing State-owned channels and culverts downstream of Prescott Hall were observed to be in poor condition and required maintenance. Specifically, open channels were overgrown with weeds and contained standing water. In some areas, culverts were observed to be blocked by sediment for as much as 60% of its respective diameter. These conditions limit the conveyance capacity of the existing drainage system, impeding stormwater from reaching the harbor during and after storm events.

RIDOT confirmed during coordination meetings throughout the project that cleaning of these drainage channels and culverts will be completed as part of the Pell Bridge Project.

Additional field visits were also performed throughout the project to document the status of construction of the ongoing Pell Bridge Project and to check the condition of critical drainage infrastructure within and downstream of Prescott Hall. Photographs from various field visits are included in **Appendix B**.

Figure 3-1. State Open Channels and Culverts Along JT Connell Highway ***(photos taken in February 2022)***

4. Stakeholder Coordination

Coordination with stakeholders was maintained through a series of coordination meetings with RIDOT, public meetings, and surveys as described below.

4.1 Coordination with RIDOT

Coordination with RIDOT was critical to understanding the components and status of the ongoing Pell Bridge Project, specifically any impacts to critical drainage infrastructure downstream of the Prescott Hall neighborhood. RIDOT provided the City with the following documentation to support the ongoing drainage study:

- *Pell Bridge Approach Roads and Ramp Improvements Newport Side Final Construction Plans, Volume 1* (VHB, 2020a)
- *Pell Bridge Approach Roads and Ramp Improvements Newport Side Final Construction Plans, Volume 2* (VHB, 2020b)
- *Pell Bridge Approach and Ramp Improvements Stormwater Management Report* (VHB, 2021)
- *Reconstruction of Pell Bridge Approach (RI Contract 2000-EH-033): Floodplain Analysis and Delineation Technical Memorandum* (VHB, 2020c)
- *Reconstruction of the Pell Bridge Approaches Final Environmental Assessment* (RIDOT and FHWA, 2020)
- Computer-Aided Design (CAD) files for the Pell Bridge Project construction plans
- Summary of roughness coefficients used in the hydraulic model for the Pell Bridge Project (VHB, 2022)

The State's engineering consultant for the Pell Bridge Project, Vanasse Hangen Brustlin, Inc. (VHB) developed a hydrologic and hydraulic model to evaluate potential flooding impacts from the Pell Bridge Project. This is documented in the technical memorandum: *Reconstruction of Pell Bridge Approach (RI Contract 2000-EH-033): Floodplain Analysis and Delineation* (VHB, 2020c). As summarized in the memorandum, this model primarily studied the depth and extent of flooding for the stream associated with the downstream drainage channels and did not include a detailed analysis of the flooding extents in the upstream subwatersheds, such as Prescott Hall.

The State's model primarily evaluated the change in peak flows entering the drainage channels for a 100-year design storm. The model included reservoirs to simulate localized flooding in the Prescott Hall neighborhood, upstream of the Pell Bridge embankment, caused by the existing bridge embankment and the limited capacity of the existing 42-inch outlet pipe.

The State's model for the Pell Bridge Project was developed using the Hydrologic Engineering Center Hydraulic Modeling System (HEC-HMS) and evaluated using the Hydrologic Engineering Center River Analysis System (HEC-RAS), developed by the U.S. Army Corps of Engineers (USACE). HEC-RAS is generally best suited for riverine hydraulics and is not typically used in urban areas characterized by both open and closed conduit drainage systems, like the neighborhoods east of the Pell Bridge Project area.

Three coordination meetings were held with representatives from RIDOT and VHB. The goal of these meetings was to update RIDOT regarding the status of the City's study, receive updates concerning the ongoing construction of the Pell Bridge Project, and coordinate on potential improvements to drainage infrastructure in the watershed to help mitigate flooding impacts in the Prescott Hall neighborhood. A summary of the meetings is included below.

- The first coordination meeting was held on March 16, 2022. The focus of this meeting was to introduce the different parties (i.e., representatives from Jacobs, RIDOT, VHB, and the City), and to exchange information that would assist Jacobs over the course of the study, as well as RIDOT during the construction of the Pell Bridge Project.
- The second coordination meeting was held on July 19, 2022. Jacobs presented the methodology for development of the Baseline Conditions model and the initial model results. This resulted in a discussion regarding preliminary alternative sketches and any feasibility issues between the sketches and the Pell Bridge Project.
- The third coordination meeting was held on August 24, 2022. The recommended alternatives and model results were presented to RIDOT. During this meeting, RIDOT expressed support for adding some of the proposed improvements to the scope of the Pell Bridge Project. The selected improvements were required to mitigate the increase in flood volumes that are projected to occur following completion of Pell Bridge construction project. Following this meeting, Jacobs shared with RIDOT and VHB the results of the phased implementation models that illustrated how flooding would be impacted at the different stages of construction of the various alternatives.

4.2 Public Involvement

This study directly impacts the local residents and as such, it was critical that a public involvement program be included to solicit feedback from key stakeholders and provide continuous updates to the public as the project progressed. Information was collected from the public through multiple methods including emails, public surveys, and a series of public meetings.

A survey was issued prior to the first public meeting to determine statistics regarding interested stakeholders and observed flooding conditions. A total of 14 responses were received for the first public survey. The results indicated that all survey respondents were residents or homeowners and 50% of survey respondents have lived in the neighborhood for over 20 years. All respondents reported to have observed basement flooding and street flooding in the past and most respondents indicated that flooding has worsened since 2012. Questions were also asked regarding historic frequency of flooding and the depth of flooding observed for Tropical Storm Ida. Sample survey results for Survey #1 are presented in Figure 4-1.

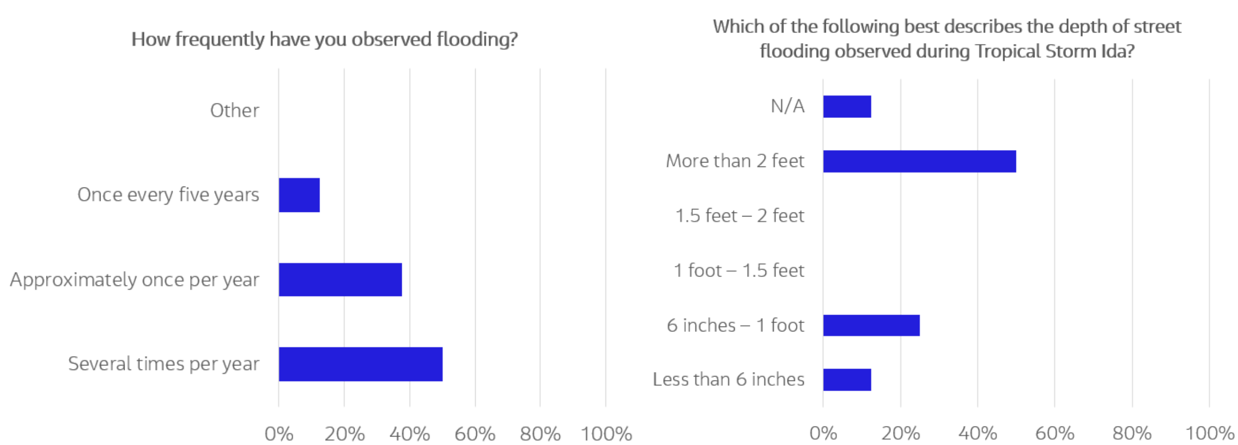

Figure 4-1. Example of Results of Public Survey #1

Three public meetings were held to update residents of the Prescott Hall neighborhood, key City personnel, and other concerned citizens. A summary of the public meetings is included below.

- The first public meeting was held on May 12, 2022. This introductory meeting covered the history of the watershed and flooding issues, the scope of the current study, and preliminary modeling results. Several homeowners in the study area spoke regarding their experiences with flooding. Several residents also provided information including photos, videos, and recorded flood depths with locations and dates, which was requested to assist with the study and validation of the hydraulic model. Examples of the information provided by the public that was used to support the study can be found in **Appendix B**.

- The second public meeting was held on June 23, 2022. During this meeting several comments from the homeowners from the first public meeting were addressed, hydraulic modeling results for the model validation and Baseline Conditions model were presented, and a broad overview of potential mitigation practices were presented. The presentation also included an overview of the alternatives evaluation process. The discussion with the residents at the meeting resulted in several additional alternatives that were added for consideration to the evaluation process. The residents were also encouraged to participate in a second public survey to rank various evaluation criteria to assist in the alternatives evaluation process.

- The third and final public workshop was held on September 15, 2022, and included a presentation of the recommended mitigation measures, implementation plan, associated modeling results, and conceptual construction cost estimates. The workshop also included a discussion regarding climate change and adaptation measures for residents located within the FEMA flood plain to consider.

5. Stormwater Hydraulic Model

A stormwater hydraulic model is a tool that estimates the extent and severity of flooding in a study area and is useful in the development and screening of potential flood mitigation alternatives. Three model scenarios were developed as part of this study, as summarized below:

- ***Existing Conditions:*** Model previously developed in 2014, updated based on current City GIS and field investigations, that characterizes existing surface runoff and flooding based on existing storm drain infrastructure and flow paths.
- ***Baseline Conditions:*** Model that reflects existing conditions, with the implementation of the Pell Bridge Project, including proposed drainage improvements and topography changes.
- ***Proposed Conditions:*** Model that reflects the baseline conditions, with the implementation of drainage improvements (i.e., flood mitigation alternatives) to meet the desired level of flood reduction.

This section describes the processes taken to develop the model scenarios, as well as modeling results for the Existing Conditions and Baseline Conditions models. Modeling results for the Proposed Conditions model are provided in Section 7.3. **Appendix C** and **Appendix D** contain comprehensive tables displaying results and input values from all scenarios, respectively. Further, additional technical documentation concerning the development of the hydraulic models can be found in **Appendix E.**

5.1 Design Criteria

To accurately compare the different model scenarios, certain standards of design are first established. Most importantly, this includes rainfall data used to simulate a storm across the watershed, and the tidal influences at the outfall to the harbor.

The Rhode Island Stormwater Design and Installation Standards Manual (RISDISM) indicates designs for new development projects must adequately convey stormwater for the 10-year, 24-hour Type III design storm. Although conveyance of the 10-year design storm is not required for retrofits to existing infrastructure, the 10-year design standard was set as an objective for the Prescott Hall study. The design storm was built using the Soil Conservation Storm (SCS) Type III method, with a 6-minute intensity interval. The total rainfall depth used for the design storm was 5.03 inches, which was obtained through the NOAA Precipitation Frequency Data Server (PFDS) for Newport, RI.

The hydraulic evaluations performed by RIDOT for the Pell Bridge Project used the 100-year design storm to estimate the 100-year flood elevations within the project area. The primary design criteria used for the State's project is to safely and non-erosively convey flow for a 100-year event.

Previous analysis of a storm on July 14, 2020, indicated this event was comparable to a 10-year return period. Therefore, the tidal data from that event was utilized as the downstream boundary condition for the 10-year, 24-hour design storm. To produce a conservative design, the tidal data was input so that the peak high tide and peak precipitation intensity for the design storm occurred at the same time. This can lead to a more intense and severe flooding event, therefore reflects a 'worst-case scenario' for the 10-year, 24-hour design storm. Figure 5-1 below illustrates how the tide height and peak rainfall intensity occur simultaneously around 12:00 PM for the design storm event.

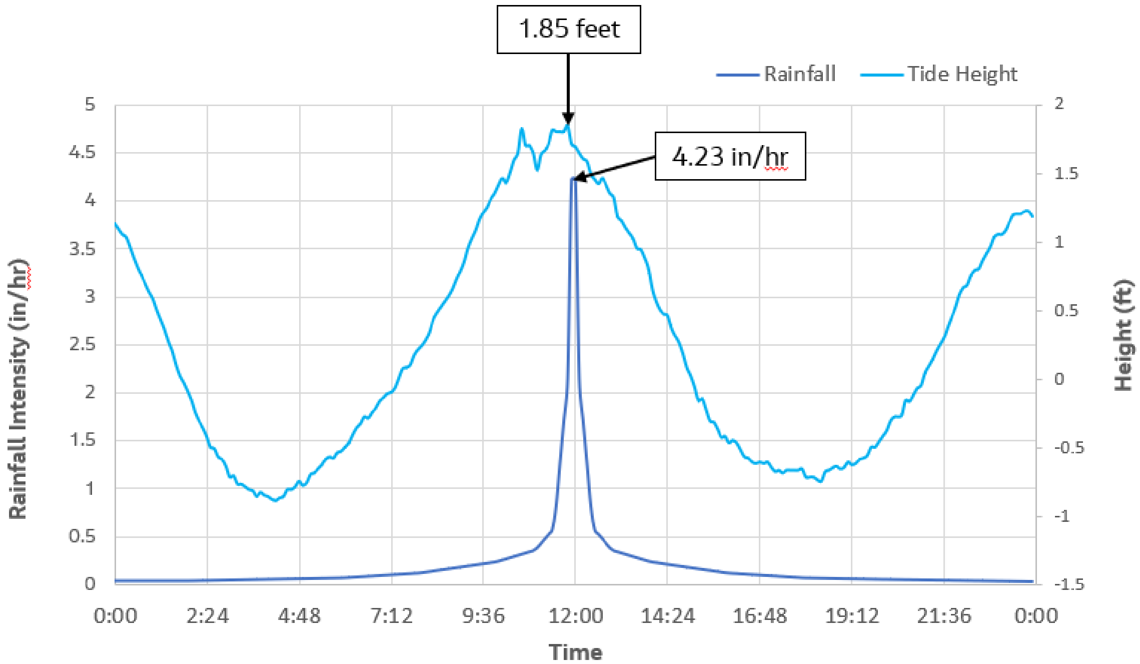

Figure 5-1. 10-year, 24-hour Design Storm Precipitation Intensity and Tidal Data

5.2 Existing Conditions Model Development

The 2014 drainage study included development of a 1D hydraulic model of the watershed area, which was used as the basis for development of the updated model for the current study. The original model was created in the U.S. Environmental Protection Agency (USEPA) Stormwater Management Model (SWMM) version 5.0.022, in the coordinate system of NAD83 Rhode Island ftUS (3438) and utilizes the North American Vertical Datum of 1988 (NAVD88). The model was then converted to an updated version of PCSWMM, PCSWMM 7.3.3095, which utilizes SWMM version 5.1.015.

Subcatchment delineations and properties were inherited from work performed during the 2014 drainage study and modified as appropriate based on current data. Sources used for the subcatchment development in the 2014 study include: LiDAR Digital Elevation Model (DEM) data, which was used to delineate the subcatchment areas and determine slope; Rhode Island Geographic Information System (RIGIS) impervious raster data, which was used to determine subcatchment imperviousness; and the Natural Resources Conservation Service's (NRCS) Web Soil Survey (WSS) for Rhode Island, which was used to determine soil characteristics and infiltration parameters.

After the model was converted to the updated SWMM engine and verified to perform at a comparable level to when it was developed, the model was updated to reflect current conditions based on findings from the data collection and field investigation task. Updates to the model that occurred as a result of the data collection and field investigations included:

- updates to subcatchment boundaries,
- updates to storm drain infrastructure to reflect recent infrastructure improvements,
- added sections of the RIDOT storm drain network not included in the 2014 model (e.g., along the railroad, Admiral Kalbfus Road, and JT Connell Highway),
- increased initial depths in manholes,
- modified sediment build-up levels in culverts,

- decreased channel widths, and
- increased channel roughness values.

The updated 1D model was then used as the foundation for the 2D model. The benefits of a 2D model include provisions to address the large volumes of overland flow observed during the recent flooding events. The 2D models provide enhanced understanding of overland flow paths, areas where flooding occurs, visualization of spread, and increased animation options. 2D models are particularly useful when considering a system where storm events far exceed the capacity of storm drainage infrastructure, as is true in the Malbone and Prescott Hall subwatersheds.

Development of the 2D mesh required data from the RIGIS website as listed below.

- DEM of the watershed and surrounding area from the 2011 Statewide LiDAR database
- Building Footprints from the University of Rhode Island Environmental Data Center
- RIDOT Roads (2016) from the University of Rhode Island Environmental Data Center
- Land Use and Land Cover (2011) from the University of Rhode Island Environmental Data Center

The Roads and Land Use and Land Cover data was used to generate characteristics for different parts of the 2D mesh. Figure 5-2 displays the mesh characteristics that differ based on land use for the Existing Conditions model. Resolution refers to the size of the 2D cells, a smaller resolution will allow for higher detail. The roadways were given a smaller resolution as they tend to convey flow similar to streams during flooding events and require higher focus due to safety concerns. Roughness values were assigned based on review of the land use cover data, as well as review of the area using aerial imagery.

To allow for flow to move between the 2D mesh and the pipe network, orifices were used to simulate the catch basins in the drainage system. The orifices were sized in a manner that properly represents a catch basin's ability to capture flow. Following a review of standard catch basin sizes in Rhode Island, it was decided to represent a singular catch basin as having a width of 3-feet and a height of 2-feet.

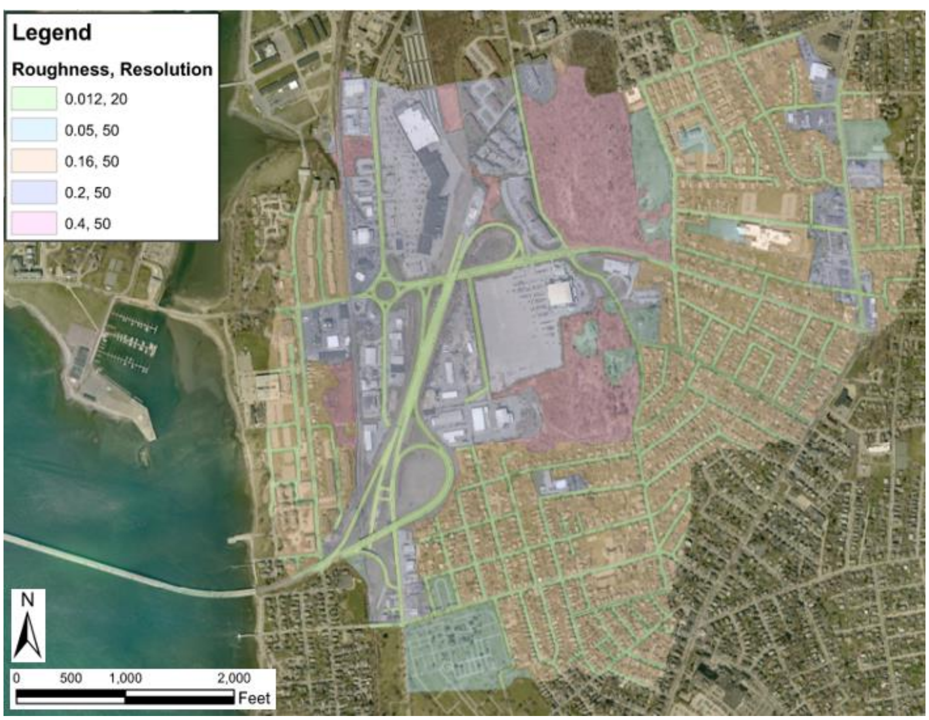

Figure 5-2. Existing Conditions Model 2D Mesh Characteristics

5.3 Existing Conditions Model Validation

Following the development of the Existing Conditions model, previous storm events were used to validate the model. Model validation is the process by which model results or model outputs (i.e., flood depths, durations, etc.) are compared to real-world observations to compare the model's correspondence with reality. The goal of the validation process is to verify the accuracy of the model. This is an important step in the study as it confirms the model is a reliable tool for estimating the expected performance of the flood mitigation alternatives.

To support the validation effort, photos, videos, and information from previous flooding events were requested from the public. The Existing Conditions model was verified at multiple points in the model using information collected from the public and information gathered during the 2014 drainage study. Three storm events were used for model validation: the August 15, 2012, storm event; a storm event on July 14, 2020; and Tropical Storm Ida on September 1 – 2, 2021.

Precipitation data for the 2012 storm events was included in the original 2014 model files. Precipitation data for the July 14, 2020 event was accessed from the National Oceanic and Atmospheric Administration (NOAA) Time Series Viewer for the Newport, Newport State Airport (KUUU) weather station. Precipitation data for Tropical Storm Ida was provided by the City from the rain gauge at the City's WPCP. Tidal data for all storms was accessed from NOAA's tides and current data for station number 8452660 in Newport, Rhode Island using NAVD88.

Results from the Tropical Storm Ida validation efforts are presented in Table 5-1. An additional 11 validation points for this storm exist, however, photos were not included with the reported depths for those points and therefore they are excluded from the table below but can be found in **Appendix E**. Results from the Tropical Storm Ida validation effort, as well as validation for the two 2012 and 2020 storms, indicated the model performs comparatively with actual conditions.

Table 5-1. Tropical Storm Ida Validation Results

Location	Reported Depth (ft)	Peak Model Depth (ft)
34 Prescott Hall Rd	1.67 - 2.50	1.50 – 2.37
79 Garfield St	1.83	1.74 – 2.38
Bayside Village @ Third St	0.33*	0.15 – 0.66
JT Connell Hwy Rotary, Looking South	0.50*	1.46 – 1.92
24 Butler St	0.50 – 0.67	0.46 – 1.11
50 Halsey St	1.50	0.40 – 0.91

*Reported depths were from 10 AM on 9/2/2021, which was approximately 5 hours after the time of peak depth.

5.4 Baseline Conditions Model Development

Construction of RIDOT's Pell Bridge Project is currently ongoing. A rendering of the anticipated final project can be found in Figure 5-3. Since this project incorporates considerable changes to the watershed's topography and downstream drainage infrastructure, a Baseline Conditions model was developed to reflect the conditions after the Pell Bridge Project is completed. The Baseline Conditions model was developed by modifying the Existing Conditions model to incorporate the proposed improvements and grading changes associated with the Pell Bridge Project.

Figure 5-3. RIDOT Pell Bridge Interchange Improvement Rendering

Source: RIDOT, 2022a

Construction plans provided by RIDOT for the project, *Pell Bridge Approach Roads and Ramp Improvements Newport Side* (VHB, 2020), were reviewed to identify modifications to existing stormwater infrastructure and new stormwater infrastructure that will be installed as a result of the project. These changes were added to the model.

The construction plans did not include increasing the size of the storm drains that convey flows from the Malbone or Prescott Hall neighborhoods through the roadway embankment; However, the plans did indicate that the open channels and culverts downstream of the embankment will be cleaned and restored as a part of the project. RIDOT also confirmed all open channels in the watershed not included in the plans would undergo restoration. As a result, attributes in the model for these open channels and culverts were modified to represent cleaned conditions; this included decreasing of roughness coefficients, increasing channel capacity, and removal of built-up sediments.

CAD files for the project were used to address the proposed grading changes for the Pell Bridge Project area. This data was combined with the existing conditions elevation data to make a DEM of the watershed for baseline conditions. The baseline conditions DEM, new roadway alignments, altered building footprint data, and the land use and land cover data was then used to create a baseline conditions 2D mesh. Figure 5-4 below displays the mesh characteristics that differ based on land use for the Baseline Conditions model.

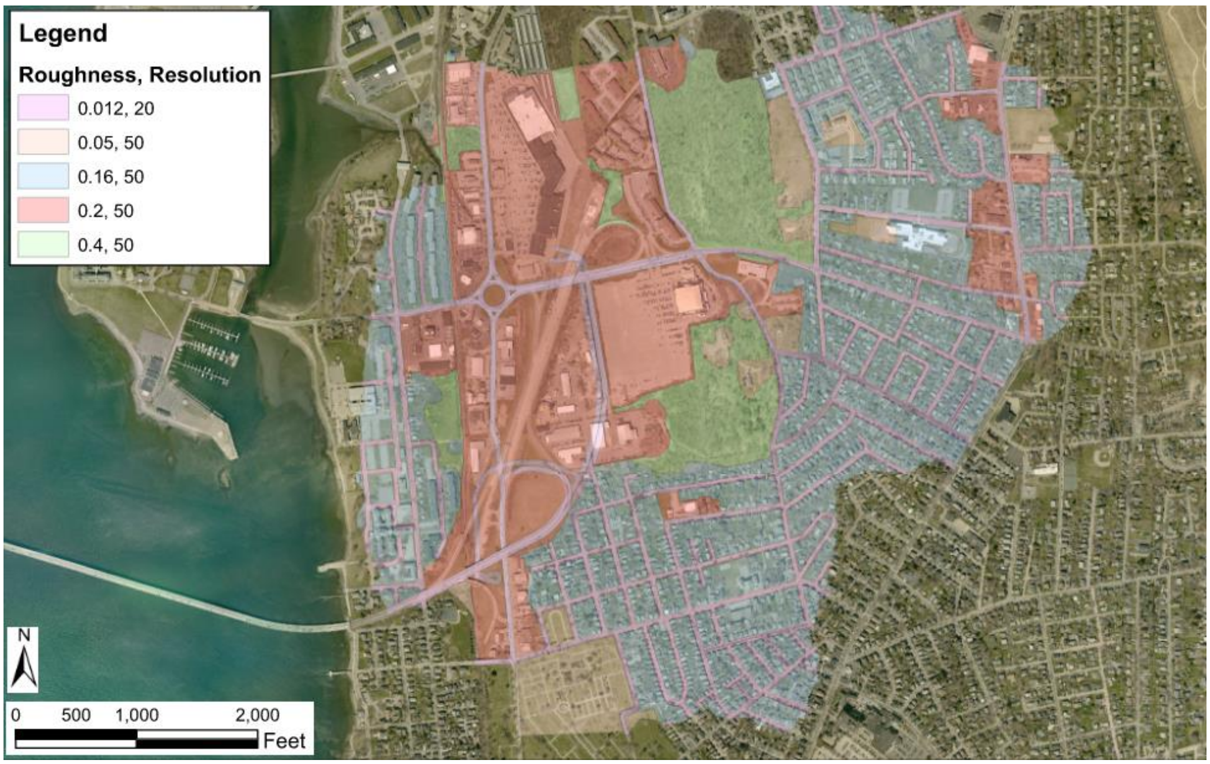

Figure 5-4. Baseline Conditions Model 2D Mesh Characteristics

5.5 Existing and Baseline Conditions Model Results

The 10-year, 24-hour design storm was run in the Existing Conditions and Baseline Conditions models to determine the total estimated volume of flooding. Running the same storm in the Existing and Baseline Conditions models allows for prediction of the change in flooding following the construction of the Pell Bridge Project. Table 5-2 summarizes the flood volumes in both model scenarios for the 10-year, 24-hour design storm.

Table 5-2. 10-year, 24-hour Design Storm Model Results

Model Scenario	Total Flood Volume (MG)	Prescott Hall Neighborhood Flood Volume (MG)	Depth of Flooding at Prescott Hall Rd and Garfield St (Ft)
Existing Conditions	31.8	3.92	2.95
Baseline Conditions	34.6	4.67	3.72

As shown in Table 5-2, overall flood volumes for the 10-year, 24-hour design storm increased by approximately 8% from Existing Conditions to Baseline Conditions (i.e., after the Pell Bridge Project improvements were incorporated into the model).

A visual representation of the difference in maximum cell depths (i.e., flood depth) between the two model scenarios is shown in Figure 5-5. Areas shown in green are where flood depths decreased following the addition of the Pell Bridge Project, areas in red, orange, and yellow show areas where flood depths increased.

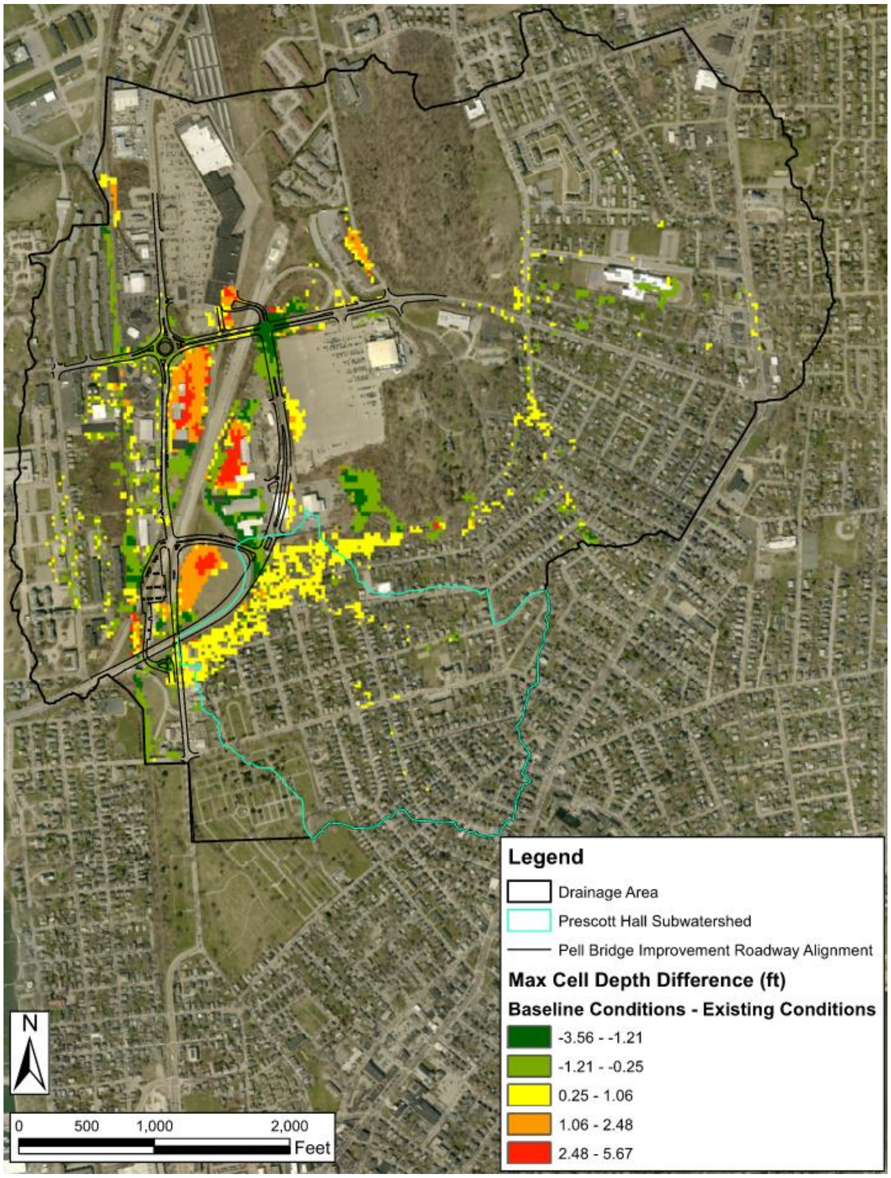

Figure 5-5. Difference Between Maximum Cell Depths Between Existing and Baseline Conditions

The model predicts the Prescott Hall subwatershed will experience increased flood depths between 3-inches to 1-foot in the area adjacent to the new Pell Bridge roadway alignment. Increases in flooding can be attributed to changes in topography, new roadway alignments restricting existing overland flow paths, and the addition of a new retaining wall being constructed adjacent to the new off-ramp near Prescott Hall.

The total volume of flooding in the Baseline Conditions model for the 10-year, 24-hour design storm was subsequently used as the target flood reduction for Phase 1 improvements in the alternatives analysis.

6. Mitigation Alternatives

6.1 Preliminary Alternative Concepts

The objective of this study is to alleviate flooding in the Prescott Hall neighborhood for the 10-year, 24-hour design storm. In order to achieve this, preliminary mitigation alternatives were developed and screened for further evaluation. The list of potential mitigation alternatives included:

- Measures recommended in the previous 2013-2014 studies
- Measures to reduce the volumes of flow from the Malbone subwatershed to the Prescott Hall subwatershed
- Measures to increase the capacity downstream of Prescott Hall
- Measures to mitigate peak discharge rates
- Measures to address observations from the updated models (e.g., existing bottlenecks and problem flooding areas including the Garfield Street/Prescott Hall Road intersection and the southwest corner of Southmayd Street)
- Measures aligned to the updated Pell Bridge ramp alignment, other upcoming development projects, and new open space

Discussions with RIDOT indicated that storage (i.e., detention) alternatives may be more feasible to incorporate into the State's ongoing Pell Bridge Project. Upsizing the State's drainage infrastructure downstream of Prescott Hall, specifically the roadway and railroad culverts, would likely have significant permitting and schedule implications and therefore are difficult to incorporate into the current project. Increasing conveyance capacity from Prescott Hall to the harbor would also increase peak discharge rates significantly. Providing a combination of storage and infrastructure upgrades was therefore evaluated to better match peak discharge rates for existing conditions downstream of the City's property.

The conceptual designs identified for this study focused on reducing the volume of stormwater reaching the Prescott Hall area and increasing conveyance to the proposed detention areas. This included creating new avenues for stormwater to leave the Prescott Hall neighborhood.

Figure 6-1, as well as Table 6-1, illustrate the 20 preliminary mitigation concepts considered during the alternatives screening process.

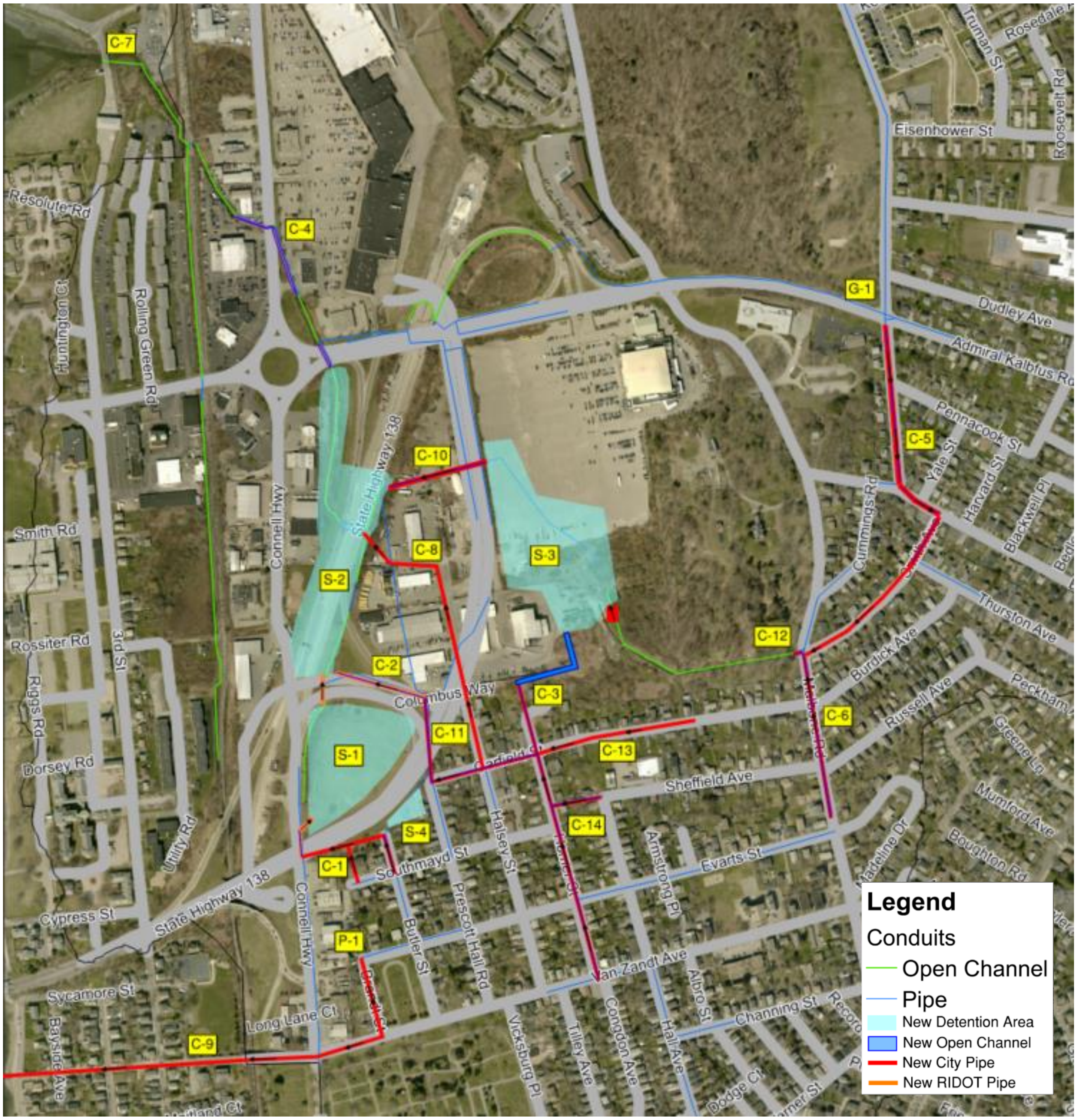

Figure 6-1. Preliminary Mitigation Concepts Considered Sketch

Table 6-1. Preliminary Mitigation Concepts Considered Sketch Key

ID	Alternative
S-1	Detention Area 1
S-2	Detention Area 2
S-3	Detention Area 3
S-4	Detention Area 4
G-1	Green Infrastructure Upstream of Watershed
C-1	Drainage Improvements on Butler/Southmayd and redirect flow to RIDOT's drain on JT Connell Hwy
C-2	Redirect Outlet from Prescott Hall to New Detention Area (S-2)
C-3	New Pipe/Channel from Garfield to New Detention Area (S-3)
C-4	Upgrade RIDOT's Existing Twin 5-ft Culverts to Twin 8-ft Culverts
C-5	Drainage Improvements on Hillside/Smith
C-6	Drainage Improvements on Malbone
C-7	Install a Tide Gate
C-8	Halsey Street Box Culvert
C-9	New Outfall West of Van Zandt
C-10	New Box Culvert from Casino Parking Lot
C-11	Line 42-inch Outlet Pipe from Prescott Hall
C-12	Malbone Channel Box Culvert
C-13	Drainage Improvements on Garfield
C-14	Drainage Improvements on Homer/Sheffield
P-1	Pump Station

6.2 Alternatives Screening Process

The 20 preliminary alternative concepts were then screened using a multi-objectional decision analysis (MODA) approach. This process assists with identifying solutions that address a broad range of constraints and community priorities. The steps that were followed as part of this process are described below.

Define Evaluation Criteria: The first step in the process was to identify priorities for the project and the evaluation of control options. An initial list of alternative evaluation criteria (i.e., project priorities and constraints) was developed and presented at the second public workshop. The list was then modified based on input received from stakeholders. The final list of evaluation criteria is included in Table 6-2.

Weight Evaluation Criteria: Next, a weighting was assigned to each evaluation criteria to represent the relative importance of each factor. These weightings were collected based on feedback provided in the second public survey. In this survey, stakeholders were asked to rank each criterion using a scale of 1-10, with 1 being of least importance and 10 being of greatest importance. Weightings were then developed based on the average of all survey responses received. The results from the second public survey and relative prioritization of evaluation criteria, is provided numerically in Table 6-2 and graphically in Figure 6-2.

Table 6-2. Evaluation Criteria Weightings from Public Survey #2

Category	Criteria	Average Weighting
State Standards Stormwater Design	Prevent adverse impacts downstream	9.27
	Include provisions for climate change	8.87
	Reduce permitting impacts	7.13
Social/Community Impacts	Improve water quality	8.80
	Maintain accessible open space	8.67
	Reduce duration of schedule	7.87
	Reduce disruption during construction	7.87
	Reduce impacts to private property	7.93
Performance Improvements	Reduce depth of flooding	9.60
	Reduce frequency of flooding	9.60
	Reduce duration of flooding	9.07
Costs/Affordability	Reduce long-term O&M costs	7.73
	Reduce capital costs	7.13
Reduce Coordination/ Reliance on External Partners	Reduce reliance on external partners	7.40

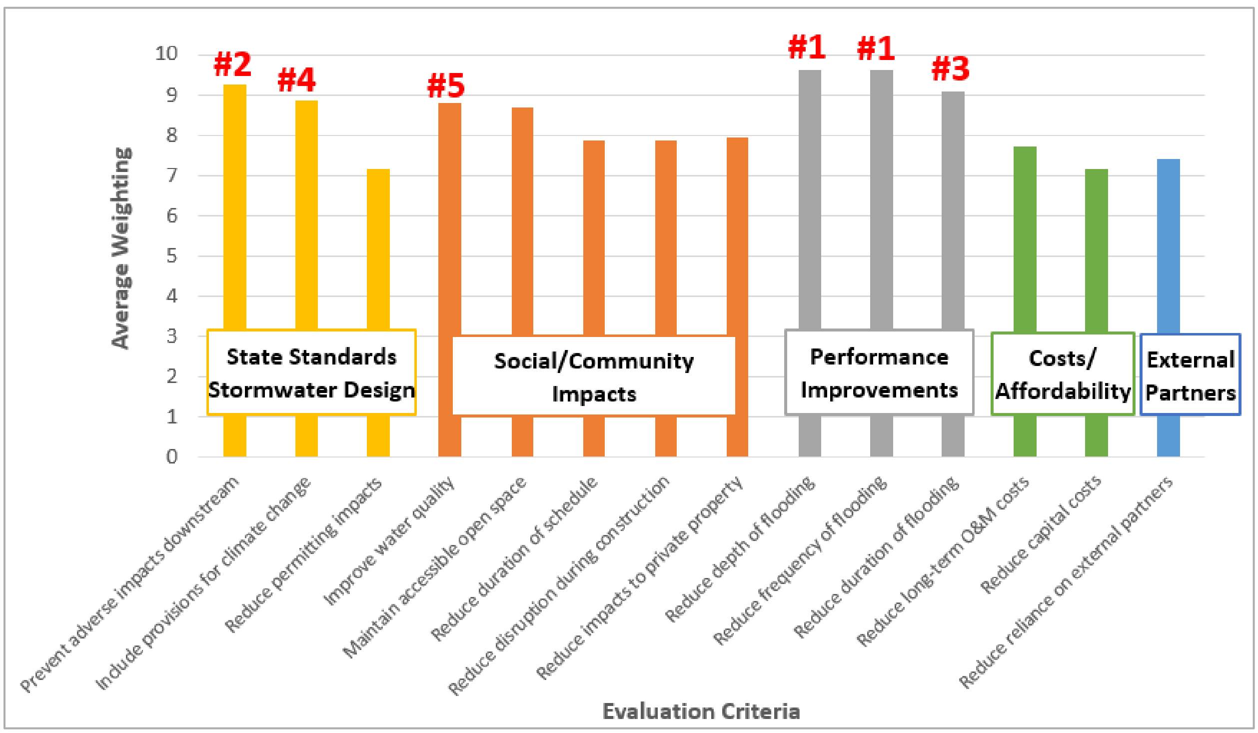

Figure 6-2. Evaluation Criteria Weightings from Public Survey #2

Define Scoring System: To determine which stormwater control options were most likely to achieve the project goals, each alternative was rated from 0-10 for its ability to address the evaluation criteria. For example, a 0 would be assigned to an alternative that is least favorable to achieve the evaluation criteria, whereas a 10 would be assigned to an alternative that is most favorable to achieve the criteria. A description of the qualitative rating system is provided below.

- ***Excellent (10):*** Most favorable – indicating highest possible rating compared to all other available alternatives
- ***Very good (7-9):*** Favorable – indicating a better than average rating, compared to all other available alternatives; but not the best possible
- ***Good (4-6):*** Moderate or average – indicating a mid-range rating compared to all other available alternatives.
- ***Poor (1-3):*** Unfavorable – indicating a worse than average rating, compared to other available alternatives, but not the worst possible.
- ***Adverse (0):*** Most unfavorable – indicating the lowest possible rating compared to all other available alternatives.

Score and Rank Alternatives: A final score was then generated for each alternative by multiplying the stakeholder weightings for each evaluation criteria by the qualitative rating. The total score for the alternative was determined by taking the sum of the scores for each evaluation criteria.

The results for the alternatives evaluation are shown in Figure 6-3. Table 6-1 contains the key to the alternative ID's. More than half of the initial 20 alternative concepts were selected for further evaluation in the hydraulic model. The alternatives that scored the highest include:

- lining the 42-inch outlet from Prescott Hall (C-11),
- redirecting the outlet from Prescott Hall to a new detention area (C-2),
- detention area 1 (S-1),
- detention area 3 (S-3),
- drainage improvements on Butler Street and Southmayd Street (C-1), and
- detention area 2 (S-2).

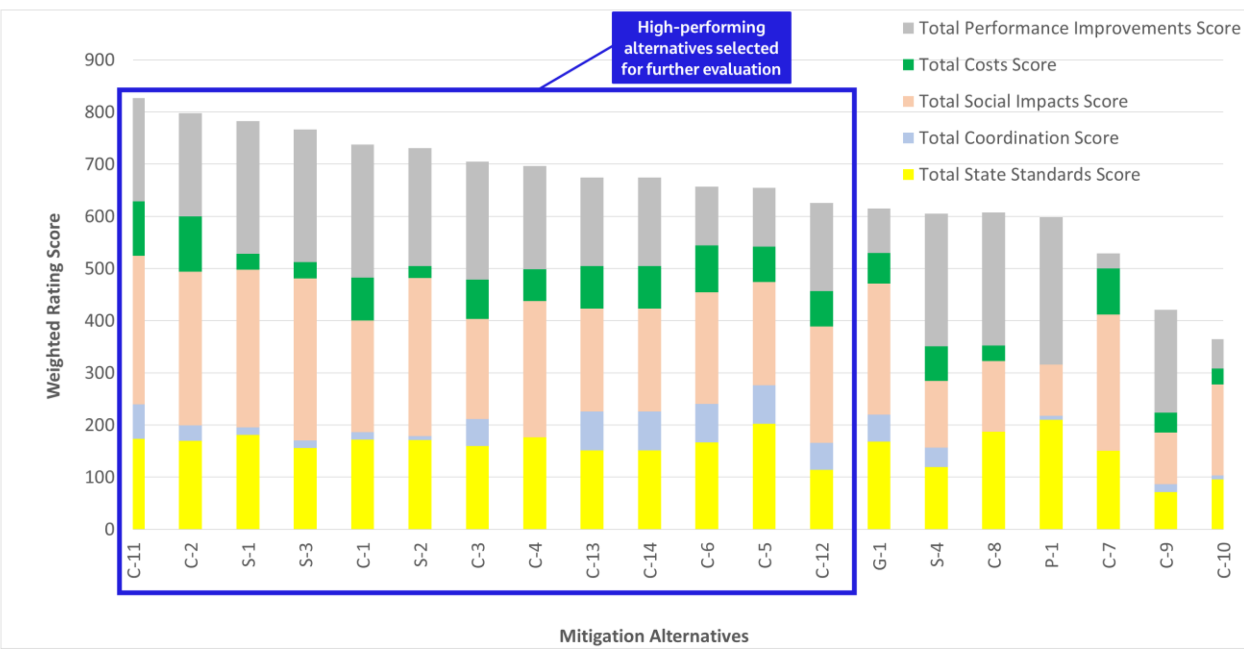

Figure 6-3. Alternatives Evaluation Results

7. Evaluation of Selected Mitigation Measures

After completion of the Baseline Conditions model, a Proposed Conditions model was developed to evaluate the effectiveness of potential drainage improvements. The purpose was to identify drainage improvements that successfully mitigated flooding in the Prescott Hall neighborhood for the 10-year, 24-hour design storm.

Development of the Proposed Conditions model was an iterative process. Initial versions of the model included only a group of the top highest performing alternatives. Based on the model results, the alternatives were adjusted, and additional mitigation measures were incorporated as needed. These updates were then tested in the model to check flood reduction performance. While many alternatives resulted in a high level of performance, some mitigation measures proved to be ineffective at reducing flooding or not cost-efficient and were subsequently removed from further analysis.

Throughout the alternatives modeling, analysis of the results was performed to determine the concepts that were the most effective toward decreasing flood volumes. Animations showing the flow paths and velocities, infrastructure utilization rates, and hydraulic profiles were evaluated to identify flow slippages and bottlenecks within the system. Review of hydraulic profiles resulted in alternatives that reduce head loss and allow for more flow to be captured and effectively conveyed.

7.1 Selected Mitigation Measures

Following the alternative screening process, 13 mitigation alternatives were identified for evaluation. These alternatives are shown in Figure 7-1 and Table 7-1.

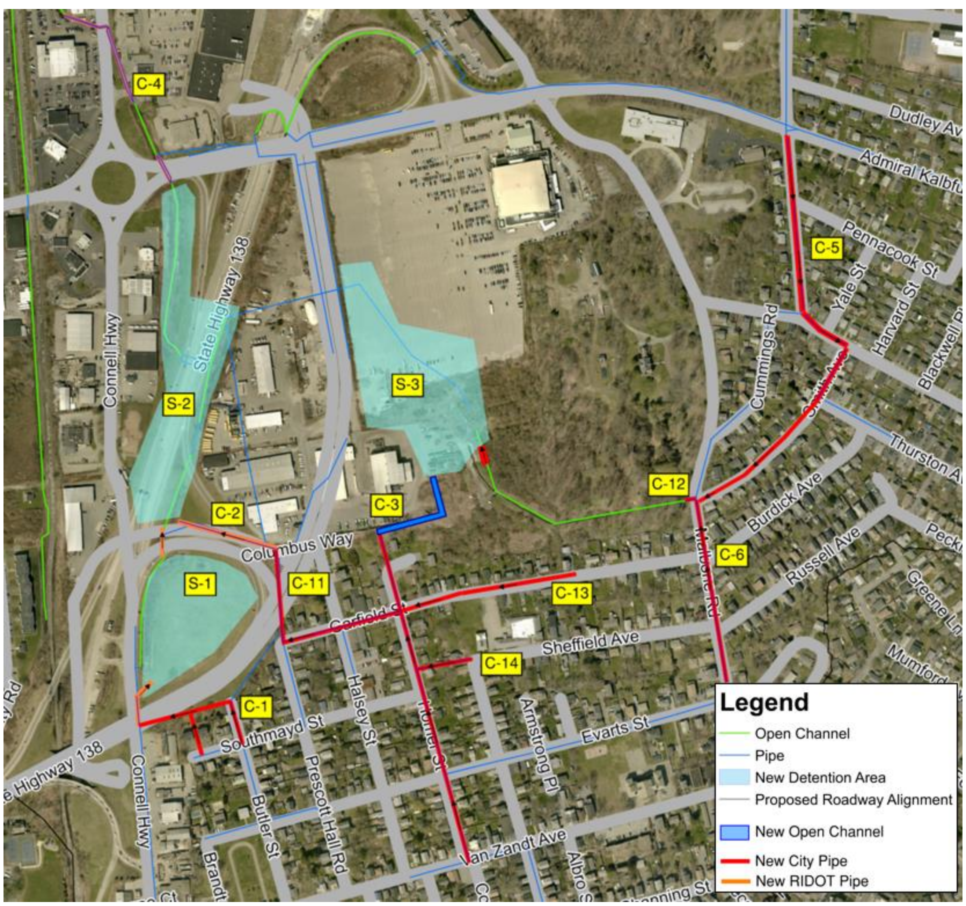

Figure 7-1. Selected Mitigation Measures Concepts Sketch

Table 7-1. Selected Mitigation Measures Concepts Sketch Key

ID	Alternative	Description
S-1	Detention Area 1	31.8 acre-ft storage volume
S-2	Detention Area 2	41.4 acre-ft storage volume
S-3	Detention Area 3	59.3 acre-ft storage volume
C-1	Drainage Improvements on Butler/Southmayd and redirect flow to RIDOT's drain on JT Connell Hwy	180 linear feet of pipe upsized from 24-inch to 30-inch 210 linear feet of pipe upsized from 24-inch to 48-inch 200 linear feet of new 24-inch pipe 380 linear feet of new 42-inch pipe
C-2	Redirect Outlet from Prescott Hall to New Detention Area (S-2)	25 linear feet of pipe upsized from 42-inch to 48-inch 401 linear feet of new 72-inch pipe
C-3	New Pipe/Channel from Garfield to New Detention Area (S-3)	340 linear feet of new 48-inch pipe 510 linear feet of new 8-foot base width x 4-foot deep grassed channel
C-4	Upgrade RIDOT's Existing Twin 5-ft Culverts to Twin 8-ft Culverts	1350 linear feet of culverts upsized from 5-feet to 8-feet
C-5	Drainage Improvements on Hillside/Smith	730 linear feet of pipe upsized from 36-inch to 48-inch 470 linear feet of pipe upsized from 18-inch to 48-inch 650 linear feet of new 48-inch pipe
C-6	Drainage Improvements on Malbone	220 linear feet of pipe upsized from 12-inch to 18-inch 530 linear feet of pipe upsized from 18-inch to 24-inch
C-11	Line 42-inch Outlet Pipe from Prescott Hall	410 linear feet of CIPP liner on 42-inch pipe
C-12	Malbone Channel Box Culvert	50 linear feet of pipe replaced with an 8-foot x 5-foot box culvert
C-13	Drainage Improvements on Garfield	130 linear feet of pipe upsized from 42-inch to 48-inch 250 linear feet of pipe upsized from 36-inch to 42-inch 730 linear feet of new 36-inch pipe
C-14	Drainage Improvements on Homer/Sheffield	360 linear feet of pipe upsized from 24-inch to 30-inch 440 linear feet of pipe upsized from 30-inch to 36-inch 240 linear feet of pipe upsized from 30-inch to 42-inch 230 linear feet of pipe upsized from 18-inch to 24-inch

Conceptual designs for the proposed detention areas include 3:1 side slopes and a clear zone of 20-feet from the edge of the travel lane of any existing or proposed roadways. The invert elevations of the detention areas were held at the invert of the closest downstream existing drainage pipe/culvert that is to remain in place. The detention areas were also modeled to have a roughness coefficient of 0.035, which represents short grass.

Pipe diameters were determined by assessing the model results of various pipe sizes, while ensuring the diameters and cross-section geometry remain feasible for known constraints.

It should be noted that the alternatives identified above are initial concepts. Some of the improvements are dependent on external property owners (e.g., RIDOT, Waste Management, and private developers), and therefore may change following detailed design and coordination with all necessary parties.

The objective of this study was to identify mitigation measures that can alleviate flooding; however, these alternatives will need to be modified to address constructability and coordination with property owners and can also likely be optimized to reduce construction costs.

7.2 Implementation Plan

Due to the large number of improvement projects necessary to meet the desired level of flood reduction, a phased implementation approach is recommended to allow time for the necessary coordination with affected property owners, acquisition of permits, and dispersing costs to accommodate funding limitations. The implementation plan includes two phases as described below. Generally, shorter-term controls, like projects proposed in Phase 1, would be expected to be implemented within 1-3 years, and Phase 2 would be expected to be implemented within 3-8 years. However, due to potential funding limitations and factors outside of the City's control, this typical schedule may not be feasible due to the scale of the project and significant stakeholder involvement needed.

7.2.1 Phase 1

The mitigation measures in Phase 1 include those that are more feasible to implement on a shorter timeline. As illustrated in Table 5-2, flood volumes in the Prescott Hall neighborhood are expected to increase approximately 19% following the construction of the Pell Bridge Project. Therefore, the main objective of the projects included in Phase 1 is to mitigate the increase in flood volumes expected from the Pell Bridge Project. Figure 7-2 illustrates the projects that are recommended in Phase 1; Table 7-1 contains the key to the ID's included in the figure.

Based on model results it was found that Detention Areas 1 and 2 and the associated piping to these facilities (i.e., projects S-1, S-2, C-1, and C-2) are necessary to mitigate impacts associated with the ongoing Pell Bridge Project. The drainage improvements within the Prescott Hall neighborhood (i.e., projects C-11, C-13, and C-14) would not require extensive coordination as these are all within City right-of-way. As a result, the measures presented in Figure 7-2 represent those that are expected to have a faster implementation schedule. These improvements also provide the most direct benefit to Prescott Hall to offset the impacts from the Pell Bridge Project, which is why these improvements are recommended for implementation in Phase 1.

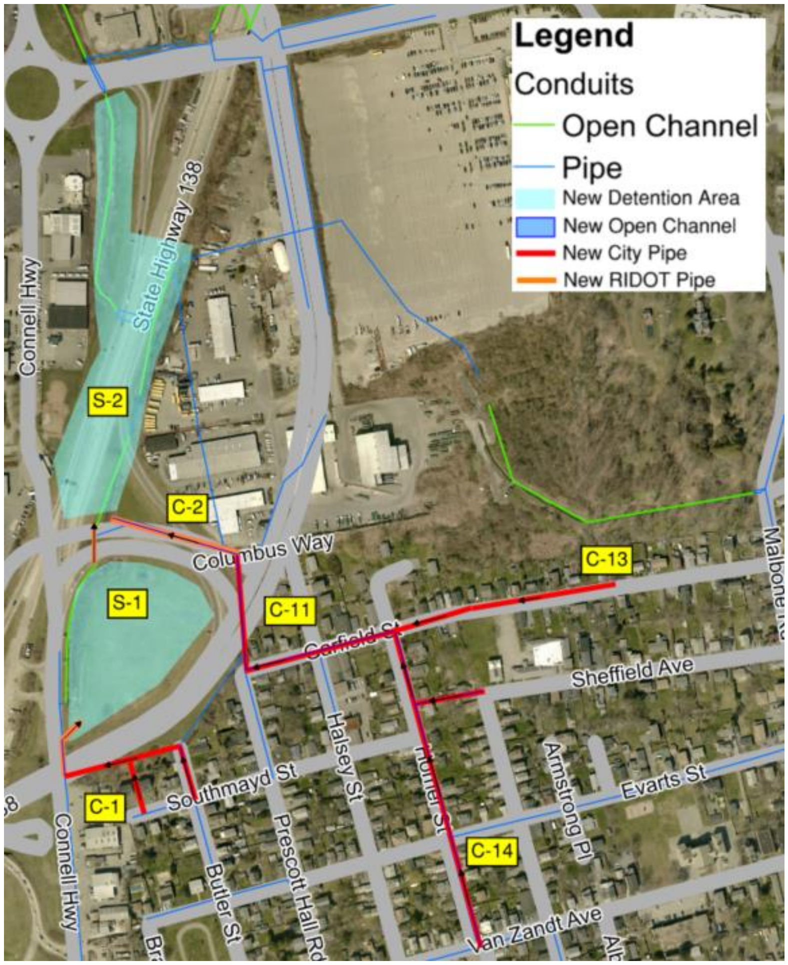

Figure 7-2. Phase 1 Recommended Mitigation Measures

7.2.2 Phase 2

The remaining mitigation measures were included in Phase 2, which mainly include alternatives located upstream of the Prescott Hall neighborhood and those requiring more extensive coordination and time to acquire necessary permits and easements. As a result, Phase 2 is anticipated to have a longer timeline. Figure 7-3 illustrates the projects that are recommended for Phase 2; Table 7-1 contains the key to the ID's seen in the figure.

Figure 7-3. Phase 2 Recommended Mitigation Measures

7.3 Proposed Conditions Model Results

The Proposed Conditions model was used to develop model scenarios for both Phase 1 and Phase 2; model results for each scenario for the 10-year, 24-hour design storm are provided in the following sections. The Phase 1 results include implementation of the first seven improvement projects recommended; the Phase 2 results represent all mitigation measures implemented (i.e., Phase 1 conditions plus the additional six improvement projects recommended in Phase 2).

7.3.1 Phase 1

Figure 7-4 depicts the results from the 10-year, 24-hour design storm for the Proposed Conditions, Phase 1 model. Table 7-2 summarizes flood volumes for the different model scenarios for the 10-year design storm.

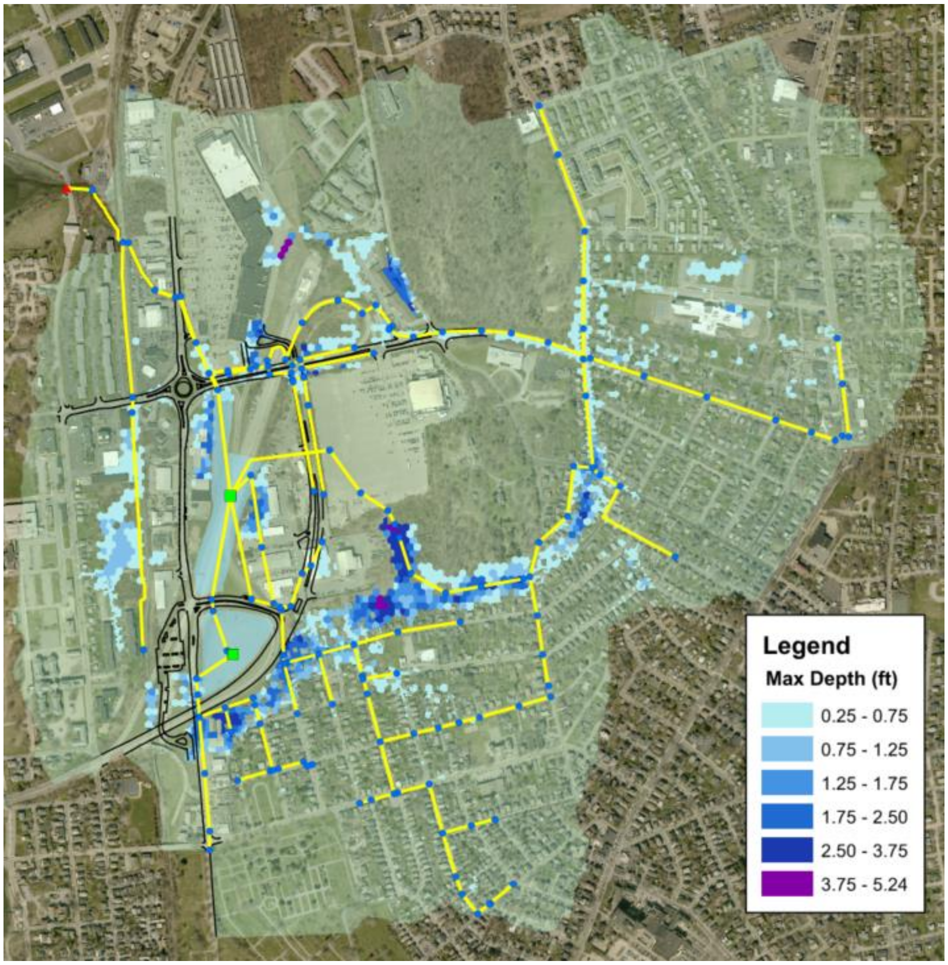

Figure 7-4. Phase 1 Mitigation Measures 10-year, 24-hour Design Storm Results

Table 7-2. Phase 1 Design Storm Results

Model Run	Total Flood Volume (MG)	Prescott Hall Neighborhood Flood Volume (MG)	Depth of Flooding at Prescott Hall Rd and Garfield St (Ft)
Existing Conditions	31.8	3.92	2.95
Baseline Conditions	34.6	4.67	3.72
Proposed Conditions - Phase 1	15.5	3.65	2.59

As illustrated above, flood volumes for the 10-year, 24-hour design storm in the Prescott Hall neighborhood decreased by approximately 7% from Existing Conditions and 22% from Baseline Conditions following the implementation of the Phase 1 mitigation measures. The alternatives in Phase 1 were able to achieve the objective for this phase, which was to mitigate the increase that is anticipated due to the construction of the Pell Bridge Project, and additionally reduced flood volumes to below those in the Existing Conditions model.

7.3.2 Phase 2

Figure 7-5 depicts the results from the 10-year, 24-hour design storm following the implementation of the Phase 1 and Phase 2 improvements. Table 7-3 summarizes flood volumes for the different model scenarios for the design storm.

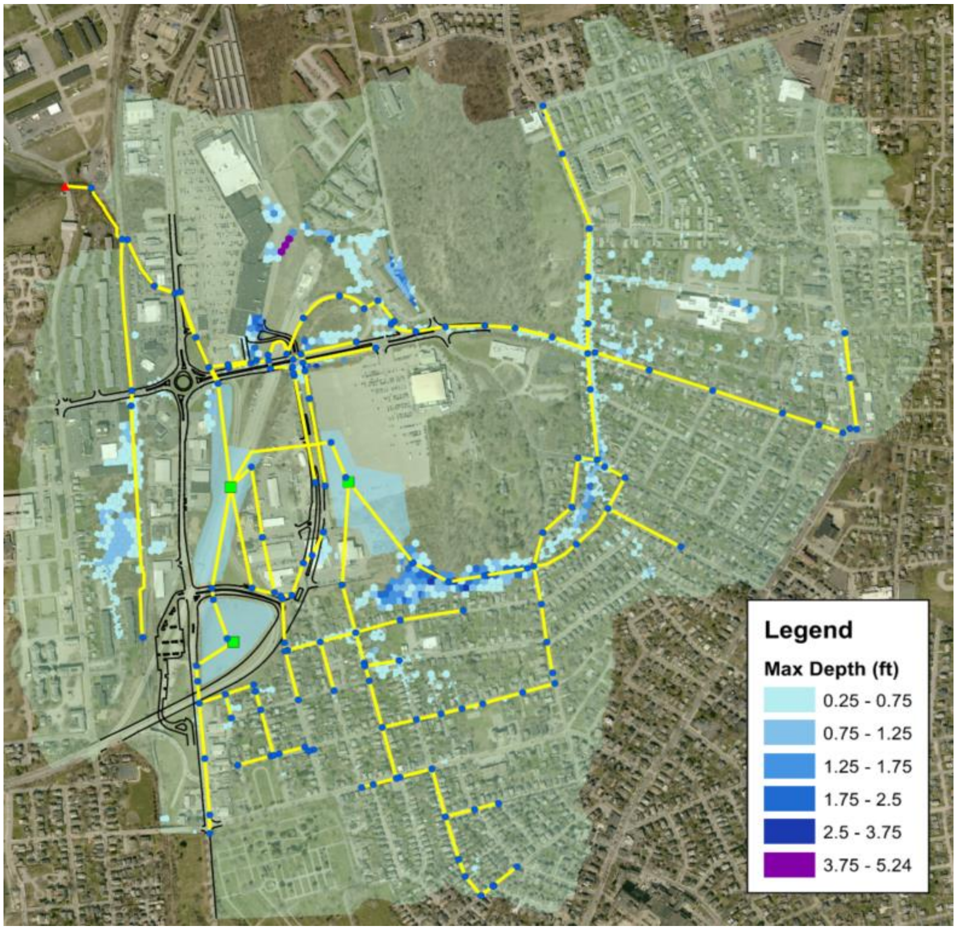

Figure 7-5. Phase 2 Mitigation Measures 10-year, 24-hour Design Storm Results

Table 7-3. Phase 2 Design Storm Results

Model Run	Total Flood Volume (MG)	Prescott Hall Neighborhood Flood Volume (MG)	Depth of Flooding at Prescott Hall Rd and Garfield St (Ft)
Existing Conditions	31.8	3.92	2.95
Baseline Conditions	34.6	4.67	3.72
Proposed Conditions - Phase 1	15.5	3.65	2.59
Proposed Conditions - Phase 2	8.96	0.87	0.73

As illustrated above, following the implementation of all proposed mitigation measures flood volumes for the 10-year, 24-hour design storm in the Prescott Hall neighborhood decreased by approximately 78% from the Existing Conditions model and 81% from Baseline Conditions model. Although the depth of flooding at the intersection of Prescott Hall Road and Garfield Street decreased by approximately 3-feet from Baseline Conditions, the model indicates 9-inches of flooding will remain at this location following the implementation of all mitigation measures; however, this peak flooding recedes to less than 6 inches within 10 minutes.

A visual representation of the difference in maximum cell depths (i.e., flood depth) between the Phase 2 model and the Existing Conditions model is shown in Figure 7-6. Areas shown in green, yellow, and orange are where flood depths decreased, whereas areas in red, are where flood depths increased.

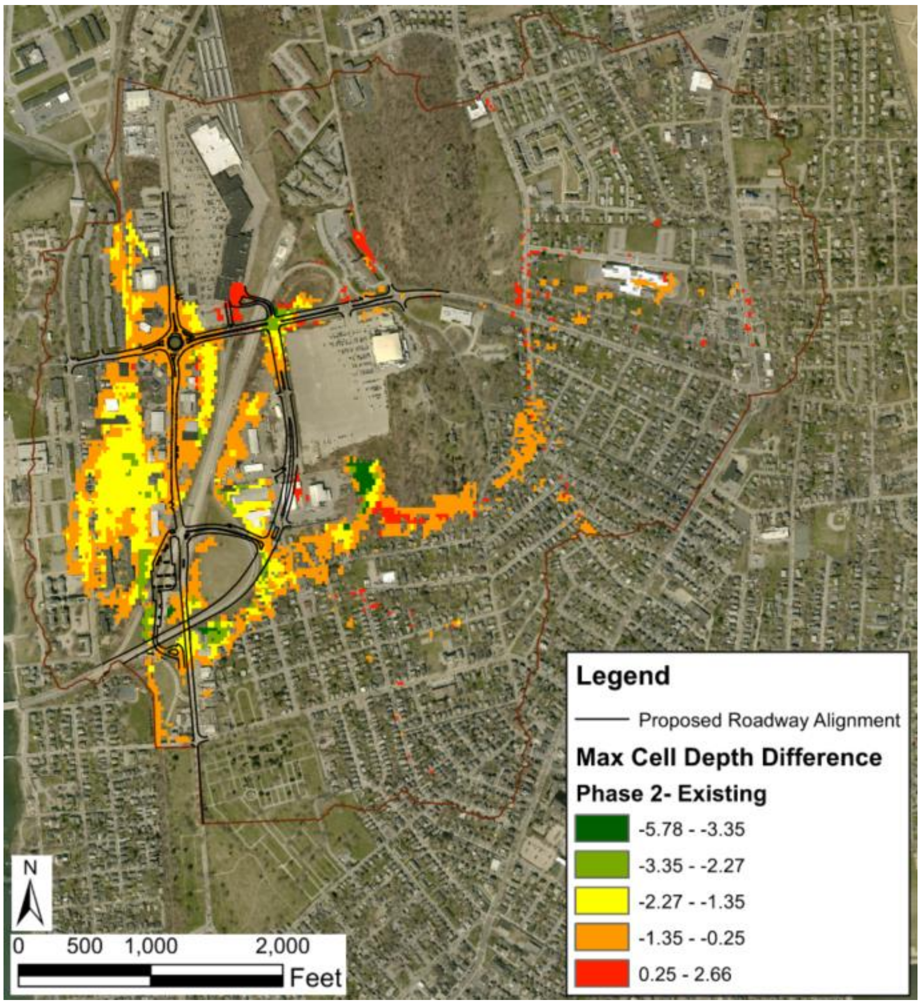

Figure 7-6. Difference Between Maximum Cell Depths Between Phase 2 and Existing Conditions

Most of the areas that indicate an increase in flood depth are a result of the changes due to the Pell Bridge Project. However, the increase in flood depth in the area around the Malbone Channel is caused by the mitigation alternatives proposed in Phase 2. The alternatives provide a new flow path from Prescott Hall into the Malbone Channel, therefore, increases in flood depths at this location is expected and is not a concern due to the nature of the terrain in this area (i.e., stormwater conveyance channel). Overall, implementation of all mitigation alternatives discussed in this section significantly reduce flood volumes and depths within the Prescott Hall neighborhood and within the entire watershed.

8. Summary and Recommendations

This report summarized efforts to analyze the historic flooding problem in the Elizabeth Brook watershed and identify potential mitigation measures that reduce flooding for the 10-year, 24-hour design storm by 72% from existing conditions. To achieve this level of control, detailed design, extensive coordination with relevant stakeholders, and significant funding is required. This report is intended to provide a foundation for design and construction projects for the installation of measures required to reduce flooding within the Prescott Hall neighborhood.

8.1 Recommended Improvements

It is recommended that 13 mitigation measures be implemented throughout the watershed in two phases. The measures in Phase 1 are intended to offset the predicted increase in flood volumes due to the Pell Bridge Project and are those that require less coordination with external partners. Phase 2 includes the measures intended to be longer-term controls and require more time to finalize detailed design and coordinate with relevant property owners.

Figure 8-1 and Table 8-1 depict the recommended mitigation measures and their associated phase.

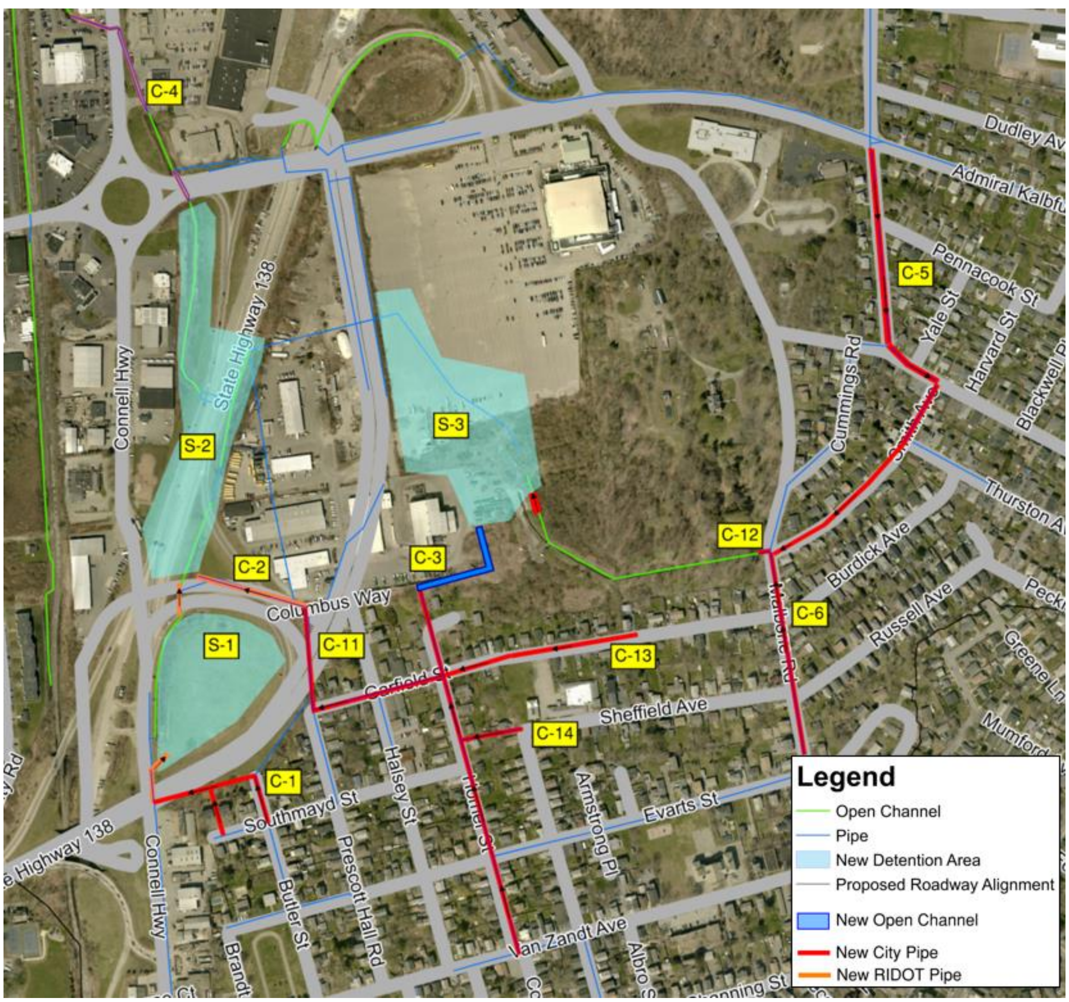

Figure 8-1. Recommended Mitigation Measures Concepts Sketch

Table 8-1. Recommended Mitigation Measures Concepts Sketch Key and Phasing

ID	Alternative	Description	Recommended Phase
S-1	Detention Area 1	31.8 acre-ft storage volume	**Phase 1**
S-2	Detention Area 2	41.4 acre-ft storage volume	
C-1	Drainage Improvements on Butler/Southmayd and redirect flow to RIDOT's drain on JT Connell Hwy	180 linear feet of pipe upsized from 24-inch to 30-inch 210 linear feet of pipe upsized from 24-inch to 48-inch 200 linear feet of new 24-inch pipe 380 linear feet of new 42-inch pipe	
C-2	Redirect Outlet from Prescott Hall to New Detention Area (S-2)	25 linear feet of pipe upsized from 42-inch to 48-inch 401 linear feet of new 72-inch pipe	
C-11	Line 42-inch Outlet Pipe from Prescott Hall	410 linear feet of CIPP liner on 42-inch pipe	
C-13	Drainage Improvements on Garfield	130 linear feet of pipe upsized from 42-inch to 48-inch 250 linear feet of pipe upsized from 36-inch to 42-inch 730 linear feet of new 36-inch pipe	
C-14	Drainage Improvements on Homer/Sheffield	360 linear feet of pipe upsized from 24-inch to 30-inch 440 linear feet of pipe upsized from 30-inch to 36-inch 240 linear feet of pipe upsized from 30-inch to 42-inch 230 linear feet of pipe upsized from 18-inch to 24-inch	
S-3	Detention Area 3	59.3 acre-ft storage volume	**Phase 2**
C-3	New Pipe/Channel from Garfield to New Detention Area (S-3)	340 linear feet of new 48-inch pipe 510 linear feet of new 8-foot base width x 4-foot deep grassed channel	
C-4	Upgrade RIDOT's Existing Twin 5-ft Culverts to Twin 8-ft Culverts	1350 linear feet of culverts upsized from 5-feet to 8-feet	
C-5	Drainage Improvements on Hillside/Smith	730 linear feet of pipe upsized from 36-inch to 48-inch 470 linear feet of pipe upsized from 18-inch to 48-inch 650 linear feet of new 48-inch pipe	
C-6	Drainage Improvements on Malbone	220 linear feet of pipe upsized from 12-inch to 18-inch 530 linear feet of pipe upsized from 18-inch to 24-inch	
C-12	Malbone Channel Box Culvert	50 linear feet of pipe replaced with an 8-foot x 5-foot box culvert	

8.2 Conceptual Construction Cost Estimates

A Class 5 Opinion of Probable Construction Cost (OPCC) was developed for the 13 mitigation measures included in the recommended plan. The estimates were prepared in accordance with the Association for the Advancement of Cost Engineering (AACE) International Recommended Practice 18R-97. Class 5 level estimates may vary +100%/-50% from a detailed cost for a specific site. The conceptual cost estimate for the Phase 1 and Phase 2 improvements are estimated to be $20,210,000, and $31,099,000, respectively.

The conceptual construction cost estimate is based on concept sketches, weighted unit prices, previous contractor bids from similar projects, and an escalation to the year 2024 for Phase 1 and escalation to the year 2028 for Phase 2. A summary is provided in Table 8-2 and additional cost details are included in **Appendix F**.

It should be noted that the estimates in Table 8-2 include construction costs only and do not represent total capital costs. Capital costs will incorporate the above construction costs plus other indirect costs necessary to complete the construction and startup such as administration costs, planning and preliminary design, engineering design and technical services, permitting, easements, among others. The total capital cost may incorporate an additional ±50% in indirect costs in addition to the estimated construction costs.

Table 8-2. Conceptual Construction Cost Estimates

	Phase 1	Phase 2
Subtotal Construction Costs	**$14.6 M**	**$19.9 M**
Contingency (30%)	$4.39 M	$5.96 M
Escalation Multiplier[1]	$1.19 M	$5.27 M
Total Estimated Construction Cost	**$20.2 M**	**$31.1 M**

[1]Phase 1 escalated to 2024 (8.2% multiplier); Phase 2 escalated to year 2028 (26.7% multiplier)

The recommended improvements are not limited to City-owned property. A breakdown of cost based on property ownership is provided in Table 8-3. This is provided for information only and is not representative of the costs to be paid by each entity; cost responsibilities are yet to be determined.

Table 8-3. Conceptual Construction Costs by Project Location

	Phase 1			Phase 2		
	City	**State**	**Private**	**City**	**State**	**Private**
Construction Costs by Location[1]	$3.23 M	$17.0 M	-	$5.11 M	$8.70 M	$17.3 M
Total Estimated Construction Cost	**$20.2 M**			**$31.1 M**		

[1]Phase 1 escalated to 2024 (8.2% multiplier); Phase 2 escalated to year 2028 (26.7% multiplier)

8.3 Project Continuation Needs

Although this study identified concepts required to meet the City's flood reduction objectives, additional investigations are needed to address constructability, design, cost, scheduling, and financial issues. Therefore, it is recommended that the City prepare a Basis of Design Report (BODR) to refine the level of detail included in the conceptual layouts and to address constructability issues beyond the scope of the current study.

The purpose of the BODR will be to refine the conceptual designs and address constructability issues not addressed by this planning study. The BODR should include additional research and design refinements. The work should be prepared at a level of detail sufficient to support the City's needs for short and long-term planning, design, and construction. The BODR should include the following.

- Summary of design criteria
- Site analysis and layouts
- Sizing, materials, and performance data for the 10 and 100-year design storms
- Preliminary subsurface utility investigations
- Development of site plans with - ROWs, property boundaries, topographic information, existing utilities, and proposed improvements
- List of required easements
- List of required permits
- Potential for impacts related to environmental conditions
- Temporary access requirements for construction
- Operation and maintenance requirements

- Preliminary design, bidding, and construction schedule
- Class 4 OPCC

It is recommended that the City continue coordination with RIDOT on infrastructure improvements that will be included in the Pell Bridge project and improvements that are proposed for future projects. The coordination should include participation in planning and coordination meetings, preparation of data, drawings, and design details for RIDOT's use, review of documents and designs prepared by RIDOT, and confirmation the system's future hydraulic characteristics and flood reduction benefits. The coordination with RIDOT should also address the long-term maintenance requirements of the State-owned drainage infrastructure.

It is recommended that the City continue coordination with property owners that may be affected by improvements to be implemented during Phase 2. This is especially important for property owners affected by Detention Area 3 and Conveyance Project 3.

The City should also continue to facilitate meetings with residents of the study area and other stakeholders. These meetings will provide a forum for discussing progress toward implementing system improvements including changes to the scope, expected benefits and/or schedule.

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Appendix A. 2014 Drainage Investigation & Flooding Analysis Memo

Newport CSO LTCP Implementation (Project #10-039), Drainage Investigation and Flooding Analysis for Prescott Hall

PREPARED FOR: Julia Forgue, P.E./City of Newport

COPY TO: Rob Shultz/City of Newport
Rita Fordiani/CH2M HILL
Dingfang Liu/CH2M HILL

PREPARED BY: Eric Kelley/CH2M HILL
Greg Brenner/CH2M HILL

ORIGINAL DATE: July 14, 2014

REVISION DATE:

PROJECT NUMBER: 401892.P3.25.B1

This memorandum summarizes the drainage system characteristics that contribute to flooding within the Prescott Hall area watershed. This memorandum also includes a previous analysis performed for the Malbone Channel watershed as the downstream watershed is shared, and therefore, impacts the development of flood mitigation alternatives.

Background

During the summer of 2012 a series of intense thunderstorm events occurred on July 28th, August 10th, and August 15th across Newport resulting in extensive flooding of streets and private property. The Malbone Road – Hillside Avenue neighborhood (referred to as the Malbone Channel watershed) in particular experienced significant street flooding that crested over street curbs at the intersection of Hillside Avenue and Bedlow Avenue and flowed across several residential properties before flowing into the Malbone Channel. In response to these flooding events the Department of Utilities requested that CH2M HILL perform a drainage analysis and flood assessment of the storm drain system in the flooded Malbone Channel watershed as well as develop several mitigation alternatives to alleviate the problem. The results of the Malbone drainage study were documented in a June 2013 Technical Memorandum: *Drainage Investigation and Flooding Analysis for Malbone Road* (CH2M HILL, June 18, 2013). One of the Malbone study's recommendations was for further analysis of the drainage system infrastructure downstream of the Malbone Channel to identify any additional areas of concern with drainage system capacity and condition.

Similar to the Malbone Road neighborhood, the Prescott Hall neighborhood experienced significant street and private property flooding during the three summer 2012 thunderstorm events noted above. As shown in Figure 1 of Attachment 1, the Prescott Hall neighborhood is located south and west of the Malbone Channel watershed and their watersheds both drain into the same stormwater drainage system downstream of the City Yard on Halsey Street. The drainage system continues from west of the City Yard through a series of culverts, open channels, and stormwater pipes under State Road 138/238, Admiral Kalbfus Road, and JT Connell Highway before discharging into Newport Harbor approximately 0.5-miles northwest of the City Yard (refer to Figure 1). The topography for the study area is provided in Figure 2 of Attachment 1.

CH2M HILL observed the Prescott Hall street flooding conditions first-hand during the August 15, 2012 storm event. The August 15th storm event produced 1.25 inches of rainfall in approximately 30 minutes.

During the storm event, CH2M HILL observed the storm drainage system surcharging along Garfield Street. The section of Garfield Street between No. 53 Garfield Street and Prescott Hall Road was being flooded by the backflow of stormwater up through the storm drains. Street flooding at the intersection of Prescott Hall Road and Garfield Street was approximately 3 feet deep. The following photographs 1, 2, and 3 document the conditions observed during the August 15th storm event.

PHOTOGRAPHS
AUGUST 15, 2012 STREET FLOODING
Prescott Hall – Garfield Street

Photograph 1: Garfield St. at Homer St., looking west

Photograph 2: Homer St. at Southmayd St., looking north

Photograph 3: Prescott Hall Road at Garfield Street, looking north

Due to the historical stormwater flooding in the Prescott Hall area, its proximity to the Malbone Road watershed, and their shared downstream drainage system, the Department of Utilities requested that CH2M HILL expand upon the Malbone Road drainage investigation and flooding analysis to conduct a similar evaluation of the Prescott Hall watershed and the drainage system downstream of the Prescott Hall and Malbone Road watersheds. The following sections of this Technical Memorandum focus primarily on the Prescott Hall analysis, but where applicable the discussion includes the Malbone Road watershed. The following sections include:

- Field reconnaissance, data collection and review
- Hydrologic/hydraulic condition definition
- Mitigation alternatives
- Planning-level cost estimate
- Constructability
- Recommendations and items for further consideration

Section 1 – Field Reconnaissance, Data Collection and Review

CH2M HILL staff completed a field reconnaissance survey of the Prescott Hall watershed to verify the existing conditions of the storm drain system, as well as portions of the City and State drainage systems downstream of Prescott Hall out to its discharge into Newport Harbor. CH2M HILL also reviewed the existing GIS data for the City's drainage system and requested the available drainage system records from the Rhode Island Department of Transportation (RIDOT).

Field Reconnaissance and Data Collection

The following summarizes the results of CH2M HILL's field reconnaissance and data collection efforts:

- Completed 26 drainage manhole inspections within the Prescott Hall watershed including: Garfield Street, Sheffield Avenue, Evarts Street, Van Zandt Avenue, Southmayd Street, Hall Avenue, Homer Street, Halsey Street, Prescott Hall Road, and Butler Street
- Completed a walking and windshield survey of the drainage area in the Prescott Hall watershed and the downstream drainage system extending from the City Yard along JT Connell Highway out to Newport Harbor
- Reviewed historical weather data for the three summer 2012 storm events
- Reviewed RIDOT drainage record plans. Electronic copies of the RIDOT records are provided on the enclosed CD
- Reviewed the June 13, 2013 Technical Memorandum for the Drainage Analysis and Flood Analysis for Malbone Road
- Completed a limited walking survey (refer to Attachment 1 for photographs) of the City and State drainage systems downstream of the City Yard on Halsey Street Extension that identified several maintenance issues for further consideration including:
  - Throughout the numerous open channels between Prescott Hall and the railroad bridge, heavy water vegetation and brush was observed to be growing within the drainage path. Additionally, large deposits of silt and debris were observed within the channels and have the potential to further restrict stormwater flow. Sand berms located within ten feet of the downstream headwall of several culverts and the channel sand/silt berms were observed to rise to elevations within a few inches below the crown of the pipes.
  - Throughout the portion of its alignment from the channel behind the City Yard to the headwall west of JT Connell Highway, the drainage system was observed at the time of inspection (October 30, 2013) to be 75 to 80% full with standing water with less than 0.3" of rain in the previous month. Flow velocity in the pipes and drainage swales was minimal and field approximated to be less than 1' per minute. The elevation of the channel inverts was observed to be generally higher than the inverts of the culvert pipes by measurements ranging from several inches to approximately two feet. The culvert pipes were measured to generally have 16" to 20" of debris/silt in their inverts.

Prescott Hall Drainage System Description

The Prescott Hall watershed drainage system consists primarily of 12" to 42" reinforced concrete pipes and curb/gutter inlet catch basins. The principle characteristics of the Prescott Hall drainage network include:

- Prescott Hall watershed is a low lying area bounded by Garfield Street on the north, Van Zandt Avenue on the south, JT Connell Highway on the west and Malbone Road on the east. The neighborhood is predominately residential with some light commercial, one school (vacant) and one cemetery.
- The northwest corner of the watershed is the lowest elevation and subsequently is subject to significant flooding during moderate to severe storm events similar to those experienced during the summer of 2012. The area subjected to street flooding includes:
  - The western end of Garfield Street extending from Prescott Hall Road to an area west of Homer Street.
  - The northern ends of Prescott Hall Road and Homer Street between Garfield Street and Southmayd Street.
  - Halsey Street between Southmayd Street and Columbus Way.
- The drainage pattern for the neighborhood north of Van Zandt Avenue generally follows the topography, which drains from south to north and east to west towards Garfield Street.
- The total drainage area for the watershed, approximately 96 acres, extends beyond the immediate area of the neighborhood east to Madeline Drive, southeast almost to Broadway, and south to Clinton Avenue.
- The extended area south of Van Zandt Avenue drains into the northern portion of the watershed either by surface flow or via a storm drain line in Hall Avenue, which conveys drainage from all of Channing Street and a section of Warner Street from Malbone Road to Gould Street.
- Many of the side streets (Congdon Avenue, Tilly Avenue, Kingston Avenue and Madeline Drive) in the extended neighborhood have little to no storm drainage infrastructure and discharge via sheet-flow to neighboring arterial roads including Van Zandt Avenue, Evarts Street and Warner Street.
- All of the storm drain lines in the neighborhood discharge into a single 42” reinforced concrete drain line at the intersection of Garfield Street and Prescott Hall Road. The 42” drain line runs north under state property (State Road 138/238 ramps) and discharges to the drainage channel located immediately west of the City Yard. The Malbone Channel and State Highway drainage systems also discharge into this open channel west of the City Yard. Malbone Channel is a trapezoidal masonry block channel extending west from Malbone Road to the Newport Grand parcels, where it flows into a 48” reinforced concrete pipe that discharges into the north end of the drainage channel. State drainage discharges into the southern end of the drainage channel from 42” and 60” drain pipes.
- The drainage channel west of the City Yard continues parallel to the elevated state highway ramps before extending west under the highway through two 60” reinforced concrete pipe culverts. From the west side of the highway, the drainage system extends approximately 650’ north through an open channel to a second set of twin 60” reinforced concrete pipe culverts, passing under the rotary into an open channel approximately 255 feet long in front of RK Newport Towne Plaza (shopping plaza). From this channel it continues into a third set of twin 60” pipe culverts that pass under JT Connell Highway

and discharge to an open channel behind the car dealership at 116 JT Connell Highway. The open channel then drains under a railroad bridge and out to the harbor.

Data Review Results

The results of the field reconnaissance and data collection supported the development of the hydrologic and hydraulic model (H/H Model) as well as the development of the figures provided in Attachment 1. The figures identify the perimeter boundary, drainage system and subcatchments of the drainage area (Figure 1) and the topographic contours of the drainage area (Figure 2). Photographs from the walking survey of the City and State drainage system downstream of Prescott Hall are also provided in Attachment 1.

Section 2 – Hydrologic/Hydraulic Condition Definition

As part of this task, CH2M HILL utilized the rainfall records from the same three summer 2012 storm events used in the Malbone study, established and delineated the additional storm drainage areas (i.e. Prescott Hall watershed and downstream) to be included in the study, utilized existing LIDAR data to develop the rim elevations for the storm drainage manholes within the study area, and developed a hydrologic/hydraulic model.

Rainfall Records Review

Flooding occurred during the subject 2012 storms (July 28th, August 10th, and August 15th). These were summer thunderstorms that had short durations and high peak intensities. There is no official rain gauge data available with 5 or 15 minutes interval (the WPCP gauge was read daily). A Middletown Weather Underground rain gauge data was selected for its close proximity to the study area. Intensity-duration-frequency analysis of the three events is summarized in Table 2-1 and graphically depicted in the hyetographs in Figure 2-1; these storms were plotted together in Figure 2-1 with a standard type III storm that is typical in the northeastern United States. Although the 10 year 24 hour storm is recognized as the standard design event in Rhode Island, this study elected the 10 year 6 hour design storm as this better reflects the observed rain events in Newport due to its shorter overall duration and earlier peak rainfall intensity as compared to the 10 year 24 hour storm.

TABLE 2-1
Summer 2012 Storm Event Rainfall Records

Start Time	Duration (hrs)	Total Rain (inches)	Return Frequency (NRCC RR 93-5)
7:16 pm, July 28	2	2.83	10-year
3:40 pm, Aug. 10	3	1.44	< 1-year
8:42 am, Aug. 15	0.5	1.25	2-year
***Design Storm**	**6**	**3.50**	**10-year**

*****Recommended for mitigation alternative assessments
Return Frequency Source: Northeast Regional Climate Center (NRCC) Publication RR93-5, Intensity-Duration-Frequency (IDF) Curves

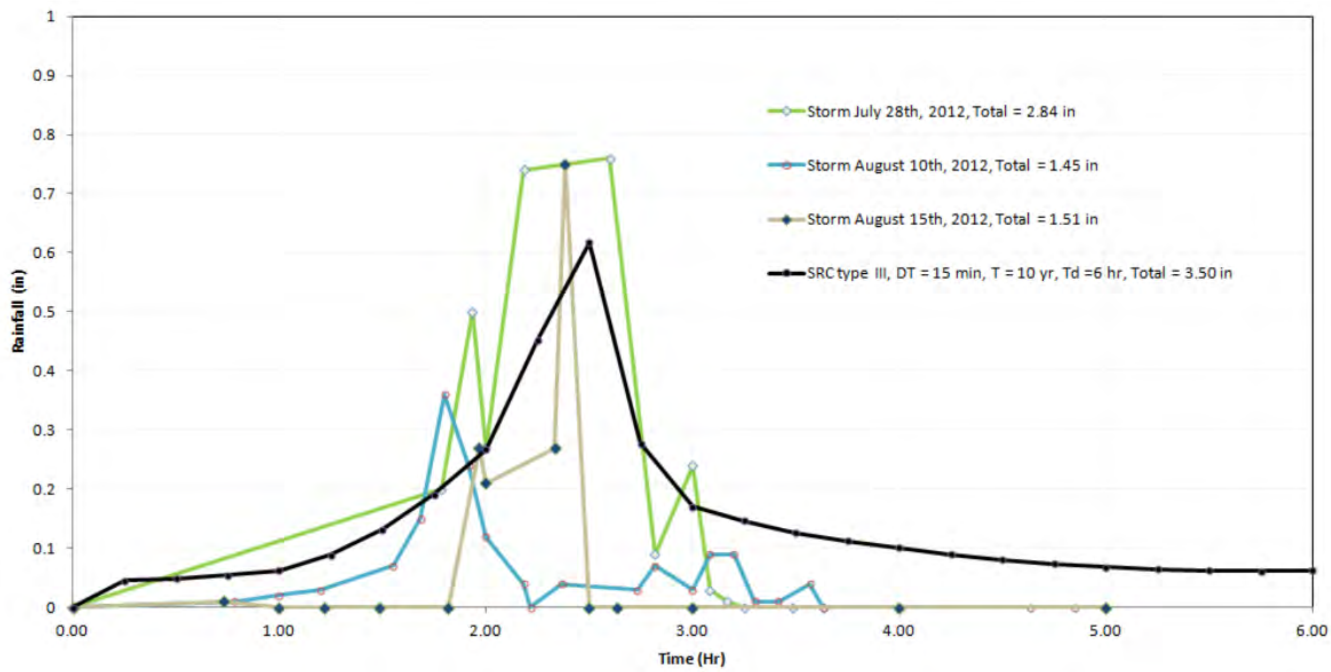


Figure 2-1 - Hyetograph of the 2012 storm events

LIDAR Data Review and Extrapolation

Available LIDAR data was obtained and reviewed for use in determining the topography of the study area, performing drainage delineations and pertinent ground and/or manhole rim elevations.

Storm Drain Tributary Area Delineation

Drainage areas were delineated using the LIDAR data and the City of Newport GIS maps of the storm drain system. The total study drainage area is 581 acres consisting of 96 acres in Prescott Hall watershed, 271 acres in the Malbone Channel watershed, and 214 acres in the downstream watershed. The drainage areas tributary to the Malbone watershed storm drain systems located within the Middletown area was delineated using existing LIDAR information and verified by the field inspection of drainage structures during the Malbone Study.

Hydrologic/Hydraulic Model Development

A hydrologic/hydraulic (H/H) model was developed for use in the hydraulic analysis. The model hydrology and hydraulic elements were obtained by the following procedures.

Hydrology

- Subcatchments were delineated using an ArcHydro procedure based on LIDAR Digital Elevation Model (DEM) data and aerial imagery.
- Subcatchments slopes were determined based on LIDAR DEM data.
- Subcatchments imperviousness values are from RIGIS impervious raster data.
- Infiltration parameters and soil characteristics were defined based on Web Soil Survey (WSS) data for Rhode Island according to the Natural Resources Conservation Service (NRCS).

Hydraulics

- A number of manholes located at critical intersections were field-inspected to acquire elevations and connection information. Interpolation was applied to junctions when manholes were not found in the field.
- Newport's storm drain system data was acquired from the Newport GIS database.
- Gutter flow was simulated as open channel flow with the assumptions of 6-inch high curbs and 2% road crown slope.
- The H/H model's downstream boundary condition was set as a free fall with no tail water interference in the outfall to Coasters Harbor (Newport Harbor).
- In addition to the Prescott Hall watershed, the Malbone Channel watershed was integrated into this model to further examine the flooding and evaluate the effectiveness of mitigation alternatives. Malbone flooding mitigation Option 1 was included in some of the Prescott Hall mitigation model runs to compare impacts as noted. Malbone flooding mitigation Option 1 was selected for the Prescott Hall analysis due its lower cost and ease of implementation based on in-place upgrades of existing storm drain infrastructure as compared to the other Malbone flooding mitigation options, such as installation of new storm drain infrastructure or siting of detention ponds on private (e.g. Malbone Estate) or protected property (e.g. Miantonomi Park).

Existing Conditions of Culverts and Channels in the Downtown Subcatchment

Observations through the field reconnaissance task showed that the culverts and channels have a significant amount of sediment build-up and vegetative overgrowth. Similar observations were made of the 48" Malbone Channel storm drain pipe and the drainage channel west of the City Yard following the summer 2012 storm events. Following those events, the City's collection system operator inspected the 48" storm drain and observed sections of the pipe that had become more than 33% obstructed by sediment deposits and a sediment dam that exceeded the elevation of the pipe crown was present at the drain pipe's outlet to the channel. These constrictions not only increase the roughness of the surface, but physically decrease the hydraulic capacity of the system. In the case of the Malbone Channel these restrictions could lead to localized flooding at the inlet to the 48" drain, which is located in an area of unimproved vegetated land adjacent to the Malbone Channel, Newport Grand, and Waste Management transfer station. However, similar hydraulic restrictions on the Prescott Hall 42" storm drain and its outlet could contribute to the localized flooding observed. It is recommended that the Prescott Hall 42" storm drain and associated manholes be inspected by CCTV and cleaned of any accumulated sediments and debris.

Drainage Analysis and Flood Assessment

Based on the records reviewed and the field investigation of the study area, the subcatchment areas that were delineated based on LIDAR DEM data were routed to the model network nodes. The model runs were performed to simulate hydrologic/hydraulic conditions during the 2012 summer storms that caused substantial flooding of roads and residential properties. Figures 1 through 6 of Attachment 1 show the watershed delineation and subcatchments, local topography, model schematic network, and existing peak flooding conditions during the 3 summer events and the 10 year 6 hour design storm, respectively. The existing conditions validation model run results generally agree with field observations of street ponding and residential property flooding where the downstream end low lying areas (e.g. north end of Prescott Hall Rd. and at the intersection of Garfield St. and Homer St.) experienced the most severe street ponding and flooding in private property.

Table 1 of Attachment 1 summarizes flood location, volume and duration during each of the three storms and for the 10 year 6 hour design storm. The flood volume in the gutter flow column is an indication of street ponding while gutter overflow is an indication of street runoff overtopping the roadway curbing and running overland and into private property. The model results generally agree with the field observations of street ponding occurring during all three storms with the most severe flooding occurred during the July 28th storm at the north end of Prescott Hall Road, Malbone channel, the culvert under JT Cornell Highway, and the culvert under Admiral Kalbfus Road. Figures 3 through 6 of Attachment 1 display the model network and identify key locations of flooding with their respective flood volumes that are summarized on Table 1.

For comparison and summary purposes, Table 2-2 displays the total flood volumes in the three study watershed areas for the summer 2012 storm events and the 10 year 6 hour design storm event under existing conditions. Flooding mitigation alternatives will be primarily based on model runs using the design storm to demonstrate improvements under worst-case conditions.

TABLE 2-2

Flood Volumes – Existing Conditions

Storm Event	Total Flood Volume (MG)			
	Prescott Hall	Malbone Channel	Downstream Conveyance	Total
July 28, 2012	2.96	7.18	3.07	13.20
August 10, 2012	1.54	3.45	1.53	6.52
August 15, 2012	1.23	4.39	2.10	7.71
Design Storm	**2.75**	**8.51**	**3.93**	**15.18**

Section 3 – Mitigation Alternatives and Results

Utilizing the model described in Section 2, CH2M HILL performed a drainage analysis of the existing storm drain systems in the project area in addition to the evaluation of several mitigation alternatives:

Mitigation Alternatives

CH2M HILL developed H/H models to simulate various mitigation options based upon the 10 year 6 hour design storm. Mitigation alternatives were specifically developed to address the flooding observed in the western end of Garfield Street extending from Prescott Hall Road to an area west of Homer Street, the northern ends of Prescott Hall Road and Homer Street between Garfield Street and Southmayd Street, and Halsey Street between Southmayd Street and Columbus Way. Mitigation alternatives include the following options:

The additional watershed mitigation options developed as part of the Prescott Hall study are:

- **Option 1 (Baseline Maintenance) – Clean Existing Culverts and Channels**
  This baseline maintenance option addresses the flooding issues strictly by conducting routine maintenance consisting of cleaning the existing culverts and channels downstream of Prescott Hall and Malbone Channel watersheds. This will remove accumulated sediment and debris, physically increase the hydraulic capacity of the system, and increase the conveyance of runoff with the objective of reducing the severity and duration of localized flooding. This was considered as a baseline element of the other options. Refer to Figures 7 and 10 of Attachment 1 for the simulated flooding conditions for the August 10, 2012 and design storm events.

- **Option 2 – Baseline Maintenance Plus Open Channel and Culvert Upgrades**
  In addition to maintenance of the downstream system, this option is to increase runoff conveyance through upgrades of downstream channel and culverts including the addition of a 924 linear foot open channel (16 feet wide, 1:3 side slopes, 5 feet deep) from the north end of Prescott Hall Road to the culvert extending underneath State Road 138/138A/238, and increasing the size of the State's six existing 60" pipe culverts to 96". Refer to Figures 8 and 10 of Attachment 11 for the simulated flooding conditions for the August 10, 2012 and design storm events.

- **Option 3A – Baseline Maintenance Plus Only Downstream Channel and Culvert Upgrades and Halsey Street Box Culvert**
  Due to concerns about constructability and project responsibility for the open channel between Prescott Hall Road and the channel west of the City Yard, this option was designed to evaluate a box culvert underneath Halsey Street to convey stormwater from Garfield Street to the channel west of the City Yard. The objective was to determine the appropriate size for a box culvert to provide similar flood relief for Prescott Hall watershed as the open channel in Option 2. It includes the same downstream maintenance and culvert upgrades as in Option 2 and replaces the open channel with a 1,200 linear foot box culvert extending north along Halsey Street from Garfield Street, continuing northwest across the City Yard, and discharging to the existing drainage channel west of the City Yard. Photographs along the proposed route are provided in Attachment 1. Refer to Figures 9 and 12 of Attachment 11 for the simulated flooding conditions for the August 10, 2012 and design storm events.

- **Option 3B – Baseline Maintenance and Halsey Street Box Culvert Only**
  Due to concerns about project sequencing for the culvert upgrades downstream, this option was designed to evaluate the Halsey Street box culvert assuming that the downstream system was cleaned and the Halsey Street culvert was completed prior to any downstream culvert upgrades. The objective was to determine the extent of flood mitigation possible in Prescott Hall and Malbone Channel if upstream improvements were completed prior to any downstream culvert upgrades. Refer to Figures 13 and 14 of Attachment 11 for the simulated flooding conditions for the design storm and July 28, 2012 storm events.

Malbone Option 1 – Increase Existing Pipe Sizes (i.e. Gray Conveyance #1 – was also included in Prescott Hall Options 2, 3a, and 3b. Malbone Option 1 includes:

- Replacement of approximately 2,700 linear feet of storm drains with larger pipes (namely segments along Malbone Road, Cummings Road, and Hillside Avenue)
- Installation of 826 linear feet of new 48" diameter storm drain in a parallel alignment to the existing 48" storm drain from the Malbone Channel Outlet across from the casino parking lot to the swale at the rear of the City Yard on the Halsey Street Extension.

The Malbone watershed model network and mitigation Malbone Option 1 are presented as Figures 1 through 3 of Attachment 2.

Mitigation Alternative Results

Figures 7 through 14 of Attachment 1 show the simulated flooding conditions under mitigation alternatives Option 1, Option 2, Option 3A, and Option 3B. Table 2 of Attachment 1 presents the simulated model results under existing conditions and for each of the mitigation alternatives evaluated, respectively. Key locations of flooding are identified on Figures 7 through 14 with their respective flood volumes that are summarized on Table 2 of Attachment 1.

Each of the Prescott Hall flooding mitigation options are presented in Table 3-1 with their level of mitigation expressed as total flooding volume reduction as compared to existing conditions for the design storm.

TABLE 3-1

Comparison of Flood Volumes and Durations – Existing Conditions and Mitigation Alternatives

10 Year 6 Hour Design Storm

Location	Parameter	Existing	Option 1 Baseline Maintenance (BM)	Option 2: BM + Channel and Culvert Upgrades[1]	Option 3A: BM + Only Downstream Channel and Culvert Upgrades + Halsey Culvert[1]	Option 3B: BM + Halsey Culvert[1]
Prescott Hall	Total Flood Volume (MG)	2.75	2.08	0.21	0.18	0.21
	Flood Volume Reduction (%)[2]	-	24	92	94	92
	Maximum Flood Duration (Hr)	7.2	5.3	1.3	1.2	1.6
Malbone Channel	Total Flood Volume (MG)	8.51	7.64	3.63	3.67	4.59
	Flood Volume Reduction (%)[2]	-	10	57	57	46
	Maximum Flood Duration (Hr)	12.0	5.9	3.2	3.1	4.3
Downstream Conveyance	Total Flood Volume (MG)	3.93	3.25	0.10	0.18	1.45
	Flood Volume Reduction (%)[2]	-	17	98	95	63
	Maximum Flood Duration (Hr)	9.2	5.8	1.5	1.2	3.6
Total	Total Flood Volume (MG)	15.18	12.97	3.94	4.03	6.25
	Flood Volume Reduction (%)[2]	-	15	74	73	59
	Maximum Flood Duration (Hr)[3]	12.0	5.9	3.2	3.1	4.3

Notes:
Malbone Channel maximum flood duration is reported for the downstream end of the channel or the 48" drain line, it is not indicative of flooding within the upper portion of the watershed. Refer to Figure 3 of Attachment 3.
[1]Includes Malbone Option 1 in analysis.
[2]Represents the reduced flood volume relative to existing conditions.
[3]Represents the maximum flood duration observed at any node in the model for that particular sub-watershed.

Option 1 Results (Baseline Maintenance) – Clean Culverts and Channels

The first option (Figures 7 and 10 of Attachment 1) evaluated consists of removing the sediment, debris, and vegetation currently constricting the existing channels and culverts in the Prescott Hall study area (refer to photographs in Attachment 1). The advantages and disadvantages of this option include:

Advantages:

- Current flooding volumes are reduced overall by 15 percent for the study area; and between 10 percent (Malbone) and 24 percent (Prescott Hall) for the individual sub-watersheds. The flood reductions are greater for the Prescott and Downstream watersheds than Malbone.

- Current maximum flood durations are reduced between 26% and 51% for the sub-watersheds
- No construction involved, therefore quicker implementation and less planning than the other 2 options
- This is the most economical solution of the four as the work is limited to maintenance cleaning of existing infrastructure

Disadvantages:

- This option provides temporary relief and would require regular scheduled maintenance
- Coordination required with RIDOT as maintenance of open channels and culverts would be RIDOT responsibility
- City has control over schedule and routine maintenance of only a small portion of the drainage system (i.e. 48" Malbone drain pipe and 42" Prescott Hall drain pipe)
- It does not provide as much relief from flooding as the other options
- Flooding during extreme conditions still exists

Option 2 Results – Baseline Maintenance Plus Open Channel and Culvert Upgrades

The second option (Figures 8 and 11 of Attachment 1) implements a new 924 linear foot open channel that is 16' wide × 5' deep with 1:3 side slopes and connects the north end of Prescott Hall Road to the culvert under State Road 138/138A/238 (west of City Yard) to provide relief for the localized neighborhood flooding. Model iterations were done to identify the appropriate sized open channel to alleviate flooding in Prescott Hall watershed. As discussed in Option 3, the constructability concerns associated with this proposed open channel would require coordination with RIDOT to address the geometry and alignment of any proposed channel. To address the limiting tail water conditions downstream, the following culverts would need to be upgraded:

- Replace existing twin 5' culverts under State Road 138/138A/238 with twin 8' culverts;
- Replace existing twin 5' culverts under the Admiral Kalbfus Rd section of the traffic circle with Training Station and JT Connell Hwy with twin 8' culverts; and
- Upgrade the twin 5' culverts under the northern section of JT Connell Hwy with twin 8' culverts.

Option 2 also includes the cleaning of existing channels and culverts (Option 1), as this is strongly recommend to improve the system and prevent future incidents.

Advantages:

- Current flooding issues are mitigated and eliminated at the downstream culverts. Flood volume reductions of 74% (overall) with localized reductions ranging between 57% (Malbone) and 98% (downstream). Option 2 would reduce flood volume of Prescott Hall watershed by 92% as compared to existing conditions
- Maximum flood durations within the three sub-watersheds would be significantly reduced (greater than 73% reductions). The flood duration reductions were higher for Prescott Hall (82%) and Downstream (86%) than Malbone (74%) due to their lower elevation within the watershed and smaller contributing area. Similar reductions for Malbone could be realized by increasing the size of the proposed 48" parallel storm drain across the Newport Grand parcel.
- The upgraded area would have a much greater hydraulic capacity potential than existing conditions

- The open channel provides a secondary means of conveying storm water from the north end of Prescott Hall Road thereby providing a level of redundancy in the event the hydraulic capacity of the 42” storm drain becomes limited due to sediment or debris

Disadvantages:

- This option requires significant infrastructure improvements and would be significantly more expensive than Option 1
- Construction disturbances to residential and commercial areas
- Local and major traffic route disruptions
- Project schedule for design and construction would be primarily under the control of RIDOT
- Culvert upgrades would require construction under a major highway interchange, a traffic circle, and two state roads further complicating construction and increasing the costs
- The objective of the simulation was to identify if an open channel option could mitigate the flooding conditions. The model iterations were done to identify the appropriate sized channel that would relieve flooding conditions in the Prescott Hall area. However, the alignment and geometry of the proposed channel need to be taken into account given the following: proximity to private and state property; required modifications to existing highway embankments (e.g. re-grading, retaining walls, traffic safety devices); and future operation and maintenance. These constructability concerns would have to be evaluated further to determine if the open channel would be a viable alternative.
- Flooding during extreme conditions still exists so further optimization of the channel and culvert sizes/geometries may provide a higher level of service

Option 3A Results – Baseline Maintenance Plus Only Downstream Channel and Culvert Upgrades and Halsey Street Box Culvert

Due to the constructability and project control considerations for Option 2, an alternative that focused on identifying a mitigation alternative incorporating elements that would be under more direct City control was evaluated (refer to Figures 9 and 12 of Attachment 1). Halsey Street extends from Garfield Street to Admiral Kalbfus Road, but the road is not a through-way and there are no storm drain pipes along Halsey Street. Option 2 was modified to replace the open channel with a 1,200 linear foot precast concrete box culvert, 10’ (W) × 5’ (H), extending from Halsey Street north under the City Yard parking lot south of the Utilities Department building to the drainage channel west of the City Yard. The photographs in Attachment 1 provide an overview of the proposed route for the drainage culvert. Similar to Option 2, the twin 5’ culverts at State Road 138/138A/238, Admiral Kalbfus Road traffic circle, and JT Connell Highway would be upgraded to twin 8’ culverts. Again it is strongly recommended that the existing channels and culverts be cleaned to best utilize this option (Option 1).

Advantages:

- This option contains similar advantages to Option 2 while avoiding some of the constructability concerns related to the siting/alignment of the open channel between Prescott Hall Road and the drainage channel west of City Yard
- Halsey Street Culvert is routed along City-owned roads/land
- Current flooding issues are mitigated and eliminated at the downstream culverts. Flood reduction volumes are similar to those achieved by Option 2 (73% overall and between 57% and 95% for the subwatersheds) as are the maximum flood durations. Malbone Channel flood reduction performance

is improved due to downstream cleaning and culvert upgrades (57% reduction for 10 Year 6 Hour Design Storm), but to a much lesser extent that achieved for Prescott Hall (92% reduction). It is important to note that the Malbone watershed flooding is only observed at the downstream end of Malbone Channel and not within the neighborhoods that make-up the upper portions of the watershed.

- The upgraded infrastructure would have a much greater hydraulic capacity potential than existing conditions

Disadvantages:

- This option is more expensive than Option 1
- Construction disturbances to residential and commercial areas
- Local and major traffic route disruptions
- Culvert upgrades would require construction under a major highway interchange and two state roads further complicating construction and increasing the costs
- Project schedule for design and construction of state drainage improvements would remain under the control of RIDOT
- Potential utility conflicts on JT Connell Highway: 6” and 10” gravity sanitary sewer and 12” Asbestos Cement water main
- Potential utility conflicts on Halsey Street due to presence of 8” gravity sanitary sewer, 6” Asbestos Cement and Cast Iron water main, and natural gas main along Halsey Street and at the City Yard
- Property access disruptions for residential and commercial properties along Halsey Street

Option 3B Results – Baseline Maintenance and Halsey Street Box Culvert Only

A risk associated with implementing upstream mitigation projects prior to addressing downstream projects is improving upstream conditions (Prescott Hall) at the expense of downstream conditions (traffic circle/JT Connell Highway). Option 3A assumes that downstream improvements associated with Option 1 (cleaning/maintenance) and the culvert upgrades of Option 2 are implemented prior to the Halsey Street culvert. Option 3B was added to evaluate the potential downstream impacts if the Halsey Street culvert and Malbone Option 1 improvements were implemented prior to the downstream culvert upgrades, but the downstream system had been cleaned (Option 1). Additionally, Option 3B was evaluated for its potential flood mitigation performance as compared to both existing conditions as well as any marginal performance beyond that achieved by the downstream maintenance cleaning (Option 1). Under both Options 3A and 3B, Malbone Option 1 was also included. Tables 3-2 and 3-3 present the comparisons for potential flood volume reduction performance for Option 3B as compared to Existing Conditions (restricted downstream conditions) and Option 1 (clean downstream conditions) for the three summer 2012 storm events and the design storm event.

Advantages:

- This option contains similar advantages to Option 2 while avoiding some of the constructability concerns related to the siting/alignment of the open channel between Prescott Hall Road and the drainage channel west of City Yard
- Culvert is routed along City-owned roads/land

- As shown in Tables 3-1 and 3-2 the Prescott Hall watershed flood volume reduction (92% for design storm) and maximum flood duration (75% reduction) performance is similar to that achieved by Options 2 and 3A. Additionally, Table 3-3 demonstrates that the Halsey Street culvert provides significant flood volume reduction performance above that provided by (Option 1).
- As shown in Tables 3-1 and 3-2 Malbone Road watershed flood volume reduction (46% for design storm) and maximum flood duration (64% reduction) are less than that achieved under Options 2 and 3A indicating that Malbone watershed is more dependent on downstream conditions than Prescott Hall. As shown in Table 3-3, the marginal performance improvements for the Malbone Channel are significantly less than those in Prescott Hall and for those higher frequency storm events (1 year and 2 year events) the Malbone Channel flood reduction performance is most affected by downstream conditions.
- As shown in Tables 3-1 and 3-2 Downstream watershed flood volume reduction (63% for design storm) and maximum flood duration (61%) are less than that achieved under Options 2 and 3A, but downstream conditions are improved as compared to Option 1 due to the increased system storage capacity provided by the Prescott Hall and Malbone improvements. As shown in Table 3-3 the marginal performance improvements from Option 1 in the downstream watershed are significant (greater than 47% for the 1 Year, 2 Year and 10 Year storm events), but as discussed below in the disadvantages, flood reduction performance decreases with storm intensity as indicated by the July 28, 2012 storm event.
- The upgraded area would have a much greater hydraulic capacity potential than existing conditions.

Disadvantages:

- This option is more expensive than Option 1
- Construction disturbances to residential and commercial areas
- Local and major traffic route disruptions
- Downstream culvert upgrades are not implemented before upstream improvements, which provides for the potential of negative downstream impacts within the Downstream watershed under more intense storm events such as the July 28, 2012 storm (10 Year Frequency). Absent the downstream culvert improvements, the downstream hydraulic capacity has the potential to be exceeded due to the improved conveyance of storm water from the Malbone and Prescott Hall watersheds.
- Project schedule for design and construction of state drainage improvements would remain under the control of RIDOT
- Potential utility conflicts on Halsey Street due to presence of 8” sanitary sewer, 6” asbestos cement and cast iron water main, and natural gas main along Halsey Street and at the City Yard
- Property access disruptions for residential and commercial properties along Halsey Street

Section 4 - Planning Level Cost Estimate:

Planning level cost estimates (Class V Order of Magnitude) for the Halsey Street Culvert and drainage system improvements are summarized in Table 4-1.

TABLE 4-1

Halsey Street Culvert Class V Planning Level Cost Estimate

Halsey Street Culvert Project Elements	Class V Planning Level Cost
Base – 10'x5' Box Culvert	$1,589,000.00
Appurtenances 25% of Base	$397,000.00
Construction Sub-Total	**$2,499,000.00**
50% Class V Construction Contingency	$993,000.00
Engineering Services 15% of Construction	$298,000.00
Total Project Cost Estimate	**$3,276,000.00**

The following are assumptions included in the cost development:

- Planning level cost estimates developed from bid results for several recent public works projects in Northeast region. Malbone Option 1 base cost referenced from Malbone Study TM. Malbone Option 1 appurtenance, construction contingency, and engineering costs have been updated to be consistent with Halsey Street Culvert cost assumptions.
- Base price includes costs for furnishing and installing the various sized drainage pipe, manhole structures, and/or culvert structures required for each mitigation alternative
- Appurtenances were assumed to be 25% of the base construction costs. Appurtenances include items such as surface restoration, paving, additional backfill materials, traffic controls, erosion controls, etc.
- Class V Cost Estimate is reflective of a planning level project (0 to 2% design) and the estimate accuracy is accepted to be within -30% and +50%
- Planning level estimate assumes suitable subsurface conditions for conventional means and methods of drainage system construction
- Cost estimates for the RIDOT drainage improvements were not developed as part of this study

Section 5 - Constructability

The flooding mitigation alternatives evaluated for this study present a variety of constructability concerns including the following:

- Project Ownership – The City's and State's drainage systems are interconnected and flood mitigation planning, design and construction would require coordination between the Department of Utilities and RIDOT. CH2M HILL recommends that the City schedule a meeting with representatives from RIDOT to discuss the historical flooding issues and the drainage studies completed for Malbone and Prescott Hall watersheds.
- Project Sequencing – As discussed with Option 3A and 3B, the sequencing of downstream and upstream mitigation projects is critical. Implementation of upstream projects in advance of

downstream projects could result in negative impacts as indicated by increased localized downstream flooding.

- Land Ownership – The proposed open channel between Prescott Hall Road and the drainage channel west of the City Yard would cross both private and state owned lands. The alignment and extend of any proposed drainage improvements along this route would have to be carefully evaluated to determine if any drainage easements or other land use agreements are necessary.
- Proximity to Developed Land – The commercial/industrial properties located on Halsey Street east of State Road 138/238 have developed footprints that extend up to their property boundaries. Any proposed drainage improvements along these property boundaries would have to evaluate construction impacts to these properties. Additionally the twin 60” pipe culverts that extend underneath JT Connell Highway also cross under the adjacent shopping plaza and the auto dealership at 112 JT Connell Highway. The potential disruptions to business operations would need to be evaluated further and additional project stakeholders would have to be consulted.
- Highway Modifications – Any proposed drainage improvements that extend across State Road 138/238, Admiral Kalbfus Road, and JT Connell Highway have the potential to require significant modifications and/or disruptions to these state roads. Upgrades to these existing 60” culverts extending under these roads would present significant construction and logistical challenges that would need to be evaluated further. Specifically the culvert upgrades would require further evaluation to optimize the geometry and alignment of any culvert upgrades.
- Utility Conflicts – The proposed drainage improvements along Halsey Street and JT Connell Highway have the potential to conflict with existing water, sanitary sewer, gas, electric, and communications utilities. Relocation of utilities, temporary service connections, bypass pumping, and/or concurrent upgrades to subsurface utilities may be required.
- Local Traffic and Property Access Disruptions – The proposed drainage improvements would have significant local traffic impacts along the streets of Malbone neighborhood, Halsey Street, Admiral Kalbfus Road, and JT Connell Highway. Additionally, access to the commercial/industrial properties on Halsey Street (including the solid waste transfer station and maintenance garage) would be disrupted by the culvert construction along Halsey Street.
- Subsurface Conditions – Potential exists for encountering unsuitable subsurface soils (wetland soils, contaminated soils, and solid waste) due to the historical and current land uses of the Halsey Street area in the vicinity of the City Yard. In addition the topography and depth to groundwater within the vicinity of Halsey Street may present challenging dewatering conditions. Preliminary geotechnical investigations would be recommended to determine the elevation of the groundwater table and characterize the subsurface soils along any proposed storm drain route.
- Stormwater Detention – The Malbone Study included several green infrastructure options for detention basins in the upper and lower portions of the Malbone watershed. These basins were proposed to manage stormwater to attenuate peak flows and provide some infiltration. The siting of these basins within the Malbone watershed is problematic due to the lack of City-owned land at the downstream end of Malbone Channel (Malbone Estate and Newport Grand) and the potential for restricted use of Miantonomi Park. An alternative site for a stormwater detention basin would be the northern parcel of the City Yard property, where currently equipment and materials are stored. This area of up to 2.6 acres could provide sufficient space for a detention

basin with between 1.75 and 2.5 Million gallons of storage capacity. A basin of this volume would provide for storage of a significant portion of the Prescott Hall flood volume (2.75 million gallons) generated during the 10 Year 6 Hour design storm. It would also avoid the land ownership/use restrictions presented by siting of a basin along Malbone Channel or at Miatonomi Park.

Section 6 – Recommendations and Items for Further Consideration

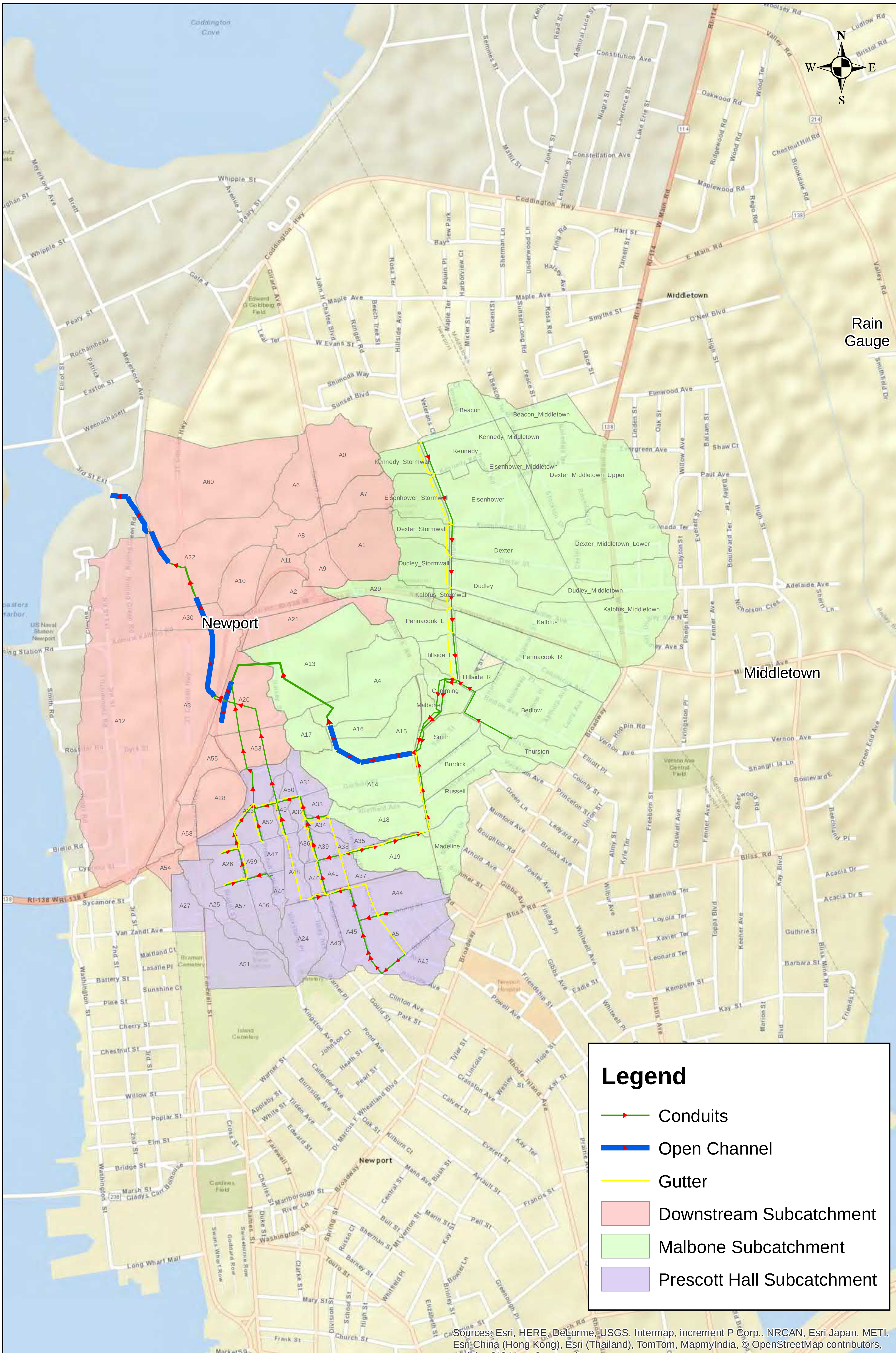
The following is a list of recommendations and issues for the City to take into consideration while reviewing the study results and when considering any future drainage infrastructure design in the study area. The list includes issues for further research that could potentially impact selection or design of mitigation alternative, key assumptions relevant to the study, and acknowledgement of various issues outside of the scope of this study.

1. Perform Option 1 (Basic Maintenance) - Clean Culverts and Channels: Increased maintenance and cleaning of the channels and culverts should be considered due to the quantity of silt, vegetation, and trash observed in the City and State channels. Several photographs taken during the limited walking survey of the drainage system are provided in Attachment 1. This would require coordination with RIDOT.
2. Consider Option 3B (Baseline Maintenance and Halsey Street Box Culvert Only): The results of the Prescott Hall drainage investigation indicate that a flooding mitigation alternative with the least amount of RIDOT involvement is Option 3B, albeit at an approximate cost to the City of $3.3 million for the Halsey Street Culvert. This does not include the additional cost of Malbone Option 1.
3. Perform Drain Pipe Inspection and Maintenance - The August 2012 CCTV Inspection and Cleaning Report for 48-inch drain pipe from Malbone Channel outlet to the channel behind the City Yard indicated a significant amount of accumulated sediment within the drain line and at its outlet. The frequency of CCTV inspection and maintenance should be increased due to the observed sedimentation. The potential for erosion of the earthern headwall at the drain outlet should be evaluated further and consideration should be given to stabilizing this slope temporarily until a permanent concrete headwall could be installed. The 42” storm drain from Prescott Hall Road to the drainage channel west of the City Yard should also be inspected and cleaned as necessary.
4. Consider Climate Change Risk and Mitigation – Potential impacts from increased storm return frequency and sea level rise could negatively impact the City’s ability to effectively collect and convey storm water.

Attachment 1

H/H Model Figures and Tables

Photographs



CH2MHILL.

0 50 100 200 300 400 Miles

Figure 1
Watershed delineation and
H/H Model Schematic

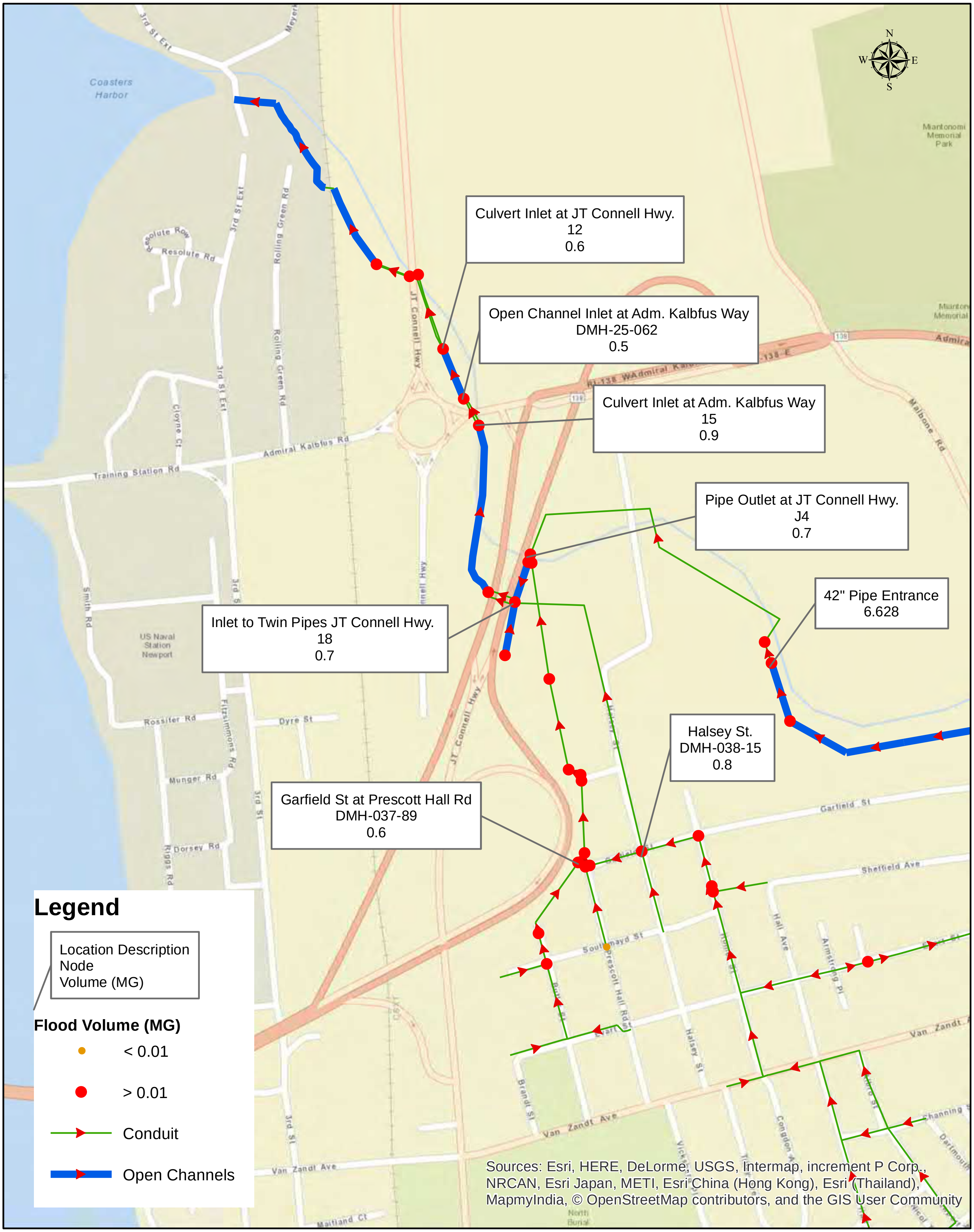
CH2MHILL

0 240 480 960 Feet

N W E S

Figure 2
Study Area Topography

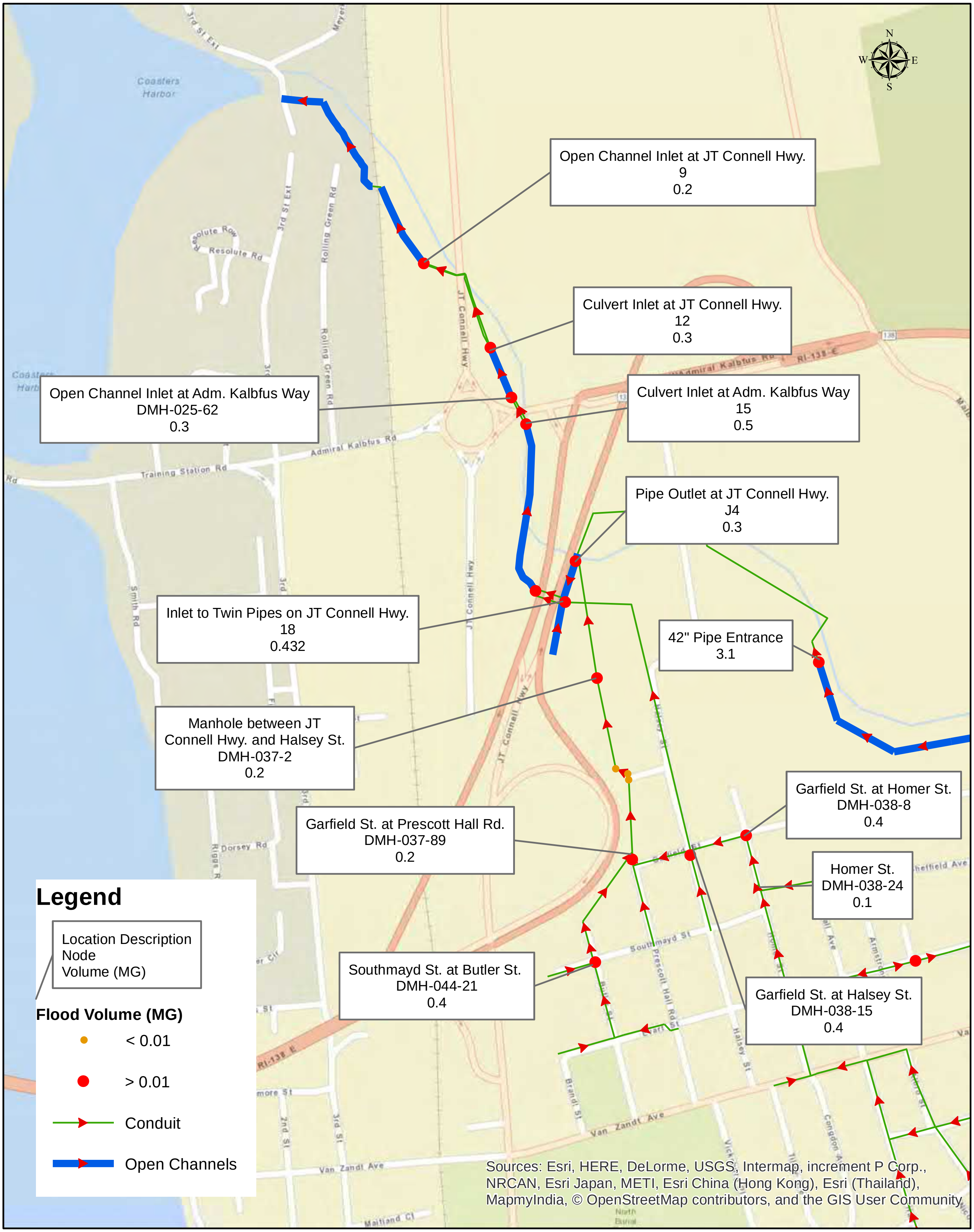
Note: Labels in the map show total flood volumes in million gallons.



0 150 300 600
Feet

Figure 3
Existing Conditions
July 28, 2012 Storm

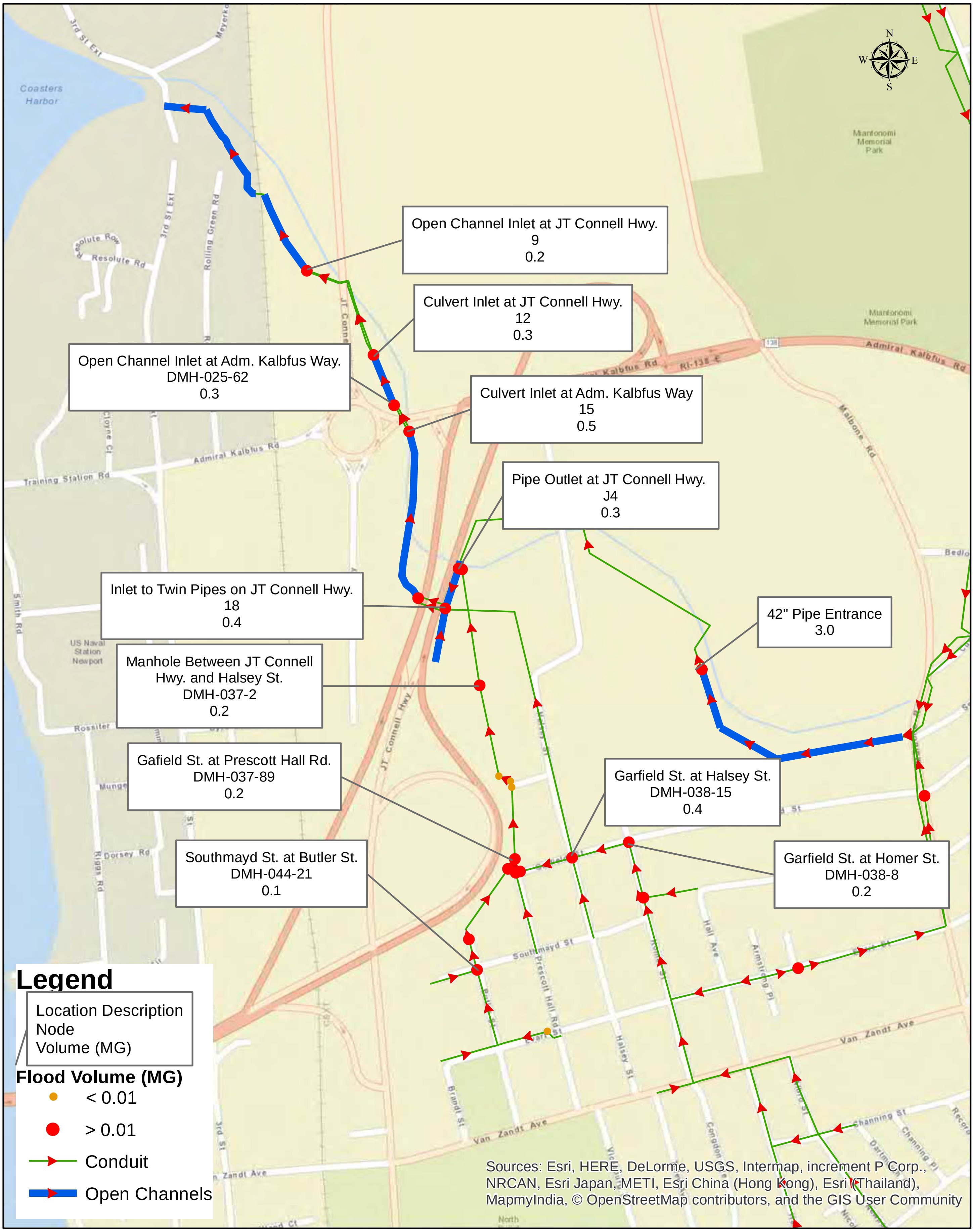
Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table1.



0 155 310 620
Feet

Figure 4
Existing Conditions
August 10, 2012 Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table1.



0 150 300 600 Feet

Figure 5
Existing Conditions
August 15, 2012 Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table1.

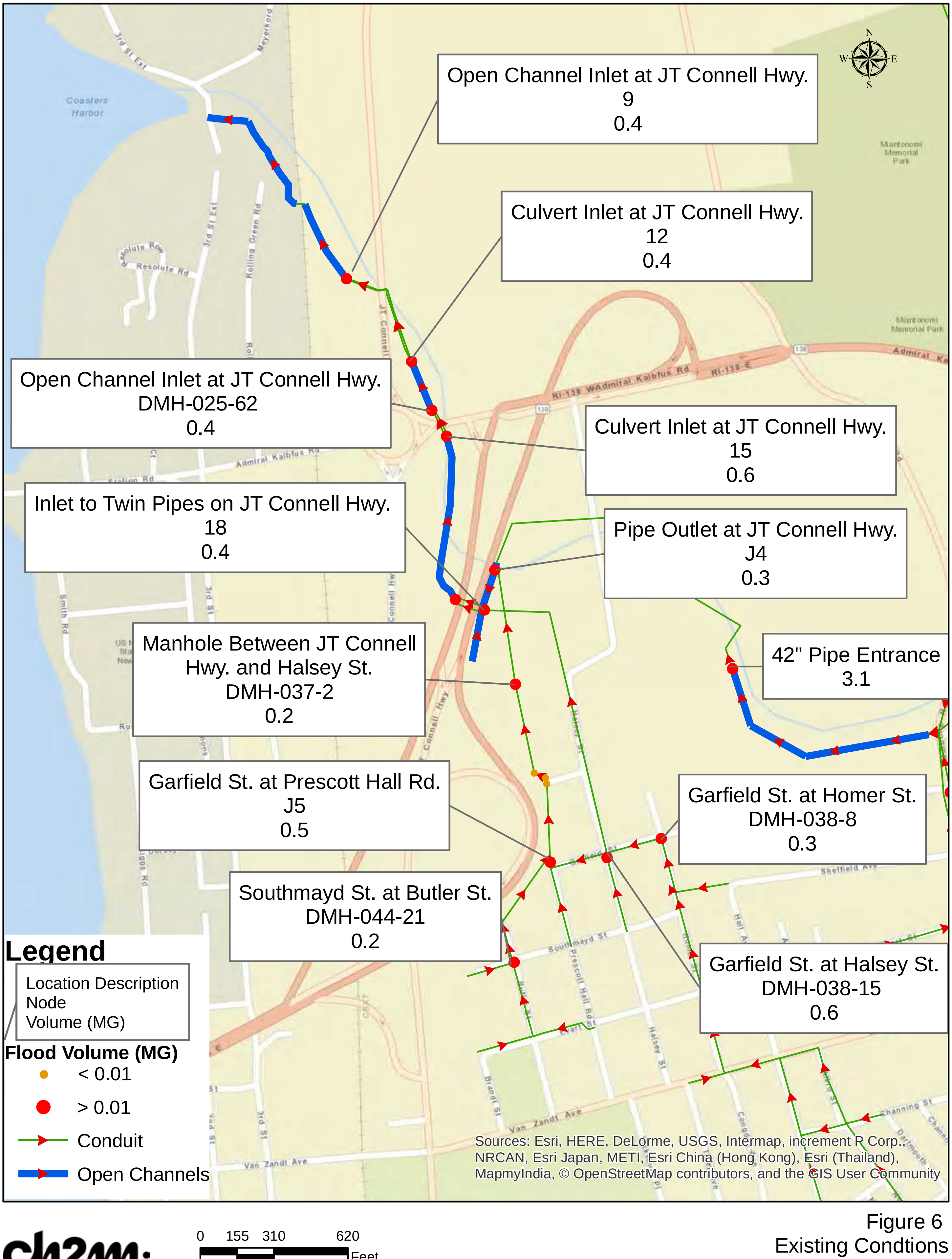
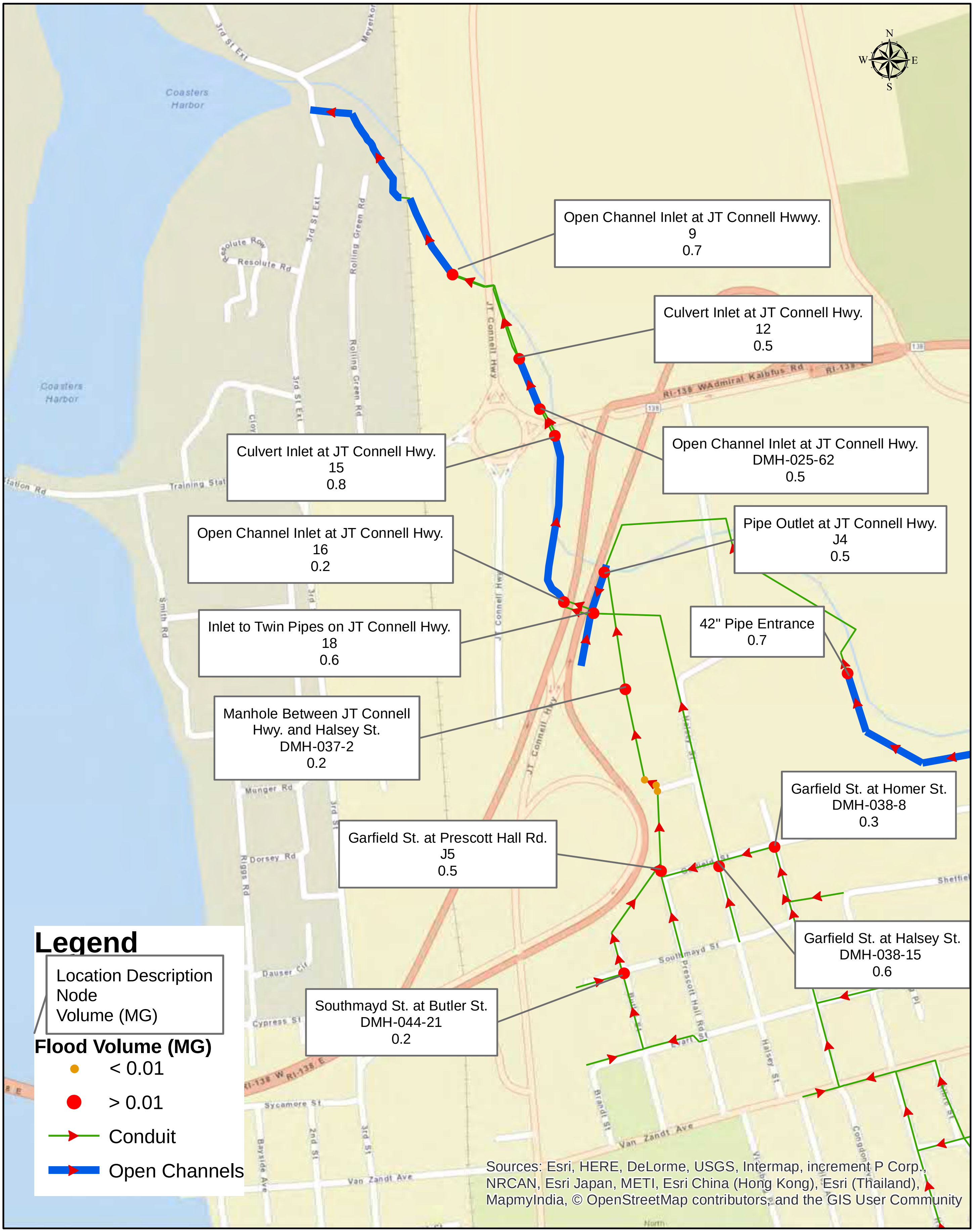


Figure 6
Existing Condtions
10-Year 6-Hour Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table1.

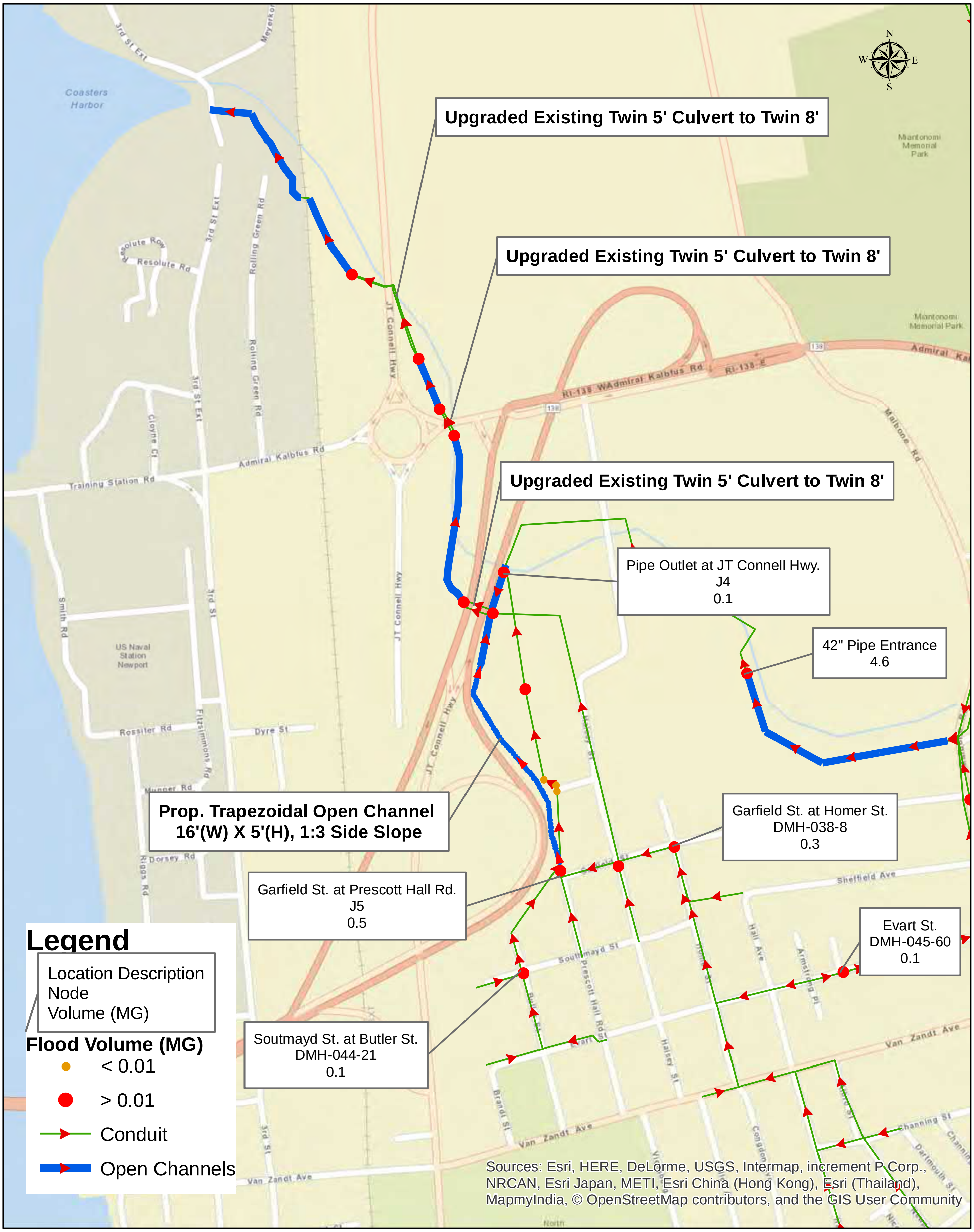


ch2m

0 155 310 620 Feet

Figure 7
Option 1: Clean Culverts and Channels
10-Year 6-Hour Storm

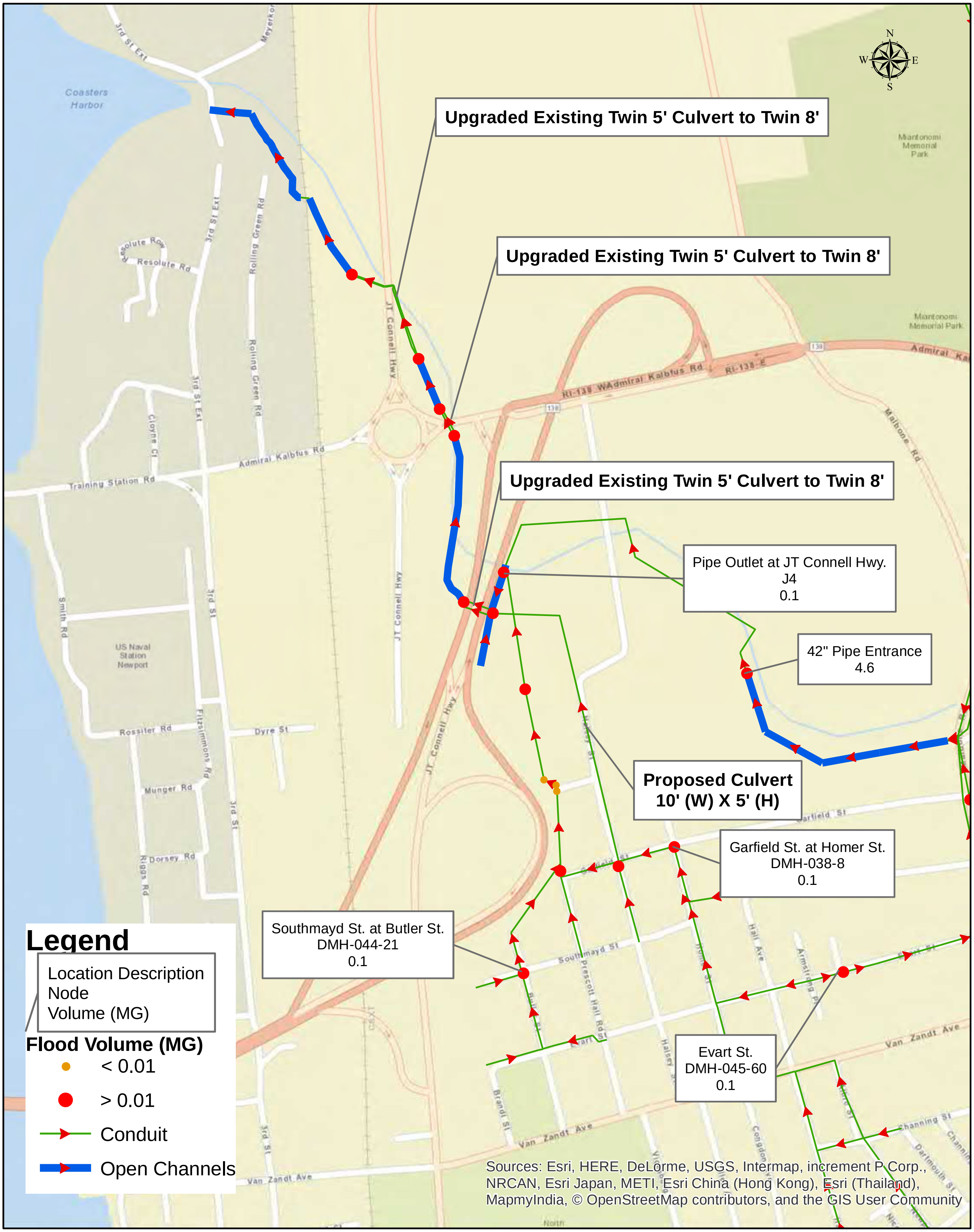
Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table 2.



0 155 310 620 Feet

Figure 8
Option 2: Open Channel Upgrade
10-Year 6-Hour Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table 2.



0 150 300 600
Feet

Figure 9
Option 2: Upgraded Box Culvert
10-Year 6-Hour Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table 2.

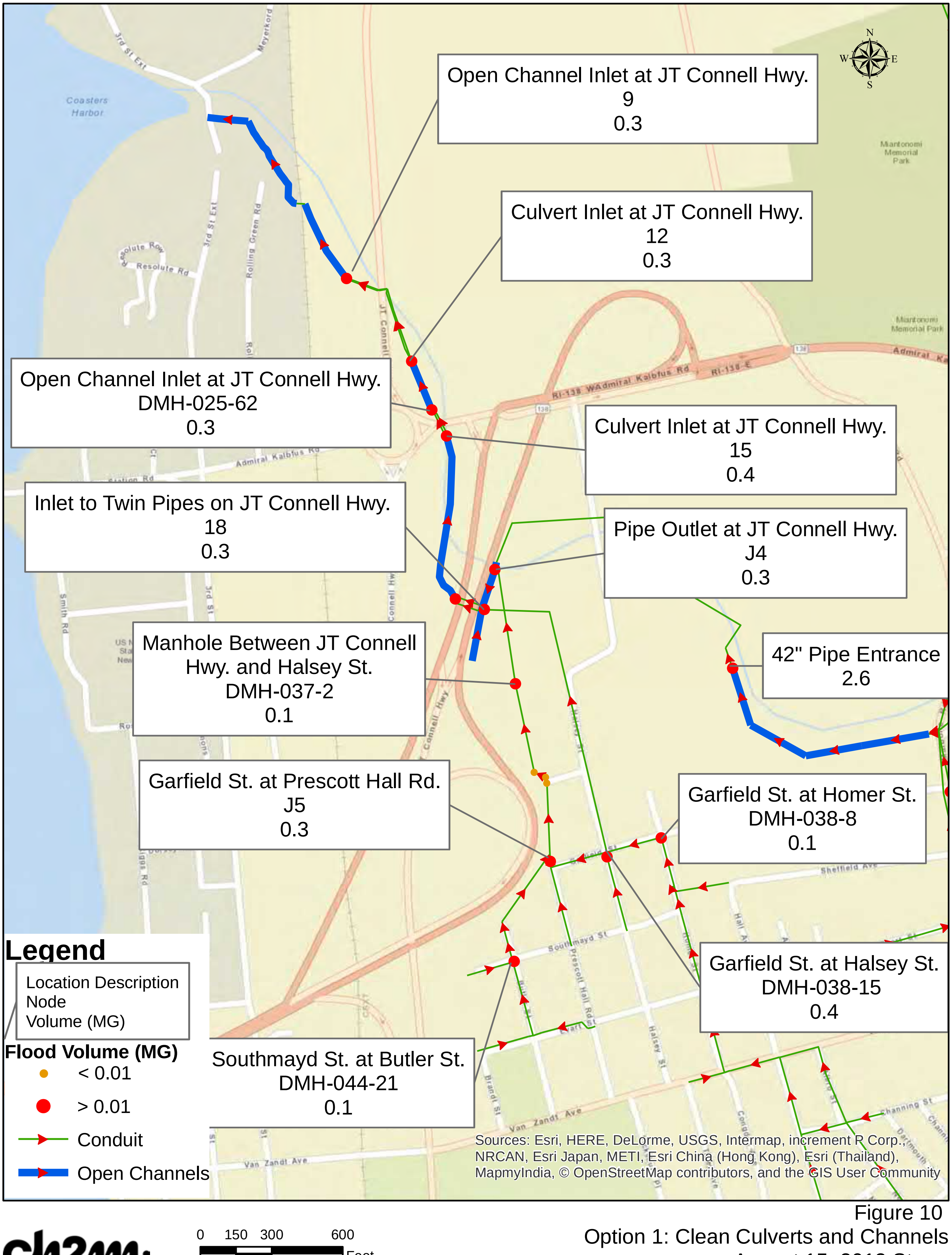


Figure 10
Option 1: Clean Culverts and Channels
August 15, 2012 Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table2.

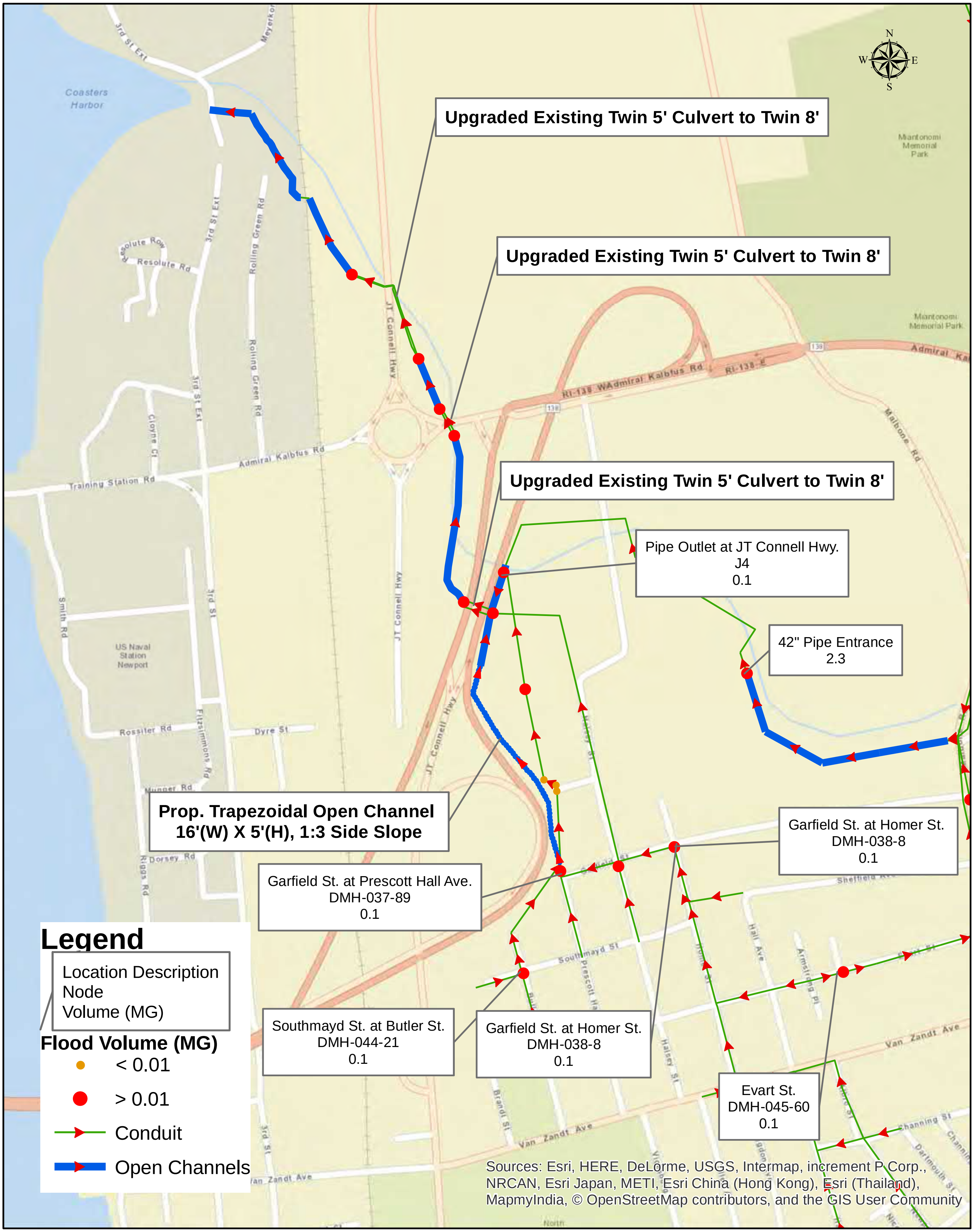


Figure 11
Option 2: Open Channel Upgrade
August 15, 2012 Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table 2.

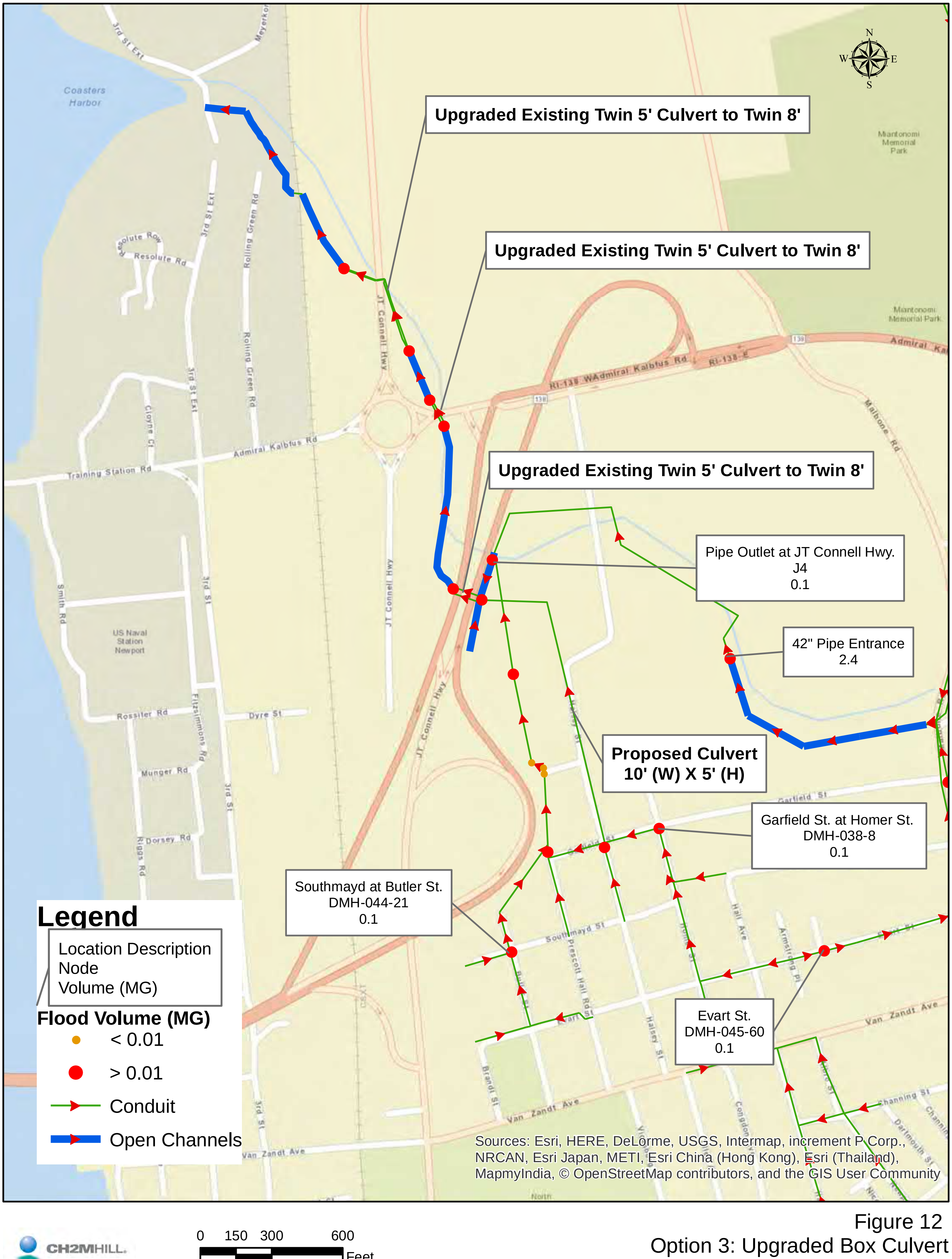
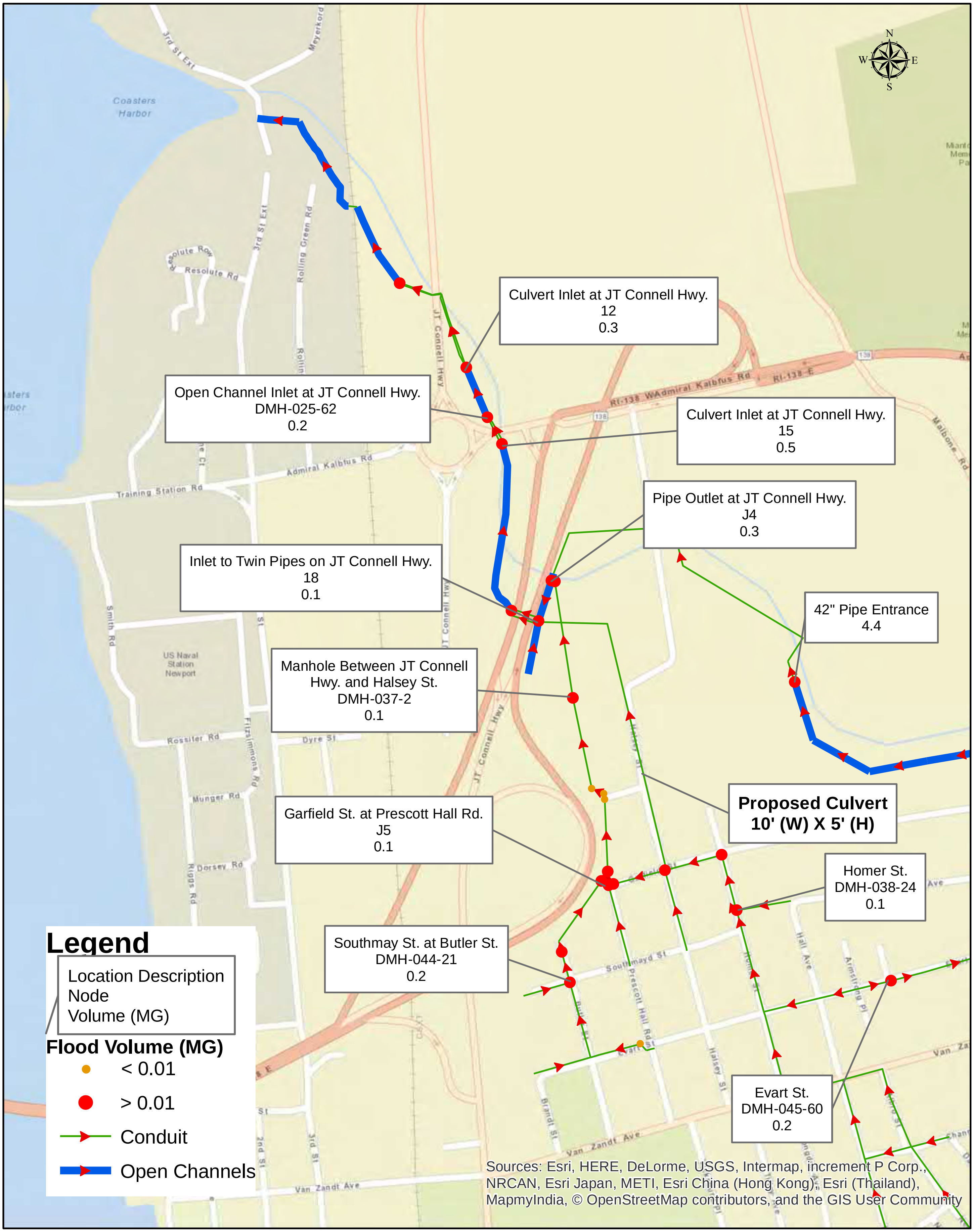


Figure 12
Option 3: Upgraded Box Culvert
August 15, 2012 Storm

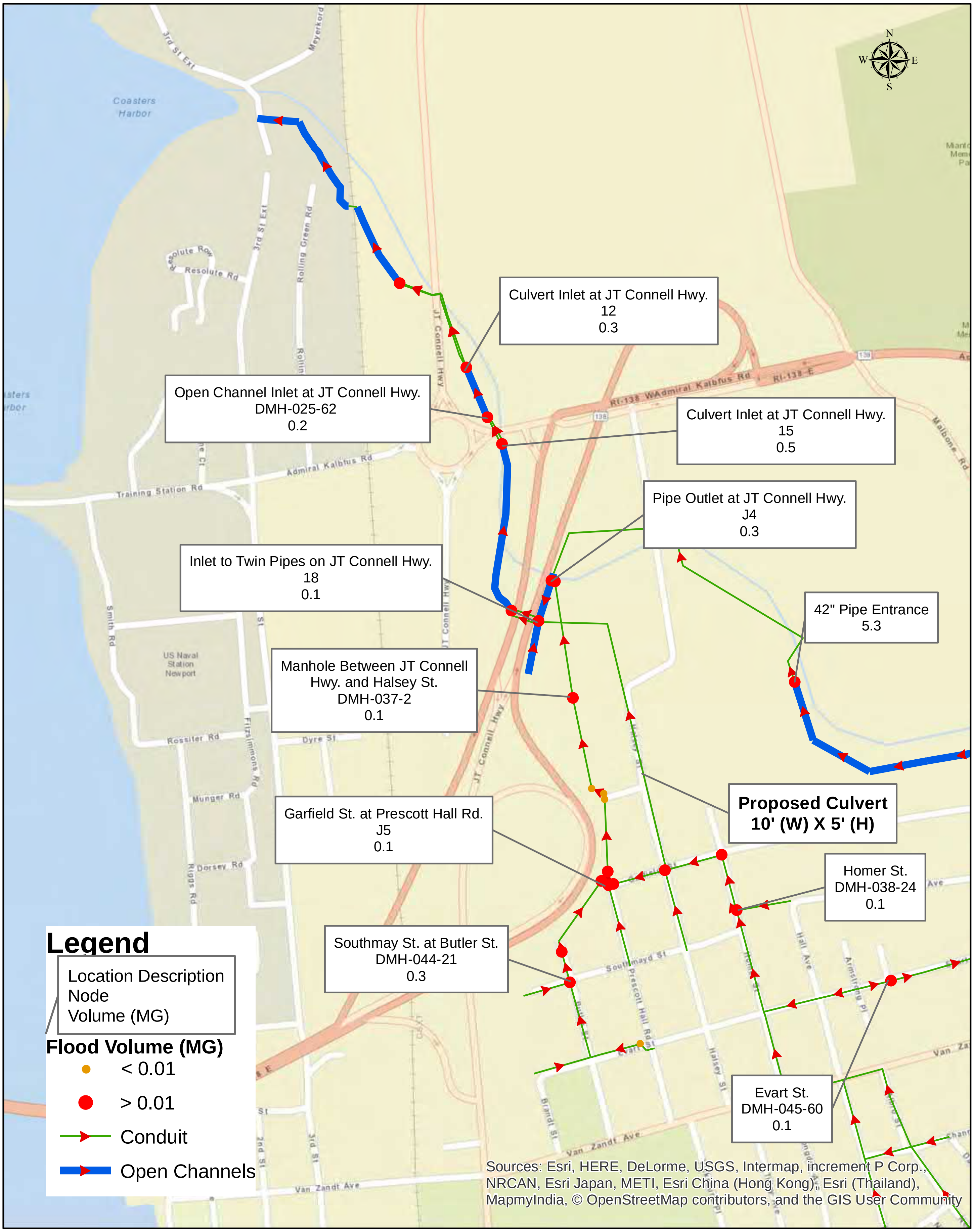
Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table 2.



0 150 300 600
Feet

Figure 13
Option 3B: Upgraded Box Culvert + Clean Downstream
10-Year 6-Hour Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table1.



0 150 300 600
Feet

Figure 14
Option 3B: Upgraded Box Culvert + Clean Downstream
July 28, 2012 Storm

Note: Labels in the map show key flood locations and total flood volumes in million gallons. Refer to Attachment 1, Table 2.

ATTACHMENT 1
PRESCOTT HALL DRAINAGE STUDY

TABLE 2
SUMMARY OF DRAINAGE ANALYSIS AND FLOOD ASSESSMENT RESULTS:
EXISTING CONDITIONS AND 3 MITIGATION ALTERNATIVES UNDER THE DESIGN STORM

Location	Gutter Flow ID	Node ID	Existing Conditions				Option 1				Option 2				Option 3A				Option 3B			
			Flood				Flood				Flood				Flood				Flood			
			Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)	Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)	Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)	Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)	Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)
JT Connell Hwy.		10	0	3,877	3,877	1.9	0	6,390	6,390	4.6	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		12	0	66,841	66,841	9.2	0	63,620	63,620	6.5	0	0	0	0.0	0	0	0	0.0	0	30,840	30,840	2.5
Adm. Kalbus Way		15	0	110,554	110,554	9.0	0	100,300	100,300	6.4	0	0	0	0.0	0	0	0	0.0	0	62,470	62,470	2.6
JT Connell Hwy.		16	0	37,965	37,965	4.2	0	30,510	30,510	4.2	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		17	0	31,281	31,281	4.8	0	22,110	22,110	4.3	0	0	0	0.0	0	0	0	0.0	0	2,883	2,883	0.1
JT Connell Hwy.		18	0	86,224	86,224	7.1	0	71,650	71,650	5.6	0	0	0	0.0	0	0	0	0.0	0	7,181	7,181	1.0
Evart St.		23	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		24	0	1,337	1,337	1.1	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		27	0	4,144	4,144	1.9	0	6,521	6,521	4.4	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Butler St.		4	0	19,517	19,517	3.8	0	5,674	5,674	4.1	0	267	267	0.2	0	134	134	0.1	0	713	713	0.5
Jt Connell Hwy.		6	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
3rd St. Ext.		7	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		9	0	45,184	45,184	2.9	0	97,740	97,740	6.2	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
N of Prescott Hall Rd.		CB-037-83	0	4,144	4,144	4.6	0	2,588	2,588	3.7	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
N of Prescott Hall Rd.		CB-037-84	0	4,010	4,010	4.9	0	2,815	2,815	4.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
N of Prescott Hall Rd.		CB-037-85	0	4,545	4,545	4.9	0	3,232	3,232	4.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Garfield Rd.		CB-037-88_BB	0	12,700	12,700	6.7	0	11,740	11,740	5.8	0	802	802	0.5	0	0	0	0.0	0	0	0	0.0
Evart St.	G16	CB-044-14	4,281	0	4,281	0.0	4,153	0	4,153	0.0	4,156	0	4,156	0.0	4,003	0	4,003	0.0	4,031	0	4,031	0.0
Evart St.		CB-044-5	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Southmayd St.	G18	CB-044-75	6,435	0	6,435	0.0	6,253	0	6,253	0.0	6,244	0	6,244	0.0	5,688	0	5,688	0.0	5,826	0	5,826	0.0
Evart St.		CB-044-8	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.		CB-045-38	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Channel		Culvert_Outlet	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Cummings Rd.	Gutter9	Cummings_MH	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hillside Ave.	Gutter1	DMH-016-21	6,942	0	6,942	0.0	6,818	0	6,818	0.0	6,927	0	6,927	0.0	6,814	0	6,814	0.0	6,815	0	6,815	0.0
Hillside Ave.	Gutter3	DMH-021-45	30,150	0	30,150	0.0	28,340	0	28,340	0.0	30,140	0	30,140	0.0	28,340	0	28,340	0.0	28,340	0	28,340	0.0
Adm. Kalbus Way		DMH-025-62	0	62,295	62,295	8.7	0	60,000	60,000	6.4	0	0	0	0.0	0	0	0	0.0	0	25,870	25,870	2.2
Hillside Ave.	Gutter5	DMH-027-11	157,300	0	157,300	0.0	25,980	0	25,980	0.0	157,300	0	157,300	0.0	25,980	0	25,980	0.0	25,980	0	25,980	0.0
Adm. Kalbus Way	Gutter6	DMH-027-14	268,100	6,550	274,650	0.2	57,290	6,656	63,946	0.2	268,100	0	268,100	0.0	57,310	0	57,310	0.0	57,310	0	57,310	0.0
Hillside Ave.	Gutter4	DMH-027-7	138,900	0	138,900	0.0	103,400	0	103,400	0.0	139,000	0	139,000	0.0	103,400	0	103,400	0.0	103,300	0	103,300	0.0
Malbone Channel		DMH-032-32A	0	197,581	197,581	2.8	0	65,060	65,060	2.1	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Bedlow Ave.		DMH-033-35	0	22,592	22,592	0.6	0	22,530	22,530	0.6	0	19,517	19,517	0.5	0	19,517	19,517	0.5	0	19,480	19,480	0.5
Cummings Rd.	Gutter10	DMH-033-37	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hillside Ave.	Gutter7	DMH-033-38	522,200	150,926	673,126	1.7	99,330	152,000	251,330	1.7	522,200	11,898	534,098	0.2	99,320	11,898	111,218	0.2	99,320	12,250	111,570	0.2
Bedlow Ave.	Gutter8	DMH-033-45	0	119,243	119,243	2.4	0	119,500	119,500	2.4	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Bedlow Ave.		DMH-033-47	0	416,684	416,684	2.7	0	417,200	417,200	2.7	0	35,827	35,827	0.4	0	35,960	35,960	0.4	0	36,040	36,040	0.4
N of Prescott Hall Rd.		DMH-037-2	0	31,682	31,682	7.2	0	25,340	25,340	5.8	0	0	0	0.0	0	0	0	0.0	0	5,963	5,963	1.4
Garfield Rd.		DMH-037-89	0	69,781	69,781	6.5	0	63,620	63,620	5.6	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Halsey St.	G14	DMH-038-15	298,600	88,363	386,963	5.9	288,700	80,910	369,610	5.2	289,900	267	290,167	0.1	0	0	0	0.0	0	0	0	0.0
Hall Ave.	G9	DMH-038-19	13,020	0	13,020	0.0	11,880	0	11,880	0.0	12,880	0	12,880	0.0	11,850	0	11,850	0.0	11,790	0	11,790	0.0
Homer St.	G12	DMH-038-21_BB	290,400	936	291,336	1.5	240,500	0	240,500	0.0	252,700	0	252,700	0.0	100,400	0	100,400	0.0	116,000	0	116,000	0.0
Homer St.	G11	DMH-038-24	238,800	10,026	248,826	3.4	191,400	10,230	201,630	2.4	197,000	7,352	204,352	0.8	101,500	7,887	109,387	1.0	113,500	8,172	121,672	1.1
Homer St.	G13	DMH-038-8	285,300	40,238	325,538	5.0	278,300	35,240	313,540	4.4	280,700	0	280,700	0.0	12,070	0	12,070	0.0	31,250	0	31,250	0.0

Location	Gutter Flow ID	Node ID	Existing Conditions				Option 1				Option 2				Option 3A				Option 3B			
			Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)
			Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	
Thurston Ave.		DMH-039-26	0	4,679	4,679	0.6	0	4,622	4,622	0.6	0	4,545	4,545	0.6	0	4,545	4,545	0.6	0	4,579	4,579	0.6
Malbone Rd.		DMH-039-34	0	936	936	0.2	0	815	815	0.2	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Rd.		DMH-039-41	0	6,818	6,818	0.4	0	6,835	6,835	0.4	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Rd.	Gutter11	DMH-039-42	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Rd.		DMH-039-43	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Southmayd St.	G19	DMH-044-21	170,400	65,504	235,904	7.3	0	21,910	21,910	3.9	0	14,705	14,705	1.3	0	13,903	13,903	1.2	0	17,170	17,170	1.6
Evart St.	G17	DMH-044-6	2,659	0	2,659	0.0	2,588	0	2,588	0.0	2,597	0	2,597	0.0	2,477	0	2,477	0.0	2,510	0	2,510	0.0
Butler St.	G20	DMH-044-69	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Prescott Hall Rd.	G15	DMH-044-71	3,306	0	3,306	0.0	32	0	32	0.0	302	0	302	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.	G27	DMH-045-23	12,640	0	12,640	0.0	11,050	0	11,050	0.0	12,630	0	12,630	0.0	11,030	0	11,030	0.0	11,040	0	11,040	0.0
Channing St.	G22	DMH-045-24	12,500	0	12,500	0.0	12,490	0	12,490	0.0	12,490	0	12,490	0.0	12,490	0	12,490	0.0	12,500	0	12,500	0.0
Channing St.		DMH-045-25	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Homer St.	G10	DMH-045-26	87,920	0	87,920	0.0	79,700	0	79,700	0.0	80,530	0	80,530	0.0	67,510	0	67,510	0.0	69,410	0	69,410	0.0
Halsey St.	G21	DMH-045-30	4,541	0	4,541	0.0	4,053	0	4,053	0.0	4,184	0	4,184	0.0	2,193	0	2,193	0.0	2,874	0	2,874	0.0
Evart St.	G27	DMH-045-33	12,640	0	12,640	0.0	11,050	0	11,050	0.0	12,630	0	12,630	0.0	11,030	0	11,030	0.0	11,040	0	11,040	0.0
Homer St.	G7	DMH-045-35	8,080	0	8,080	0.0	8,065	0	8,065	0.0	8,067	0	8,067	0.0	7,950	0	7,950	0.0	7,965	0	7,965	0.0
Evart St.		DMH-045-37	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hall Ave.	G4	DMH-045-40	795	0	795	0.0	797	0	797	0.0	795	0	795	0.0	796	0	796	0.0	796	0	796	0.0
Van Zandt Ave.		DMH-045-44	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Van Zandt Ave.	G6	DMH-045-45	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Van Zandt Ave.	G5	DMH-045-48	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.		DMH-045-51	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.		DMH-045-59	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.		DMH-045-60	0	4,144	4,144	1.8	0	4,156	4,156	1.8	0	4,010	4,010	1.7	0	4,010	4,010	1.7	0	4,025	4,025	1.7
Malbone Rd.	G25	DMH-046-61	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hall Ave.		DMH-051-36	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hall Ave.		DMH-051-37	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Warner St.		DMH-051-38	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Warner St.		DMH-051-39	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Warner St.		DMH-051-41	0	401	401	0.7	0	374	374	0.8	0	401	401	0.7	0	401	401	0.8	0	373	373	0.7
Warner St.		DMH-051-43	0	668	668	0.9	0	647	647	0.9	0	668	668	0.9	0	668	668	0.9	0	653	653	0.9
Hall Ave.		DMH-051-67	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Prescott Hall Rd.		J1	0	13,635	13,635	6.3	0	11,760	11,760	5.4	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		J2	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		J3	0	38,500	38,500	9.1	0	30,090	30,090	6.2	0	7,219	7,219	1.2	0	8,021	8,021	1.1	0	17,680	17,680	3.6
JT Connell Hwy.		J4	0	78,872	78,872	7.6	0	71,010	71,010	5.7	0	5,882	5,882	0.5	0	7,753	7,753	0.5	0	39,130	39,130	2.5
Prescott Hall Rd.		J5	0	45,184	45,184	6.3	0	34,840	34,840	5.5	0	0	0	0.0	0	0	0	0.0	0	1,435	1,435	1.0
Hillside Ave.	Gutter2	Kennedy_MH	151	0	151	0.0	133	0	133	0.0	149	0	149	0.0	134	0	134	0.0	134	0	134	0.0
Malbone Channel		MalboneChannel1	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Channel		MalboneChannel2	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Channel		MalboneChannel3	0	48,526	48,526	5.5	0	43,550	43,550	4.9	0	8,155	8,155	0.5	0	8,556	8,556	0.5	0	0	0	1.8
Malbone Channel		PipeEntrance	0	938,441	938,441	12.0	0	913,100	913,100	10.8	0	611,323	611,323	4.7	0	613,061	613,061	4.7	0	588,500	588,500	4.3
Hall Ave.		SMH-051-77	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Halsey St. Conduit		J6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0	0
Halsey St. Conduit		J7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	223300	223,300	0.75
Malbone Channel		MalboneChan ExitOrifice2	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	23920	23,920	0

Note:

1. The absence of flood conditions, gutter or curb overflow, is indicated by a zero value in the table. Positive values indicate gutter flow and/or curb overflow were simulated by the H/H model at the gutter section or manhole node.
2. Design Storm is Type III 10-Year 6-Hour Storm

ATTACHMENT 1
PRESCOTT HALL DRAINAGE STUDY

TABLE 1
SUMMARY OF DRAINAGE ANALYSIS AND FLOOD ASSESSMENT RESULTS:
EXISTING CONDITIONS UNDER THE SUMMER 2012 AND DESIGN STORM EVENTS

Location	Gutter Flow ID	Node ID	July 28th Storm				August 10th Storm				August 15th Storm				Design Storm			
			Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)
			Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	
JT Connell Hwy.		10	0	5,318	5,318	1.4	0	0	0	0.0	0	0	0	0.0	0	3,703	3,703	1.9
JT Connell Hwy.		12	0	73,260	73,260	7.3	0	38,530	38,530	3.9	0	38,340	38,340	3.8	0	67,620	67,620	9.2
Adm. Kalbus Way		15	0	123,500	123,500	7.2	0	57,470	57,470	3.8	0	66,390	66,390	3.7	0	110,900	110,900	9.0
JT Connell Hwy.		16	0	45,310	45,310	2.7	0	1,337	1,337	0.3	0	2,512	2,512	0.3	0	37,960	37,960	4.2
JT Connell Hwy.		17	0	35,540	35,540	3.3	0	6,243	6,243	0.4	0	10,180	10,180	0.5	0	30,310	30,310	4.8
JT Connell Hwy.		18	0	94,310	94,310	5.6	0	41,410	41,410	2.7	0	67,530	67,530	2.6	0	88,270	88,270	7.1
Evart St.		23	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		24	0	3,791	3,791	1.0	0	0	0	0.0	0	0	0	0.0	0	1,362	1,362	1.1
JT Connell Hwy.		27	0	5,645	5,645	1.4	0	0	0	0.0	0	0	0	0.0	0	4,152	4,152	1.9
Butler St.		4	0	15,970	15,970	2.9	0	3,430	3,430	1.0	0	3,528	3,528	0.5	0	19,390	19,390	3.8
Jt Connell Hwy.		6	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
3rd St. Ext.		7	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		9	0	52,370	52,370	1.8	0	24,220	24,220	0.6	0	24,870	24,870	0.6	0	46,600	46,600	2.9
N of Prescott Hall Rd.		CB-037-83	0	4,966	4,966	3.4	0	491	491	0.7	0	357	357	0.6	0	4,232	4,232	4.6
N of Prescott Hall Rd.		CB-037-84	0	4,730	4,730	3.6	0	914	914	1.1	0	798	798	1.0	0	4,029	4,029	4.9
N of Prescott Hall Rd.		CB-037-85	0	5,410	5,410	3.6	0	1,106	1,106	1.1	0	903	903	1.0	0	4,550	4,550	4.9
Garfield Rd.		CB-037-88_BB	0	13,930	13,930	5.2	0	8,877	8,877	2.8	0	8,497	8,497	2.8	0	12,660	12,660	6.7
Evart St.	G16	CB-044-14	8,349	0	8,349	0.0	3,333	0	3,333	0.0	3,021	0	3,021	0.0	4,281	0	4,281	0.0
Evart St.		CB-044-5	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0

Location	Gutter Flow ID	Node ID	July 28th Storm				August 10th Storm				August 15th Storm				Design Storm			
			Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)
			Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	
Southmayd St.	G18	CB-044-75	12,390	0	12,390	0.0	6,102	0	6,102	0.0	5,152	0	5,152	0.0	6,435	0	6,435	0.0
Evart St.		CB-044-8	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.		CB-045-38	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Channel		Culvert_Outlet	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Cummings Rd.	Gutter9	Cummings_MH	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hillside Ave.	Gutter1	DMH-016-21	17,450	0	17,450	0.0	11,820	0	11,820	0.0	10,050	0	10,050	0.0	6,942	0	6,942	0.0
Hillside Ave.	Gutter3	DMH-021-45	68,740	0	68,740	0.0	46,730	0	46,730	0.0	39,500	0	39,500	0.0	30,150	0	30,150	0.0
Adm. Kalbus Way		DMH-025-62	0	70,190	70,190	6.9	0	43,310	43,310	3.6	0	42,110	42,110	3.5	0	61,820	61,820	8.7
Hillside Ave.	Gutter5	DMH-027-11	270,500	26,720	297,220	0.6	151,600	27,890	179,490	0.3	135,600	21,820	157,420	0.3	157,300	0	157,300	0.0
Adm. Kalbus Way	Gutter6	DMH-027-14	409,100	15,410	424,510	0.8	216,100	20,700	236,800	0.4	197,800	22,310	220,110	0.3	268,100	6,672	274,772	0.2
Hillside Ave.	Gutter4	DMH-027-7	233,600	15,310	248,910	0.3	130,000	47,270	177,270	0.3	116,100	33,150	149,250	0.2	138,900	0	138,900	0.0
Malbone Channel		DMH-032-32A	0	2,845	2,845	0.4	0	0	0	0.0	0	0	0	0.0	0	197,400	197,400	2.8
Bedlow Ave.		DMH-033-35	0	45,430	45,430	0.8	0	29,600	29,600	0.3	0	29,160	29,160	0.3	0	22,530	22,530	0.6
Cummings Rd.	Gutter10	DMH-033-37	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hillside Ave.	Gutter7	DMH-033-38	541,700	272,200	813,900	1.9	299,600	154,700	454,300	0.9	300,800	138,900	439,700	0.9	522,200	152,000	674,200	1.7
Bedlow Ave.	Gutter8	DMH-033-45	839	149,600	150,439	2.3	0	98,430	98,430	1.3	0	95,550	95,550	1.4	0	119,600	119,600	2.4
Bedlow Ave.		DMH-033-47	0	384,300	384,300	2.4	0	200,200	200,200	1.5	0	203,400	203,400	1.5	0	416,900	416,900	2.7
N of Prescott Hall Rd.		DMH-037-2	0	33,770	33,770	5.5	0	19,080	19,080	3.0	0	18,660	18,660	2.9	0	31,620	31,620	7.2
Garfield Rd.		DMH-037-89	0	76,800	76,800	5.1	0	48,500	48,500	2.6	0	45,980	45,980	2.6	0	69,920	69,920	6.5
Halsey St.	G14	DMH-038-15	249,800	101,700	351,500	4.7	125,800	56,040	181,840	2.2	123,900	54,560	178,460	2.1	298,600	87,870	386,470	5.9
Hall Ave.	G9	DMH-038-19	48,540	0	48,540	0.0	31,780	0	31,780	0.0	22,350	0	22,350	0.0	13,020	0	13,020	0.0
Homer St.	G12	DMH-038-21_BB	258,000	8,260	266,260	1.9	114,900	1,530	116,430	0.2	102,800	0	102,800	0.0	290,400	863	291,263	1.5
Homer St.	G11	DMH-038-24	230,500	17,950	248,450	2.5	104,400	15,060	119,460	0.6	100,100	13,170	113,270	0.8	238,800	10,820	249,620	3.4
Homer St.	G13	DMH-038-8	232,700	49,770	282,470	3.9	116,200	22,140	138,340	1.4	107,500	19,460	126,960	1.3	285,300	40,230	325,530	5.0
Thurston Ave.		DMH-039-26	0	8,644	8,644	0.8	0	5,545	5,545	0.3	0	5,699	5,699	0.2	0	4,623	4,623	0.6
Malbone Rd.		DMH-039-34	0	5,617	5,617	0.3	0	8,123	8,123	0.2	0	9,228	9,228	0.2	0	816	816	0.2
Malbone Rd.		DMH-039-41	0	13,470	13,470	0.7	0	9,669	9,669	0.2	0	10,890	10,890	0.2	0	6,838	6,838	0.4
Malbone Rd.	Gutter11	DMH-039-42	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Rd.		DMH-039-43	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Southmayd St.	G19	DMH-044-21	154,100	60,270	214,370	6.1	0	17,350	17,350	1.1	0	12,600	12,600	0.9	170,400	62,260	232,660	7.3

Location	Gutter Flow ID	Node ID	July 28th Storm				August 10th Storm				August 15th Storm				Design Storm			
			Flood				Flood				Flood				Flood			
			Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)	Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)	Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)	Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	Duration (Hr)
Evart St.	G17	DMH-044-6	11,020	0	11,020	0.0	5,394	0	5,394	0.0	4,964	0	4,964	0.0	2,659	0	2,659	0.0
Butler St.	G20	DMH-044-69	2,412	0	2,412	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Prescott Hall Rd.	G15	DMH-044-71	2,666	311	2,977	0.3	715	0	715	0.0	867	0	867	0.0	3,306	0	3,306	0.0
Evart St.	G27	DMH-045-23	22,240	0	22,240	0.0	12,300	0	12,300	0.0	10,330	0	10,330	0.0	12,640	0	12,640	0.0
Channing St.	G22	DMH-045-24	23,630	0	23,630	0.0	13,440	0	13,440	0.0	10,930	0	10,930	0.0	12,500	0	12,500	0.0
Channing St.		DMH-045-25	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Homer St.	G10	DMH-045-26	135,300	0	135,300	0.0	49,360	0	49,360	0.0	46,990	0	46,990	0.0	87,920	0	87,920	0.0
Halsey St.	G21	DMH-045-30	20,330	0	20,330	0.0	10,320	0	10,320	0.0	8,092	0	8,092	0.0	4,541	0	4,541	0.0
Evart St.	G27	DMH-045-33	22,240	0	22,240	0.0	12,300	0	12,300	0.0	10,330	0	10,330	0.0	12,640	0	12,640	0.0
Homer St.	G7	DMH-045-35	15,640	0	15,640	0.0	10,140	0	10,140	0.0	8,175	0	8,175	0.0	8,080	0	8,080	0.0
Evart St.		DMH-045-37	0	0	0	0.0	0	272	272	0.1	0	166	166	0.1	0	0	0	0.0
Hall Ave.	G4	DMH-045-40	1,847	0	1,847	0.0	777	0	777	0.0	676	0	676	0.0	795	0	795	0.0
Van Zandt Ave.		DMH-045-44	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Van Zandt Ave.	G6	DMH-045-45	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Van Zandt Ave.	G5	DMH-045-48	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.		DMH-045-51	0	0	0	0.0	0	4	4	0.0	0	72	72	0.0	0	0	0	0.0
Evart St.		DMH-045-59	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Evart St.		DMH-045-60	0	4,530	4,530	1.6	0	2,565	2,565	0.8	0	2,499	2,499	0.9	0	4,158	4,158	1.8
Malbone Rd.	G25	DMH-046-61	1	0	1	0.0	1,083	0	1,083	0.0	1,316	0	1,316	0.0	0	0	0	0.0
Hall Ave.		DMH-051-36	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Hall Ave.		DMH-051-37	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Warner St.		DMH-051-38	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Warner St.		DMH-051-39	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Warner St.		DMH-051-41	0	464	464	0.9	0	230	230	0.3	0	244	244	0.3	0	373	373	0.7
Warner St.		DMH-051-43	0	772	772	1.0	0	533	533	0.5	0	677	677	0.5	0	649	649	0.9
Hall Ave.		DMH-051-67	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Prescott Hall Rd.		J1	0	15,220	15,220	4.9	0	8,030	8,030	2.5	0	7,576	7,576	2.4	0	13,650	13,650	6.3
JT Connell Hwy.		J2	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
JT Connell Hwy.		J3	0	40,440	40,440	7.1	0	24,810	24,810	3.8	0	24,430	24,430	3.9	0	38,480	38,480	9.1
JT Connell Hwy.		J4	0	89,260	89,260	5.9	0	63,100	63,100	2.9	0	39,850	39,850	2.8	0	78,150	78,150	7.6

Location	Gutter Flow ID	Node ID	July 28th Storm				August 10th Storm				August 15th Storm				Design Storm			
			Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)	Flood			Duration (Hr)
			Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)		Gutter Flow (cf)	Curb Overflow (cf)	Total (cf)	
Prescott Hall Rd.		J5	0	43,190	43,190	5.0	0	23,350	23,350	2.6	0	22,060	22,060	2.6	0	44,900	44,900	6.3
Hillside Ave.	Gutter2	Kennedy_MH	8,192	0	8,192	0.0	15,000	0	15,000	0.0	13,990	0	13,990	0.0	151	0	151	0.0
Malbone Channel		MalboneChannel 1	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Channel		MalboneChannel 2	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Malbone Channel		MalboneChannel 3	0	40,470	40,470	3.5	0	0	0	0.0	0	0	0	0.0	0	48,620	48,620	5.5
Malbone Channel		PipeEntrance	0	886,700	886,700	9.6	0	413,700	413,700	5.2	0	405,900	405,900	5.2	0	938,600	938,600	12.0
Hall Ave.		SMH-051-77	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0

Note:

1. The absence of flood conditions, gutter or curb overflow, is indicated by a zero value in the table. Positive values indicate gutter flow and/or curb overflow were simulated by the H/H model at the gutter section or manhole node.
2. Design Storm is Type III 10-Year 6-Hour Storm
3. July 28th Storm = 10-Year Return Frequency
4. August 10th Storm = Less than 1-Year Return Frequency
5. August 15th Storm = 2-Year Return Frequency

Photo 1: Drainage Manhole DMH-037-2A (looking west) located on western side of City Yard, upstream is 42" storm drain from Prescott Hall, downstream is 42" (assumed) outlet into drainage channel (01/09/2014)

Photo 2: Drainage channel west of City Yard at 42" outfall from DMH-037-2A (looking west), vegetation, debris, and sediment visible (01/09/2014)

Photo 3: Downstream headwall (looking east) of 42" storm drain from Prescott Hall, pipe crown submerged (01/09/2014).

Photo 4: Downstream headwall (looking west) of 42" storm drain from State 138/238, discharges into southern end of drainage channel located immediately west of City Yard. Vegetation and debris visible (01/09/2014).

Photo 5: Drainage channel west of City Yard, looking north from headwall of 42" storm drain in Photo 4 (01/09/2014)

Photo 6: Drainage channel west of City Yard, upstream headwall for twin 60" pipe culverts, vegetation, debris, and sediment visible (01/09/2014)

Photo 7: State drainage channel west of State 138/238 looking northwest from headwall of twin 60" pipe culverts (01/09/2014)

Photos 8-9: State drainage channel west of State 138/238 looking east at downstream headwall of twin 60" pipe culverts, vegetation and sediment visible (01/09/2014)

Photo 10: State drainage channel looking north towards rotary at intersection of Admiral Kalbfus and JT Connell Highway. (01/09/2014)

Photo 11: Upstream headwall for twin 60" pipe culvert under rotary (looking north) at intersection of Admiral Kalbfus and JT Connell Highway, vegetation visible. (01/09/2014).

Photo 12: Downstream headwall for twin 60" pipe culvert under rotary (looking south) at intersection of Admiral Kalbfus and JT Connell Highway, vegetation visible. (01/09/2014).

Photo 13: Drainage channel on northeast side of rotary (looking north at channel outlet). (01/09/2014)

Photo 14: Upstream headwall at north end of drainage channel at northeast corner of Kalbfus/JT Connell rotary, twin 60" pipe culverts, debris and vegetation visible. Pipe invert elevations appear to be higher than the pipe invert elevations at channel inlet (Photo 12). (01/09/2014)

Photo 15: Downstream headwall of twin 60" pipe culvert west of JT Connell Highway (rear of car dealership at 116 JT Connell Highway). (01/09/2014)

Photo 16: Drainage channel (looking northwest) downstream of headwall at 116 JT Connell Highway (Photo 15). (01/09/2014)

Photo 17: Downstream side of 12’ railroad box culvert (looking east), drainage channel continues to Newport Harbor. (01/09/2014)

Photo 18: Halsey Street (looking south towards Garfield Street) from road block separating northern and southern segments of street. (06/20/2014)

Photo 19: Halsey Street (looking north towards City Yard) from road block separating northern and southern segments of street. (06/20/2014)

Photo 20: Halsey Street (looking north towards Garfield Street) from entrance to City Yard. (06/20/2014)

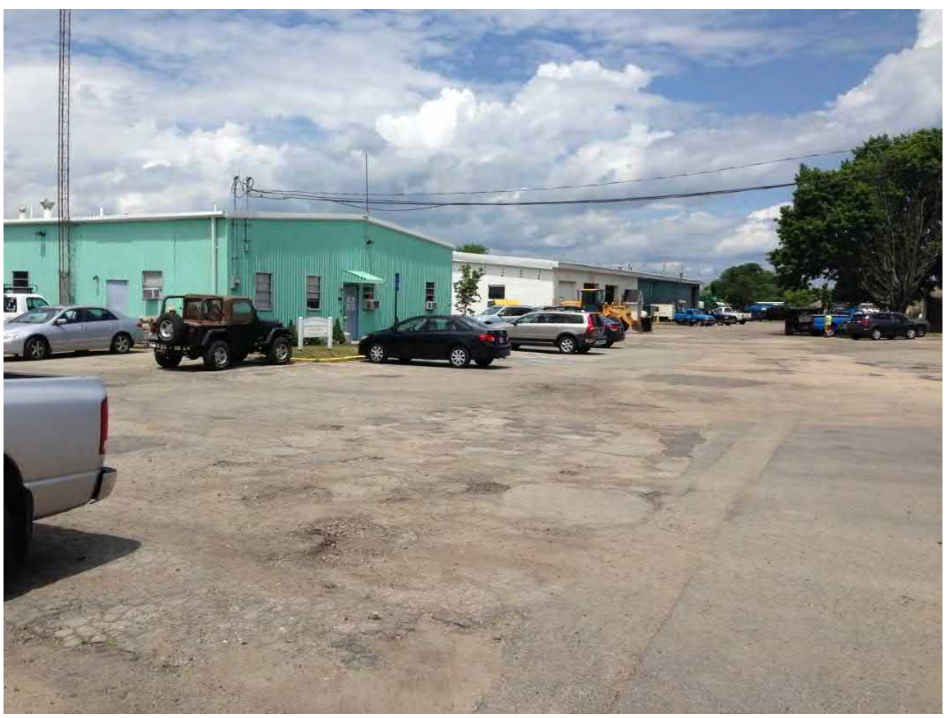


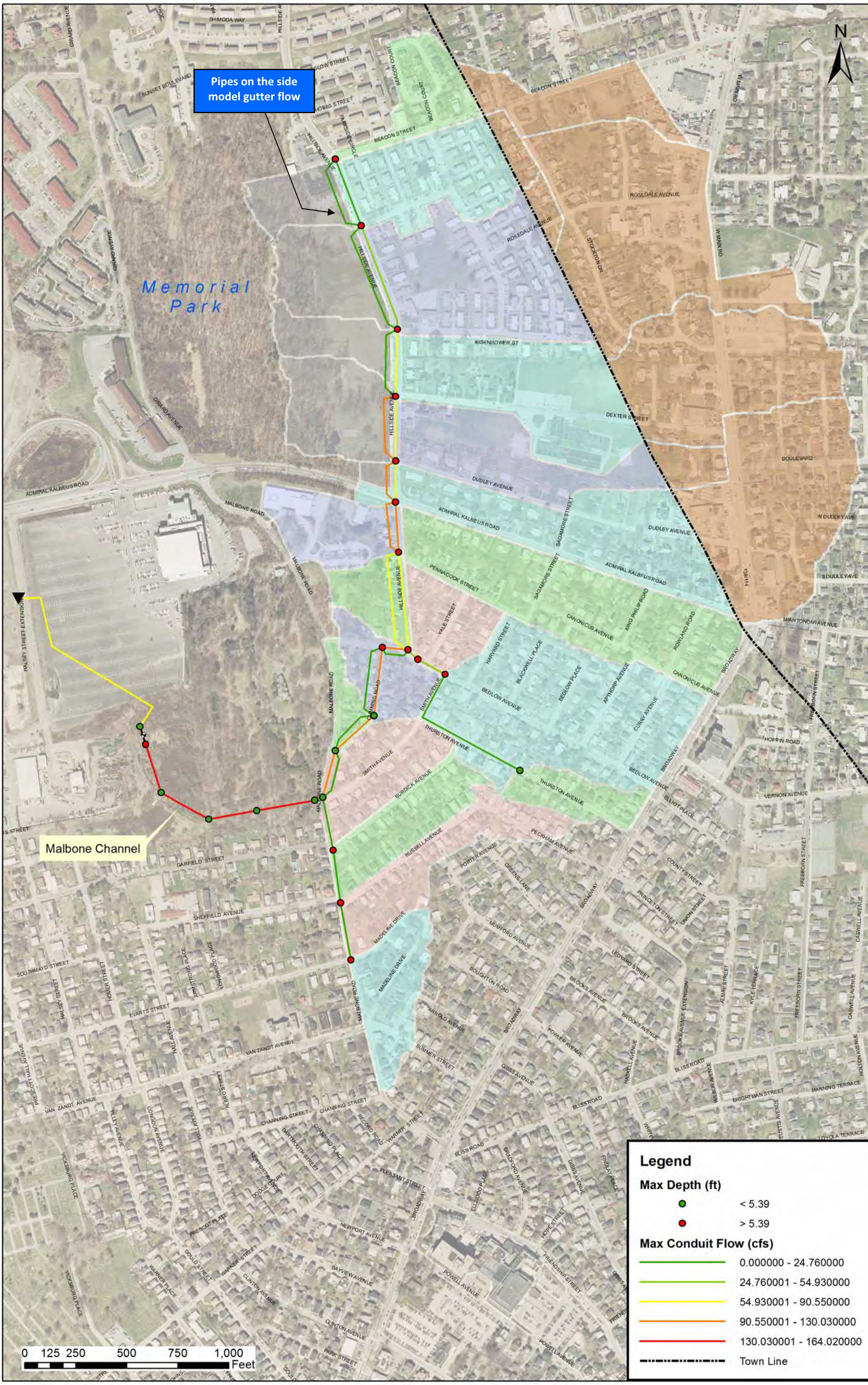
Photo 21: City Yard (looking north from Halsey Street). (06/20/2014)

Photo 22: City Yard (looking west) between Department of Utilities and Public Services buildings, potential route of proposes Halsey Street storm culvert. (06/20/2014)

Photo 23: City Yard (looking west from southeast of fuel island), proposed Halsey Street storm culvert would discharge into drainage channel behind storage containers. (06/20/2014)

Attachment 2

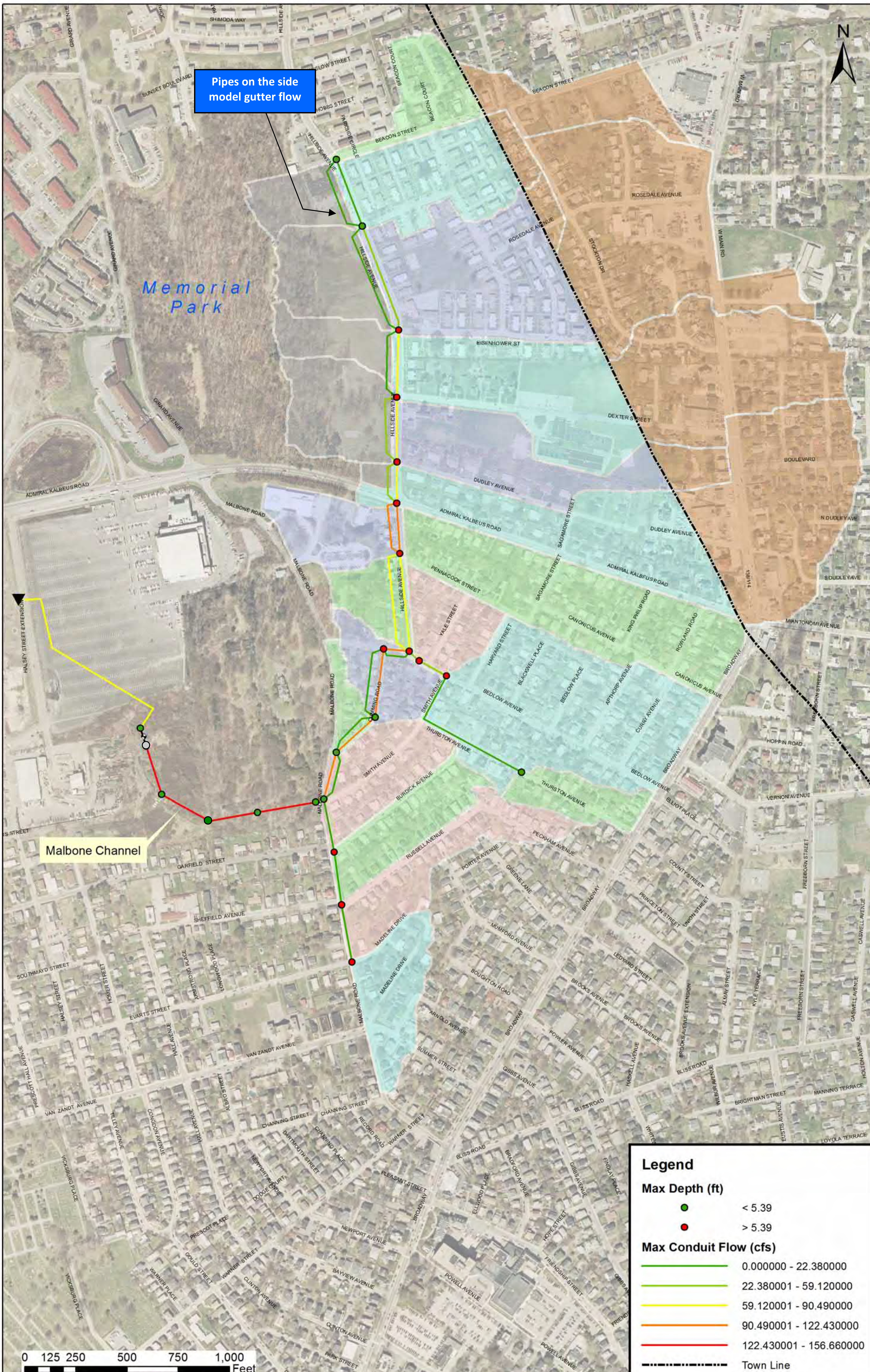
Malbone Road Study Figures



CH2MHILL.

ATTACHMENT 2: FIGURE 1—MODEL SCHEMATIC

EXISTING CONDITIONS—JULY 28, 2012 STORM EVENT



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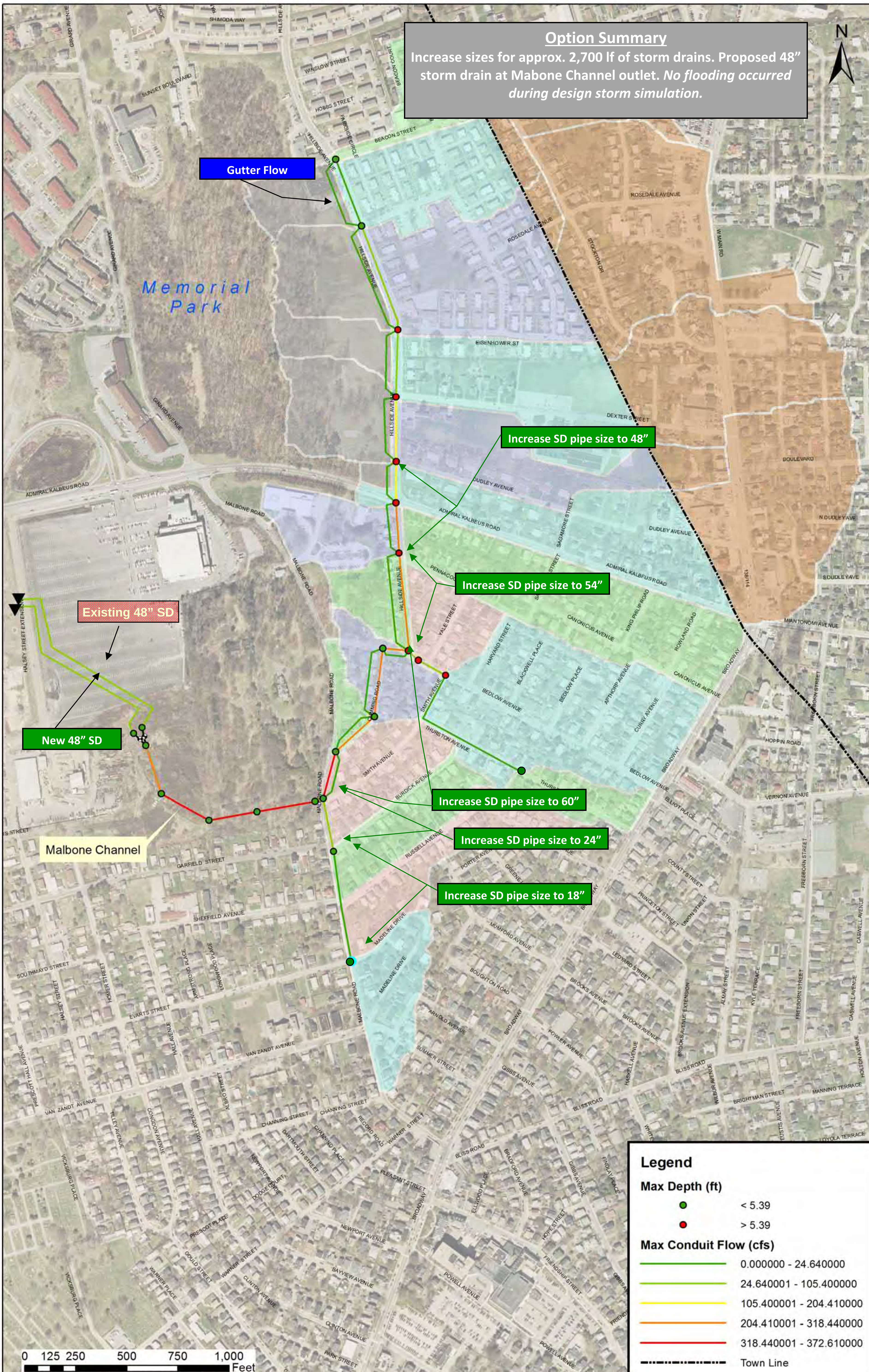
ATTACHMENT 2: FIGURE 2—MODEL SCHEMATIC

EXISTING CONDITIONS—10 YEAR 6-HOUR DESIGN STORM



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ATTACHMENT 2: FIGURE 3—MODEL SCHEMATIC

OPTION 1—GRAY CONVEYANCE #1

Appendix B. Photographs

Photo 1: Drainage Channel DP-19-1 (looking north) taken on the northern side of the crossing under Admiral Kalbfus Rd (02/24/2022)

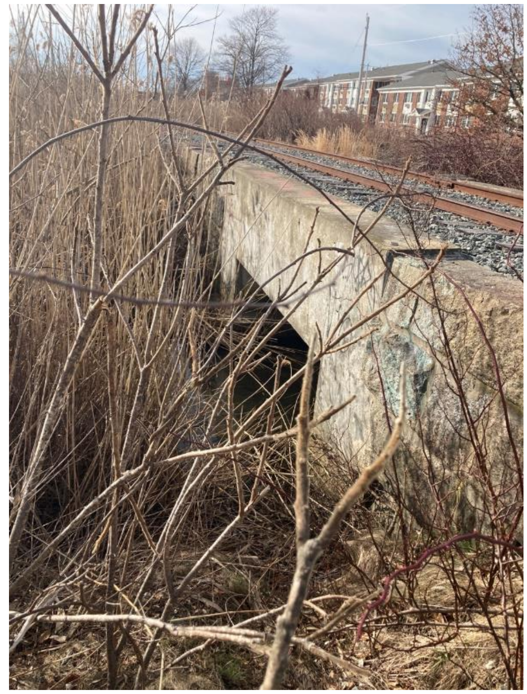

Photo 2: Drainage Channel DP-19-4 (looking southwest) taken at the box culvert crossing under the railroad before discharging to the harbor (02/24/2022)

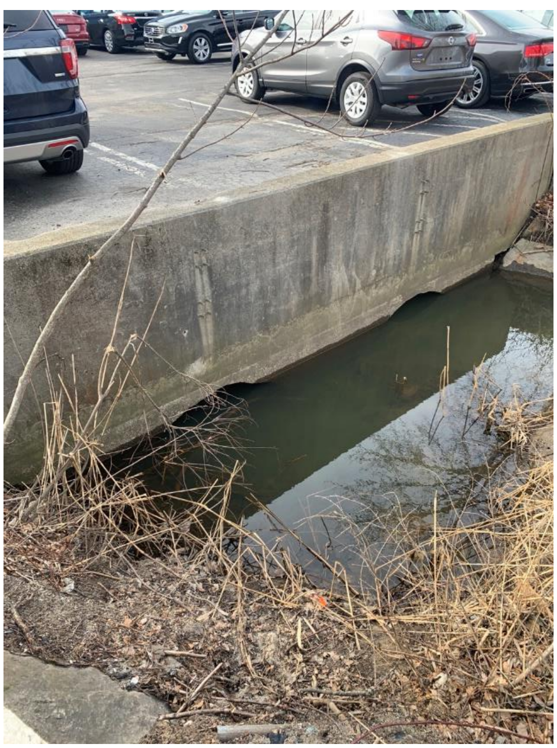

Photo 3: Culvert DP-025-7 (looking southeast) taken looking at the crossing under car dealership parking lot (02/24/2022)

Photo 4: Culvert DP-025-7 (looking northwest) taken looking at the crossing under JT Connell Hwy (02/24/2022)

Photo 5: Culvert DP-025-13 (looking northwest) taken looking at the crossing under Admiral Kalbfus Rd (02/24/2022)

Photo 6: Drainage Channel DP-025-8 (looking northeast) taken after the crossing under Admiral Kalbfus Rd (05/26/2022)

Photo 7: Culvert DP-025-7 (looking northwest) taken looking at the crossing under JT Connell Hwy (05/26/2022)

Photo 8: Pell Bridge Project construction progress (looking southwest) taken at the end of Halsey St (05/26/2022)

Photo 9: Pell Bridge Project retaining wall construction progress (looking north) taken at Prescott Hall Rd and Garfield St (05/26/2022)

Photo 10: Pell Bridge Project retaining wall construction progress (looking north) taken at Prescott Hall Rd and Garfield St (09/18/2022)

Photo 11: Pell Bridge Project Construction Progress (looking southwest) taken at the end of Halsey St (09/18/2022)

Photo 12: Resident provided photo of flooding due to an event on 7/14/2020, taken at 79 Garfield St

Photo 13: Resident provided photo of flooding due to Tropical Storm Ida (9/1/2021 – 9/2/2021), taken at 34 Prescott Hall Rd

Photo 14: Resident provided photo of high-water mark due to Tropical Storm Ida (9/1/2021 – 9/2/2021), taken at 50 Halsey St

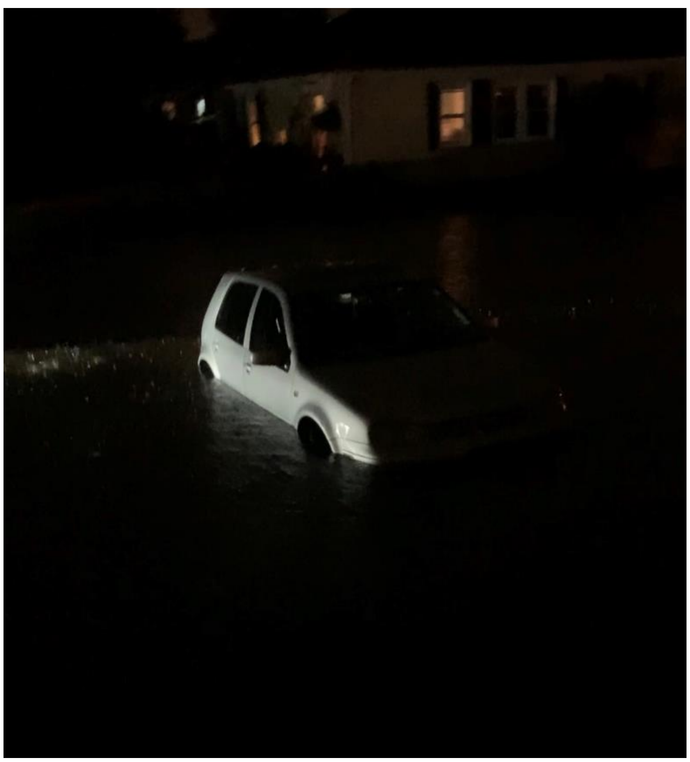

Photo 14: Resident provided photo of flooding due to Tropical Storm Ida (9/1/2021 – 9/2/2021), taken at 79 Garfield Rd

Photo 15: Resident provided photo of flooding due to an event on 9/13/2022, taken at 55 Garfield St

Photo 16: Resident provided photo of high-water mark due to an event on 9/13/2022, taken at 32 Halsey St

Appendix C. Model Result Tables

Conduit ID (1D only)	10-year, 24-hour Design Storm - Conduit Results														
	Existing Condtions					Baseline Condtions					Alternatives Model				
	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth
....	56.97	11:55:00 AM	8.06	1.11	1	59.37	11:57:00 AM	8.4	1.16	1	83.16	11:56:00 AM	11.76	1.63	1
C2	105	12:07:00 PM	3.87	0.54	0.79	135.6	12:04:00 AM	2.51	0.52	1	309.6	12:30:00 PM	5.733	1.06	1
C3	38.29	07/14/2020 14:38 PM	9.72	3.61	1	22.62	07/14/2020 13:48 PM	5.79	0.59	1	0.57	12:24:00 PM	0.09	0	0.62
C5	30.78	12:03:00 PM	3.2	1.83	1	48.49	11:58:00 AM	5.04	2.88	1	111.69	12:10:00 PM	12.8	4.2	1
C68602	-	-	-	-	-	-	-	-	-	-	16.83	07/14/2020 16:42 PM	6.16	1.67	0.64
C68603	-	-	-	-	-	-	-	-	-	-	31.95	07/14/2020 15:07 PM	5.34	0.06	0.83
C68604	-	-	-	-	-	-	-	-	-	-	197.38	07/14/2020 13:22 PM	5.56	2.43	1
Garfield_Overflow	-	-	-	-	-	-	-	-	-	-	131.23	12:09:00 PM	11.07	1.48	1
C8	16.75	07/14/2020 14:44 PM	2.17	0.78	1	30.26	07/14/2020 13:26 PM	1.54	0.59	1	142.95	12:50:00 PM	5.43	0.52	0.69
C9	16	07/14/2020 14:44 PM	4.59	3.02	1	29	07/14/2020 13:22 PM	7.72	5.47	0.93	140.36	12:51:00 PM	3.99	0.48	0.67
DP-016-1	14	12:24:00 PM	7.92	1.43	1	14.17	12:23:00 PM	8.02	1.45	1	14.76	11:50:00 AM	8.45	1.51	1
DP-019-1	126.05	07/14/2020 14:29 PM	2.8	2.42	1	90.49	07/14/2020 15:23 PM	2.35	0.2	0.6	27.24	07/14/2020 13:00 PM	0.7	0.06	0.6
DP-019-2_2	198.29	07/14/2020 15:23 PM	1.62	0.36	0.45	166.1	12:00:00 AM	0.6	1.26	1	338.5	12:00:00 AM	1.105	1.26	1
DP-019-2_3	108.23	12:06:00 PM	2.25	2.61	1	135.4	12:06:00 PM	1.218	0.26	0.64	309.37	12:30:00 PM	2.96	0.76	0.74
DP-021-19	31.69	11:47:00 AM	6.45	0.79	1	31.49	11:47:00 AM	6.42	0.79	1	45.64	11:52:00 AM	9.3	1.14	1
DP-021-25	36.35	12:00:00 PM	7.41	0.89	1	36.89	11:59:00 AM	7.51	0.9	1	36.91	11:58:00 AM	7.52	0.9	1
DP-025-1	37.29	12:24:00 PM	2.63	0.02	0.13	41.03	12:34:00 PM	2.66	0.02	0.14	39.4	12:18:00 PM	2.59	0.02	0.14
DP-025-1_1	45	12:06:00 PM	3.27	0.03	0.13	47.09	12:06:00 PM	5.09	0.03	0.09	44.94	12:12:00 PM	4.99	0.03	0.08
DP-025-1_2	44.82	12:07:00 PM	0.71	0.02	0.55	1.01	12:07:00 PM	0.1	0	0.37	0.96	12:12:00 PM	0.16	0	0.29
DP-025-10	30.87	12:06:00 PM	4.58	0.75	1	38.33	12:28:00 PM	3.98	0.41	1	55.09	12:53:00 PM	5.73	0.59	1
DP-025-10_B	-	-	-	-	-	48.47	12:15:00 PM	5.04	0.49	1	86.85	12:35:00 PM	9.03	0.88	1
DP-025-12	8.62	9:58:00 AM	2.85	1.41	1	32.8	12:06:00 PM	1.67	0.33	1	99	07/14/2020 13:22 PM	5.46	0.21	0.68
DP-025-13	8.54	9:58:00 AM	2.82	1.41	1	32.59	12:06:00 PM	1.66	0.33	1	98.77	07/14/2020 13:22 PM	5.43	0.21	0.68
DP-025-15	233.31	12:00:00 AM	2.45	1.17	1	68.35	12:32:00 PM	0.23	0.11	1	269.49	12:52:00 PM	1.87	0.59	0.79
DP-025-16	18.63	07/14/2020 18:33 PM	5.93	2.78	1	27.83	07/14/2020 13:19 PM	9.3	4.16	1	25.9	12:49:00 PM	9.3	3.87	0.83
DP-025-5	16.02	07/14/2020 14:44 PM	4.59	3.02	1	29.05	07/14/2020 13:22 PM	7.73	5.47	0.93	140.42	12:51:00 PM	3.99	0.48	0.67
DP-025-7	16.23	07/14/2020 15:53 PM	1.65	0.7	1	29.01	07/14/2020 13:26 PM	2.95	1.26	1	140.27	12:51:00 PM	5.37	0.41	0.69
DP-025-8	15.26	07/14/2020 14:44 PM	1.92	0.79	1	27.85	07/14/2020 13:26 PM	1.42	0.6	1	137.42	12:50:00 PM	4.83	0.55	0.69
DP-025-A11	-	-	-	-	-	0.17	12:06:00 PM	0.38	0.03	0.56	0.17	12:06:00 PM	0.53	0.03	0.56
DP-025-A7	-	-	-	-	-	27.16	12:08:00 PM	5.53	0.55	1	31.74	12:01:00 PM	7.08	0.65	1
DP-026-12	6.76	12:00:00 PM	9.39	1.14	1	6.76	12:02:00 PM	9.35	1.14	1	6.58	12:10:00 PM	9.4	1.11	0.89
DP-026-14	29.49	12:16:00 PM	9.39	2.64	1	32.29	12:25:00 PM	10.28	2.89	1	30.92	12:19:00 PM	9.84	2.77	1
DP-026-15	7.17	11:46:00 AM	9.13	1.18	1	7.18	11:45:00 AM	9.14	1.18	1	7.12	11:50:00 AM	9.06	1.17	1
DP-026-18	3.99	07/14/2020 13:25 PM	5.31	1.41	1	4.36	11:43:00 AM	5.6	1.54	1	3.36	11:49:00 AM	4.38	1.19	1
DP-026-5	37.28	12:16:00 PM	17.34	1.43	0.65	39.75	12:23:00 PM	18.22	1.52	0.66	38.66	12:18:00 PM	17.83	1.48	0.65
DP-026-7	15.2	12:11:00 PM	8.6	0.93	1	11.16	12:07:00 PM	7.84	0.68	1	8.19	12:10:00 PM	7.64	0.5	0.76
DP-026-8	12.95	12:12:00 PM	7.33	1.06	1	13.25	12:07:00 PM	7.5	1.09	1	9.83	12:10:00 PM	5.76	0.8	1
DP-026-9	7.74	07/14/2020 13:22 PM	4.52	0.61	1	6.7	11:53:00 AM	4.51	0.53	1	6.2	12:29:00 PM	3.65	0.49	1
DP-027-15	62.01	12:05:00 PM	8.77	1.26	1	63.41	12:05:00 PM	8.97	1.29	1	80.46	11:56:00 AM	11.38	1.64	1
DP-027-34	3.3	11:35:00 AM	4.37	1.44	1	3.35	11:35:00 AM	4.47	1.46	1	2.83	11:49:00 AM	3.63	1.24	1
DP-027-4	5.28	07/14/2020 13:54 PM	4.73	1.16	1	4.41	07/14/2020 13:44 PM	4.61	0.97	1	5.79	07/14/2020 13:00 PM	4.72	1.28	1
DP-027-7	11.48	07/14/2020 13:53 PM	9.49	0.83	1	10.6	07/14/2020 13:47 PM	8.79	0.76	1	21.19	11:55:00 AM	17.27	1.53	1
DP-027-9	3.84	12:19:00 PM	4.35	0.55	0.8	7.53	12:10:00 PM	6.14	1.08	1	7.53	12:09:00 PM	6.14	1.08	1
DP-028-07	3.41	12:06:00 PM	4.34	1.24	1	3.6	11:48:00 AM	4.58	1.31	1	3.54	12:44:00 PM	4.51	1.28	1
DP-028-09	3.62	12:12:00 PM	5.52	2.07	0.78	4.05	12:02:00 PM	5.49	2.32	1	4.05	12:02:00 PM	5.48	2.32	1
DP-028-09_1	3.77	12:13:00 PM	5.84	0.37	0.47	4.51	12:04:00 PM	5.83	0.44	1	4.51	12:04:00 PM	5.83	0.44	1
DP-031-10	54.87	12:40:00 PM	5.7	1.85	1	71.75	12:05:00 PM	7.49	2.42	1	78.5	07/14/2020 15:52 PM	8.21	1.2	1
DP-031-2	38.22	12:06:00 PM	3.97	2.12	1	23.58	11:57:00 AM	2.79	1.31	1	0.41	12:26:00 PM	0.5	0.02	0.18
DP-031-9	65.35	12:02:00 PM	1.45	1.53	1	71.34	12:04:00 PM	1.59	1.67	1	71.34	12:04:00 PM	1.59	1.67	1
DP-033-16	11.32	11:37:00 AM	6.41	3.58	1	11.04	11:35:00 AM	6.25	3.49	1	166.35	12:22:00 PM	13.28	0.67	1
DP-033-18	12.87	11:39:00 AM	7.28	1.38	1	13.62	11:40:00 AM	7.71	1.46	1	194.24	12:21:00 PM	15.46	1.73	1
DP-033-2	46.56	11:39:00 AM	6.59	1.17	1	46.13	11:36:00 AM	6.53	1.16	1	175.02	11:58:00 AM	14.13	1.45	1
DP-033-20	73.54	12:06:00 PM	10.4	2.6	1	74.45	12:03:00 PM	10.53	2.63	1	67.41	12:06:00 PM	9.54	2.38	1
DP-033-20A	73.54	12:06:00 PM	11.55	2.6	0.95	74.44	12:03:00 PM	11.64	2.63	1	67.41	12:06:00 PM	11.25	2.38	0.8
DP-033-23	94.49	12:06:00 PM	16.11	0.78	0.95	96.72	12:06:00 PM	16.09	0.8	1	81.36	12:06:00 PM	15.74	0.68	0.71
DP-033-24	52.44	12:33:00 PM	7.42	1.11	1	50.44	12:32:00 PM	7.14	1.06	1	117.48	12:28:00 PM	10.19	0.83	1
DP-033-27	3.84	12:17:00 PM	6.58	0.83	0.72	4.68	12:57:00 PM	6.57	1.01	1	4.88	12:57:00 PM	6.61	1.05	1
DP-033-7_1	-	-	-	-	-	-	-	-	-	-	2.77	12:06:00 PM	4.39	0.5	0.75
DP-033-7_2	-	-	-	-	-	-	-	-	-	-	225.07	12:13:00 PM	17.91	1.21	1
DP-034-14	3.84	12:16:00 PM	6.63	0.83	0.69	4.89	12:03:00 PM	6.77	1.05	1	4.89	12:03:00 PM	6.77	1.05	1
DP-034-7	3.84	12:13:00 PM	6.28	0.91	0.73	5.65	12:04:00 PM	7.2	1.34	1	5.63	12:04:00 PM	7.17	1.34	1

Conduit ID (1D only)	10-year, 24-hour Design Storm - Conduit Results														
	Existing Condtions					Baseline Condtions					Alternatives Model				
	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth
DP-034-8	3.82	12:13:00 PM	6.28	0.79	0.72	5.03	12:04:00 PM	6.41	1.04	1	5.01	12:04:00 PM	6.37	1.03	1
DP-037-16	26.33	11:50:00 AM	2.74	0.55	1	32.99	11:34:00 AM	3.43	0.69	1	87.92	12:07:00 PM	7	0.93	1
DP-037-16-2	29.35	11:25:00 AM	3.05	0.49	1	36.95	11:36:00 AM	3.84	0.61	1	90.54	12:06:00 PM	7.2	0.76	1
DP-037-17	0.12	12:05:00 PM	0.89	0.02	0.65	0.83	12:06:00 PM	1.48	0.12	0.69	0.83	12:06:00 PM	2.85	0.12	0.62
DP-037-20	14.27	12:06:00 PM	4.54	1.36	1	23.93	12:03:00 PM	7.62	1.29	1	101.02	12:07:00 PM	8.05	1.6	1
DP-037-4	54.47	12:13:00 PM	8	1.17	1	38.49	12:23:00 PM	5.45	0.82	1	109.07	12:11:00 PM	11.11	0.24	0.5
DP-037-5	27.24	11:30:00 AM	2.83	1.36	1	58.06	11:58:00 AM	6.03	2.89	1	111.69	12:10:00 PM	12.8	3.52	1
DP-037-6	30.04	12:44:00 PM	3.12	1.66	1	58.05	11:58:00 AM	6.1	3.2	1	0.08	12:34:00 PM	0.25	0	0.09
DP-037-8	27.26	11:30:00 AM	2.83	1.34	1	58.07	11:58:00 AM	6.04	2.85	1	111.68	12:10:00 PM	11.45	1.91	0.72
DP-037-9	40.54	12:05:00 PM	3.12	0.7	0.92	66.97	12:58:00 PM	6.96	2.11	1	18.12	07/14/2020 15:02 PM	9.52	0.57	0.65
DP-038-10	11.96	12:16:00 PM	6.77	1.03	1	12.63	12:03:00 PM	7.15	1.09	1	34.5	12:10:00 PM	10.98	1	1
DP-038-15	24.35	11:33:00 AM	3.44	1.05	1	31.42	11:34:00 AM	4.45	1.35	1	61.44	12:46:00 PM	6.49	1.27	1
DP-038-16	0.15	11:54:00 AM	0.16	0.02	1	0.17	11:57:00 AM	0.19	0.02	1	0	11:48:00 AM	0.04	0	0.5
DP-038-7	46.33	11:57:00 AM	9.44	1.14	1	46.11	11:59:00 AM	9.39	1.14	1	91.83	12:06:00 PM	12.99	1.01	1
DP-038-8	59.29	12:02:00 PM	12.08	2.12	1	51.16	11:57:00 AM	10.42	1.83	1	128.08	12:06:00 PM	13.46	0.9	1
DP-039-18	99.93	12:06:00 PM	14.14	1.02	1	102.48	12:03:00 PM	14.5	1.05	1	87.13	12:06:00 PM	12.95	0.89	0.91
DP-039-20	1.41	11:56:00 AM	0.88	0.24	1	2.07	07/14/2020 13:27 PM	1.45	0.35	1	3.61	12:07:00 PM	1.17	0.15	0.97
DP-039-21	0	12:00:00 AM	0	0	0	0	12:00:00 AM	0	0	0	0	12:00:00 AM	0	0	0
DP-039-9	0.04	12:08:00 PM	0.04	0	0.52	0	12:00:00 AM	0	0	0.5	0.73	12:06:00 PM	4.71	0.01	0.45
DP-044-11	4.49	12:06:00 PM	8.1	0.96	0.67	4.49	12:06:00 PM	8.05	0.96	0.69	4.49	12:06:00 PM	8.08	0.96	0.67
DP-044-26	2.06	10:44:00 AM	2.62	2.92	1	2.48	11:39:00 AM	3.15	3.52	1	13.29	12:21:00 PM	4.23	1.8	1
DP-044-27	7.91	12:06:00 PM	4.48	0.77	1	8.36	12:06:00 PM	4.73	0.81	1	9.81	12:06:00 PM	6.76	0.95	0.89
DP-044-28	11.91	12:06:00 PM	3.79	1.04	1	11.58	12:05:00 PM	3.69	1.01	1	15.35	12:06:00 PM	5.42	0.35	0.87
DP-044-28-2	6.04	12:11:00 PM	1.92	1.03	1	6.5	12:06:00 PM	2.07	1.11	1	16.27	12:06:00 PM	3.9	0.4	1
DP-044-29	4.24	12:01:00 PM	3.95	1.67	1	4.48	11:59:00 AM	4.05	1.76	1	4.52	12:01:00 PM	4.2	1.78	0.98
DP-044-4	4.05	12:16:00 PM	7.42	0.67	1	3.93	12:20:00 PM	7.3	0.65	1	4.68	12:14:00 PM	8.58	0.78	1
DP-044-6	4.49	12:06:00 PM	10.86	0.43	0.74	4.49	12:06:00 PM	10.39	0.43	0.75	4.49	12:06:00 PM	10.71	0.43	0.57
DP-045-1	6.53	11:48:00 AM	8.41	1.05	1	4.82	12:05:00 PM	7.2	0.78	1	4.76	12:06:00 PM	7.37	0.77	0.8
DP-045-10	23.23	12:31:00 PM	8.18	0.28	1	25.37	12:25:00 PM	8.62	0.31	1	38.9	12:06:00 PM	13.71	0.48	0.87
DP-045-13	22.66	12:31:00 PM	8.14	0.54	1	24.9	12:25:00 PM	8.28	0.59	1	38.49	12:06:00 PM	9.16	0.91	0.6
DP-045-22-2	5.06	11:44:00 AM	6.44	0.89	1	5.1	12:28:00 PM	6.5	0.9	1	5.1	11:45:00 AM	6.49	0.9	1
DP-045-23	6.54	12:05:00 PM	8.32	0.91	1	7.83	12:34:00 PM	9.97	1.1	1	6.41	12:05:00 PM	8.16	0.9	1
DP-045-24	5.14	12:09:00 PM	6.55	2.8	1	5.12	12:17:00 PM	6.52	2.78	1	5.12	11:35:00 AM	6.52	2.78	1
DP-045-26	3.32	07/14/2020 13:25 PM	4.22	1.31	1	3.2	07/14/2020 13:26 PM	4.07	1.26	1	3.19	07/14/2020 13:27 PM	4.07	1.26	1
DP-045-27	4.22	11:49:00 AM	5.46	1.71	1	4.16	11:51:00 AM	5.43	1.68	1	4.17	12:06:00 PM	5.48	1.69	0.93
DP-045-30	47.52	12:05:00 PM	9.68	1.12	1	48.08	12:03:00 PM	9.79	1.13	1	83.77	12:06:00 PM	13.28	0.87	0.88
DP-045-31	31.23	12:31:00 PM	9.94	1.4	1	30.57	12:14:00 PM	9.73	1.37	1	60.21	12:06:00 PM	13.2	1.07	0.98
DP-045-36	23.18	12:07:00 PM	4.74	0.39	0.72	16.81	12:07:00 PM	4.68	0.28	0.68	16.47	12:09:00 PM	4.72	0.28	0.53
DP-045-39	6.88	12:06:00 PM	8.77	1.13	1	7.11	12:04:00 PM	9.06	1.17	1	7.04	12:05:00 PM	8.97	1.16	1
DP-045-40	4.89	12:06:00 PM	6.33	1.43	0.95	4.94	12:04:00 PM	6.39	1.44	0.96	4.94	12:10:00 PM	6.39	1.44	0.96
DP-045-6	4.5	12:06:00 PM	4.59	0.47	0.55	4.51	12:06:00 PM	4.58	0.47	0.55	4.5	12:06:00 PM	4.59	0.47	0.55
DP-045-7	4.51	12:06:00 PM	5.86	0.3	0.45	4.51	12:06:00 PM	5.88	0.3	0.45	4.51	12:06:00 PM	5.87	0.3	0.45
DP-045-9	6.52	12:43:00 PM	5.53	0.45	1	4.82	12:05:00 PM	5.56	0.34	1	4.76	12:06:00 PM	6.17	0.33	0.7
Dp-050-101	3.87	11:50:00 AM	2.34	0.36	1	10.05	12:00:00 PM	5.69	6.54	1	10.22	12:01:00 PM	5.78	6.65	1
DP-051-19_2	6.79	12:07:00 PM	3.84	0.71	1	7.72	12:04:00 PM	4.37	0.8	1	6.94	12:08:00 PM	3.92	0.72	1
DP-051-20	6.11	12:18:00 PM	4.73	0.93	1	6.91	12:04:00 PM	4.71	1.05	1	5.25	12:10:00 PM	4.71	0.8	1
DP-051-21	5.61	12:03:00 PM	7.39	1.69	1	5.31	12:05:00 PM	7.42	1.6	0.92	5.23	12:07:00 PM	7.42	1.57	0.89
DP-051-22	6.28	12:02:00 PM	9.34	0.91	1	5.44	12:03:00 PM	9.19	0.79	0.92	5.42	12:03:00 PM	9.19	0.78	0.89
DP-051-26	0.05	12:03:00 PM	0.12	0.02	1	0.06	12:04:00 PM	0.21	0.02	0.67	0.02	11:43:00 AM	0.11	0.01	0.58
DP-051-36	9.2	12:08:00 PM	5.54	2.74	0.89	9.56	12:05:00 PM	5.72	2.84	0.9	8.82	12:08:00 PM	5.34	2.62	0.88
DP-A10-025	-	-	-	-	-	22.36	12:23:00 PM	7.12	1.1	1	30.65	12:01:00 PM	9.95	1.51	1
DP-A11-M5	-	-	-	-	-	7.62	12:06:00 PM	4.6	0.67	1	7.21	12:11:00 PM	4.81	0.64	1
DP-A12-A11	-	-	-	-	-	5.32	12:02:00 PM	6.77	1.82	1	5.42	12:07:00 PM	6.91	1.86	1
DP-A13-A14	-	-	-	-	-	9.72	12:02:00 PM	5.5	0.38	1	9.94	12:08:00 PM	5.62	0.39	1
DP-A14-M4	-	-	-	-	-	18.44	12:03:00 PM	5.87	0.96	1	19.79	12:09:00 PM	6.3	1.03	1
DP-A15-A14	-	-	-	-	-	9.84	11:46:00 AM	5.57	1.16	1	12.34	11:56:00 AM	6.98	1.46	1
DP-A27-A37	-	-	-	-	-	4.49	11:32:00 AM	6.09	1.07	1	0	12:00:00 AM	0	0	0.5
DP-A28-A13	-	-	-	-	-	3.59	12:02:00 PM	4.76	0.87	1	3.82	12:03:00 PM	5.3	0.93	0.98
DP-A37-A15	-	-	-	-	-	12.69	11:55:00 AM	7.18	1.12	1	13.53	11:56:00 AM	7.66	1.2	1
DP-A39-A10	-	-	-	-	-	8.17	12:49:00 PM	4.62	0.72	1	18.82	07/14/2020 13:31 PM	10.65	1.66	1
DP-A55-A12	-	-	-	-	-	0.12	12:06:00 PM	0.27	0.02	0.55	0.12	12:06:00 PM	0.39	0.02	0.55

Conduit ID (1D only)	10-year, 24-hour Design Storm - Conduit Results														
	Existing Condtions					Baseline Condtions					Alternatives Model				
	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth	Max Flow (cfs)	Time Max Flow	Max Velocity (ft/s)	Max/Full Flow	Max/Full Depth
DP-A7-M2	-	-	-	-	-	19.53	12:08:00 PM	4.92	0.23	1	38.85	12:17:00 PM	7.91	0.46	1
DP-C13-044	-	-	-	-	-	19.66	11:55:00 AM	4.01	0.63	1	34.51	11:58:00 AM	7.03	0.88	1
DP-C25-M26	-	-	-	-	-	44.57	12:14:00 PM	9.08	1.46	1	100.95	12:07:00 PM	8.28	0.94	0.94
DP-C3-C13	-	-	-	-	-	30.81	12:06:00 PM	9.81	1.02	1	32.39	12:01:00 PM	10.31	1.08	1
DP-D10-M28	-	-	-	-	-	12.46	12:12:00 PM	7.05	1.2	1	127.07	12:10:00 PM	10.46	0.24	0.45
DP-D1-M27	-	-	-	-	-	6.7	11:57:00 AM	8.54	1.18	1	6.69	11:57:00 AM	8.54	1.18	1
DP-D5-D9	-	-	-	-	-	13.28	12:01:00 PM	7.51	1.17	1	15.51	12:12:00 PM	8.78	1.36	1
DP-D9-D10	-	-	-	-	-	15.13	12:24:00 PM	8.56	1.34	1	15.51	12:12:00 PM	8.86	1.37	0.97
DP-M27-D5	-	-	-	-	-	13.71	12:00:00 PM	7.76	1.17	1	14.57	12:03:00 PM	8.25	1.24	1
DP-M28-M60	-	-	-	-	-	12.46	12:12:00 PM	7.05	0.67	1	126.39	12:11:00 PM	6.53	0.3	0.73
DP-M3-A10	-	-	-	-	-	20.82	12:06:00 PM	6.63	1.12	1	23.78	12:13:00 PM	7.57	1.28	1
DP-M4-M3	-	-	-	-	-	19.38	12:05:00 PM	6.17	1.14	1	20.11	12:10:00 PM	6.4	1.18	1
DP-M5-WS7	-	-	-	-	-	8.91	12:07:00 PM	5.04	0.86	1	8.17	12:12:00 PM	4.62	0.78	1
DP-WS7-A39	-	-	-	-	-	40.8	12:33:00 PM	0.52	0.02	0.63	30.8	12:54:00 PM	0.71	0.01	0.52
Dum_GW_C1	0	12:00:00 AM	0	0	0	0	12:00:00 AM	0	0	0	0	12:00:00 AM	0	0	0
Dum_GW_C2	12.38	12:17:00 PM	1.03	0	0	0	12:15:00 PM	0	0	0	0	12:14:00 PM	0	0	0
Dum_GW_C3	33.85	12:58:00 PM	0.67	0	0	0	12:17:00 PM	0	0	0	0	07/14/2020 13:00 PM	0	0	0
MalboneChannel1	163.29	12:08:00 PM	15.53	0.18	0.39	167.61	12:12:00 PM	14.52	0.19	0.4	234.99	12:06:00 PM	16.52	0.26	0.46
MalboneChannel2	156.31	12:16:00 PM	14.62	0.18	0.37	126.49	12:15:00 PM	21.52	0.15	0.21	141.27	12:09:00 PM	22.4	0.17	0.23
MalboneChannel3	142.72	12:18:00 PM	8.04	0.24	0.72	2.07	12:15:00 PM	0.24	0	0.52	2.34	12:09:00 PM	0.84	0	0.17
MalboneChannel4	75.74	12:17:00 PM	2.81	0.19	1	61.37	12:19:00 PM	2.27	0.15	1	78.16	12:16:00 PM	5.07	0.12	0.65
sLink_12	16.29	07/14/2020 15:53 PM	1.66	0.7	1	29.12	07/14/2020 13:26 PM	2.97	1.25	1	140.37	12:51:00 PM	5.4	0.41	0.69
sLink_2	20.07	11:46:00 AM	4.98	0.45	1	21.07	11:29:00 AM	5.51	0.47	1	98.39	12:01:00 PM	12.15	0.65	1
sLink_7	198.3	07/14/2020 15:22 PM	2.23	0.68	0.61	162.8	12:01:00 AM	1.92	0.93	0.97	336.4	12:01:00 AM	2.122	0.93	0.98
DP-045-22	5.99	12:07:00 PM	7.63	1.09	1	5.97	12:02:00 PM	7.6	1.08	1	5.91	12:26:00 PM	7.52	1.07	1
C6	7.39	12:06:00 PM	2.35	0.45	1	10.53	11:51:00 AM	4.14	0.64	1	282.64	12:12:00 PM	4.28	0.66	1
DP-SU3-032	-	-	-	-	-	-	-	-	-	-	75.8	07/14/2020 16:01 PM	7.88	7.53	1
MalboneBox	-	-	-	-	-	-	-	-	-	-	351.46	12:06:00 PM	12.74	0.69	0.69
DP-Gar-2	-	-	-	-	-	-	-	-	-	-	32.58	12:06:00 PM	5.79	0.35	0.82
DP-Gar-1	-	-	-	-	-	-	-	-	-	-	35.45	12:06:00 PM	11.86	0.37	0.52
C68606	-	-	-	-	-	-	-	-	-	-	241.48	12:07:00 PM	19.22	1.14	1
DP-Sm-2	-	-	-	-	-	-	-	-	-	-	261.36	12:05:00 PM	20.8	1.23	1
C4_1	-	-	-	-	-	-	-	-	-	-	35.84	12:06:00 PM	3.99	0.5	1
C4_2	-	-	-	-	-	-	-	-	-	-	41.86	12:06:00 PM	4.35	0.59	1
C1	13.24	07/14/2020 14:05 PM	4.21	3.73	1	11.48	07/14/2020 13:32 PM	3.65	3.24	1	-	-	-	-	-
Culvert1	64.59	12:06:00 PM	14.95	1.99	0.82	64.24	12:11:00 PM	15.03	1.98	0.82	-	-	-	-	-
Culvert2	64.59	12:06:00 PM	14.95	1.99	0.82	64.24	12:11:00 PM	15.03	1.98	0.82	-	-	-	-	-
DP-025-11	139.33	12:18:00 PM	1.94	1.65	1	103.25	07/14/2020 13:50 PM	0.69	0.24	1	-	-	-	-	-
DP-031-11_A	107.46	12:06:00 PM	2.02	0.17	1	64.18	12:13:00 PM	0.98	0.1	0.92	-	-	-	-	-
DP-031-12	30.42	12:07:00 PM	0.5	0.01	0.9	67.23	07/14/2020 13:24 PM	0.33	0.03	1	-	-	-	-	-
DP-031-3	59.32	07/14/2020 13:03 PM	4.82	2.54	1	80.69	07/14/2020 13:47 PM	4.11	1.74	1	-	-	-	-	-
DP-031-5	60.05	07/14/2020 13:03 PM	4.88	2.52	1	81.51	07/14/2020 13:47 PM	4.15	1.72	1	-	-	-	-	-
DP-033-7	2.3	12:03:00 PM	2.93	0.65	1	2.4	12:07:00 PM	3.05	0.68	1	-	-	-	-	-
DP-037-7	30.04	12:44:00 PM	3.12	1.5	1	58.06	11:58:00 AM	6.03	2.9	1	-	-	-	-	-
DP-032-2	54.87	12:40:00 PM	4.37	1.98	1	55.26	07/14/2020 13:09 PM	4.4	1.99	1	-	-	-	-	-
48inch_1	54.87	12:40:00 PM	4.37	0.26	1	44.23	12:03:00 PM	3.87	0.21	1	-	-	-	-	-
48inch_2	54.87	12:40:00 PM	4.37	0.83	1	55.26	07/14/2020 13:09 PM	4.4	0.83	1	-	-	-	-	-
DP-031-11	162.73	12:00:00 AM	3.61	0.35	1	83.39	07/14/2020 13:50 PM	0.52	0.02	0.97	-	-	-	-	-
DP-031-1	52.68	12:06:00 PM	3.33	1.79	0.95	71.04	12:51:00 PM	3.62	2.45	1	-	-	-	-	-
DP-037-10	37.47	12:11:00 PM	0.44	0.36	0.91	99.09	12:38:00 PM	0.25	0.53	1	-	-	-	-	-
DP-037-10_1	46.81	12:11:00 PM	0.53	0.33	0.91	71.14	12:41:00 PM	0.15	0.03	1	-	-	-	-	-
DP-037-11	42.22	12:06:00 PM	0.4	0.2	0.94	73.26	12:48:00 PM	0.49	0.28	1	-	-	-	-	-
DP-025-9	37.28	07/14/2020 13:03 PM	7.59	1.2	1	-	-	-	-	-	-	-	-	-	-
DP-025-4	12.14	07/14/2020 16:49 PM	2.47	0.52	1	-	-	-	-	-	-	-	-	-	-
DP-044-25	12.35	12:05:00 PM	6.99	1.64	1	-	-	-	-	-	-	-	-	-	-
DP-044-24	9.09	11:50:00 AM	5.14	1.73	1	-	-	-	-	-	-	-	-	-	-
DP-044-23	11.21	11:44:00 AM	3.57	1.98	1	-	-	-	-	-	-	-	-	-	-
DP-025-3	24.1	12:04:00 PM	0.39	0.01	0.89	-	-	-	-	-	-	-	-	-	-
DP-025-2	2.41	12:14:00 PM	0.05	0	0.51	-	-	-	-	-	-	-	-	-	-

Junction ID (1D only)	10-year, 24-hour Design Storm - Junction Results																				
	Existing Condtions							Baseline Condtions							Alternatives Model						
	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)
10	5	6.14	07/14/2020 15:53 PM	0	11.8	14.21	1.138	6.39	10.02	07/14/2020 13:26 PM	0	21.6	15.46	5.024	3.05	5.45	12:30:00 PM	0	45	0	0
12	4.72	5.97	07/14/2020 14:44 PM	2.23	13.1	0	0	6.37	9.83	07/14/2020 13:20 PM	2.23	22.8	0	0	2.83	5.57	12:36:00 PM	2.23	45	0	0
15	4.59	5.65	07/14/2020 14:42 PM	0.506	22.5	0	0	6	9.46	07/14/2020 13:27 PM	0	21	0	0	2.49	5.31	12:40:00 PM	0	38	0	0
23	0.48	7.43	11:42:00 AM	0	0.42	0.86	5.428	0.39	6.76	12:28:00 PM	0	0.417	0.82	4.764	0.34	6.96	12:28:00 PM	0	0.417	0.83	4.96
27	4.97	6.07	07/14/2020 14:44 PM	0	11.8	13.92	1.075	6.58	10.11	07/14/2020 13:26 PM	0	21.7	15.39	5.114	3.03	5.52	12:30:00 PM	0	44.9	0	0
4	2.13	5.8	12:20:00 PM	0	0.967	9.2	3.798	1.81	6.47	12:28:00 PM	0	1.13	6.7	4.474	0.23	3.22	12:06:00 PM	0	0.532	0.2	0.723
6	1.75	3.49	07/14/2020 15:21 PM	0	16	0	0	3.11	4.62	11:48:00 AM	0	25.2	0	0	3.15	5.04	12:19:00 PM	0	47.7	0	0
7	1.49	2.52	07/14/2020 15:23 PM	0	44.6	0	0	3.59	5.22	11:47:00 AM	0	42.7	1.24	0.216	3.55	5.2	11:47:00 AM	0	52.5	1.32	0.201
9	2.05	5.07	12:07:00 PM	3.07	14.9	0	0	2.87	4.37	12:06:00 PM	3.07	24.9	0	0	3.12	5.33	12:24:00 PM	3.07	47.9	0	0
A10	-	-	-	-	-	-	-	2.47	6.04	12:24:00 PM	0	3.28	12.61	4.041	0.69	5.23	12:36:00 PM	0	2.81	1.49	3.233
A11_J	-	-	-	-	-	-	-	0.37	2.85	12:29:00 PM	0.038	0.257	1.2	0.852	0.15	1.99	12:34:00 PM	0.038	0.216	0	0
A12_J	-	-	-	-	-	-	-	0.32	2.98	12:13:00 PM	0.042	0.191	1.38	0.981	0.18	2.74	12:17:00 PM	0.042	0.161	0.84	0.742
A13	-	-	-	-	-	-	-	1.09	5.19	12:13:00 PM	0.111	0.331	4.71	3.185	0.28	4.81	12:19:00 PM	0.111	0.315	1.09	2.81
A14_J	-	-	-	-	-	-	-	1.76	5.84	12:15:00 PM	0	1.84	9.99	3.838	0.49	5.65	12:17:00 PM	0	0.933	1.21	3.648
A15	-	-	-	-	-	-	-	1.59	5.69	12:13:00 PM	0	1.49	7.43	3.687	0.47	5.5	12:16:00 PM	0	0.584	1.18	3.497
A27_J	-	-	-	-	-	-	-	0.49	2.81	12:05:00 PM	2.3	2.3	0.38	0.81	0	0	12:23:00 PM	0	0	0	0
A28_J	-	-	-	-	-	-	-	0.14	1.04	12:06:00 PM	0.164	0.164	0	0	0.13	0.97	12:06:00 PM	0.164	0.164	0	0
A37_J	-	-	-	-	-	-	-	0.86	5.84	12:40:00 PM	0.589	1.58	2.19	3.844	0.38	5.56	11:56:00 AM	0.589	0.589	1.06	3.56
A39_J	-	-	-	-	-	-	-	2.21	5.82	12:37:00 PM	0.525	2.51	0	0	0.73	5.01	12:39:00 PM	0.525	2.47	0	0
A55_J	-	-	-	-	-	-	-	0.01	0.09	12:06:00 PM	0.048	0.048	0	0	0.01	0.09	12:06:00 PM	0.048	0.048	0	0
A7	-	-	-	-	-	-	-	4.27	7.75	07/14/2020 13:26 PM	0	3.28	14.95	5.254	0.9	6.47	12:29:00 PM	0	3.1	2	3.97
C13	-	-	-	-	-	-	-	1.31	5.19	12:28:00 PM	0.532	1.74	4.34	2.686	0.36	3.59	12:05:00 PM	0.532	1.58	0.36	1.09
C25	-	-	-	-	-	-	-	2.84	7.35	12:45:00 PM	0	2.82	12.36	4.855	0.6	3.97	12:07:00 PM	0	3.57	0	0
C3	-	-	-	-	-	-	-	0.3	4.88	12:00:00 PM	0.734	1.03	0.27	2.883	0.26	5.1	12:01:00 PM	0.734	1.03	0.14	3.101
CB-025-02	-	-	-	-	-	-	-	2.84	6.44	12:43:00 PM	0	3.32	12.65	3.937	0.59	5.02	12:30:00 PM	0	2.99	1.19	2.522
CB-025-19	-	-	-	-	-	-	-	0.01	0.12	12:06:00 PM	0.068	0.068	0	0	0.01	0.12	12:06:00 PM	0.068	0.068	0	0
CB-026-70	0.81	7.66	12:06:00 PM	0	0.896	1.73	5.661	0.76	7.85	12:13:00 PM	0	1.05	1.68	5.853	0.59	7.68	12:26:00 PM	0	0.757	1.44	5.675
CB-026-74	0.54	8.31	12:13:00 PM	0	0.581	1.32	6.314	0.5	8.08	12:07:00 PM	0	0.551	1.27	6.085	0.31	5.31	12:10:00 PM	0	0.413	1.03	3.315
CB-026-75	0.67	6.61	12:13:00 PM	0	0.694	1.66	4.612	0.63	6.89	12:08:00 PM	0	0.676	1.63	4.89	0.48	6.74	12:10:00 PM	0	0.51	1.39	4.741
CB-026-76	0.15	0.75	12:06:00 PM	0.184	2.43	0	0	0.18	0.82	12:06:00 PM	0.184	2.6	0	0	0.17	0.79	12:12:00 PM	0.184	2.38	0	0
CB-026-86	0.24	8.5	12:16:00 PM	0	0.572	0.21	6.495	0.2	4.73	12:07:00 PM	0	0.508	0.16	2.735	0.15	0.79	12:10:00 PM	0	0.398	0	0
CB-026-87	0.59	13.18	12:19:00 PM	0	0.482	1.66	11.182	0.48	7.93	12:14:00 PM	0	0.455	1.41	5.928	0.36	11.8	12:10:00 PM	0	0.386	1.06	9.802
CB-026-91	0.72	7.48	12:06:00 PM	0.342	0.548	1.59	5.48	0.59	9.97	11:44:00 AM	0.342	0.521	1.32	7.973	0.42	7.24	12:07:00 PM	0.342	0.453	1	5.235
CB-027-2	1.54	6.45	12:05:00 PM	0.022	0.203	2.01	4.454	1.46	6.52	12:07:00 PM	0.022	0.203	1.84	4.52	1.27	6.3	12:06:00 PM	0.022	0.152	1.08	4.297
CB-028-101	2.15	9.53	12:05:00 PM	1.73	1.73	5.42	7.531	2.08	9.61	12:05:00 PM	1.73	1.73	5.42	7.614	1.96	9.55	12:04:00 PM	1.73	1.73	5.42	7.549
CB-028-105	2.02	7.75	12:07:00 PM	0	0.904	6.1	5.752	1.97	10.36	12:29:00 PM	0	0.903	6.1	8.355	1.87	10.42	12:27:00 PM	0	0.903	6.1	8.418
CB-034-66	0.32	0.57	12:13:00 PM	0	0.904	0	0	0.47	6.19	12:07:00 PM	0	0.916	0.51	4.193	0.42	6.2	12:08:00 PM	0	0.916	0.53	4.199
CB-037-83	4.6	9.83	12:35:00 PM	0	7.43	15.04	6.325	3.25	7.66	12:51:00 PM	0	10.5	10	4.163	0	0.16	12:40:00 PM	0	0	0	0
CB-037-85	4.58	9.92	12:35:00 PM	0	7.26	14.34	6.424	3.34	8.24	12:41:00 PM	0	10.5	9.96	4.735	0.72	3.52	12:10:00 PM	0	5.64	0	0
CB-037-86	1.87	4.57	12:50:00 PM	0.311	3.64	0	0	3.6	8.4	07/14/2020 13:08 PM	0.311	6.12	0	0	0.67	2.24	12:41:00 PM	0.311	3.08	0	0
CB-037-88_BB	4.35	9.89	12:20:00 PM	0	5.91	11.5	6.39	3.48	10.12	12:24:00 PM	0	6.52	8.57	6.618	0.96	7.87	12:09:00 PM	0	5.3	0.85	3.872
CB-044-14	0.28	2.19	12:07:00 PM	0	0.151	0.22	0.186	0.3	2.47	12:05:00 PM	0	0.17	0.38	0.47	0.28	2.39	12:07:00 PM	0	0.18	0.28	0.392
CB-044-5	0.08	0.47	12:06:00 PM	0	0.122	0	0	0.08	0.51	12:06:00 PM	0	0.122	0	0	0.08	0.47	12:06:00 PM	0	0.122	0	0
CB-044-74	1.17	3.91	12:20:00 PM	0.175	2	4.86	1.911	2.29	6.75	12:32:00 PM	0.134	2.01	11.43	4.251	0.68	4.87	12:07:00 PM	0.134	3.57	0.24	0.871
CB-044-75	1.45	4.86	12:35:00 PM	0.346	0.717	6.38	2.856	1.32	5.51	12:29:00 PM	0.346	0.704	4.75	3.507	0.46	4.47	12:07:00 PM	0.346	0.6	0.63	2.468
CB-044-8	0.12	1.64	12:06:00 PM	0	0.154	0	0	0.14	2.19	12:06:00 PM	0	0.181	0.08	0.187	0.11	1.21	12:06:00 PM	0	0.19	0	0
CB-045-38	0.1	0.57	12:06:00 PM	0.122	0.122	0	0	0.1	0.57	12:06:00 PM	0.122	0.122	0	0	0.09	0.57	12:06:00 PM	0.122	0.122	0	0
CB-050-34	0.55	6.52	12:05:00 PM	0.298	0.298	1.19	4.519	0.46	6	12:04:00 PM	0.298	0.298	0.41	4.004	0.41	6.17	12:01:00 PM	0.298	0.298	0.35	4.17
Culvert_Outlet	0.47	1.61	12:07:00 PM	0	13.4	0	0	0.31	1.59	12:11:00 PM	0	12.5	0	0	0.31	1.96	12:06:00 PM	0	17	0	0
Cummings_MH	2.29	11.14	12:02:00 PM	0	10.5	3.01	8.137	2.21	12.33	12:03:00 PM	0	10.5	2.96	9.326	0.74	10.31	12:07:00 PM	0	2.53	0.53	7.312
D1	-	-	-	-	-	-	-	0.34	2.98	12:06:00 PM	0.716	0.724	0.71	0.978	0.3	2.97	12:04:00 PM	0.716	0.724	0.58	0.965
D10	-	-	-	-	-	-	-	0.57	5.55	12:33:00 PM	0	0.773	0.86	3.55	0.45	2.28	12:10:00 PM	0	6.34	0	0
D5	-	-	-	-	-	-	-	0.48	6.16	12:13:00 PM	0	0.688	0.81	4.155	0.32	5.17	12:01:00 PM	0	0.707	0.38	3.174
D9	-	-	-	-	-	-	-	0.5	6.11	12:24:00 PM	0	0.773	0.84	4.112	0.28	2.04	12:12:00 PM	0	0.708	0.11	0.039
DMH-016-21	0.76	11.12	12:05:00 PM	0.999	0.999	0.74	9.125	0.68	13.39	12:23:00 PM	0.999	0.999	0.72	11.388	0.56	14.96	11:52:00 AM	0.999	0.999	0.67	12.962
DMH-021-45	1.18	12.6	12:05:00 PM	1.46	3.23	1.3	10.105	1.07	12.43	12:32:00 PM	1.46	3.22	1.37	9.928	0.77	12.36	12:05:00 PM	1.46	3.23	0.71	9.86
DMH-025-61	3.64	5.37	12:06:00 PM	0.525	5.95	14.19	1.871	2.39	5.79	12:45:00 PM	0	1.97	10.76	2.291	0.27	4.73	12:38:00 PM	0	1.79	0.96	1.226
DMH-025-62	4.45	5.7	07/14/2020 14:44 PM	0	11	0	0	6.31	9.77	07/14/2020 13:20 PM	0.506	21.5	0	0	2.8	5.56	12:37:00 PM	0.506	43.2	0	0
DMH-026-4	1.35	14.86	12:15:00 PM	1.34	2.75	1.82	12.859	1.37	16.36	12:22:00 PM	1.34	3.11	1.78	14.357	1.01	15.62	12:18:00 PM	1.34	2.64	1.52	13.619
DMH-027-11	1.78	13.97	12:05:00 PM	0	4.9	2.14	10.97	1.65	14.23	12:06:00 PM	0	4.87	2.05	11.23	0.94	13.86	12:06:00 PM	0	5.12	0.77	10.863
DMH-027-14	2.03	13.53	12:05:00 PM	0	7.08	2.49	10.535	1.88	13.48	12:06:00 PM	0	6.99	2.41	10.485	0.87	12.14	12:07:00 PM	0	8.12	0.52	8.136
DMH-027-15	1.33	10.2	12:06:00 PM	1.27	2.59	2.35	8.199	1.23	10.68	12:06:00 PM	1.27	2.39	2.21	8.676	0.8	10.62	12:06:00 PM	1.27	2.54	1.41	8.618
DMH-027-19	1.21	7.37	12:20:00 PM	0	1.04	2.31	5.373	1.07	7.42	12:08:00 PM	0	1	1.98	5.423	0.81	7.56	11:50:00 AM	0	1.01	1.31	5.56
DMH-027-22	0.36	0.75	12:19:00 PM	0	0.905	0	0	0.68	8.93	12:09:00 PM	0	1	1	6.932	0.58	8.95	12:12:00 PM	0	1	0.91	6.947
DMH-027-7	1.72	15.93	12:05:00 PM	2.26	4.89	1.91	12.931	1.61	16.45	12:05:00 PM	2.26	4.86	1.87	13.454	1.03	16.39	12:05:00 PM	2.26	4.96	0.81	13.393
DMH-032-33	5.57	10.81	12:35:00 PM	0	9.39	19.12	6.811	4.03	9.98	12:41:00 PM	0	8.79	12.3	5.978	2.32	6.6	07/14/2020 13:32 PM	2.3	21	6.81	3.096
DMH-033-35	1.91	15.26	12:05:00 PM	2.01	2.09	2.86	13.261	1.83	16.49	12:42:00 PM	2.01	2.1	2.83	14.488	0.87	14.99	11:58:00 AM	2.01	12.4	0.47	10.987
DMH-033-37	0.71	2.68	12:06:00 PM	0.393	11	0	0	0.71	7.42	12:03:00 PM	0.393	11	0.1	4.42	0.31	1.81	12:06:00 PM	0.393	2.92	0	0
DMH-033-38	2.24	13.61	12:05:00 PM	2.09	9.22	2.74	10.607	2.08	13.73	12:05:00 PM	2.09	8.65	2.63	10.729	1.05	13.03	12:05:00 PM	2.09	10.2	0.57	9.027
DMH-033-45	2.53	13.43	12:05:00 PM	0.704	10.5	3.06	10.329	2.42	13.85	12:05:00 PM	0.704	10.5	3.01	10.748	0.75	12.22	12:07:00 PM	0.704	12.4	0.48	8.218
DMH-033-47	2.45	13.64	12:06:00 PM	0	1.48	4.83	11.638	2.35	13.95	12:06:00 PM	0	1.52	4.82	11.948	1.03	13.45	12:07:00 PM	0	10.4	0.57	9.452
DMH-034-64	0.36	0.69	12:17:00 PM	0	0.905	0	0	0.6	9.92	12:05:00 PM	0	0.937	0.77	7.919	0.53	9.93	12:05:00 PM	0	0.937	0.77	7.933
DMH-034-66	0.36	0.69	12:16:00 PM	0	0.905	0	0	0.56	8.7	12:17:00 PM	0	0.935	0.63	6.704	0.5	11.16	12:10:00 PM	0	0.935	0.65	9.164
DMH-034-68	0.36	0.69	12:13:00 PM	0	0.904	0	0	0.57	7.6	12:05:00 PM	0	0.924	0.72	5.595	0.5	7.68	12:07:00 PM	0	0.924	0.73	5.677
DMH-034-70	0.39	0.76	12:13:00 PM	0	0.905	0	0	0.62	7.84	12:09:00 PM	0	0.935	0.77	5.837	0.55	7.8	12:09:00 PM	0	0.935	0.78	5.804
DMH-037-2	4.68	9.53	12:06:00 PM	0.716	8.14	16.16	6.027	2.88	5.99	07/14/2020 13:26 PM	0	10.5	10.11	2.49	0.02	0.45	12:42:00 PM	0	0.003	0	0
DMH-037-89	4.44	9.92	12:20:00 PM	0.138	6.86	11.98	6.421	3.56	10.06	12:24:00 PM	0.138	8.26	9.13	6.559	0.96	7.24	12:09:00 PM	0.138	5.64	0.5	3.242
DMH-038-15	3.94	9.68	12:19:00 PM	0.299	4.83	9.45	6.181	3.12	9.78	12:24:00 PM	0.299	5.87	6.93	6.28	0.8	7.69	12:08:00 PM	0.299	5.26	0.55	3.689
DMH-038-19	0.3	4.7	12:08:00 PM	0	0.36	0.62	2.701	0.27	5.21	12:08:00 PM	0	0.391	0.81	3.207	0.1	4.73	12:09:00 PM	0	0.612	0.19	2.729
DMH-038-21_BB	0.98	4.06	12:19:00 PM	0	4.66	2.89	1.561	0.91	4.31	12:21:00 PM	0	4.55	2.59	1.814	0.51	3.81	12:07:00 PM	0	5.6	0.14	0.306
DMH-038-24	1.07	4.7	12:08:00 PM	0.266	4.71	2.55	2.2	0.99	4.41	12:18:00 PM	0.266	4.71	2.36	1.912	0.74	3.93	12:07:00 PM	0.266	5.39	0.08	0.178
DMH-038-8	3.11	8.72	12:20:00 PM	0.199	4.4	8.18	5.724	2.61	9.18	12:23:00 PM	0.199	5.27	6.01	6.18	0.8	6.86	12:08:00 PM	0.199	7.32	0.44	2.858
DMH-039-26	0.18	5.96	12:03:00 PM	0	0.08	0.14	3.959	0.23	7.01	12:04:00 PM	0	0.091	0.34	5.005	0.09	0.5	12:06:00 PM	0	0.092	0	0
DMH-039-34	0	0.05	12:08:00 PM	0	0	0	0	0	0	12:00:00 AM	0	0	0	0	0.03	0.17	12:06:00 PM	0	0.024	0	0

Junction ID (1D only)	10-year, 24-hour Design Storm - Junction Results																				
	Existing Condtions							Baseline Condtions							Alternatives Model						
	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)
DMH-039-41	0.22	8.14	11:56:00 AM	0	0.005	0.71	6.144	0.19	5.16	11:55:00 AM	0	0.005	0.55	3.158	0.12	1.89	12:05:00 PM	0	0.099	0	0
DMH-039-42	0.9	11.64	11:58:00 AM	0.165	11.1	0.43	8.64	0.88	9.57	12:03:00 PM	0.165	11.2	0.4	6.568	0.36	2.43	12:06:00 PM	0.165	3.09	0	0
DMH-039-43	1.37	6.73	12:07:00 PM	0	12.9	1.96	3.729	1.5	6.82	12:06:00 PM	0	12.2	2.17	3.821	0.65	4.94	12:06:00 PM	0	17	0	0
DMH-044-21	1.64	5.3	12:20:00 PM	0.151	0.722	7.49	3.302	1.37	6.46	12:34:00 PM	0.151	0.802	5.36	4.456	0.19	1.87	12:06:00 PM	0.151	0.486	0	0
DMH-044-6	0.22	2.83	12:06:00 PM	0	0.278	0.15	0.831	0.25	3.57	12:06:00 PM	0	0.326	0.38	1.567	0.18	1.17	12:06:00 PM	0	0.335	0	0
DMH-044-69	2.2	5.93	12:20:00 PM	0.564	2.37	9.36	3.931	1.87	6.59	12:31:00 PM	0.564	1.99	6.85	4.587	0.32	3.55	12:06:00 PM	0.564	1.12	0.02	0.054
DMH-044-71	0.04	0.37	12:24:00 PM	0	0.004	0	0	0.07	0.48	12:25:00 PM	0	0.027	0	0	0.06	0.29	12:06:00 PM	0	0.027	0	0
DMH-045-23	0.99	6.14	11:33:00 AM	0.228	0.832	2.74	4.138	0.91	8.89	12:37:00 PM	0.228	0.82	2.74	6.891	0.85	5.14	12:03:00 PM	0.228	0.82	2.74	3.136
DMH-045-24	0.66	7.55	12:05:00 PM	0.843	0.843	1.1	5.547	0.64	8.66	12:36:00 PM	0.843	0.843	1.1	6.662	0.55	8.21	12:04:00 PM	0.843	0.843	1.11	6.213
DMH-045-25	0.64	12.35	11:39:00 AM	0	0.638	1.33	10.348	0.61	5.22	12:13:00 PM	0	0.641	1.33	3.216	0.55	12.35	11:39:00 AM	0	0.641	1.33	10.345
DMH-045-26	0.81	5.13	12:06:00 PM	0.098	4.06	1.18	2.634	0.76	4.84	12:05:00 PM	0.098	4.08	1.14	2.34	0.49	4.2	12:03:00 PM	0.098	4.41	0.14	1.202
DMH-045-30	0.17	1.51	12:23:00 PM	0	0.001	0	0	0.13	1.76	12:23:00 PM	0	0.001	0	0	0	0	07/14/2020 16:26 PM	0	0	0	0
DMH-045-33	0.9	9.98	11:34:00 AM	0.575	0.978	1.53	7.981	0.74	39	12:34:00 PM	0.575	0.979	1.48	37	0.65	8.2	11:35:00 AM	0.575	0.979	1.48	6.195
DMH-045-35	0.78	6.78	12:04:00 PM	0.527	3.98	0.86	4.282	0.7	6.9	12:06:00 PM	0.527	3.85	0.72	4.397	0.45	2.3	12:06:00 PM	0.527	4.13	0	0
DMH-045-37	0.13	0.88	12:06:00 PM	0	0.122	0	0	0.12	0.86	12:06:00 PM	0	0.122	0	0	0.12	0.88	12:06:00 PM	0	0.122	0	0
DMH-045-40	0.62	4.72	12:06:00 PM	0.677	1.88	0.65	1.717	0.56	4.9	12:05:00 PM	0.677	1.77	0.47	1.904	0.46	2.13	12:06:00 PM	0.677	1.77	0	0
DMH-045-44	0.48	6.11	12:07:00 PM	0	1.69	0.79	3.107	0.4	6.08	12:06:00 PM	0	1.68	0.62	3.083	0.22	1.49	12:07:00 PM	0	1.8	0	0
DMH-045-45	1.04	11.13	12:05:00 PM	0.536	2.67	1	9.131	0.88	11.21	12:06:00 PM	0.536	2.62	0.86	9.209	0.4	4.38	12:06:00 PM	0.536	2.81	0.03	1.876
DMH-045-48	0.42	5.23	12:10:00 PM	0	0.442	0.85	3.232	0.32	4.3	12:06:00 PM	0	0.437	0.59	2.299	0.2	0.59	12:06:00 PM	0	0.456	0	0
DMH-045-49	0.37	3.23	12:05:00 PM	0.667	0.681	0.9	1.234	0.24	1.28	12:06:00 PM	0.667	0.72	0	0	0.23	1.07	12:06:00 PM	0.667	0.667	0	0
DMH-045-51	0.13	0.78	12:06:00 PM	0	0.122	0	0	0.12	0.78	12:06:00 PM	0	0.122	0	0	0.12	0.78	12:06:00 PM	0	0.122	0	0
DMH-045-59	1.01	5.82	12:08:00 PM	0	0.697	2.75	3.817	0.9	5.23	12:05:00 PM	0	0.695	2.75	3.225	0.84	5.2	12:15:00 PM	0	0.695	2.75	3.2
DMH-045-60	1.59	11.29	11:34:00 AM	0	0.744	2.97	9.293	1.44	20.74	12:41:00 PM	0	0.74	2.97	18.744	1.31	10.39	11:35:00 AM	0	0.74	2.97	8.394
DMH-046-61	0.54	7.69	12:05:00 PM	0.521	0.522	0.79	5.688	0.42	6.96	12:26:00 PM	0.521	0.521	0.76	4.964	0.37	9.53	12:26:00 PM	0.521	0.522	0.76	7.531
DMH-051-36	0.32	1.3	12:07:00 PM	0	1.2	0	0	0.31	1.09	12:07:00 PM	0	1.09	0	0	0.3	1.08	12:09:00 PM	0	1.09	0	0
DMH-051-37	0.33	4.99	12:02:00 PM	0	0.45	0.32	2.987	0.3	5.31	12:04:00 PM	0	0.449	0.33	3.31	0.27	4.02	12:08:00 PM	0	0.449	0.33	2.017
DMH-051-38	0.37	7	12:02:00 PM	0	0.44	0.36	5.5	0.34	6.42	12:04:00 PM	0	0.431	0.21	4.425	0.31	4.44	12:04:00 PM	0	0.43	0.2	2.445
DMH-051-39	0.64	7.08	12:05:00 PM	0.545	0.545	0.99	5.077	0.57	13.51	11:43:00 AM	0.545	0.545	0.98	11.513	0.5	13.47	11:43:00 AM	0.545	0.545	0.99	11.468
DMH-051-41	0.04	1.25	12:07:00 PM	0	0	0	0	0.02	0.45	12:05:00 PM	0	0	0	0	0.01	0.36	12:08:00 PM	0	0	0	0
DMH-051-43	0.22	1.66	12:08:00 PM	0	0.44	0	0	0.19	0.84	12:05:00 PM	0	0.431	0	0	0.19	0.77	12:08:00 PM	0	0.431	0	0
DMH-051-67	0.61	6.24	12:02:00 PM	0	0.47	0.72	4.244	0.57	6.17	12:04:00 PM	0	0.467	0.65	4.167	0.53	4.97	12:08:00 PM	0	0.467	0.65	2.967
Dum_019-1	2.43	6.22	07/14/2020 14:50 PM	0	25.9	0	0	1	2.41	07/14/2020 15:23 PM	0	15.4	0	0	0.54	1.33	07/14/2020 13:00 PM	0	4.47	0	0
Dum_025-1	0.1	0.51	12:07:00 PM	0	2.43	0	0	0.01	0.05	12:07:00 PM	0	2.6	0	0	0.01	0.05	12:12:00 PM	0	2.37	0	0
Dum_025-16	2.69	6.18	07/14/2020 14:49 PM	0	5.04	0	0	2.85	6.11	07/14/2020 15:20 PM	0	8.88	0	0	1.52	5.59	12:45:00 PM	0	4.86	0	0
Dum_026-5	0.12	0.59	12:24:00 PM	0	2.25	0	0	0.12	0.62	12:34:00 PM	0	2.42	0	0	0.11	0.61	12:18:00 PM	0	2.19	0	0
Dum_031-9	2.42	5.88	12:13:00 PM	5.27	5.82	0	0	2.62	5.82	12:17:00 PM	5.27	6.16	0	0	1.41	5.82	12:17:00 PM	5.27	5.3	0	0
Dum_GW_J1	0	0	12:00:00 AM	0	0	0	0	0	0	12:00:00 AM	0	0	0	0	0	0	12:00:00 AM	0	0	0	0
Dum_GW_J2	0.01	0.11	12:57:00 PM	0	1.07	0	0	0	0	12:17:00 PM	0	0	0	0	0	0	07/14/2020 13:00 PM	0	0	0	0
Dum_GW_J3	0	0.02	12:16:00 PM	0	0.154	0	0	0	0	12:15:00 PM	0	0	0	0	0	0	12:14:00 PM	0	0	0	0
IN-WS-7	-	-	-	-	-	-	-	0.89	3.62	12:37:00 PM	0.162	1.64	0	0	0.2	2.82	12:39:00 PM	0.162	1.11	0	0
J1	4.45	9.88	12:20:00 PM	0	7.43	12.11	6.384	3.54	9.86	12:25:00 PM	0	10.5	9.24	6.358	0.93	6.76	12:10:00 PM	0	5.64	0.89	3.426
J2	1.82	3.58	07/14/2020 15:21 PM	0	44.6	0	0	3.2	4.7	11:48:00 AM	0	42.1	0	0	3.19	4.8	12:19:00 PM	0	52.3	0	0
J24369	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.71	2.24	12:42:00 PM	0	2.77	0	0
J24371	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.81	18.03	11:58:00 AM	0	13.1	0.46	14.034
J3	4.68	8.48	07/14/2020 13:25 PM	0	9.24	17.12	4.975	2.85	5.69	07/14/2020 13:26 PM	0	6.31	11.14	2.191	0.04	0.81	12:40:00 PM	0	0.008	0	0
Kennedy_MH	0.68	10.41	12:05:00 PM	0.873	1.75	0.77	7.914	0.61	10.48	12:05:00 PM	0.873	1.74	0.75	7.982	0.52	10.84	12:07:00 PM	0.873	1.74	0.58	8.341
M2	-	-	-	-	-	-	-	4.8	8.38	07/14/2020 13:26 PM	0	4.57	14.39	4.875	1.29	6.53	12:27:00 PM	0	4.88	1.51	3.029
M26	-	-	-	-	-	-	-	3.17	7.66	07/14/2020 13:00 PM	0.173	7.63	0	0	0.83	3.56	12:07:00 PM	0.173	3.75	0	0
M27	-	-	-	-	-	-	-	0.45	5.49	12:13:00 PM	0	0.636	0.79	3.491	0.33	5.25	12:10:00 PM	0	0.688	0.4	3.249
M28	-	-	-	-	-	-	-	1.75	5.12	12:44:00 PM	0	0.731	11.47	3.117	0.88	3.41	12:37:00 PM	0	6.34	0	0
M3	-	-	-	-	-	-	-	2.29	5.91	12:25:00 PM	0	1.89	12.48	3.908	0.53	5.48	12:28:00 PM	0	1.01	1.4	3.477
M4	-	-	-	-	-	-	-	1.91	5.89	12:25:00 PM	0	1.88	11.18	3.885	0.5	5.69	12:17:00 PM	0	0.978	1.27	3.685
M5	-	-	-	-	-	-	-	0.67	3.49	12:33:00 PM	0	0.289	1.94	1.492	0.2	2.6	12:37:00 PM	0	0.23	0.73	0.603
M60	-	-	-	-	-	-	-	3.61	7.35	07/14/2020 13:27 PM	0.243	6.7	0	0	0.37	2.33	12:40:00 PM	0.243	3.32	0	0
MalboneChannel1	0.19	1.59	12:15:00 PM	0.344	13.7	0	0	0.16	1.61	12:15:00 PM	0.344	8.43	0	0	0.15	1.71	12:09:00 PM	0.344	10.3	0	0
MalboneChannel2	0.18	1.34	12:18:00 PM	0	6.02	0	0	0.01	0.11	12:15:00 PM	0	3.89	0	0	0.01	0.11	12:09:00 PM	0	4.52	0	0
MalboneChannel3	1.1	6.39	12:44:00 PM	0	7.64	0	0	0.77	5.11	12:56:00 PM	0	4.41	0	0	0.17	0.88	12:16:00 PM	0	4.63	0	0
DMH-039-34_US	0	0	12:00:00 AM	0	0	0	0	0	0	12:00:00 AM	0	0	0	0	0	0	12:00:00 AM	0	0	0	0
Overflow_MH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.72	5.73	07/14/2020 13:46 PM	0	9.45	0	0
SU3_Out	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.52	7.02	07/14/2020 13:40 PM	0	18.8	0	0
DMH-Gar-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21	1.92	12:07:00 PM	0	1.02	0	0
DMH-Gar-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	1.27	12:06:00 PM	0.975	0.993	0	0
DMH-Sm-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.81	17.59	11:58:00 AM	0.566	13.7	0.5	13.591
J4_New	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.42	4.37	12:06:00 PM	0	1.74	0.25	0.869
16	4.31	6.31	12:18:00 PM	2.34	22.2	0	0	5.56	8.99	07/14/2020 13:27 PM	2.34	27.1	0	0	-	-	-	-	-	-	-
17	2.09	4.76	12:55:00 PM	0.988	4.18	0	0	3.62	7.17	07/14/2020 13:40 PM	0	7.84	0	0	-	-	-	-	-	-	-
18	4.35	7.03	12:55:00 PM	0	22	0	0	5.56	9.44	07/14/2020 13:40 PM	0.988	25	0	0	-	-	-	-	-	-	-
24	4.22	6.91	12:55:00 PM	2.48	11.9	0	0	2.48	5.51	07/14/2020 13:40 PM	0	9.41	0	0	-	-	-	-	-	-	-
CB-037-84	4.59	9.92	12:35:00 PM	0	7.45	14.57	6.415	3.3	8.02	12:41:00 PM	0	10.4	9.95	4.519	-	-	-	-	-	-	-
DMH-032-32A	2.16	9.28	12:35:00 PM	1.18	9.41	4.84	5.28	1.6	8.28	12:46:00 PM	1.18	6.66	3.53	4.277	-	-	-	-	-	-	-
J4	4.3	6.98	12:55:00 PM	0	21	0	0	2.5	5.58	07/14/2020 13:40 PM	0	15.4	0	0	-	-	-	-	-	-	-
J5	2.61	7.82	12:20:00 PM	0	2.11	9.72	5.825	2.05	8.04	12:25:00 PM	0	3.22	7.16	6.044	-	-	-	-	-	-	-
PipeEntrance	2.38	9.69	12:44:00 PM	0	7.72	0	0	1.78	8.44	12:56:00 PM	0	5.03	0	0	-	-	-	-	-	-	-
DMH-032-32	5.57	11.84	12:35:00 PM	0	9.37	16.83	7.839	3.99	11.13	12:46:00 PM	0	7.7	11.5	7.125	-	-	-	-	-	-	-
DMH-032-32B	4.87	11.84	12:35:00 PM	0	9.35	9.33	7.843	3.37	11.08	12:47:00 PM	0	7.76	7.29	7.08	-	-	-	-	-	-	-
DMH-037-80	2.03	4.73	12:49:00 PM	0	3.37	0	0	3.69	7.43	07/14/2020 13:27 PM	0	6.49	0	0	-	-	-	-	-	-	-
Dum_037-4	1.82	4.53	12:49:00 PM	0	6.15	0	0	3.25	7.98	07/14/2020 13:08 PM	0	4.52	0	0	-	-	-	-	-	-	-
Dum_037-10	1.84	4.54	12:49:00 PM	0	3.54	0	0	3.24	7.98	07/14/2020 13:08 PM	0	3.38	0	0	-	-	-	-	-	-	-
Dum_025-2_1	1.4	5.63	07/14/2020 13:02 PM	0.706	1.23	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dum_025-2_2	0.01	0.1	12:14:00 PM	0	0.034	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dum_025-3	0.67	3.95	07/14/2020 13:02 PM	0	0.174	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dum_037-9	1.95	4.64	12:49:00 PM	0.243	3.47	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-025-68	1.98	6.43	07/14/2020 13:00 PM	0.403	5.68	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-037-1	1.51	3.58	12:52:00 PM	0	13.6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Junction ID (1D only)	10-year, 24-hour Design Storm - Junction Results																				
	Existing Condtions							Baseline Condtions							Alternatives Model						
	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)	Avg Depth (ft)	Max Depth (ft)	Time Max HGL	Total Lat. Inflow (MG)	Total Inflow (MG)	Hours Surcharged	Max Surcharge (ft)
CB-044-10	1.1	4.25	12:06:00 PM	0.532	1.37	3.25	2.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-044-15	0.92	5.9	12:05:00 PM	0.133	0.978	2.28	3.902	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-050-31	0.92	9.06	12:06:00 PM	0.734	0.928	1.65	7.056	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Outfall ID	10-year, 24-hour Design Storm - Outfall Results																	
	Existing Condtions						Baseline Condtions						Alternatives Model					
	Avg Depth (ft)	Max Depth (ft)	Total Lat. Inflow (MG)	Total Inflow (MG)	Avg Flow (cfs)	Max Flow (cfs)	Avg Depth (ft)	Max Depth (ft)	Total Lat. Inflow (MG)	Total Inflow (MG)	Avg Flow (cfs)	Max Flow (cfs)	Avg Depth (ft)	Max Depth (ft)	Total Lat. Inflow (MG)	Total Inflow (MG)	Avg Flow (cfs)	Max Flow (cfs)
8	0.31	0.85	0	44.5	71.18	198.29	4.22	5.83	0	42.1	65.4	166.1	4.22	5.83	0	52	80.71	338.5
Dum_GW_Outfall	0	0.04	0	1.07	3.53	33.85	0	0	0	0	0	0	0	0	0	0	0	0

Outfall ID	10-year, 24-hour Design Storm - Storage Results								
	Alternatives Model								
	Avg Depth (ft)	Max Depth (ft)	Time Max Depth	Total Lat. Inflow (MG)	Total Inflow (MG)	Avg Volume (1000 ft3)	Avg Percent Full	Max Volume (1000 ft3)	Max Percent Full
SU1	0.96	2.57	13:24:00 PM	0	3.74	131.07	9	355.501	26
SU2	2.48	5.32	12:40:00 PM	3.33	38.1	501.52	28	1132.23	63
SU3	2.87	7.83	13:47:00 PM	1.18	21.9	618.38	24	1752.27	68

Subcatchment ID	10-year, 24-hour Design Storm - Subcatchment Results											
	Existing Condtions				Baseline Condtions				Alternatives Model			
	Infiltration (in)	Runoff Depth (in)	Runoff Volume (in)	Peak Runoff (cfs)	Infiltration (in)	Runoff Depth (in)	Runoff Volume (in)	Peak Runoff (cfs)	Infiltration (in)	Runoff Depth (in)	Runoff Volume (MG)	Peak Runoff (cfs)
A0	2.57	2.45	0.66	24.67	2.57	2.45	0.66	24.67	2.57	2.45	0.66	24.67
A1	3.15	1.88	0.47	20.97	3.15	1.88	0.47	20.97	3.15	1.88	0.47	20.97
A10	1.52	3.48	0.52	20.78	1.52	3.48	0.52	20.78	1.52	3.48	0.52	20.78
A11	2.41	2.61	0.18	8.51	2.41	2.61	0.18	8.51	2.41	2.61	0.18	8.51
A12	1.47	3.52	5.27	173.7	1.47	3.52	5.27	173.7	1.47	3.52	5.27	173.7
A13_1	-	-	-	-	0.08	4.87	2.3	67.28	0.08	4.87	2.3	67.28
A13_2	-	-	-	-	1.21	3.75	0.16	4.67	1.21	3.75	0.16	4.67
A14	2.1	2.91	0.96	30.24	2.1	2.91	0.96	30.24	2.05	2.96	0.97	35.16
A15	3.27	1.76	0.34	11.92	3.27	1.76	0.34	11.92	3.27	1.76	0.34	11.92
A16	3.49	1.54	0.09	3.77	3.49	1.54	0.09	3.77	3.49	1.54	0.09	3.77
A17	0.97	4.03	0.35	12.78	0.97	4.03	0.35	12.78	0.97	4.03	0.35	12.78
A18	1.72	3.29	0.57	19.27	1.72	3.29	0.57	19.27	1.72	3.29	0.57	19.27
A19	1.46	3.54	0.58	20.1	1.46	3.54	0.58	20.1	1.46	3.54	0.58	20.1
A2_1	-	-	-	-	1.93	3.08	0.05	2.19	1.93	3.08	0.05	2.19
A2_2	-	-	-	-	2.14	2.87	0.07	3.39	2.14	2.87	0.07	3.39
A2_3	-	-	-	-	2.87	2.15	0.16	7.83	2.87	2.15	0.16	7.83
A2_4	-	-	-	-	1.93	3.09	0.04	1.99	1.93	3.09	0.04	1.99
A2_5	-	-	-	-	2.14	2.87	0.04	1.89	2.14	2.87	0.04	1.89
A20	0.97	4.02	0.99	34.98	0.97	4.02	0.99	34.98	0.97	4.02	0.99	34.98
A21_1	-	-	-	-	0.92	4.07	0.59	19.64	0.92	4.07	0.59	19.64
A21_2	-	-	-	-	1.83	3.19	0.11	4.77	1.83	3.19	0.11	4.77
A22	0.37	4.6	2.23	69.57	0.37	4.6	2.23	69.57	0.37	4.6	2.23	69.57
A23	1.81	3.19	0.56	19.14	1.81	3.19	0.56	19.14	1.81	3.19	0.56	19.14
A24	1.36	3.63	0.67	21.16	1.36	3.63	0.67	21.16	1.36	3.63	0.67	21.16
A25	1.48	3.52	0.53	17.67	1.48	3.52	0.53	17.67	1.48	3.52	0.53	17.67
A26	1.05	3.94	0.35	12.33	1.05	3.94	0.35	12.33	1.05	3.94	0.35	12.33
A27	1.77	3.23	0.3	11.51	1.77	3.23	0.3	11.51	1.77	3.23	0.3	11.51
A28	3.12	1.9	0.31	13.4	3.12	1.9	0.31	13.4	3.12	1.9	0.31	13.4
A29	2.05	2.96	0.34	13.59	2.05	2.96	0.34	13.59	2.05	2.96	0.34	13.59
A3	1.46	3.53	2.34	72.97	1.46	3.53	2.34	72.97	1.46	3.53	2.34	72.97
A30	0.99	4	0.51	18.13	0.99	4	0.51	18.13	0.99	4	0.51	18.13
A31	1.07	3.93	0.21	7.77	1.07	3.93	0.21	7.77	1.07	3.93	0.21	7.77
A32	1.81	3.2	0.08	2.97	1.81	3.2	0.08	2.97	1.81	3.2	0.08	2.97
A33	2.03	2.98	0.12	5.02	2.03	2.98	0.12	5.02	2.03	2.98	0.12	5.02
A34	1.41	3.59	0.08	3.06	1.41	3.59	0.08	3.06	1.41	3.59	0.08	3.06
A35	1.08	3.92	0.19	6.77	1.08	3.92	0.19	6.77	1.08	3.92	0.19	6.77
A36	0.95	4.04	0.1	3.56	0.95	4.04	0.1	3.56	0.95	4.04	0.1	3.56
A37	0.93	4.06	0.18	6.32	0.93	4.06	0.18	6.32	0.93	4.06	0.18	6.32
A38	0.43	4.56	0.05	1.6	0.43	4.56	0.05	1.6	0.43	4.56	0.05	1.6
A39	0.89	4.1	0.19	6.97	0.89	4.1	0.19	6.97	0.89	4.1	0.19	6.97
A4	2.93	2.1	0.74	21.91	2.93	2.1	0.74	21.91	2.93	2.1	0.74	21.91
A40	1.1	3.9	0.12	4.49	1.1	3.9	0.12	4.49	1.1	3.9	0.12	4.49
A41	0.54	4.44	0.22	7.48	0.54	4.44	0.22	7.48	0.54	4.44	0.22	7.48
A42	1.03	3.95	0.55	18.32	1.03	3.95	0.55	18.32	1.03	3.95	0.55	18.32
A43	1.12	3.86	0.39	11.85	1.12	3.86	0.39	11.85	1.12	3.86	0.39	11.85
A44	1.39	3.61	0.68	23.05	1.39	3.61	0.68	23.05	1.39	3.61	0.68	23.05
A45	0.77	4.22	0.54	18.1	0.77	4.22	0.54	18.1	0.77	4.22	0.54	18.1
A46	1.2	3.79	0.12	4.51	1.2	3.79	0.12	4.51	1.2	3.79	0.12	4.51
A47	1.03	3.96	0.21	7.78	1.03	3.96	0.21	7.78	1.03	3.96	0.21	7.78

Subcatchment ID	10-year, 24-hour Design Storm - Subcatchment Results											
	Existing Condtions				Baseline Condtions				Alternatives Model			
	Infiltration (in)	Runoff Depth (in)	Runoff Volume (in)	Peak Runoff (cfs)	Infiltration (in)	Runoff Depth (in)	Runoff Volume (in)	Peak Runoff (cfs)	Infiltration (in)	Runoff Depth (in)	Runoff Volume (MG)	Peak Runoff (cfs)
A48	0.81	4.17	0.36	12.42	0.81	4.17	0.36	12.42	0.81	4.17	0.36	12.42
A49	0.72	4.26	0.23	7.68	0.72	4.26	0.23	7.68	0.72	4.26	0.23	7.68
A5	1.14	3.85	0.84	28.53	1.14	3.85	0.84	28.53	1.14	3.85	0.84	28.53
A50	1.53	3.47	0.07	2.63	1.53	3.47	0.07	2.63	1.53	3.47	0.07	2.63
A51	2.06	2.95	0.73	23.25	2.06	2.95	0.73	23.25	2.06	2.95	0.73	23.25
A52	1.36	3.64	0.14	5.13	1.36	3.64	0.14	5.13	1.36	3.64	0.14	5.13
A53	0.15	4.82	0.72	22.77	0.15	4.82	0.72	22.77	0.15	4.82	0.72	22.77
A54	1.89	3.11	0.13	5.18	1.87	3.14	0.13	5.64	1.87	3.14	0.13	5.64
A55	2.11	2.9	0.24	10.11	2.11	2.9	0.24	10.11	2.11	2.9	0.24	10.11
A56	1.6	3.41	0.31	10.73	1.6	3.41	0.31	10.73	1.6	3.41	0.31	10.73
A57	1.91	3.1	0.26	9.73	1.91	3.1	0.26	9.73	1.91	3.1	0.26	9.73
A58	2.27	2.75	0.17	8.53	2.29	2.72	0.17	7.77	2.29	2.72	0.17	7.77
A59	1.02	3.97	0.15	5.61	1.02	3.97	0.15	5.61	1.02	3.97	0.15	5.61
A6	0.72	4.25	0.67	20.82	0.72	4.25	0.67	20.82	0.72	4.25	0.67	20.82
A60	0.89	4.08	3.07	88.45	0.89	4.08	3.07	88.45	0.89	4.08	3.07	88.45
A7	3.18	1.85	0.28	12.61	3.18	1.85	0.28	12.61	3.18	1.85	0.28	12.61
A8	1.76	3.24	0.3	10.2	1.76	3.24	0.3	10.2	1.76	3.24	0.3	10.2
A9	0.58	4.4	0.37	12.45	0.58	4.4	0.37	12.45	0.58	4.4	0.37	12.45
Beacon	0.65	4.35	0.49	17.25	0.65	4.35	0.49	17.25	0.65	4.35	0.49	17.25
Beacon_Middletown	1.45	3.55	0.5	14.2	1.45	3.55	0.5	14.2	1.45	3.55	0.5	14.2
Bedlow	0.67	4.32	2.01	67.2	0.67	4.32	2.01	67.2	0.67	4.32	2.01	67.2
Burdick_1	-	-	-	-	-	-	-	-	0.87	4.13	0.29	10.72
Burdick_2	-	-	-	-	-	-	-	-	0.87	4.13	0.24	8.92
Cumming	0.94	4.07	0.39	14.18	0.94	4.07	0.39	14.18	0.94	4.07	0.39	14.18
Dexter	2.56	2.45	0.79	28.33	2.56	2.45	0.79	28.33	2.56	2.45	0.79	28.33
Dexter_Middletown_Lower	1.05	3.95	1.4	50.81	1.05	3.95	1.4	50.81	1.05	3.95	1.4	50.81
Dexter_Middletown_Upper	2.03	2.96	1.47	43.59	2.03	2.96	1.47	43.59	2.03	2.96	1.47	43.59
Dexter_Stormwall	4.55	0.48	0.04	2.37	4.55	0.48	0.04	2.37	4.55	0.48	0.04	2.37
Dudley	3.38	1.64	0.36	15.72	3.38	1.64	0.36	15.72	3.38	1.64	0.36	15.72
Dudley_Middletown	1.44	3.58	0.15	6.07	1.44	3.58	0.15	6.07	1.44	3.58	0.15	6.07
Dudley_Stormwall	4.14	0.89	0.13	5.9	4.14	0.89	0.13	5.9	4.14	0.89	0.13	5.9
Eisenhower	0.82	4.18	1.46	49.57	0.82	4.18	1.46	49.57	0.82	4.18	1.46	49.57
Eisenhower_Middletown	1.13	3.88	0.09	3.38	1.13	3.88	0.09	3.38	1.13	3.88	0.09	3.38
Eisenhower_Stormwall	4.5	0.53	0.07	3.63	4.5	0.53	0.07	3.63	4.5	0.53	0.07	3.63
Hillside_L	1.48	3.53	0.27	10.75	1.48	3.53	0.27	10.75	1.48	3.53	0.27	10.75
Hillside_R	0.63	4.37	0.43	15.15	0.63	4.37	0.43	15.15	0.63	4.37	0.43	15.15
Kalbfus	1.03	3.97	1.27	42.25	1.03	3.97	1.27	42.25	1.03	3.97	1.27	42.25
Kalbfus_Middletown	0.67	4.32	1.73	58.01	0.67	4.32	1.73	58.01	0.67	4.32	1.73	58.01
Kalbfus_Stormwall	2.99	2.04	0.02	1.54	2.99	2.04	0.02	1.54	2.99	2.04	0.02	1.54
Kennedy	0.81	4.19	0.87	30.64	0.81	4.19	0.87	30.64	0.81	4.19	0.87	30.64
Kennedy_Middletown	1.33	3.68	0.1	4.02	1.33	3.68	0.1	4.02	1.33	3.68	0.1	4.02
Kennedy_Stormwall	3.06	1.96	0.15	6.37	3.06	1.96	0.15	6.37	3.06	1.96	0.15	6.37
Madeline	0.99	4.01	0.52	19.01	0.99	4.01	0.52	19.01	0.99	4.01	0.52	19.01
Malbone	0.67	4.34	0.16	5.9	0.67	4.34	0.16	5.9	0.67	4.34	0.16	5.9
Pennacook_L	0.61	4.38	0.56	19.55	0.61	4.38	0.56	19.55	0.61	4.38	0.56	19.55
Pennacook_R	0.88	4.12	1.53	51.96	0.88	4.12	1.53	51.96	0.88	4.12	1.53	51.96
Russell_1	-	-	-	-	-	-	-	-	0.91	4.09	0.35	12.32
Russell_2	-	-	-	-	-	-	-	-	0.91	4.09	0.32	11.55
Smith	0.93	4.07	0.57	20.9	0.93	4.07	0.57	20.9	0.93	4.07	0.57	20.75

Subcatchment ID	10-year, 24-hour Design Storm - Subcatchment Results											
	Existing Condtions				Baseline Condtions				Alternatives Model			
	Infiltration (in)	Runoff Depth (in)	Runoff Volume (in)	Peak Runoff (cfs)	Infiltration (in)	Runoff Depth (in)	Runoff Volume (in)	Peak Runoff (cfs)	Infiltration (in)	Runoff Depth (in)	Runoff Volume (MG)	Peak Runoff (cfs)
Thurston	0.85	4.15	0.33	11.73	0.85	4.15	0.33	11.73	0.85	4.15	0.33	11.73
Burdick	0.87	4.13	0.54	19.64	0.87	4.13	0.54	19.64	-	-	-	-
Russell	0.91	4.09	0.67	23.87	0.91	4.09	0.67	23.87	-	-	-	-
A13	0.14	4.81	2.48	71.76	-	-	-	-	-	-	-	-
A2	2.17	2.84	0.4	17.9	-	-	-	-	-	-	-	-
A21	1.07	3.92	0.71	24.95	-	-	-	-	-	-	-	-

Appendix D. Model Inputs

Model Inputs - Existing Conditions

```
[TITLE]
;;Project Title/Notes
Existing Conditons for the Prescott Hall Watershed in Newport RI. Updated from a 1D model developed in 2014. This model was used

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           07/14/2020
START_TIME           00:00:00
REPORT_START_DATE    07/14/2020
REPORT_START_TIME    00:00:00
END_DATE             07/15/2020
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:01:00
DRY_STEP             00:05:00
ROUTING_STEP         0.5
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         1
MAX_TRIALS           30
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.001
THREADS              5

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
```

```
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- -------- -------- ----------
10yr_24hr_DS_6min_INT INTENSITY 0:06     1.0      TIMESERIES SCS_Type_III_5.03in

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
;Updated by EO on 3.28.22: changed outlet
A0               10yr_24hr_DS_6min_INT J11599      9.862046 18.322   441.972  10.984   0
;Updated by EO on 3.28.22: changed outlet
A1               10yr_24hr_DS_6min_INT J12425      9.271104 1.1      506.12   14.097   0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A10              10yr_24hr_DS_6min_INT DMH-025-61  5.556311 56.82    398.539  11.265   0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A11              10yr_24hr_DS_6min_INT CB-026-76   2.595391 32.396   271.48   8.369    0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A12              10yr_24hr_DS_6min_INT Dum_031-9   55.14121 63.173   2227.866 2.981    0
A13              10yr_24hr_DS_6min_INT 24          19.012476 91.291  552.058  3.16     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A14              10yr_24hr_DS_6min_INT J19485      12.1153  37.993   395.543  4.51     0
A15              10yr_24hr_DS_6min_INT MalboneChannel1 7.215144 1.575 368.561 5.66     0
A16              10yr_24hr_DS_6min_INT DMH-032-32A 2.189369 0        143.709  5.49     0
A17              10yr_24hr_DS_6min_INT DMH-032-32A 3.1865   69.303   250.765  7.126    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A18              10yr_24hr_DS_6min_INT J20353      6.349541 45.64    270.887  4.818    0
A19              10yr_24hr_DS_6min_INT DMH-045-33  5.981308 53.475   274.251  5.296    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A2               10yr_24hr_DS_6min_INT CB-025-68   5.220471 38.958   436.358  12.558   0
A20              10yr_24hr_DS_6min_INT 17          9.0555   67.646   607.27   4.098    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A21              10yr_24hr_DS_6min_INT Dum_025-2_1 6.622884 59.115   328.415  8.523    0
A22              10yr_24hr_DS_6min_INT 12          17.874451 82.552  680.974  3.563    0
A23              10yr_24hr_DS_6min_INT DMH-044-69  6.517371 47.926   246.564  5.146    0
;Updated by EO on 3.29.22: changed outlet
A24              10yr_24hr_DS_6min_INT DMH-045-49  6.767905 57.154   329.403  1.634    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A25              10yr_24hr_DS_6min_INT CB-044-10   5.574783 55.874   205.798  4.297    0
A26              10yr_24hr_DS_6min_INT CB-044-75   3.231058 66.449   237.189  3.387    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A27              10yr_24hr_DS_6min_INT CB-050-34   3.396114 50.372   219.987  6.835    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A28              10yr_24hr_DS_6min_INT CB-037-86   6.024608 14.471   454.357  5.399    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
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A29              10yr_24hr_DS_6min_INT CB-026-91   4.261817 37.121   199.84   14.737   0
A3               10yr_24hr_DS_6min_INT 16          24.451847 58.13   622.032  4.541    0
A30              10yr_24hr_DS_6min_INT 15          4.653138 70.007   390.714  3.186    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A31              10yr_24hr_DS_6min_INT J19694      1.9465   61.794   342.242  2.042    0
A32              10yr_24hr_DS_6min_INT DMH-038-8   0.912043 41.901   123.7    1.213    0
A33              10yr_24hr_DS_6min_INT DMH-038-8   1.486232 34.417   199.172  3.08     0
A34              10yr_24hr_DS_6min_INT DMH-038-24  0.803157 54.226   113.745  2.846    0
A35              10yr_24hr_DS_6min_INT DMH-038-24  1.764976 65.124   138.682  3.626    0
A36              10yr_24hr_DS_6min_INT DMH-045-26  0.892069 69.151   103.724  2.615    0
A37              10yr_24hr_DS_6min_INT DMH-045-23  1.642409 69.918   94.915   4.334    0
A38              10yr_24hr_DS_6min_INT DMH-045-23  0.378077 85.95    118.735  3.285    0
A39              10yr_24hr_DS_6min_INT DMH-045-35  1.711119 71.042   233.21   3.155    0
A4               10yr_24hr_DS_6min_INT DMH-032-32A 12.974479 8.103   442.53   7.461    0
A40              10yr_24hr_DS_6min_INT DMH-045-35  1.129771 64.246   141.242  3.597    0
A41              10yr_24hr_DS_6min_INT DMH-045-35  1.798022 82.191   202.696  3.621    0
A42              10yr_24hr_DS_6min_INT DMH-051-39  5.07769  66.912   249.529  3.043    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A43              10yr_24hr_DS_6min_INT J23993      3.743771 64.961   156.317  1.28     0
A44              10yr_24hr_DS_6min_INT DMH-045-40  6.907604 55.872   303.036  4.289    0
A45              10yr_24hr_DS_6min_INT DMH-045-45  4.686171 75.248   375.848  1.473    0
A46              10yr_24hr_DS_6min_INT CB-045-38   1.181965 61.064   108.986  3.561    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A47              10yr_24hr_DS_6min_INT J21996      1.948188 66.348   234.783  3.489    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A48              10yr_24hr_DS_6min_INT J22156      3.186529 73.813   200.832  3.226    0
A49              10yr_24hr_DS_6min_INT DMH-038-15  1.9485   77.32    189.801  1.306    0
A5               10yr_24hr_DS_6min_INT DMH-045-24  8.076291 63.396   362.664  3.853    0
A50              10yr_24hr_DS_6min_INT DMH-038-15  0.781215 53.268   151.41   0.358    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A51              10yr_24hr_DS_6min_INT CB-050-31   9.184796 35.632   356.37   3.787    0
A52              10yr_24hr_DS_6min_INT DMH-037-89  1.392598 56.602   166.057  1.917    0
A53              10yr_24hr_DS_6min_INT DMH-037-2   5.4754   91.894   404.023  3.212    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A54              10yr_24hr_DS_6min_INT CB-044-15   1.575882 47.389   69.09    14.644   0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A55              10yr_24hr_DS_6min_INT Dum_037-9   3.094246 40.925   294.568  5.16     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A56              10yr_24hr_DS_6min_INT J23148      3.322986 49.166   178.476  3.837    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A57              10yr_24hr_DS_6min_INT J23338      3.111877 39.089   208.067  4.451    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A58              10yr_24hr_DS_6min_INT CB-044-74   2.342303 35.727   382.352  8.606    0
A59              10yr_24hr_DS_6min_INT DMH-044-21  1.399596 66.697   163.804  4.025    0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A6               10yr_24hr_DS_6min_INT DMH-026-4   5.808772 76.959   131.581  5.999    0
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;Updated by EO on 3.28.22: changed width/flow length
A60              10yr_24hr_DS_6min_INT 9           27.685575 69.686  517.916  4.406    0
;Updated by EO on 3.28.22: changed outlet
A7               10yr_24hr_DS_6min_INT J12125      5.624072 1.148    306.483  14.275   0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A8               10yr_24hr_DS_6min_INT DMH-026-4   3.353072 46.841   130.644  6.176    0
;Updated by EO on 4.4.22: changed outlet and width/flow length for added RIDOT infrastructure
A9               10yr_24hr_DS_6min_INT DMH-026-4   3.122486 81.883   165.885  3.795    0
Beacon           10yr_24hr_DS_6min_INT DMH-016-21  4.188447 68       482      5.29     0
;Updated by EO on 3.28.22: changed width/flow length
Beacon_Middletown 10yr_24hr_DS_6min_INT DMH-016-21 5.223106 44       115.272  5.29     0
Bedlow           10yr_24hr_DS_6min_INT DMH-033-35  17.136437 67      975      5.47     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Burdick          10yr_24hr_DS_6min_INT J18673      4.800026 57       516      13.12    0
Cumming          10yr_24hr_DS_6min_INT DMH-033-37  3.560011 56       444      4.69     0
Dexter           10yr_24hr_DS_6min_INT DMH-027-7   11.879784 47      812      7.93     0
;Updated by EO on 3.28.22: changed outlet
Dexter_Middletown_Lower 10yr_24hr_DS_6min_INT J6738 13.052338 61     851      7.93     0
;Updated by EO on 3.28.22: changed width/flow length
Dexter_Middletown_Upper 10yr_24hr_DS_6min_INT DMH-027-7 18.317223 52 282.603  5.59     0
;Updated by EO on 3.28.22: changed outlet
Dexter_Stormwall 10yr_24hr_DS_6min_INT J1544       2.871491 1        399      10.19    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Dudley           10yr_24hr_DS_6min_INT J13761      8.025331 26       667      7.02     0
;Updated by EO on 3.28.22: changed outlet
Dudley_Middletown 10yr_24hr_DS_6min_INT J6063      1.561469 29       294      7.02     0
;Updated by EO on 3.28.22: changed outlet
Dudley_Stormwall 10yr_24hr_DS_6min_INT J1313       5.455658 2        550      8.97     0
Eisenhower       10yr_24hr_DS_6min_INT DMH-021-45  12.844843 60      844      5.59     0
;Updated by EO on 3.28.22: changed outlet
Eisenhower_Middletown 10yr_24hr_DS_6min_INT J11148 0.828575 44       214      5.29     0
;Updated by EO on 3.28.22: changed outlet
Eisenhower_Stormwall 10yr_24hr_DS_6min_INT J1502   4.882416 2        520      7.72     0
Hillside_L       10yr_24hr_DS_6min_INT DMH-033-45  2.822726 40       396      5.56     0
Hillside_R       10yr_24hr_DS_6min_INT DMH-033-45  3.652676 69       450      6.11     0
;Updated by EO on 4.4.22: changed outlet due to added RIDOT infrastructure; Updated by EO on 4.4.22: changed outlet and width/flo
Kalbfus          10yr_24hr_DS_6min_INT DMH-027-15  11.797277 52      558.478  6.82     0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
Kalbfus_Middletown 10yr_24hr_DS_6min_INT CB-028-101 14.735068 67     783.271  6.82     0
;Updated by EO on 3.28.22: changed outlet; Updated by EO on 4.4.22: changed outlet due to added RIDOT infrastructure
Kalbfus_Stormwall 10yr_24hr_DS_6min_INT CB-027-2   0.403628 9        150      12.38    0
Kennedy          10yr_24hr_DS_6min_INT Kennedy_MH  7.682963 60       653      7.03     0
;Updated by EO on 3.28.22: changed outlet
Kennedy_Middletown 10yr_24hr_DS_6min_INT J6538     1.000335 34       236      7.03     0
;Updated by EO on 3.28.22: changed outlet
Kennedy_Stormwall 10yr_24hr_DS_6min_INT J1430      2.846935 26       397      12.33    0
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Madeline         10yr_24hr_DS_6min_INT DMH-046-61  4.786957 51       515      8.34     0
Malbone          10yr_24hr_DS_6min_INT DMH-039-42  1.400517 67       279      12.31    0
Pennacook_L      10yr_24hr_DS_6min_INT DMH-033-38  4.690246 76       510      6.37     0
Pennacook_R      10yr_24hr_DS_6min_INT DMH-033-38  13.694345 57      872      5.68     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Russell          10yr_24hr_DS_6min_INT J19138      6.035549 55       579      6.89     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Smith            10yr_24hr_DS_6min_INT J18072      5.120813 54       533      16.24    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Thurston         10yr_24hr_DS_6min_INT J18643      2.92801  58       403      3.64     0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A0               0.018      0.2        0.05       0.1        25         OUTLET
A1               0.018      0.2        0.05       0.1        25         OUTLET
A10              0.018      0.2        0.05       0.1        25         OUTLET
A11              0.018      0.2        0.05       0.1        25         OUTLET
A12              0.018      0.2        0.05       0.1        25         OUTLET
A13              0.018      0.2        0.05       0.1        25         OUTLET
A14              0.018      0.2        0.05       0.1        25         OUTLET
A15              0.018      0.2        0.05       0.1        25         OUTLET
A16              0.018      0.2        0.05       0.1        25         OUTLET
A17              0.018      0.2        0.05       0.1        25         OUTLET
A18              0.018      0.2        0.05       0.1        25         OUTLET
A19              0.018      0.2        0.05       0.1        25         OUTLET
A2               0.018      0.2        0.05       0.1        25         OUTLET
A20              0.018      0.2        0.05       0.1        25         OUTLET
A21              0.018      0.2        0.05       0.1        25         OUTLET
A22              0.018      0.2        0.05       0.1        25         OUTLET
A23              0.018      0.2        0.05       0.1        25         OUTLET
A24              0.018      0.2        0.05       0.1        25         OUTLET
A25              0.018      0.2        0.05       0.1        25         OUTLET
A26              0.018      0.2        0.05       0.1        25         OUTLET
A27              0.018      0.2        0.05       0.1        25         OUTLET
A28              0.018      0.2        0.05       0.1        25         OUTLET
A29              0.018      0.2        0.05       0.1        25         OUTLET
A3               0.018      0.2        0.05       0.1        25         OUTLET
A30              0.018      0.2        0.05       0.1        25         OUTLET
A31              0.018      0.2        0.05       0.1        25         OUTLET
A32              0.018      0.2        0.05       0.1        25         OUTLET
A33              0.018      0.2        0.05       0.1        25         OUTLET
A34              0.018      0.2        0.05       0.1        25         OUTLET
A35              0.018      0.2        0.05       0.1        25         OUTLET
A36              0.018      0.2        0.05       0.1        25         OUTLET
A37              0.018      0.2        0.05       0.1        25         OUTLET
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A38	0.018	0.2	0.05	0.1	25	OUTLET
A39	0.018	0.2	0.05	0.1	25	OUTLET
A4	0.018	0.2	0.05	0.1	25	OUTLET
A40	0.018	0.2	0.05	0.1	25	OUTLET
A41	0.018	0.2	0.05	0.1	25	OUTLET
A42	0.018	0.2	0.05	0.1	25	OUTLET
A43	0.018	0.2	0.05	0.1	25	OUTLET
A44	0.018	0.2	0.05	0.1	25	OUTLET
A45	0.018	0.2	0.05	0.1	25	OUTLET
A46	0.018	0.2	0.05	0.1	25	OUTLET
A47	0.018	0.2	0.05	0.1	25	OUTLET
A48	0.018	0.2	0.05	0.1	25	OUTLET
A49	0.018	0.2	0.05	0.1	25	OUTLET
A5	0.018	0.2	0.05	0.1	25	OUTLET
A50	0.018	0.2	0.05	0.1	25	OUTLET
A51	0.018	0.2	0.05	0.1	25	OUTLET
A52	0.018	0.2	0.05	0.1	25	OUTLET
A53	0.018	0.2	0.05	0.1	25	OUTLET
A54	0.018	0.2	0.05	0.1	25	OUTLET
A55	0.018	0.2	0.05	0.1	25	OUTLET
A56	0.018	0.2	0.05	0.1	25	OUTLET
A57	0.018	0.2	0.05	0.1	25	OUTLET
A58	0.018	0.2	0.05	0.1	25	OUTLET
A59	0.018	0.2	0.05	0.1	25	OUTLET
A6	0.018	0.2	0.05	0.1	25	OUTLET
A60	0.018	0.2	0.05	0.1	25	OUTLET
A7	0.018	0.2	0.05	0.1	25	OUTLET
A8	0.018	0.2	0.05	0.1	25	OUTLET
A9	0.018	0.2	0.05	0.1	25	OUTLET
Beacon	0.018	0.2	0.05	0.1	25	OUTLET
Beacon_Middletown	0.018	0.2	0.05	0.1	25	OUTLET
Bedlow	0.018	0.2	0.05	0.1	25	OUTLET
Burdick	0.018	0.2	0.05	0.1	25	OUTLET
Cumming	0.018	0.2	0.05	0.1	25	OUTLET
Dexter	0.018	0.2	0.05	0.1	25	OUTLET
Dexter_Middletown_Lower	0.018	0.2	0.05	0.1	25	OUTLET
Dexter_Middletown_Upper	0.018	0.2	0.05	0.1	25	OUTLET
Dexter_Stormwall	0.018	0.35	0.05	0.5	25	OUTLET
Dudley	0.018	0.2	0.05	0.1	25	OUTLET
Dudley_Middletown	0.018	0.2	0.05	0.1	25	OUTLET
Dudley_Stormwall	0.018	0.35	0.05	0.5	25	OUTLET
Eisenhower	0.018	0.2	0.05	0.1	25	OUTLET
Eisenhower_Middletown	0.018	0.2	0.05	0.1	25	OUTLET
Eisenhower_Stormwall	0.018	0.35	0.05	0.5	25	OUTLET
Hillside_L	0.018	0.2	0.05	0.1	25	OUTLET
Hillside_R	0.018	0.2	0.05	0.1	25	OUTLET

```
Kalbfus          0.018      0.2        0.05       0.1        25         OUTLET
Kalbfus_Middletown 0.018    0.2        0.05       0.1        25         OUTLET
Kalbfus_Stormwall 0.018     0.2        0.05       0.1        25         OUTLET
Kennedy          0.018      0.2        0.05       0.1        25         OUTLET
Kennedy_Middletown 0.018    0.2        0.05       0.1        25         OUTLET
Kennedy_Stormwall 0.018     0.35       0.05       0.5        25         OUTLET
Madeline         0.018      0.2        0.05       0.1        25         OUTLET
Malbone          0.018      0.2        0.05       0.1        25         OUTLET
Pennacook_L      0.018      0.2        0.05       0.1        25         OUTLET
Pennacook_R      0.018      0.2        0.05       0.1        25         OUTLET
Russell          0.018      0.2        0.05       0.1        25         OUTLET
Smith            0.018      0.2        0.05       0.1        25         OUTLET
Thurston         0.018      0.2        0.05       0.1        25         OUTLET

[INFILTRATION]
;;Subcatchment   Param1     Param2     Param3     Param4     Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
A0               6.69       0.26       0.15       7          0
A1               6.61       0.27       0.15       7          0
A10              4.47       0.42       0.15       7          0
A11              4.37       0.43       0.15       7          0
A12              6.24       0.61       0.15       7          0
A13              7.71       0.07       0.15       7          0
A14              6.12       0.3        0.15       7          0
A15              6.33       0.29       0.15       7          0
A16              5.46       0.35       0.15       7          0
A17              5.75       0.28       0.15       7          0
A18              6.69       0.26       0.15       7          0
A19              6.69       0.26       0.15       7          0
A2               4.33       0.43       0.15       7          0
A20              6.08       0.24       0.15       7          0
A21              6.92       0.17       0.15       7          0
A22              7.45       0.11       0.15       7          0
A23              5.33       0.35       0.15       7          0
A24              6.69       0.26       0.15       7          0
A25              5.98       0.31       0.15       7          0
A26              6.61       0.27       0.15       7          0
A27              4.45       0.42       0.15       7          0
A28              4.33       0.43       0.15       7          0
A29              6.15       0.3        0.15       7          0
A3               5.6        0.34       0.15       7          0
A30              5.38       0.32       0.15       7          0
A31              7.05       0.2        0.15       7          0
A32              6.69       0.26       0.15       7          0
A33              6.69       0.26       0.15       7          0
A34              6.69       0.26       0.15       7          0
```

A35	6.69	0.26	0.15	7	0
A36	6.69	0.26	0.15	7	0
A37	6.69	0.26	0.15	7	0
A38	6.69	0.26	0.15	7	0
A39	6.69	0.26	0.15	7	0
A4	6.53	0.25	0.15	7	0
A40	6.69	0.26	0.15	7	0
A41	6.69	0.26	0.15	7	0
A42	6.69	0.26	0.15	7	0
A43	6.69	0.26	0.15	7	0
A44	6.69	0.26	0.15	7	0
A45	6.69	0.26	0.15	7	0
A46	6.69	0.26	0.15	7	0
A47	6.69	0.26	0.15	7	0
A48	6.69	0.26	0.15	7	0
A49	6.33	0.29	0.15	7	0
A5	6.69	0.26	0.15	7	0
A50	6.13	0.3	0.15	7	0
A51	6.67	0.26	0.15	7	0
A52	6.56	0.27	0.15	7	0
A53	7.5	0.09	0.15	7	0
A54	4.33	0.43	0.15	7	0
A55	4.33	0.43	0.15	7	0
A56	6.69	0.26	0.15	7	0
A57	6.69	0.26	0.15	7	0
A58	4.33	0.43	0.15	7	0
A59	6.69	0.26	0.15	7	0
A6	6.69	0.26	0.15	7	0
A60	6.63	0.21	0.15	7	0
A7	6.42	0.28	0.15	7	0
A8	6.12	0.3	0.15	7	0
A9	6.34	0.29	0.15	7	0
Beacon	8.27	0.1	0.15	7	0
Beacon_Middletown	8.27	0.15	0.15	7	0
Bedlow	8.27	0.1	0.15	7	0
Burdick	8.27	0.1	0.15	7	0
Cumming	7.92	0.11	0.17	7	0
Dexter	8.27	1.89	0.15	7	0
Dexter_Middletown_Lower	8.27	0.18	0.15	7	0
Dexter_Middletown_Upper	8.27	0.64	0.15	7	0
Dexter_Stormwall	6.26	0.86	0.22	7	0
Dudley	8.27	1.3	0.15	7	0
Dudley_Middletown	8.27	0.1	0.15	7	0
Dudley_Stormwall	6.79	0.51	0.21	7	0
Eisenhower	8.27	0.1	0.15	7	0
Eisenhower_Middletown	8.27	0.1	0.15	7	0

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Eisenhower_Stormwall 6.28   0.79       0.22       7          0
Hillside_L       7.58       0.15       0.18       7          0
Hillside_R       8.27       0.1        0.15       7          0
Kalbfus          8.2        0.11       0.16       7          0
Kalbfus_Middletown 8.27     0.1        0.15       7          0
Kalbfus_Stormwall 6.71      0.33       0.22       7          0
Kennedy          8.27       0.1        0.15       7          0
Kennedy_Middletown 8.27     0.1        0.15       7          0
Kennedy_Stormwall 6.86      0.52       0.21       7          0
Madeline         8.27       0.1        0.15       7          0
Malbone          7.43       0.1        0.19       7          0
Pennacook_L      6.84       0.16       0.21       7          0
Pennacook_R      8.27       0.1        0.15       7          0
Russell          8.27       0.1        0.15       7          0
Smith            8.06       0.1        0.16       7          0
Thurston         8.27       0.1        0.15       7          0

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
10               1.45       8.1        0          30         0
;Updated by EO on 3.7.22 based on field conditions: Increased initial depth to 2.5ft.
12               1.89       5          2.5        30         0
;Updated by EO on 3.7.22 based on field conditions: Increased initial depth to 3.75ft.
15               2.3        5          3.75       30         0
;Updated by EO on 3.7.22 based on field conditions: Increased initial depth to 3.32ft.
16               2.796      8.314      3.32       30         0
17               5.17       5          0          30         0
;Updated by EO on 3.7.22 based on field conditions: Increased initial depth to 2.6ft.
18               2.897      6.463      2.6        30         0
;Updated by EO on 5.10.22: changed flow direction & invert/rim elevations as per the City's GIS.
23               49.949     9          0          30         0
24               3.026      10.734     0          30         0
27               1.5        8.5        0          30         0
;Updated by EO on 5.9.22: Updated Rim/Invert elevations.
4                6.21       4.526      0          30         0
......
Too many junction entities (24823 in total).

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;Updated by EO on 4.7.22: Changed the invert elevation from 0 to 1 ft to account for the elevation shown in the DEM.
8                1          TIMESERIES July_14_2020_ADJ_TIDES NO
;Added by EO on 4.25.22 to fix glass wall effect.
Dum_GW_Outfall   1          FREE                        NO
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[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
;GENERAL DRAINAGE MAP
....             DMH-027-11       DMH-027-14       202.557    0.018      0          0          0          0
;Drain Pipe
;Updated by EO on 3.15.2022: Replaced a portion of the old 42inch to model change in pipe sizes.
48inch_1         DMH-032-32A      DMH-032-32B      76.304     0.018      0          0          0          0
;Drain Pipe
;Updated by EO on 3.15.2022: Replaced a portion of the old 42inch to model change in pipe sizes.
48inch_2         DMH-032-32B      DMH-032-32       215.781    0.018      0          0          0          0
;surveyed pipe. Updated on 4.28.2022 by EO: changed length from default of 400' to actual length of 318'.
C1               DMH-044-69       J5               318        0.018      0          0          0          0
C10              J24692           J24683           13.281     0.012      0          0          0          0
C100             J24682           J24681           10.561     0.012      0          0          0          0
C1000            J24483           J24511           12.033     0.012      0          0          0          0
C10000           J22140           J22191           11.768     0.012      0          0          0          0
C10001           J22191           J22141           11.768     0.012      0          0          0          0
C10002           J22192           J22142           11.768     0.012      0          0          0          0
......
Too many conduit entities (69738 in total).

[ORIFICES]
;;Name           From Node        To Node          Type         Offset     Qcoeff     Gated    CloseTime
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- ----------
Entrance         PipeEntrance     DMH-032-32A      SIDE         0          0.65       NO       0
OR1              J5445            10               BOTTOM       0          0.65       NO       0
OR10             J21390           4                BOTTOM       0          0.65       NO       0
OR100            J13544           CB-026-91        BOTTOM       0          0.65       NO       0
OR101            J13466           CB-026-87        BOTTOM       0          0.65       NO       0
OR102            J4293            CB-026-86        BOTTOM       0          0.65       NO       0
OR103            J13670           CB-026-74        BOTTOM       0          0.65       NO       0
OR104            J5217            CB-026-75        BOTTOM       0          0.65       NO       0
OR105            J5196            CB-026-70        BOTTOM       0          0.65       NO       0
OR106            J5117            DMH-026-4        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR107            J13053           Dum_026-5        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR108            J599             CB-026-76        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR109            J5174            Dum_025-1        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR11             J615             6                BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR110            J4446            CB-025-68        BOTTOM       0          0.65       NO       0
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OR111            J14281           DMH-025-61       BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR112            J13794           Dum_025-2_2      BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR113            J14230           Dum_025-2_1      BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR114            J14294           Dum_025-3        BOTTOM       0          0.65       NO        0
OR115            J24022           CB-050-34        BOTTOM       0          0.65       NO        0
OR116            J23896           CB-050-31        BOTTOM       0          0.65       NO        0
OR117            J23178           CB-044-15        BOTTOM       0          0.65       NO        0
OR118            J22759           CB-044-10        BOTTOM       0          0.65       NO        0
OR119            J21699           CB-044-74        BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR12             J5436            9                BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width/outlet to accurately convey flow
OR120            J2678            CB-037-1         BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR121            J20651           Dum_037-4        BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR122            J19894           Dum_037-10       BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR123            J19302           CB-037-86        BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR124            J2872            Dum_037-9        BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR125            J2849            DMH-037-80       BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR126            J20028           Dum_031-9        BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR127            J15228           Dum_025-16       BOTTOM       0          0.65       NO        0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR128            J5520            Dum_019-1        BOTTOM       0          0.65       NO        0
;Added by EO on 4.22.22 to help with a glass wall.
OR129            J612             J2               BOTTOM       0          0.65       NO        0
OR13             J19472           CB-037-83        BOTTOM       0          0.65       NO        0
;Added by EO on 4.22.22 to help with a glass wall.
OR130            J616             J2               BOTTOM       0          0.65       NO        0
;Added by EO on 4.25.22: To accurately convey flow
OR131            J2701            CB-037-1         BOTTOM       0          0.65       NO        0
;Added by EO on 4.25.22 to fix glass wall effect.
OR132            J1411            Dum_GW_J1        BOTTOM       0          0.65       NO        0
;Added by EO on 4.25.22 to fix glass wall effect.
OR133            J2582            Dum_GW_J2        BOTTOM       0          0.65       NO        0
;Added by EO on 4.25.22 to fix glass wall effect.
OR134            J2598            Dum_GW_J3        BOTTOM       0          0.65       NO        0
OR14             J4203            CB-037-84        BOTTOM       0          0.65       NO        0
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OR16             J20212           CB-037-88_BB     BOTTOM       0          0.65       NO       0
OR17             J22950           CB-044-14        BOTTOM       0          0.65       NO       0
OR18             J22710           CB-044-5         BOTTOM       0          0.65       NO       0
OR19             J21877           CB-044-75        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR2              J13509           12               BOTTOM       0          0.65       NO       0
OR20             J22858           CB-044-8         BOTTOM       0          0.65       NO       0
OR21             J22557           CB-045-38        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR22             J518             Culvert_Outlet   BOTTOM       0          0.65       NO       0
OR23             J16509           Cummings_MH      BOTTOM       0          0.65       NO       0
OR24             J10605           DMH-016-21       BOTTOM       0          0.65       NO       0
OR25             J11952           DMH-021-45       BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR26             J14515           DMH-025-62       BOTTOM       0          0.65       NO       0
OR27             J13303           DMH-027-11       BOTTOM       0          0.65       NO       0
OR28             J13926           DMH-027-14       BOTTOM       0          0.65       NO       0
OR29             J12310           DMH-027-7        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR3              J14822           15               BOTTOM       0          0.65       NO       0
OR30             J4010            DMH-032-32A      BOTTOM       0          0.65       NO       0
OR31             J17158           DMH-033-35       BOTTOM       0          0.65       NO       0
OR32             J17464           DMH-033-37       BOTTOM       0          0.65       NO       0
OR33             J15262           DMH-033-38       BOTTOM       0          0.65       NO       0
OR34             J16574           DMH-033-45       BOTTOM       0          0.65       NO       0
OR35             J16683           DMH-033-47       BOTTOM       0          0.65       NO       0
OR36             J4034            DMH-037-2        BOTTOM       0          0.65       NO       0
OR37             J20463           DMH-037-89       BOTTOM       0          0.65       NO       0
OR38             J19949           DMH-038-15       BOTTOM       0          0.65       NO       0
OR39             J20728           DMH-038-19       BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR4              J17138           16               BOTTOM       0          0.65       NO       0
OR40             J20222           DMH-038-21_BB    BOTTOM       0          0.65       NO       0
OR41             J20724           DMH-038-24       BOTTOM       0          0.65       NO       0
OR42             J20051           DMH-038-8        BOTTOM       0          0.65       NO       0
OR43             J18325           DMH-039-26       BOTTOM       0          0.65       NO       0
OR44             J20058           DMH-039-34       BOTTOM       0          0.65       NO       0
OR45             J19383           DMH-039-41       BOTTOM       0          0.65       NO       0
OR46             J17888           DMH-039-42       BOTTOM       0          0.65       NO       0
OR47             J18669           DMH-039-43       BOTTOM       0          0.65       NO       0
OR48             J21582           DMH-044-21       BOTTOM       0          0.65       NO       0
OR49             J22607           DMH-044-6        BOTTOM       0          0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR5              J4055            17               BOTTOM       0          0.65       NO       0
OR50             J21324           DMH-044-69       BOTTOM       0          0.65       NO       0
OR51             J21589           DMH-044-71       BOTTOM       0          0.65       NO       0
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OR52             J22006           DMH-045-23       BOTTOM       0           0.65       NO       0
OR53             J23684           DMH-045-24       BOTTOM       0           0.65       NO       0
OR54             J23673           DMH-045-25       BOTTOM       0           0.65       NO       0
OR55             J21076           DMH-045-26       BOTTOM       0           0.65       NO       0
OR56             J21133           DMH-045-30       BOTTOM       0           0.65       NO       0
OR57             J21673           DMH-045-33       BOTTOM       0           0.65       NO       0
OR58             J22159           DMH-045-35       BOTTOM       0           0.65       NO       0
OR59             J22436           DMH-045-37       BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR6              J17363           18               BOTTOM       0           0.65       NO       0
OR60             J23011           DMH-045-40       BOTTOM       0           0.65       NO       0
OR61             J23235           DMH-045-44       BOTTOM       0           0.65       NO       0
OR62             J23156           DMH-045-45       BOTTOM       0           0.65       NO       0
OR63             J23191           DMH-045-48       BOTTOM       0           0.65       NO       0
OR64             J22821           DMH-045-51       BOTTOM       0           0.65       NO       0
OR65             J21664           DMH-045-59       BOTTOM       0           0.65       NO       0
OR66             J21603           DMH-045-60       BOTTOM       0           0.65       NO       0
OR67             J21087           DMH-046-61       BOTTOM       0           0.65       NO       0
OR68             J23670           DMH-051-36       BOTTOM       0           0.65       NO       0
OR69             J24481           DMH-051-37       BOTTOM       0           0.65       NO       0
OR7              J21421           23               BOTTOM       0           0.65       NO       0
OR70             J24343           DMH-051-39       BOTTOM       0           0.65       NO       0
OR71             J24601           DMH-051-41       BOTTOM       0           0.65       NO       0
OR72             J24618           DMH-051-43       BOTTOM       0           0.65       NO       0
OR73             J24337           DMH-051-67       BOTTOM       0           0.65       NO       0
OR74             J20151           J1               BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR75             J5375            J2               BOTTOM       0           0.65       NO       0
OR76             J3815            J3               BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR77             J16773           J4               BOTTOM       0           0.65       NO       0
OR78             J20399           J5               BOTTOM       0           0.65       NO       0
OR79             J11207           Kennedy_MH       BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR8              J16609           24               BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR80             J551             MalboneChannel1  BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping
OR81             J487             MalboneChannel2  BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping. Updated by EO on 4.30.22: changed inlet.
OR82             J483             MalboneChannel3  BOTTOM       0           0.65       NO       0
;Updated by EO on 4.25.22: Changed height/width to account for bank overtopping. Updated by EO on 4.30.22: changed inlet.
OR83             J392             PipeEntrance     BOTTOM       0           0.65       NO       0
OR85             J23224           DMH-045-49       BOTTOM       0           0.65       NO       0
OR86             J3903            DMH-032-32       BOTTOM       0           0.65       NO       0
OR87             J16310           DMH-032-33       BOTTOM       0           0.65       NO       0
```

```
OR88             J268             DMH-032-32B      BOTTOM       0          0.65       NO       0
OR89             J13203           CB-028-101       BOTTOM       0          0.65       NO       0
OR9              J12815           27               BOTTOM       0          0.65       NO       0
OR90             J14798           CB-028-105       BOTTOM       0          0.65       NO       0
OR91             J2338            CB-034-66        BOTTOM       0          0.65       NO       0
OR92             J15860           DMH-034-68       BOTTOM       0          0.65       NO       0
OR93             J16196           DMH-034-70       BOTTOM       0          0.65       NO       0
OR94             J15961           DMH-034-66       BOTTOM       0          0.65       NO       0
OR95             J5948            DMH-034-64       BOTTOM       0          0.65       NO       0
OR96             J14929           DMH-027-22       BOTTOM       0          0.65       NO       0
OR97             J14383           DMH-027-19       BOTTOM       0          0.65       NO       0
OR98             J13871           DMH-027-15       BOTTOM       0          0.65       NO       0
OR99             J13680           CB-027-2         BOTTOM       0          0.65       NO       0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
....             CIRCULAR     3                0          0          0          1
48inch_1         CIRCULAR     4                0          0          0          1
48inch_2         CIRCULAR     4                0          0          0          1
C1               CIRCULAR     2                0          0          0          1
C10              RECT_OPEN    30               13.281     2          0          1
C100             RECT_OPEN    30               11.735     1          0          1
C1000            RECT_OPEN    30               10.939     2          0          1
C10000           RECT_OPEN    30               9.806      2          0          1
C10001           RECT_OPEN    30               9.806      2          0          1
C10002           RECT_OPEN    30               9.806      2          0          1
......
Too many conduit entities (69738 in total).
Entrance         CIRCULAR     3.5              0          0          0
OR1              RECT_CLOSED  2                9          0          0
OR10             RECT_CLOSED  2                9          0          0
OR100            RECT_CLOSED  2                6          0          0
OR101            RECT_CLOSED  2                6          0          0
OR102            RECT_CLOSED  2                6          0          0
OR103            RECT_CLOSED  2                6          0          0
OR104            RECT_CLOSED  2                3          0          0
OR105            RECT_CLOSED  2                3          0          0
OR106            RECT_CLOSED  2                12         0          0
OR107            RECT_CLOSED  30               200.739    0          0
OR108            RECT_CLOSED  30               493.488    0          0
OR109            RECT_CLOSED  30               525.163    0          0
OR11             RECT_CLOSED  30               361.79     0          0
OR110            RECT_CLOSED  30               232.414    0          0
OR111            RECT_CLOSED  2                3          0          0
OR112            RECT_CLOSED  30               467.164    0          0
```

OR113	RECT_CLOSED	30	573.567	0	0
OR114	RECT_CLOSED	30	106.403	0	0
OR115	RECT_CLOSED	2	9	0	0
OR116	RECT_CLOSED	2	9	0	0
OR117	RECT_CLOSED	2	6	0	0
OR118	RECT_CLOSED	2	6	0	0
OR119	RECT_CLOSED	2	6	0	0
OR12	RECT_CLOSED	30	361.79	0	0
OR120	RECT_CLOSED	30	373.92	0	0
OR121	RECT_CLOSED	30	236.702	0	0
OR122	RECT_CLOSED	30	466.794	0	0
OR123	RECT_CLOSED	30	230.092	0	0
OR124	RECT_CLOSED	30	335.438	0	0
OR125	RECT_CLOSED	30	335.438	0	0
OR126	RECT_CLOSED	30	1594.447	0	0
OR127	RECT_CLOSED	30	1594.447	0	0
OR128	RECT_CLOSED	30	1004.902	0	0
OR129	RECT_CLOSED	2	12	0	0
OR13	RECT_CLOSED	2	9	0	0
OR130	RECT_CLOSED	2	1	0	0
OR131	RECT_CLOSED	30	246.02	0	0
OR132	RECT_CLOSED	2	6	0	0
OR133	RECT_CLOSED	2	6	0	0
OR134	RECT_CLOSED	2	6	0	0
OR14	RECT_CLOSED	2	6	0	0
OR16	RECT_CLOSED	2	3	0	0
OR17	RECT_CLOSED	2	9	0	0
OR18	RECT_CLOSED	2	9	0	0
OR19	RECT_CLOSED	2	9	0	0
OR2	RECT_CLOSED	30	222.86	0	0
OR20	RECT_CLOSED	2	9	0	0
OR21	RECT_CLOSED	2	9	0	0
OR22	RECT_CLOSED	30	317.94	0	0
OR23	RECT_CLOSED	2	6	0	0
OR24	RECT_CLOSED	2	9	0	0
OR25	RECT_CLOSED	2	9	0	0
OR26	RECT_CLOSED	30	222.86	0	0
OR27	RECT_CLOSED	2	6	0	0
OR28	RECT_CLOSED	2	9	0	0
OR29	RECT_CLOSED	2	9	0	0
OR3	RECT_CLOSED	30	717.93	0	0
OR30	RECT_CLOSED	2	6	0	0
OR31	RECT_CLOSED	2	6	0	0
OR32	RECT_CLOSED	2	9	0	0
OR33	RECT_CLOSED	2	6	0	0
OR34	RECT_CLOSED	2	9	0	0

OR35	RECT_CLOSED	2	3	0	0
OR36	RECT_CLOSED	2	9	0	0
OR37	RECT_CLOSED	2	6	0	0
OR38	RECT_CLOSED	2	6	0	0
OR39	RECT_CLOSED	2	9	0	0
OR4	RECT_CLOSED	30	717.93	0	0
OR40	RECT_CLOSED	2	9	0	0
OR41	RECT_CLOSED	2	9	0	0
OR42	RECT_CLOSED	2	6	0	0
OR43	RECT_CLOSED	2	6	0	0
OR44	RECT_CLOSED	2	9	0	0
OR45	RECT_CLOSED	2	9	0	0
OR46	RECT_CLOSED	2	9	0	0
OR47	RECT_CLOSED	2	9	0	0
OR48	RECT_CLOSED	2	6	0	0
OR49	RECT_CLOSED	2	6	0	0
OR5	RECT_CLOSED	30	222.9	0	0
OR50	RECT_CLOSED	2	9	0	0
OR51	RECT_CLOSED	2	6	0	0
OR52	RECT_CLOSED	2	6	0	0
OR53	RECT_CLOSED	2	6	0	0
OR54	RECT_CLOSED	2	6	0	0
OR55	RECT_CLOSED	2	6	0	0
OR56	RECT_CLOSED	2	6	0	0
OR57	RECT_CLOSED	2	9	0	0
OR58	RECT_CLOSED	2	6	0	0
OR59	RECT_CLOSED	2	6	0	0
OR6	RECT_CLOSED	30	173.832	0	0
OR60	RECT_CLOSED	2	6	0	0
OR61	RECT_CLOSED	2	6	0	0
OR62	RECT_CLOSED	2	6	0	0
OR63	RECT_CLOSED	2	6	0	0
OR64	RECT_CLOSED	2	9	0	0
OR65	RECT_CLOSED	2	6	0	0
OR66	RECT_CLOSED	2	6	0	0
OR67	RECT_CLOSED	2	9	0	0
OR68	RECT_CLOSED	2	6	0	0
OR69	RECT_CLOSED	2	9	0	0
OR7	RECT_CLOSED	2	9	0	0
OR70	RECT_CLOSED	2	6	0	0
OR71	RECT_CLOSED	2	6	0	0
OR72	RECT_CLOSED	2	9	0	0
OR73	RECT_CLOSED	2	9	0	0
OR74	RECT_CLOSED	2	9	0	0
OR75	RECT_CLOSED	30	417.86	0	0
OR76	RECT_CLOSED	2	9	0	0

```
OR77             RECT_CLOSED  30               303.57     0          0
OR78             RECT_CLOSED  2                9          0          0
OR79             RECT_CLOSED  2                9          0          0
OR8              RECT_CLOSED  30               129.738    0          0
OR80             RECT_CLOSED  30               561.44     0          0
OR81             RECT_CLOSED  30               506.58     0          0
OR82             RECT_CLOSED  30               458.11     0          0
OR83             RECT_CLOSED  30               195.03     0          0
OR85             RECT_CLOSED  2                6          0          0
OR86             RECT_CLOSED  2                9          0          0
OR87             RECT_CLOSED  2                9          0          0
OR88             RECT_CLOSED  2                6          0          0
OR89             RECT_CLOSED  2                6          0          0
OR9              RECT_CLOSED  2                9          0          0
OR90             RECT_CLOSED  2                6          0          0
OR91             RECT_CLOSED  2                3          0          0
OR92             RECT_CLOSED  2                6          0          0
OR93             RECT_CLOSED  2                3          0          0
OR94             RECT_CLOSED  2                9          0          0
OR95             RECT_CLOSED  2                9          0          0
OR96             RECT_CLOSED  2                9          0          0
OR97             RECT_CLOSED  2                9          0          0
OR98             RECT_CLOSED  2                9          0          0
OR99             RECT_CLOSED  2                6          0          0

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
48inch_1         0          1          0          NO         0
48inch_2         0          1          0          NO         0
C2               0          0.5        0          NO         0
C3               0          1          0          NO         0
C8               0          1          0          NO         0
C9               0          1          0          NO         0
Culvert1         0          1          0          NO         0
Culvert2         0          1          0          NO         0
DP-025-10        0          1          0          NO         0
DP-025-12        0          1          0          NO         0
......
Too many conduit entities (69738 in total).

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
July_14_2020_ADJ_TIDES 7/14/2020  0:00       1.14
July_14_2020_ADJ_TIDES 7/14/2020  0:06       1.1
```

July_14_2020_ADJ_TIDES	7/14/2020	0:12	1.06
July_14_2020_ADJ_TIDES	7/14/2020	0:18	1.04
July_14_2020_ADJ_TIDES	7/14/2020	0:24	0.97
July_14_2020_ADJ_TIDES	7/14/2020	0:30	0.89
July_14_2020_ADJ_TIDES	7/14/2020	0:36	0.82
July_14_2020_ADJ_TIDES	7/14/2020	0:42	0.76
July_14_2020_ADJ_TIDES	7/14/2020	0:48	0.7
July_14_2020_ADJ_TIDES	7/14/2020	0:54	0.64
July_14_2020_ADJ_TIDES	7/14/2020	1:00	0.59
July_14_2020_ADJ_TIDES	7/14/2020	1:06	0.51
July_14_2020_ADJ_TIDES	7/14/2020	1:12	0.44
July_14_2020_ADJ_TIDES	7/14/2020	1:18	0.37
July_14_2020_ADJ_TIDES	7/14/2020	1:24	0.28
July_14_2020_ADJ_TIDES	7/14/2020	1:30	0.21
July_14_2020_ADJ_TIDES	7/14/2020	1:36	0.11
July_14_2020_ADJ_TIDES	7/14/2020	1:42	0.03
July_14_2020_ADJ_TIDES	7/14/2020	1:48	-0.02
July_14_2020_ADJ_TIDES	7/14/2020	1:54	-0.08
July_14_2020_ADJ_TIDES	7/14/2020	2:00	-0.15
July_14_2020_ADJ_TIDES	7/14/2020	2:06	-0.24
July_14_2020_ADJ_TIDES	7/14/2020	2:12	-0.3
July_14_2020_ADJ_TIDES	7/14/2020	2:18	-0.35
July_14_2020_ADJ_TIDES	7/14/2020	2:24	-0.41
July_14_2020_ADJ_TIDES	7/14/2020	2:30	-0.49
July_14_2020_ADJ_TIDES	7/14/2020	2:36	-0.5
July_14_2020_ADJ_TIDES	7/14/2020	2:42	-0.56
July_14_2020_ADJ_TIDES	7/14/2020	2:48	-0.58
July_14_2020_ADJ_TIDES	7/14/2020	2:54	-0.63
July_14_2020_ADJ_TIDES	7/14/2020	3:00	-0.71
July_14_2020_ADJ_TIDES	7/14/2020	3:06	-0.7
July_14_2020_ADJ_TIDES	7/14/2020	3:12	-0.76
July_14_2020_ADJ_TIDES	7/14/2020	3:18	-0.76
July_14_2020_ADJ_TIDES	7/14/2020	3:24	-0.78
July_14_2020_ADJ_TIDES	7/14/2020	3:30	-0.8
July_14_2020_ADJ_TIDES	7/14/2020	3:36	-0.81
July_14_2020_ADJ_TIDES	7/14/2020	3:42	-0.85
July_14_2020_ADJ_TIDES	7/14/2020	3:48	-0.82
July_14_2020_ADJ_TIDES	7/14/2020	3:54	-0.84
July_14_2020_ADJ_TIDES	7/14/2020	4:00	-0.85
July_14_2020_ADJ_TIDES	7/14/2020	4:06	-0.87
July_14_2020_ADJ_TIDES	7/14/2020	4:12	-0.88
July_14_2020_ADJ_TIDES	7/14/2020	4:18	-0.86
July_14_2020_ADJ_TIDES	7/14/2020	4:24	-0.85
July_14_2020_ADJ_TIDES	7/14/2020	4:30	-0.8
July_14_2020_ADJ_TIDES	7/14/2020	4:36	-0.8
July_14_2020_ADJ_TIDES	7/14/2020	4:42	-0.78

July_14_2020_ADJ_TIDES	7/14/2020	4:48	-0.74
July_14_2020_ADJ_TIDES	7/14/2020	4:54	-0.77
July_14_2020_ADJ_TIDES	7/14/2020	5:00	-0.75
July_14_2020_ADJ_TIDES	7/14/2020	5:06	-0.69
July_14_2020_ADJ_TIDES	7/14/2020	5:12	-0.68
July_14_2020_ADJ_TIDES	7/14/2020	5:18	-0.65
July_14_2020_ADJ_TIDES	7/14/2020	5:24	-0.62
July_14_2020_ADJ_TIDES	7/14/2020	5:30	-0.58
July_14_2020_ADJ_TIDES	7/14/2020	5:36	-0.56
July_14_2020_ADJ_TIDES	7/14/2020	5:42	-0.57
July_14_2020_ADJ_TIDES	7/14/2020	5:48	-0.53
July_14_2020_ADJ_TIDES	7/14/2020	5:54	-0.52
July_14_2020_ADJ_TIDES	7/14/2020	6:00	-0.49
July_14_2020_ADJ_TIDES	7/14/2020	6:06	-0.46
July_14_2020_ADJ_TIDES	7/14/2020	6:12	-0.4
July_14_2020_ADJ_TIDES	7/14/2020	6:18	-0.35
July_14_2020_ADJ_TIDES	7/14/2020	6:24	-0.32
July_14_2020_ADJ_TIDES	7/14/2020	6:30	-0.27
July_14_2020_ADJ_TIDES	7/14/2020	6:36	-0.28
July_14_2020_ADJ_TIDES	7/14/2020	6:42	-0.24
July_14_2020_ADJ_TIDES	7/14/2020	6:48	-0.21
July_14_2020_ADJ_TIDES	7/14/2020	6:54	-0.16
July_14_2020_ADJ_TIDES	7/14/2020	7:00	-0.13
July_14_2020_ADJ_TIDES	7/14/2020	7:06	-0.1
July_14_2020_ADJ_TIDES	7/14/2020	7:12	-0.09
July_14_2020_ADJ_TIDES	7/14/2020	7:18	-0.06
July_14_2020_ADJ_TIDES	7/14/2020	7:24	0.01
July_14_2020_ADJ_TIDES	7/14/2020	7:30	0.08
July_14_2020_ADJ_TIDES	7/14/2020	7:36	0.09
July_14_2020_ADJ_TIDES	7/14/2020	7:42	0.11
July_14_2020_ADJ_TIDES	7/14/2020	7:48	0.18
July_14_2020_ADJ_TIDES	7/14/2020	7:54	0.22
July_14_2020_ADJ_TIDES	7/14/2020	8:00	0.25
July_14_2020_ADJ_TIDES	7/14/2020	8:06	0.29
July_14_2020_ADJ_TIDES	7/14/2020	8:12	0.35
July_14_2020_ADJ_TIDES	7/14/2020	8:18	0.44
July_14_2020_ADJ_TIDES	7/14/2020	8:24	0.49
July_14_2020_ADJ_TIDES	7/14/2020	8:30	0.53
July_14_2020_ADJ_TIDES	7/14/2020	8:36	0.57
July_14_2020_ADJ_TIDES	7/14/2020	8:42	0.61
July_14_2020_ADJ_TIDES	7/14/2020	8:48	0.66
July_14_2020_ADJ_TIDES	7/14/2020	8:54	0.73
July_14_2020_ADJ_TIDES	7/14/2020	9:00	0.79
July_14_2020_ADJ_TIDES	7/14/2020	9:06	0.86
July_14_2020_ADJ_TIDES	7/14/2020	9:12	0.96
July_14_2020_ADJ_TIDES	7/14/2020	9:18	1.03

July_14_2020_ADJ_TIDES	7/14/2020	9:24	1.09
July_14_2020_ADJ_TIDES	7/14/2020	9:30	1.17
July_14_2020_ADJ_TIDES	7/14/2020	9:36	1.22
July_14_2020_ADJ_TIDES	7/14/2020	9:42	1.26
July_14_2020_ADJ_TIDES	7/14/2020	9:48	1.32
July_14_2020_ADJ_TIDES	7/14/2020	9:54	1.36
July_14_2020_ADJ_TIDES	7/14/2020	10:00	1.42
July_14_2020_ADJ_TIDES	7/14/2020	10:06	1.47
July_14_2020_ADJ_TIDES	7/14/2020	10:12	1.44
July_14_2020_ADJ_TIDES	7/14/2020	10:18	1.51
July_14_2020_ADJ_TIDES	7/14/2020	10:24	1.6
July_14_2020_ADJ_TIDES	7/14/2020	10:30	1.65
July_14_2020_ADJ_TIDES	7/14/2020	10:36	1.83
July_14_2020_ADJ_TIDES	7/14/2020	10:42	1.71
July_14_2020_ADJ_TIDES	7/14/2020	10:48	1.71
July_14_2020_ADJ_TIDES	7/14/2020	10:54	1.65
July_14_2020_ADJ_TIDES	7/14/2020	11:00	1.53
July_14_2020_ADJ_TIDES	7/14/2020	11:06	1.64
July_14_2020_ADJ_TIDES	7/14/2020	11:12	1.67
July_14_2020_ADJ_TIDES	7/14/2020	11:18	1.72
July_14_2020_ADJ_TIDES	7/14/2020	11:24	1.82
July_14_2020_ADJ_TIDES	7/14/2020	11:30	1.81
July_14_2020_ADJ_TIDES	7/14/2020	11:36	1.81
July_14_2020_ADJ_TIDES	7/14/2020	11:42	1.81
July_14_2020_ADJ_TIDES	7/14/2020	11:48	1.85
July_14_2020_ADJ_TIDES	7/14/2020	11:54	1.72
July_14_2020_ADJ_TIDES	7/14/2020	12:00	1.7
July_14_2020_ADJ_TIDES	7/14/2020	12:06	1.65
July_14_2020_ADJ_TIDES	7/14/2020	12:12	1.61
July_14_2020_ADJ_TIDES	7/14/2020	12:18	1.59
July_14_2020_ADJ_TIDES	7/14/2020	12:24	1.5
July_14_2020_ADJ_TIDES	7/14/2020	12:30	1.46
July_14_2020_ADJ_TIDES	7/14/2020	12:36	1.43
July_14_2020_ADJ_TIDES	7/14/2020	12:42	1.47
July_14_2020_ADJ_TIDES	7/14/2020	12:48	1.42
July_14_2020_ADJ_TIDES	7/14/2020	12:54	1.36
July_14_2020_ADJ_TIDES	7/14/2020	13:00	1.33
July_14_2020_ADJ_TIDES	7/14/2020	13:06	1.19
July_14_2020_ADJ_TIDES	7/14/2020	13:12	1.16
July_14_2020_ADJ_TIDES	7/14/2020	13:18	1.11
July_14_2020_ADJ_TIDES	7/14/2020	13:24	1.07
July_14_2020_ADJ_TIDES	7/14/2020	13:30	1.03
July_14_2020_ADJ_TIDES	7/14/2020	13:36	0.96
July_14_2020_ADJ_TIDES	7/14/2020	13:42	0.95
July_14_2020_ADJ_TIDES	7/14/2020	13:48	0.89
July_14_2020_ADJ_TIDES	7/14/2020	13:54	0.81

July_14_2020_ADJ_TIDES	7/14/2020	14:00	0.66
July_14_2020_ADJ_TIDES	7/14/2020	14:06	0.57
July_14_2020_ADJ_TIDES	7/14/2020	14:12	0.51
July_14_2020_ADJ_TIDES	7/14/2020	14:18	0.48
July_14_2020_ADJ_TIDES	7/14/2020	14:24	0.47
July_14_2020_ADJ_TIDES	7/14/2020	14:30	0.38
July_14_2020_ADJ_TIDES	7/14/2020	14:36	0.32
July_14_2020_ADJ_TIDES	7/14/2020	14:42	0.27
July_14_2020_ADJ_TIDES	7/14/2020	14:48	0.19
July_14_2020_ADJ_TIDES	7/14/2020	14:54	0.09
July_14_2020_ADJ_TIDES	7/14/2020	15:00	0.03
July_14_2020_ADJ_TIDES	7/14/2020	15:06	-0.05
July_14_2020_ADJ_TIDES	7/14/2020	15:12	-0.15
July_14_2020_ADJ_TIDES	7/14/2020	15:18	-0.14
July_14_2020_ADJ_TIDES	7/14/2020	15:24	-0.22
July_14_2020_ADJ_TIDES	7/14/2020	15:30	-0.3
July_14_2020_ADJ_TIDES	7/14/2020	15:36	-0.31
July_14_2020_ADJ_TIDES	7/14/2020	15:42	-0.36
July_14_2020_ADJ_TIDES	7/14/2020	15:48	-0.42
July_14_2020_ADJ_TIDES	7/14/2020	15:54	-0.41
July_14_2020_ADJ_TIDES	7/14/2020	16:00	-0.46
July_14_2020_ADJ_TIDES	7/14/2020	16:06	-0.44
July_14_2020_ADJ_TIDES	7/14/2020	16:12	-0.46
July_14_2020_ADJ_TIDES	7/14/2020	16:18	-0.51
July_14_2020_ADJ_TIDES	7/14/2020	16:24	-0.56
July_14_2020_ADJ_TIDES	7/14/2020	16:30	-0.57
July_14_2020_ADJ_TIDES	7/14/2020	16:36	-0.6
July_14_2020_ADJ_TIDES	7/14/2020	16:42	-0.61
July_14_2020_ADJ_TIDES	7/14/2020	16:48	-0.6
July_14_2020_ADJ_TIDES	7/14/2020	16:54	-0.61
July_14_2020_ADJ_TIDES	7/14/2020	17:00	-0.6
July_14_2020_ADJ_TIDES	7/14/2020	17:06	-0.64
July_14_2020_ADJ_TIDES	7/14/2020	17:12	-0.67
July_14_2020_ADJ_TIDES	7/14/2020	17:18	-0.66
July_14_2020_ADJ_TIDES	7/14/2020	17:24	-0.68
July_14_2020_ADJ_TIDES	7/14/2020	17:30	-0.66
July_14_2020_ADJ_TIDES	7/14/2020	17:36	-0.66
July_14_2020_ADJ_TIDES	7/14/2020	17:42	-0.66
July_14_2020_ADJ_TIDES	7/14/2020	17:48	-0.66
July_14_2020_ADJ_TIDES	7/14/2020	17:54	-0.65
July_14_2020_ADJ_TIDES	7/14/2020	18:00	-0.71
July_14_2020_ADJ_TIDES	7/14/2020	18:06	-0.71
July_14_2020_ADJ_TIDES	7/14/2020	18:12	-0.71
July_14_2020_ADJ_TIDES	7/14/2020	18:18	-0.73
July_14_2020_ADJ_TIDES	7/14/2020	18:24	-0.74
July_14_2020_ADJ_TIDES	7/14/2020	18:30	-0.67

July_14_2020_ADJ_TIDES	7/14/2020	18:36	-0.66
July_14_2020_ADJ_TIDES	7/14/2020	18:42	-0.64
July_14_2020_ADJ_TIDES	7/14/2020	18:48	-0.63
July_14_2020_ADJ_TIDES	7/14/2020	18:54	-0.65
July_14_2020_ADJ_TIDES	7/14/2020	19:00	-0.64
July_14_2020_ADJ_TIDES	7/14/2020	19:06	-0.6
July_14_2020_ADJ_TIDES	7/14/2020	19:12	-0.62
July_14_2020_ADJ_TIDES	7/14/2020	19:18	-0.61
July_14_2020_ADJ_TIDES	7/14/2020	19:24	-0.58
July_14_2020_ADJ_TIDES	7/14/2020	19:30	-0.57
July_14_2020_ADJ_TIDES	7/14/2020	19:36	-0.55
July_14_2020_ADJ_TIDES	7/14/2020	19:42	-0.49
July_14_2020_ADJ_TIDES	7/14/2020	19:48	-0.49
July_14_2020_ADJ_TIDES	7/14/2020	19:54	-0.45
July_14_2020_ADJ_TIDES	7/14/2020	20:00	-0.41
July_14_2020_ADJ_TIDES	7/14/2020	20:06	-0.37
July_14_2020_ADJ_TIDES	7/14/2020	20:12	-0.3
July_14_2020_ADJ_TIDES	7/14/2020	20:18	-0.27
July_14_2020_ADJ_TIDES	7/14/2020	20:24	-0.27
July_14_2020_ADJ_TIDES	7/14/2020	20:30	-0.26
July_14_2020_ADJ_TIDES	7/14/2020	20:36	-0.15
July_14_2020_ADJ_TIDES	7/14/2020	20:42	-0.16
July_14_2020_ADJ_TIDES	7/14/2020	20:48	-0.11
July_14_2020_ADJ_TIDES	7/14/2020	20:54	-0.06
July_14_2020_ADJ_TIDES	7/14/2020	21:00	-0.04
July_14_2020_ADJ_TIDES	7/14/2020	21:06	0.05
July_14_2020_ADJ_TIDES	7/14/2020	21:12	0.1
July_14_2020_ADJ_TIDES	7/14/2020	21:18	0.15
July_14_2020_ADJ_TIDES	7/14/2020	21:24	0.21
July_14_2020_ADJ_TIDES	7/14/2020	21:30	0.26
July_14_2020_ADJ_TIDES	7/14/2020	21:36	0.31
July_14_2020_ADJ_TIDES	7/14/2020	21:42	0.39
July_14_2020_ADJ_TIDES	7/14/2020	21:48	0.46
July_14_2020_ADJ_TIDES	7/14/2020	21:54	0.53
July_14_2020_ADJ_TIDES	7/14/2020	22:00	0.62
July_14_2020_ADJ_TIDES	7/14/2020	22:06	0.67
July_14_2020_ADJ_TIDES	7/14/2020	22:12	0.69
July_14_2020_ADJ_TIDES	7/14/2020	22:18	0.76
July_14_2020_ADJ_TIDES	7/14/2020	22:24	0.8
July_14_2020_ADJ_TIDES	7/14/2020	22:30	0.81
July_14_2020_ADJ_TIDES	7/14/2020	22:36	0.87
July_14_2020_ADJ_TIDES	7/14/2020	22:42	0.92
July_14_2020_ADJ_TIDES	7/14/2020	22:48	0.97
July_14_2020_ADJ_TIDES	7/14/2020	22:54	1.04
July_14_2020_ADJ_TIDES	7/14/2020	23:00	1.06
July_14_2020_ADJ_TIDES	7/14/2020	23:06	1.06

```
July_14_2020_ADJ_TIDES 7/14/2020  23:12      1.09
July_14_2020_ADJ_TIDES 7/14/2020  23:18      1.15
July_14_2020_ADJ_TIDES 7/14/2020  23:24      1.2
July_14_2020_ADJ_TIDES 7/14/2020  23:30      1.21
July_14_2020_ADJ_TIDES 7/14/2020  23:36      1.21
July_14_2020_ADJ_TIDES 7/14/2020  23:42      1.23
July_14_2020_ADJ_TIDES 7/14/2020  23:48      1.23
July_14_2020_ADJ_TIDES 7/14/2020  23:54      1.19

;SCS_Type_III_5.03in design storm, total rainfall = 5.03 in, rain interval = 6 minutes, rain units = in/hr.
SCS_Type_III_5.03in            0:00       0.0503
SCS_Type_III_5.03in            0:06       0.0503
SCS_Type_III_5.03in            0:12       0.0503
SCS_Type_III_5.03in            0:18       0.0503
SCS_Type_III_5.03in            0:24       0.0503
SCS_Type_III_5.03in            0:30       0.0503
SCS_Type_III_5.03in            0:36       0.0503
SCS_Type_III_5.03in            0:42       0.0503
SCS_Type_III_5.03in            0:48       0.0503
SCS_Type_III_5.03in            0:54       0.0503
SCS_Type_III_5.03in            1:00       0.0503
SCS_Type_III_5.03in            1:06       0.0503
SCS_Type_III_5.03in            1:12       0.0503
SCS_Type_III_5.03in            1:18       0.0503
SCS_Type_III_5.03in            1:24       0.0503
SCS_Type_III_5.03in            1:30       0.0503
SCS_Type_III_5.03in            1:36       0.0503
SCS_Type_III_5.03in            1:42       0.0503
SCS_Type_III_5.03in            1:48       0.0503
SCS_Type_III_5.03in            1:54       0.0503
SCS_Type_III_5.03in            2:00       0.0508
SCS_Type_III_5.03in            2:06       0.05131
SCS_Type_III_5.03in            2:12       0.05231
SCS_Type_III_5.03in            2:18       0.05282
SCS_Type_III_5.03in            2:24       0.05382
SCS_Type_III_5.03in            2:30       0.05432
SCS_Type_III_5.03in            2:36       0.05533
SCS_Type_III_5.03in            2:42       0.05583
SCS_Type_III_5.03in            2:48       0.05684
SCS_Type_III_5.03in            2:54       0.05734
SCS_Type_III_5.03in            3:00       0.05835
SCS_Type_III_5.03in            3:06       0.05885
SCS_Type_III_5.03in            3:12       0.05986
SCS_Type_III_5.03in            3:18       0.06036
SCS_Type_III_5.03in            3:24       0.06137
SCS_Type_III_5.03in            3:30       0.06187
```

SCS_Type_III_5.03in	3:36	0.06288
SCS_Type_III_5.03in	3:42	0.06338
SCS_Type_III_5.03in	3:48	0.06438
SCS_Type_III_5.03in	3:54	0.06489
SCS_Type_III_5.03in	4:00	0.06589
SCS_Type_III_5.03in	4:06	0.0664
SCS_Type_III_5.03in	4:12	0.0674
SCS_Type_III_5.03in	4:18	0.0679
SCS_Type_III_5.03in	4:24	0.06891
SCS_Type_III_5.03in	4:30	0.06941
SCS_Type_III_5.03in	4:36	0.07042
SCS_Type_III_5.03in	4:42	0.07092
SCS_Type_III_5.03in	4:48	0.07193
SCS_Type_III_5.03in	4:54	0.07243
SCS_Type_III_5.03in	5:00	0.07344
SCS_Type_III_5.03in	5:06	0.07394
SCS_Type_III_5.03in	5:12	0.07495
SCS_Type_III_5.03in	5:18	0.07545
SCS_Type_III_5.03in	5:24	0.07646
SCS_Type_III_5.03in	5:30	0.07696
SCS_Type_III_5.03in	5:36	0.07796
SCS_Type_III_5.03in	5:42	0.07847
SCS_Type_III_5.03in	5:48	0.07947
SCS_Type_III_5.03in	5:54	0.07998
SCS_Type_III_5.03in	6:00	0.08199
SCS_Type_III_5.03in	6:06	0.084
SCS_Type_III_5.03in	6:12	0.08702
SCS_Type_III_5.03in	6:18	0.08903
SCS_Type_III_5.03in	6:24	0.09205
SCS_Type_III_5.03in	6:30	0.09406
SCS_Type_III_5.03in	6:36	0.09708
SCS_Type_III_5.03in	6:42	0.09909
SCS_Type_III_5.03in	6:48	0.10211
SCS_Type_III_5.03in	6:54	0.10412
SCS_Type_III_5.03in	7:00	0.10714
SCS_Type_III_5.03in	7:06	0.10915
SCS_Type_III_5.03in	7:12	0.11217
SCS_Type_III_5.03in	7:18	0.11418
SCS_Type_III_5.03in	7:24	0.1172
SCS_Type_III_5.03in	7:30	0.11921
SCS_Type_III_5.03in	7:36	0.12223
SCS_Type_III_5.03in	7:42	0.12424
SCS_Type_III_5.03in	7:48	0.12726
SCS_Type_III_5.03in	7:54	0.12927
SCS_Type_III_5.03in	8:00	0.1338
SCS_Type_III_5.03in	8:06	0.13933

SCS_Type_III_5.03in	8:12	0.14537
SCS_Type_III_5.03in	8:18	0.1509
SCS_Type_III_5.03in	8:24	0.15694
SCS_Type_III_5.03in	8:30	0.16247
SCS_Type_III_5.03in	8:36	0.16851
SCS_Type_III_5.03in	8:42	0.17404
SCS_Type_III_5.03in	8:48	0.18007
SCS_Type_III_5.03in	8:54	0.18561
SCS_Type_III_5.03in	9:00	0.19164
SCS_Type_III_5.03in	9:06	0.19718
SCS_Type_III_5.03in	9:12	0.20321
SCS_Type_III_5.03in	9:18	0.20874
SCS_Type_III_5.03in	9:24	0.21478
SCS_Type_III_5.03in	9:30	0.22031
SCS_Type_III_5.03in	9:36	0.22635
SCS_Type_III_5.03in	9:42	0.23188
SCS_Type_III_5.03in	9:48	0.23792
SCS_Type_III_5.03in	9:54	0.24345
SCS_Type_III_5.03in	10:00	0.25251
SCS_Type_III_5.03in	10:06	0.26458
SCS_Type_III_5.03in	10:12	0.27665
SCS_Type_III_5.03in	10:18	0.28872
SCS_Type_III_5.03in	10:24	0.30079
SCS_Type_III_5.03in	10:30	0.31287
SCS_Type_III_5.03in	10:36	0.32494
SCS_Type_III_5.03in	10:42	0.33701
SCS_Type_III_5.03in	10:48	0.34908
SCS_Type_III_5.03in	10:54	0.36115
SCS_Type_III_5.03in	11:00	0.39033
SCS_Type_III_5.03in	11:06	0.4366
SCS_Type_III_5.03in	11:12	0.48288
SCS_Type_III_5.03in	11:18	0.52916
SCS_Type_III_5.03in	11:24	0.57543
SCS_Type_III_5.03in	11:30	0.81989
SCS_Type_III_5.03in	11:36	1.26253
SCS_Type_III_5.03in	11:42	1.70517
SCS_Type_III_5.03in	11:48	2.14781
SCS_Type_III_5.03in	11:54	4.2252
SCS_Type_III_5.03in	12:00	4.2252
SCS_Type_III_5.03in	12:06	2.14781
SCS_Type_III_5.03in	12:12	1.70517
SCS_Type_III_5.03in	12:18	1.26253
SCS_Type_III_5.03in	12:24	0.81989
SCS_Type_III_5.03in	12:30	0.57543
SCS_Type_III_5.03in	12:36	0.52916
SCS_Type_III_5.03in	12:42	0.48288

SCS_Type_III_5.03in	12:48	0.4366
SCS_Type_III_5.03in	12:54	0.39033
SCS_Type_III_5.03in	13:00	0.36115
SCS_Type_III_5.03in	13:06	0.34908
SCS_Type_III_5.03in	13:12	0.33701
SCS_Type_III_5.03in	13:18	0.32494
SCS_Type_III_5.03in	13:24	0.31287
SCS_Type_III_5.03in	13:30	0.30079
SCS_Type_III_5.03in	13:36	0.28872
SCS_Type_III_5.03in	13:42	0.27665
SCS_Type_III_5.03in	13:48	0.26458
SCS_Type_III_5.03in	13:54	0.25251
SCS_Type_III_5.03in	14:00	0.24345
SCS_Type_III_5.03in	14:06	0.23792
SCS_Type_III_5.03in	14:12	0.23188
SCS_Type_III_5.03in	14:18	0.22635
SCS_Type_III_5.03in	14:24	0.22031
SCS_Type_III_5.03in	14:30	0.21478
SCS_Type_III_5.03in	14:36	0.20875
SCS_Type_III_5.03in	14:42	0.20321
SCS_Type_III_5.03in	14:48	0.19718
SCS_Type_III_5.03in	14:54	0.19164
SCS_Type_III_5.03in	15:00	0.18561
SCS_Type_III_5.03in	15:06	0.18007
SCS_Type_III_5.03in	15:12	0.17404
SCS_Type_III_5.03in	15:18	0.1685
SCS_Type_III_5.03in	15:24	0.16247
SCS_Type_III_5.03in	15:30	0.15694
SCS_Type_III_5.03in	15:36	0.1509
SCS_Type_III_5.03in	15:42	0.14537
SCS_Type_III_5.03in	15:48	0.13933
SCS_Type_III_5.03in	15:54	0.1338
SCS_Type_III_5.03in	16:00	0.12977
SCS_Type_III_5.03in	16:06	0.12676
SCS_Type_III_5.03in	16:12	0.12474
SCS_Type_III_5.03in	16:18	0.12173
SCS_Type_III_5.03in	16:24	0.11971
SCS_Type_III_5.03in	16:30	0.1167
SCS_Type_III_5.03in	16:36	0.11468
SCS_Type_III_5.03in	16:42	0.11167
SCS_Type_III_5.03in	16:48	0.10965
SCS_Type_III_5.03in	16:54	0.10664
SCS_Type_III_5.03in	17:00	0.10462
SCS_Type_III_5.03in	17:06	0.10161
SCS_Type_III_5.03in	17:12	0.09959
SCS_Type_III_5.03in	17:18	0.09658

SCS_Type_III_5.03in	17:24	0.09456
SCS_Type_III_5.03in	17:30	0.09155
SCS_Type_III_5.03in	17:36	0.08953
SCS_Type_III_5.03in	17:42	0.08652
SCS_Type_III_5.03in	17:48	0.0845
SCS_Type_III_5.03in	17:54	0.08149
SCS_Type_III_5.03in	18:00	0.07998
SCS_Type_III_5.03in	18:06	0.07947
SCS_Type_III_5.03in	18:12	0.07847
SCS_Type_III_5.03in	18:18	0.07797
SCS_Type_III_5.03in	18:24	0.07696
SCS_Type_III_5.03in	18:30	0.07646
SCS_Type_III_5.03in	18:36	0.07545
SCS_Type_III_5.03in	18:42	0.07495
SCS_Type_III_5.03in	18:48	0.07394
SCS_Type_III_5.03in	18:54	0.07344
SCS_Type_III_5.03in	19:00	0.07243
SCS_Type_III_5.03in	19:06	0.07193
SCS_Type_III_5.03in	19:12	0.07092
SCS_Type_III_5.03in	19:18	0.07042
SCS_Type_III_5.03in	19:24	0.06941
SCS_Type_III_5.03in	19:30	0.06891
SCS_Type_III_5.03in	19:36	0.06791
SCS_Type_III_5.03in	19:42	0.0674
SCS_Type_III_5.03in	19:48	0.0664
SCS_Type_III_5.03in	19:54	0.06589
SCS_Type_III_5.03in	20:00	0.06489
SCS_Type_III_5.03in	20:06	0.06489
SCS_Type_III_5.03in	20:12	0.06388
SCS_Type_III_5.03in	20:18	0.06338
SCS_Type_III_5.03in	20:24	0.06288
SCS_Type_III_5.03in	20:30	0.06237
SCS_Type_III_5.03in	20:36	0.06137
SCS_Type_III_5.03in	20:42	0.06137
SCS_Type_III_5.03in	20:48	0.06036
SCS_Type_III_5.03in	20:54	0.06036
SCS_Type_III_5.03in	21:00	0.05935
SCS_Type_III_5.03in	21:06	0.05885
SCS_Type_III_5.03in	21:12	0.05835
SCS_Type_III_5.03in	21:18	0.05784
SCS_Type_III_5.03in	21:24	0.05684
SCS_Type_III_5.03in	21:30	0.05684
SCS_Type_III_5.03in	21:36	0.05583
SCS_Type_III_5.03in	21:42	0.05583
SCS_Type_III_5.03in	21:48	0.05483
SCS_Type_III_5.03in	21:54	0.05432

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SCS_Type_III_5.03in            22:00      0.05382
SCS_Type_III_5.03in            22:06      0.05332
SCS_Type_III_5.03in            22:12      0.05231
SCS_Type_III_5.03in            22:18      0.05231
SCS_Type_III_5.03in            22:24      0.05131
SCS_Type_III_5.03in            22:30      0.05131
SCS_Type_III_5.03in            22:36      0.0503
SCS_Type_III_5.03in            22:42      0.0498
SCS_Type_III_5.03in            22:48      0.04929
SCS_Type_III_5.03in            22:54      0.04879
SCS_Type_III_5.03in            23:00      0.04779
SCS_Type_III_5.03in            23:06      0.04778
SCS_Type_III_5.03in            23:12      0.04678
SCS_Type_III_5.03in            23:18      0.04678
SCS_Type_III_5.03in            23:24      0.04577
SCS_Type_III_5.03in            23:30      0.04527
SCS_Type_III_5.03in            23:36      0.04477
SCS_Type_III_5.03in            23:42      0.04426
SCS_Type_III_5.03in            23:48      0.04326
SCS_Type_III_5.03in            23:54      0.04326

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Subcatch   A0                03252014_Import
Subcatch   A1                03252014_Import
Subcatch   A10               03252014_Import
Subcatch   A11               03252014_Import
Subcatch   A12               03252014_Import
Subcatch   A13               03252014_Import
Subcatch   A14               03252014_Import
Subcatch   A15               03252014_Import
Subcatch   A16               03252014_Import
Subcatch   A17               03252014_Import
......
Too many tags (94677 in total).

[MAP]
DIMENSIONS       376600.291683335 150475.547749986 383304.183383334 157230.895249984
UNITS            Feet
```

```
[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
10               377995.1           155032.589
12               378132.457         154733.162
15               378279.299         154417.899
16               378317.615         153731.179
17               378388.026         153470.367
18               378428.979         153689.476
23               380279.898         152318.662
24               378491.283         153886.128
27               378029.814         155038.128
4                378525.494         152325.925
......
Too many junction entities (24823 in total).

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
C8               378104.336         154784.84
C8               378026.178         155020.245
C9               377988.374         155032.038
C9               377877.538         155072.002
Culvert1         380325.142         153170.867
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A17	379036.516	153346.496
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A17	379014.998	153432.913

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A17              379014.184         153437.746
A17              379013.935         153446.34
A17              379060.388         153498.027
......
Too many subcatchment entities (91 in total).

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
```

Model Inputs – Baseline Conditions

```
[TITLE]
;;Project Title/Notes
This model updated the Existing Conditions model to include changes to the watershed as a part of RIDOT's Reconstruction of the P

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           07/14/2020
START_TIME           00:00:00
REPORT_START_DATE    07/14/2020
REPORT_START_TIME    00:00:00
END_DATE             07/15/2020
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:01:00
DRY_STEP             00:05:00
ROUTING_STEP         0.5
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         1
MAX_TRIALS           30
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.001
THREADS              7

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
```

```
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source    
;;-------------- --------- -------- -------- ----------
10yr_24hr_6min_INT INTENSITY 0:06     1.0      TIMESERIES SCS_Type_III_5.03in

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack        
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
;Updated by EO on 3.28.22: changed outlet
A0               10yr_24hr_6min_INT J1732          9.862046 18.322   441.972  10.984   0                        
;Updated by EO on 3.28.22: changed outlet
A1               10yr_24hr_6min_INT J2599          9.271104 1.1      506.12   14.097   0                        
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A10              10yr_24hr_6min_INT A39_J          5.556311 56.82    398.539  11.265   0                        
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A11              10yr_24hr_6min_INT CB-026-76      2.595391 32.396   271.48   8.369    0                        
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A12              10yr_24hr_6min_INT Dum_031-9      55.14121 63.173   2227.866 2.981    0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A13_1            10yr_24hr_6min_INT A27_J          17.406937 95      592.899  3.16     0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A13_2            10yr_24hr_6min_INT A28_J          1.605553 25       110.316  3.16     0                        
;Updated by EO on 3.29.22: changed outlet to account for street flow
A14              10yr_24hr_6min_INT J9240          12.1153  37.993   395.543  4.51     0                        
A15              10yr_24hr_6min_INT MalboneChannel1 7.215144 1.575   368.561  5.66     0                        
A16              10yr_24hr_6min_INT DMH-032-32A    2.189369 0        143.709  5.49     0                        
A17              10yr_24hr_6min_INT DMH-032-32A    3.1865   69.303   250.765  7.126    0                        
;Updated by EO on 3.29.22: changed outlet to account for street flow
A18              10yr_24hr_6min_INT J10097         6.349541 45.64    270.887  4.818    0                        
A19              10yr_24hr_6min_INT DMH-045-33     5.981308 53.475   274.251  5.296    0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_1             10yr_24hr_6min_INT A55_J          0.567842 45       94.33    12.558   0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_2             10yr_24hr_6min_INT CB-025-19      0.877582 38.958   184.55   12.558   0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure.
A2_3             10yr_24hr_6min_INT IN-WS-7        2.778846 20       207.339  12.558   0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_4             10yr_24hr_6min_INT A12_J          0.507651 45       107.669  12.558   0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_5             10yr_24hr_6min_INT A11_J          0.488535 38.958   103.039  12.558   0                        
;Updated by EO on 6.21.22: updated outlet.
A20              10yr_24hr_6min_INT 18             9.0555   67.646   607.27   4.098    0                        
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A21_1            10yr_24hr_6min_INT A37_J          5.337168 65       168.973  8.523    0                        
```

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;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A21_2            10yr_24hr_6min_INT A13             1.285716 30       168.368  8.523    0
A22              10yr_24hr_6min_INT 12              17.874451 82.552  680.974  3.563    0
A23              10yr_24hr_6min_INT DMH-044-69      6.517371 47.926   246.564  5.146    0
;Updated by EO on 3.29.22: changed outlet
A24              10yr_24hr_6min_INT DMH-045-49      6.767905 57.154   329.403  1.634    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A25              10yr_24hr_6min_INT C13             5.574783 55.874   205.798  4.297    0
A26              10yr_24hr_6min_INT CB-044-75       3.231058 66.449   237.189  3.387    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A27              10yr_24hr_6min_INT CB-050-34       3.396114 50.372   219.987  6.835    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A28              10yr_24hr_6min_INT CB-037-86       6.024608 14.471   454.357  5.399    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A29              10yr_24hr_6min_INT CB-026-91       4.261817 37.121   199.84   14.737   0
A3               10yr_24hr_6min_INT 16              24.451847 58.13   622.032  4.541    0
;Updated by EO on 6.21.22: updated outlet.
A30              10yr_24hr_6min_INT DMH-025-62      4.653138 70.007   390.714  3.186    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A31              10yr_24hr_6min_INT J9512           1.9465   61.794   342.242  2.042    0
A32              10yr_24hr_6min_INT DMH-038-8       0.912043 41.901   123.7    1.213    0
A33              10yr_24hr_6min_INT DMH-038-8       1.486232 34.417   199.172  3.08     0
A34              10yr_24hr_6min_INT DMH-038-24      0.803157 54.226   113.745  2.846    0
A35              10yr_24hr_6min_INT DMH-038-24      1.764976 65.124   138.682  3.626    0
A36              10yr_24hr_6min_INT DMH-045-26      0.892069 69.151   103.724  2.615    0
A37              10yr_24hr_6min_INT DMH-045-23      1.642409 69.918   94.915   4.334    0
A38              10yr_24hr_6min_INT DMH-045-23      0.378077 85.95    118.735  3.285    0
A39              10yr_24hr_6min_INT DMH-045-35      1.711119 71.042   233.21   3.155    0
A4               10yr_24hr_6min_INT DMH-032-32A     12.974479 8.103   442.53   7.461    0
A40              10yr_24hr_6min_INT DMH-045-35      1.129771 64.246   141.242  3.597    0
A41              10yr_24hr_6min_INT DMH-045-35      1.798022 82.191   202.696  3.621    0
A42              10yr_24hr_6min_INT DMH-051-39      5.07769  66.912   249.529  3.043    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A43              10yr_24hr_6min_INT J13620          3.743771 64.961   156.317  1.28     0
A44              10yr_24hr_6min_INT DMH-045-40      6.907604 55.872   303.036  4.289    0
A45              10yr_24hr_6min_INT DMH-045-45      4.686171 75.248   375.848  1.473    0
A46              10yr_24hr_6min_INT CB-045-38       1.181965 61.064   108.986  3.561    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A47              10yr_24hr_6min_INT J11663          1.948188 66.348   234.783  3.489    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A48              10yr_24hr_6min_INT J11782          3.186529 73.813   200.832  3.226    0
A49              10yr_24hr_6min_INT DMH-038-15      1.9485   77.32    189.801  1.306    0
A5               10yr_24hr_6min_INT DMH-045-24      8.076291 63.396   362.664  3.853    0
A50              10yr_24hr_6min_INT DMH-038-15      0.781215 53.268   151.41   0.358    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A51              10yr_24hr_6min_INT C3              9.184796 35.632   356.37   3.787    0
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A52             10yr_24hr_6min_INT DMH-037-89     1.392598 56.602   166.057  1.917    0
A53             10yr_24hr_6min_INT D1             5.4754   91.894   404.023  3.212    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A54             10yr_24hr_6min_INT CB-044-74      1.575882 47.389   112.285  14.644   0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A55             10yr_24hr_6min_INT M60            3.094246 40.925   294.568  5.16     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A56             10yr_24hr_6min_INT J12750         3.322986 49.166   178.476  3.837    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A57             10yr_24hr_6min_INT J12970         3.111877 39.089   208.067  4.451    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 6.21.22: changed outlet and width/flow length for added RI
A58             10yr_24hr_6min_INT M26            2.342303 35.727   226.308  8.606    0
A59             10yr_24hr_6min_INT DMH-044-21     1.399596 66.697   163.804  4.025    0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A6              10yr_24hr_6min_INT DMH-026-4      5.808772 76.959   131.581  5.999    0
;Updated by EO on 3.28.22: changed width/flow length
A60             10yr_24hr_6min_INT 9              27.685575 69.686  517.916  4.406    0
;Updated by EO on 3.28.22: changed outlet
A7              10yr_24hr_6min_INT J2287          5.624072 1.148    306.483  14.275   0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A8              10yr_24hr_6min_INT DMH-026-4      3.353072 46.841   130.644  6.176    0
;Updated by EO on 4.4.22: changed outlet and width/flow length for added RIDOT infrastructure
A9              10yr_24hr_6min_INT DMH-026-4      3.122486 81.883   165.885  3.795    0
Beacon          10yr_24hr_6min_INT DMH-016-21     4.188447 68       482      5.29     0
;Updated by EO on 3.28.22: changed width/flow length
Beacon_Middletown 10yr_24hr_6min_INT DMH-016-21    5.223106 44       115.272  5.29     0
Bedlow          10yr_24hr_6min_INT DMH-033-35     17.136437 67      975      5.47     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Burdick         10yr_24hr_6min_INT J8334          4.800026 57       516      13.12    0
Cumming         10yr_24hr_6min_INT DMH-033-37     3.560011 56       444      4.69     0
Dexter          10yr_24hr_6min_INT DMH-027-7      11.879784 47      812      7.93     0
;Updated by EO on 3.28.22: changed outlet
Dexter_Middletown_Lower 10yr_24hr_6min_INT J23936  13.052338 61      851      7.93     0
;Updated by EO on 3.28.22: changed width/flow length
Dexter_Middletown_Upper 10yr_24hr_6min_INT DMH-027-7 18.317223 52    282.603  5.59     0
;Updated by EO on 3.28.22: changed outlet
Dexter_Stormwall 10yr_24hr_6min_INT J15904         2.871491 1        399      10.19    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Dudley          10yr_24hr_6min_INT J3790          8.025331 26       667      7.02     0
;Updated by EO on 3.28.22: changed outlet
Dudley_Middletown 10yr_24hr_6min_INT J23263        1.561469 29       294      7.02     0
;Updated by EO on 3.28.22: changed outlet
Dudley_Stormwall 10yr_24hr_6min_INT J15670         5.455658 2        550      8.97     0
Eisenhower      10yr_24hr_6min_INT DMH-021-45     12.844843 60      844      5.59     0
;Updated by EO on 3.28.22: changed outlet
Eisenhower_Middletown 10yr_24hr_6min_INT J1298     0.828575 44       214      5.29     0
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;Updated by EO on 3.28.22: changed outlet
Eisenhower_Stormwall 10yr_24hr_6min_INT J15862     4.882416 2        520      7.72     0
Hillside_L       10yr_24hr_6min_INT DMH-033-45     2.822726 40       396      5.56     0
Hillside_R       10yr_24hr_6min_INT DMH-033-45     3.652676 69       450      6.11     0
;Updated by EO on 4.4.22: changed outlet due to added RIDOT infrastructure; Updated by EO on 4.4.22: changed outlet and width/flo
Kalbfus          10yr_24hr_6min_INT DMH-027-15     11.797277 52      558.478  6.82     0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
Kalbfus_Middletown 10yr_24hr_6min_INT CB-028-101   14.735068 67      783.271  6.82     0
;Updated by EO on 3.28.22: changed outlet; Updated by EO on 4.4.22: changed outlet due to added RIDOT infrastructure
Kalbfus_Stormwall 10yr_24hr_6min_INT CB-027-2      0.403628 9        150      12.38    0
Kennedy          10yr_24hr_6min_INT Kennedy_MH     7.682963 60       653      7.03     0
;Updated by EO on 3.28.22: changed outlet
Kennedy_Middletown 10yr_24hr_6min_INT J23738       1.000335 34       236      7.03     0
Kennedy_Stormwall 10yr_24hr_6min_INT J15790        2.846935 26       397      12.33    0
Madeline         10yr_24hr_6min_INT DMH-046-61     4.786957 51       515      8.34     0
Malbone          10yr_24hr_6min_INT DMH-039-42     1.400517 67       279      12.31    0
Pennacook_L      10yr_24hr_6min_INT DMH-033-38     4.690246 76       510      6.37     0
Pennacook_R      10yr_24hr_6min_INT DMH-033-38     13.694345 57      872      5.68     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Russell          10yr_24hr_6min_INT J8852          6.035549 55       579      6.89     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Smith            10yr_24hr_6min_INT J7767          5.120813 54       533      16.24    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Thurston         10yr_24hr_6min_INT J8304          2.92801  58       403      3.64     0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A0               0.018      0.2        0.05       0.1        25         OUTLET
A1               0.018      0.2        0.05       0.1        25         OUTLET
A10              0.018      0.2        0.05       0.1        25         OUTLET
A11              0.018      0.2        0.05       0.1        25         OUTLET
A12              0.018      0.2        0.05       0.1        25         OUTLET
A13_1            0.018      0.2        0.05       0.1        25         OUTLET
A13_2            0.018      0.2        0.05       0.1        25         OUTLET
A14              0.018      0.2        0.05       0.1        25         OUTLET
A15              0.018      0.2        0.05       0.1        25         OUTLET
A16              0.018      0.2        0.05       0.1        25         OUTLET
A17              0.018      0.2        0.05       0.1        25         OUTLET
A18              0.018      0.2        0.05       0.1        25         OUTLET
A19              0.018      0.2        0.05       0.1        25         OUTLET
A2_1             0.018      0.2        0.05       0.1        25         OUTLET
A2_2             0.018      0.2        0.05       0.1        25         OUTLET
A2_3             0.018      0.2        0.05       0.1        25         OUTLET
A2_4             0.018      0.2        0.05       0.1        25         OUTLET
A2_5             0.018      0.2        0.05       0.1        25         OUTLET
```

A20	0.018	0.2	0.05	0.1	25	OUTLET
A21_1	0.018	0.2	0.05	0.1	25	OUTLET
A21_2	0.018	0.2	0.05	0.1	25	OUTLET
A22	0.018	0.2	0.05	0.1	25	OUTLET
A23	0.018	0.2	0.05	0.1	25	OUTLET
A24	0.018	0.2	0.05	0.1	25	OUTLET
A25	0.018	0.2	0.05	0.1	25	OUTLET
A26	0.018	0.2	0.05	0.1	25	OUTLET
A27	0.018	0.2	0.05	0.1	25	OUTLET
A28	0.018	0.2	0.05	0.1	25	OUTLET
A29	0.018	0.2	0.05	0.1	25	OUTLET
A3	0.018	0.2	0.05	0.1	25	OUTLET
A30	0.018	0.2	0.05	0.1	25	OUTLET
A31	0.018	0.2	0.05	0.1	25	OUTLET
A32	0.018	0.2	0.05	0.1	25	OUTLET
A33	0.018	0.2	0.05	0.1	25	OUTLET
A34	0.018	0.2	0.05	0.1	25	OUTLET
A35	0.018	0.2	0.05	0.1	25	OUTLET
A36	0.018	0.2	0.05	0.1	25	OUTLET
A37	0.018	0.2	0.05	0.1	25	OUTLET
A38	0.018	0.2	0.05	0.1	25	OUTLET
A39	0.018	0.2	0.05	0.1	25	OUTLET
A4	0.018	0.2	0.05	0.1	25	OUTLET
A40	0.018	0.2	0.05	0.1	25	OUTLET
A41	0.018	0.2	0.05	0.1	25	OUTLET
A42	0.018	0.2	0.05	0.1	25	OUTLET
A43	0.018	0.2	0.05	0.1	25	OUTLET
A44	0.018	0.2	0.05	0.1	25	OUTLET
A45	0.018	0.2	0.05	0.1	25	OUTLET
A46	0.018	0.2	0.05	0.1	25	OUTLET
A47	0.018	0.2	0.05	0.1	25	OUTLET
A48	0.018	0.2	0.05	0.1	25	OUTLET
A49	0.018	0.2	0.05	0.1	25	OUTLET
A5	0.018	0.2	0.05	0.1	25	OUTLET
A50	0.018	0.2	0.05	0.1	25	OUTLET
A51	0.018	0.2	0.05	0.1	25	OUTLET
A52	0.018	0.2	0.05	0.1	25	OUTLET
A53	0.018	0.2	0.05	0.1	25	OUTLET
A54	0.018	0.2	0.05	0.1	25	OUTLET
A55	0.018	0.2	0.05	0.1	25	OUTLET
A56	0.018	0.2	0.05	0.1	25	OUTLET
A57	0.018	0.2	0.05	0.1	25	OUTLET
A58	0.018	0.2	0.05	0.1	25	OUTLET
A59	0.018	0.2	0.05	0.1	25	OUTLET
A6	0.018	0.2	0.05	0.1	25	OUTLET
A60	0.018	0.2	0.05	0.1	25	OUTLET

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A7               0.018      0.2        0.05       0.1        25         OUTLET
A8               0.018      0.2        0.05       0.1        25         OUTLET
A9               0.018      0.2        0.05       0.1        25         OUTLET
Beacon           0.018      0.2        0.05       0.1        25         OUTLET
Beacon_Middletown 0.018     0.2        0.05       0.1        25         OUTLET
Bedlow           0.018      0.2        0.05       0.1        25         OUTLET
Burdick          0.018      0.2        0.05       0.1        25         OUTLET
Cumming          0.018      0.2        0.05       0.1        25         OUTLET
Dexter           0.018      0.2        0.05       0.1        25         OUTLET
Dexter_Middletown_Lower 0.018 0.2      0.05       0.1        25         OUTLET
Dexter_Middletown_Upper 0.018 0.2      0.05       0.1        25         OUTLET
Dexter_Stormwall 0.018      0.35       0.05       0.5        25         OUTLET
Dudley           0.018      0.2        0.05       0.1        25         OUTLET
Dudley_Middletown 0.018     0.2        0.05       0.1        25         OUTLET
Dudley_Stormwall 0.018      0.35       0.05       0.5        25         OUTLET
Eisenhower       0.018      0.2        0.05       0.1        25         OUTLET
Eisenhower_Middletown 0.018 0.2        0.05       0.1        25         OUTLET
Eisenhower_Stormwall 0.018  0.35       0.05       0.5        25         OUTLET
Hillside_L       0.018      0.2        0.05       0.1        25         OUTLET
Hillside_R       0.018      0.2        0.05       0.1        25         OUTLET
Kalbfus          0.018      0.2        0.05       0.1        25         OUTLET
Kalbfus_Middletown 0.018    0.2        0.05       0.1        25         OUTLET
Kalbfus_Stormwall 0.018     0.2        0.05       0.1        25         OUTLET
Kennedy          0.018      0.2        0.05       0.1        25         OUTLET
Kennedy_Middletown 0.018    0.2        0.05       0.1        25         OUTLET
Kennedy_Stormwall 0.018     0.35       0.05       0.5        25         OUTLET
Madeline         0.018      0.2        0.05       0.1        25         OUTLET
Malbone          0.018      0.2        0.05       0.1        25         OUTLET
Pennacook_L      0.018      0.2        0.05       0.1        25         OUTLET
Pennacook_R      0.018      0.2        0.05       0.1        25         OUTLET
Russell          0.018      0.2        0.05       0.1        25         OUTLET
Smith            0.018      0.2        0.05       0.1        25         OUTLET
Thurston         0.018      0.2        0.05       0.1        25         OUTLET

[INFILTRATION]
;;Subcatchment   Param1     Param2     Param3     Param4     Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
A0               6.69       0.26       0.15       7          0
A1               6.61       0.27       0.15       7          0
A10              4.47       0.42       0.15       7          0
A11              4.37       0.43       0.15       7          0
A12              6.24       0.61       0.15       7          0
A13_1            7.71       0.07       0.15       0          0
A13_2            7.71       0.07       0.15       0          0
A14              6.12       0.3        0.15       7          0
A15              6.33       0.29       0.15       7          0
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A16	5.46	0.35	0.15	7	0
A17	5.75	0.28	0.15	7	0
A18	6.69	0.26	0.15	7	0
A19	6.69	0.26	0.15	7	0
A2_1	4.33	0.43	0.15	0	0
A2_2	4.33	0.43	0.15	0	0
A2_3	4.33	0.43	0.15	0	0
A2_4	4.33	0.43	0.15	0	0
A2_5	4.33	0.43	0.15	0	0
A20	6.08	0.24	0.15	7	0
A21_1	6.92	0.17	0.15	0	0
A21_2	6.92	0.17	0.15	0	0
A22	7.45	0.11	0.15	7	0
A23	5.33	0.35	0.15	7	0
A24	6.69	0.26	0.15	7	0
A25	5.98	0.31	0.15	7	0
A26	6.61	0.27	0.15	7	0
A27	4.45	0.42	0.15	7	0
A28	4.33	0.43	0.15	7	0
A29	6.15	0.3	0.15	7	0
A3	5.6	0.34	0.15	7	0
A30	5.38	0.32	0.15	7	0
A31	7.05	0.2	0.15	7	0
A32	6.69	0.26	0.15	7	0
A33	6.69	0.26	0.15	7	0
A34	6.69	0.26	0.15	7	0
A35	6.69	0.26	0.15	7	0
A36	6.69	0.26	0.15	7	0
A37	6.69	0.26	0.15	7	0
A38	6.69	0.26	0.15	7	0
A39	6.69	0.26	0.15	7	0
A4	6.53	0.25	0.15	7	0
A40	6.69	0.26	0.15	7	0
A41	6.69	0.26	0.15	7	0
A42	6.69	0.26	0.15	7	0
A43	6.69	0.26	0.15	7	0
A44	6.69	0.26	0.15	7	0
A45	6.69	0.26	0.15	7	0
A46	6.69	0.26	0.15	7	0
A47	6.69	0.26	0.15	7	0
A48	6.69	0.26	0.15	7	0
A49	6.33	0.29	0.15	7	0
A5	6.69	0.26	0.15	7	0
A50	6.13	0.3	0.15	7	0
A51	6.67	0.26	0.15	7	0
A52	6.56	0.27	0.15	7	0

```
A53             7.5        0.09       0.15       7          0
A54             4.33       0.43       0.15       7          0
A55             4.33       0.43       0.15       7          0
A56             6.69       0.26       0.15       7          0
A57             6.69       0.26       0.15       7          0
A58             4.33       0.43       0.15       7          0
A59             6.69       0.26       0.15       7          0
A6              6.69       0.26       0.15       7          0
A60             6.63       0.21       0.15       7          0
A7              6.42       0.28       0.15       7          0
A8              6.12       0.3        0.15       7          0
A9              6.34       0.29       0.15       7          0
Beacon          8.27       0.1        0.15       7          0
Beacon_Middletown 8.27     0.15       0.15       7          0
Bedlow          8.27       0.1        0.15       7          0
Burdick         8.27       0.1        0.15       7          0
Cumming         7.92       0.11       0.17       7          0
Dexter          8.27       1.89       0.15       7          0
Dexter_Middletown_Lower 8.27 0.18     0.15       7          0
Dexter_Middletown_Upper 8.27 0.64     0.15       7          0
Dexter_Stormwall 6.26      0.86       0.22       7          0
Dudley          8.27       1.3        0.15       7          0
Dudley_Middletown 8.27     0.1        0.15       7          0
Dudley_Stormwall 6.79      0.51       0.21       7          0
Eisenhower      8.27       0.1        0.15       7          0
Eisenhower_Middletown 8.27  0.1       0.15       7          0
Eisenhower_Stormwall 6.28   0.79      0.22       7          0
Hillside_L      7.58       0.15       0.18       7          0
Hillside_R      8.27       0.1        0.15       7          0
Kalbfus         8.2        0.11       0.16       7          0
Kalbfus_Middletown 8.27    0.1        0.15       7          0
Kalbfus_Stormwall 6.71     0.33       0.22       7          0
Kennedy         8.27       0.1        0.15       7          0
Kennedy_Middletown 8.27    0.1        0.15       7          0
Kennedy_Stormwall 6.86     0.52       0.21       7          0
Madeline        8.27       0.1        0.15       7          0
Malbone         7.43       0.1        0.19       7          0
Pennacook_L     6.84       0.16       0.21       7          0
Pennacook_R     8.27       0.1        0.15       7          0
Russell         8.27       0.1        0.15       7          0
Smith           8.06       0.1        0.16       7          0
Thurston        8.27       0.1        0.15       7          0

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
```

```
;Updated by EO on 6.8.22: changed invert.
10               -2.27      11.82      0          30         0
;Updated by EO on 6.8.22: changed invert.
12               -1.92      8.81       0          30         0
;Updated by EO on 6.8.22: changed invert.
15               -1.51      8.81       0          30         0
;Updated by EO on 3.7.22 based on field conditions: Increased initial depth to 3.32ft.  Updated by EO on 6.8.22: changed invert.
16               -1.01      12.12      0          30         0
;Updated by EO on 6.8.22: changed invert.
17               1.36       8.81       0          30         0
;Updated by EO on 6.8.22: changed invert.
18               -0.91      10.27      0          30         0
;Updated by EO on 5.10.22: changed flow direction & invert/rim elevations as per the City's GIS.
23               49.949     9          0          30         0
24               3.026      10.734     0          30         0
;Updated by EO on 6.8.22: changed invert.
27               -2.22      12.22      0          30         0
;Updated by EO on 5.9.22: Updated Rim/Invert elevations.
4                6.21       4.526      0          30         0
......
Too many junction entities (24517 in total).

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;Updated by EO on 6.10.22: Changed the invert elevation from 1 to -4 ft to account for the new inverts from RIDOT plans.
8                -4         TIMESERIES July_14_Tides_ADJ NO
;Added by EO on 4.25.22 to fix glass wall effect.
Dum_GW_Outfall   1          FREE                        NO

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
;GENERAL DRAINAGE MAP
....             DMH-027-11       DMH-027-14       202.557    0.018      0          0          0          0
;Drain Pipe
;Updated by EO on 3.15.2022: Replaced a portion of the old 42inch to model change in pipe sizes.
48inch_1         DMH-032-32A      DMH-032-32B      76.304     0.018      0          0          0          0
;Drain Pipe
;Updated by EO on 3.15.2022: Replaced a portion of the old 42inch to model change in pipe sizes.
48inch_2         DMH-032-32B      DMH-032-32       215.781    0.018      0          0          0          0
;surveyed pipe. Updated on 4.28.2022 by EO: changed length from default of 400' to actual length of 318'.
C1               DMH-044-69       J5               318        0.018      0          0          0          0
C10              J14350           J14356           13.409     0.012      0          0          0          0
C100             J16296           J16314           29.424     0.05       0          0          0          0
C1000            J16976           J16980           27.833     0.16       0          0          0          0
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C10000          J17517          J17499          28.323     0.16       0          0          0          0
C10001          J17500          J17517          28.418     0.16       0          0          0          0
C10002          J17510          J11900          17.724     0.16       0          0          0          0
......
Too many conduit entities (68753 in total).

[ORIFICES]
;;Name          From Node        To Node          Type         Offset     Qcoeff     Gated    CloseTime
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- ----------
Entrance         PipeEntrance     DMH-032-32A      SIDE         0          0.65       NO       0
OR1              J22194           10               BOTTOM       0          0.65       NO       0
OR10             J11018           4                BOTTOM       0          0.65       NO       0
OR100            J3319            Dum_025-1        BOTTOM       0          0.65       NO       0
OR101            J22270           Dum_019-1        BOTTOM       0          0.65       NO       0
OR102            J19719           Dum_025-16       BOTTOM       0          0.65       NO       0
OR103            J9735            Dum_031-9        BOTTOM       0          0.65       NO       0
OR104            J19632           Dum_037-4        BOTTOM       0          0.65       NO       0
OR105            J8689            M60              BOTTOM       0          0.65       NO       0
OR106            J19594           Dum_037-10       BOTTOM       0          0.65       NO       0
OR107            J5878            CB-034-66        BOTTOM       0          0.65       NO       0
OR108            J21914           CB-026-70        BOTTOM       0          0.65       NO       0
OR109            J21042           CB-026-86        BOTTOM       0          0.65       NO       0
OR11             J14972           6                BOTTOM       0          0.65       NO       0
OR110            J3500            CB-026-87        BOTTOM       0          0.65       NO       0
OR111            J3571            CB-026-91        BOTTOM       0          0.65       NO       0
OR112            J3706            CB-027-2         BOTTOM       0          0.65       NO       0
OR113            J3694            CB-026-74        BOTTOM       0          0.65       NO       0
OR114            J21944           CB-026-75        BOTTOM       0          0.65       NO       0
OR115            J14947           CB-026-76        BOTTOM       0          0.65       NO       0
OR116            J19565           CB-037-86        BOTTOM       0          0.65       NO       0
;Added to convey flow in non-modeled channel.
OR117            J19701           M26              BOTTOM       0          0.65       NO       0
OR118            J11202           CB-044-74        BOTTOM       0          0.65       NO       0
OR119            J12254           C13              BOTTOM       0          0.65       NO       0
OR12             J22186           9                BOTTOM       0          0.65       NO       0
OR120            J13361           C3               BOTTOM       0          0.65       NO       0
OR121            J13650           CB-050-34        BOTTOM       0          0.65       NO       0
OR122            J3286            CB-028-101       BOTTOM       0          0.65       NO       0
OR123            J4799            CB-028-105       BOTTOM       0          0.65       NO       0
OR124            J10395           DMH-039-34_US    BOTTOM       0          0.65       NO       0
;Added to convey flow in non-modeled channel.
OR125            J19936           M26              BOTTOM       0          0.65       NO       0
OR126            J19425           Dum_GW_J3        BOTTOM       0          0.65       NO       0
OR127            J19406           Dum_GW_J2        BOTTOM       0          0.65       NO       0
OR128            J15771           Dum_GW_J1        BOTTOM       0          0.65       NO       0
OR129            J19647           C25              BOTTOM       0          0.65       NO       0
```

OR13	J20435	CB-037-83	BOTTOM	0	0.65	NO	0
OR131	J7763	D1	BOTTOM	0	0.65	NO	0
OR132	J20988	M27	BOTTOM	0	0.65	NO	0
OR133	J21009	D5	BOTTOM	0	0.65	NO	0
OR134	J9055	D9	BOTTOM	0	0.65	NO	0
OR135	J9044	D10	BOTTOM	0	0.65	NO	0
OR136	J8578	M28	BOTTOM	0	0.65	NO	0
OR137	J20849	A27_J	BOTTOM	0	0.65	NO	0
OR138	J6524	A28_J	BOTTOM	0	0.65	NO	0
OR139	J5134	A37_J	BOTTOM	0	0.65	NO	0
OR14	J20477	CB-037-84	BOTTOM	0	0.65	NO	0
OR140	J4699	A13	BOTTOM	0	0.65	NO	0
OR141	J4393	A15	BOTTOM	0	0.65	NO	0
OR142	J4477	A14_J	BOTTOM	0	0.65	NO	0
OR143	J4385	M4	BOTTOM	0	0.65	NO	0
OR144	J4380	M3	BOTTOM	0	0.65	NO	0
OR145	J4176	A10	BOTTOM	0	0.65	NO	0
OR146	J4372	CB-025-02	BOTTOM	0	0.65	NO	0
OR147	J4620	A7	BOTTOM	0	0.65	NO	0
OR148	J22036	M2	BOTTOM	0	0.65	NO	0
OR149	J4068	A55_J	BOTTOM	0	0.65	NO	0
OR15	J9042	CB-037-85	BOTTOM	0	0.65	NO	0
OR150	J4324	A12_J	BOTTOM	0	0.65	NO	0
OR151	J21988	CB-025-19	BOTTOM	0	0.65	NO	0
OR152	J3806	A11_J	BOTTOM	0	0.65	NO	0
OR153	J3805	M5	BOTTOM	0	0.65	NO	0
OR154	J21984	IN-WS-7	BOTTOM	0	0.65	NO	0
OR155	J22002	A39_J	BOTTOM	0	0.65	NO	0
OR156	J14969	J2	BOTTOM	0	0.65	NO	0
;Added by EO on 6.20.22 to represent additional catch basins.							
OR157	J11826	C13	BOTTOM	0	0.65	NO	0
;Added by EO on 6.20.22 to represent additional catch basins.							
OR158	J11541	CB-044-74	BOTTOM	0	0.65	NO	0
OR16	J9964	CB-037-88_BB	BOTTOM	0	0.65	NO	0
OR17	J12596	CB-044-14	BOTTOM	0	0.65	NO	0
OR18	J12361	CB-044-5	BOTTOM	0	0.65	NO	0
OR19	J17591	CB-044-75	BOTTOM	0	0.65	NO	0
OR2	J3543	12	BOTTOM	0	0.65	NO	0
OR20	J12504	CB-044-8	BOTTOM	0	0.65	NO	0
OR21	J12160	CB-045-38	BOTTOM	0	0.65	NO	0
OR22	J14869	Culvert_Outlet	BOTTOM	0	0.65	NO	0
OR23	J6372	Cummings_MH	BOTTOM	0	0.65	NO	0
OR24	J763	DMH-016-21	BOTTOM	0	0.65	NO	0
OR25	J2171	DMH-021-45	BOTTOM	0	0.65	NO	0
OR26	J4613	DMH-025-62	BOTTOM	0	0.65	NO	0
OR27	J3434	DMH-027-11	BOTTOM	0	0.65	NO	0

OR28	J3897	DMH-027-14	BOTTOM	0	0.65	NO	0
OR29	J15904	DMH-027-7	BOTTOM	0	0.65	NO	0
OR3	J4820	15	BOTTOM	0	0.65	NO	0
OR30	J14708	DMH-032-32A	BOTTOM	0	0.65	NO	0
OR31	J6990	DMH-033-35	BOTTOM	0	0.65	NO	0
OR32	J7089	DMH-033-37	BOTTOM	0	0.65	NO	0
OR33	J5255	DMH-033-38	BOTTOM	0	0.65	NO	0
OR34	J6380	DMH-033-45	BOTTOM	0	0.65	NO	0
OR35	J6485	DMH-033-47	BOTTOM	0	0.65	NO	0
OR36	J20321	DMH-037-2	BOTTOM	0	0.65	NO	0
OR37	J10265	DMH-037-89	BOTTOM	0	0.65	NO	0
OR38	J9615	DMH-038-15	BOTTOM	0	0.65	NO	0
OR39	J10538	DMH-038-19	BOTTOM	0	0.65	NO	0
OR4	J20223	16	BOTTOM	0	0.65	NO	0
OR40	J9867	DMH-038-21_BB	BOTTOM	0	0.65	NO	0
OR41	J10327	DMH-038-24	BOTTOM	0	0.65	NO	0
OR42	J9805	DMH-038-8	BOTTOM	0	0.65	NO	0
OR43	J8048	DMH-039-26	BOTTOM	0	0.65	NO	0
OR44	J9763	DMH-039-34	BOTTOM	0	0.65	NO	0
OR45	J9135	DMH-039-41	BOTTOM	0	0.65	NO	0
OR46	J7512	DMH-039-42	BOTTOM	0	0.65	NO	0
OR47	J8329	DMH-039-43	BOTTOM	0	0.65	NO	0
OR48	J17983	DMH-044-21	BOTTOM	0	0.65	NO	0
OR49	J12257	DMH-044-6	BOTTOM	0	0.65	NO	0
OR5	J20304	17	BOTTOM	0	0.65	NO	0
OR50	J10953	DMH-044-69	BOTTOM	0	0.65	NO	0
OR51	J11387	DMH-044-71	BOTTOM	0	0.65	NO	0
OR52	J11674	DMH-045-23	BOTTOM	0	0.65	NO	0
OR53	J13352	DMH-045-24	BOTTOM	0	0.65	NO	0
OR54	J13211	DMH-045-25	BOTTOM	0	0.65	NO	0
OR55	J10725	DMH-045-26	BOTTOM	0	0.65	NO	0
OR56	J10771	DMH-045-30	BOTTOM	0	0.65	NO	0
OR57	J11354	DMH-045-33	BOTTOM	0	0.65	NO	0
OR58	J11840	DMH-045-35	BOTTOM	0	0.65	NO	0
OR59	J11945	DMH-045-37	BOTTOM	0	0.65	NO	0
OR6	J20273	18	BOTTOM	0	0.65	NO	0
OR60	J12693	DMH-045-40	BOTTOM	0	0.65	NO	0
OR61	J12869	DMH-045-44	BOTTOM	0	0.65	NO	0
OR62	J12791	DMH-045-45	BOTTOM	0	0.65	NO	0
OR63	J12824	DMH-045-48	BOTTOM	0	0.65	NO	0
OR64	J12466	DMH-045-51	BOTTOM	0	0.65	NO	0
OR65	J11285	DMH-045-59	BOTTOM	0	0.65	NO	0
OR66	J11227	DMH-045-60	BOTTOM	0	0.65	NO	0
OR67	J10853	DMH-046-61	BOTTOM	0	0.65	NO	0
OR68	J13542	DMH-051-36	BOTTOM	0	0.65	NO	0
OR69	J14063	DMH-051-37	BOTTOM	0	0.65	NO	0

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OR7              J11176           23               BOTTOM        0          0.65       NO        0
OR70             J14214           DMH-051-38       BOTTOM        0          0.65       NO        0
OR71             J13953           DMH-051-39       BOTTOM        0          0.65       NO        0
OR72             J14247           DMH-051-41       BOTTOM        0          0.65       NO        0
OR73             J14264           DMH-051-43       BOTTOM        0          0.65       NO        0
OR74             J13945           DMH-051-67       BOTTOM        0          0.65       NO        0
OR75             J9792            J1               BOTTOM        0          0.65       NO        0
OR76             J22551           J2               BOTTOM        0          0.65       NO        0
OR77             J20244           J3               BOTTOM        0          0.65       NO        0
OR78             J20226           J4               BOTTOM        0          0.65       NO        0
OR79             J10079           J5               BOTTOM        0          0.65       NO        0
OR8              J20198           24               BOTTOM        0          0.65       NO        0
OR80             J1358            Kennedy_MH       BOTTOM        0          0.65       NO        0
OR81             J14904           MalboneChannel1  BOTTOM        0          0.65       NO        0
OR82             J14914           MalboneChannel2  BOTTOM        0          0.65       NO        0
OR83             J14836           MalboneChannel3  BOTTOM        0          0.65       NO        0
OR84             J14745           PipeEntrance     BOTTOM        0          0.65       NO        0
OR85             J12755           DMH-045-49       BOTTOM        0          0.65       NO        0
OR86             J20886           DMH-032-32       BOTTOM        0          0.65       NO        0
OR87             J20802           DMH-032-33       BOTTOM        0          0.65       NO        0
OR88             J14686           DMH-032-32B      BOTTOM        0          0.65       NO        0
OR89             J22002           DMH-025-61       BOTTOM        0          0.65       NO        0
OR9              J3020            27               BOTTOM        0          0.65       NO        0
OR90             J20417           DMH-037-80       BOTTOM        0          0.65       NO        0
OR91             J4404            DMH-027-19       BOTTOM        0          0.65       NO        0
OR92             J4718            DMH-027-22       BOTTOM        0          0.65       NO        0
OR93             J23148           DMH-034-64       BOTTOM        0          0.65       NO        0
OR94             J5817            DMH-034-66       BOTTOM        0          0.65       NO        0
OR95             J6027            DMH-034-70       BOTTOM        0          0.65       NO        0
OR96             J5731            DMH-034-68       BOTTOM        0          0.65       NO        0
OR97             J21779           DMH-026-4        BOTTOM        0          0.65       NO        0
OR98             J3782            DMH-027-15       BOTTOM        0          0.65       NO        0
OR99             J21881           Dum_026-5        BOTTOM        0          0.65       NO        0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
....             CIRCULAR     3                0          0          0          1
48inch_1         CIRCULAR     4                0          0          0          1
48inch_2         CIRCULAR     4                0          0          0          1
C1               CIRCULAR     2                0          0          0          1
C10              RECT_OPEN    30               13.409     2          0          1
C100             RECT_OPEN    30               24.52      2          0          1
C1000            RECT_OPEN    30               21.41      2          0          1
C10000           RECT_OPEN    30               23.602     2          0          1
C10001           RECT_OPEN    30               23.682     2          0          1
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C10002	RECT_OPEN	30	16.113	2	0	1

......
Too many conduit entities (68753 in total).

Entrance	CIRCULAR	3.5	0	0	0
OR1	RECT_CLOSED	2	9	0	0
OR10	RECT_CLOSED	2	9	0	0
OR100	RECT_CLOSED	30	525.16	0	0
OR101	RECT_CLOSED	30	1004.9	0	0
OR102	RECT_CLOSED	30	1594.45	0	0
OR103	RECT_CLOSED	30	1594.45	0	0
OR104	RECT_CLOSED	30	236.7	0	0
OR105	RECT_CLOSED	30	335.44	0	0
OR106	RECT_CLOSED	30	466.79	0	0
OR107	RECT_CLOSED	2	3	0	0
OR108	RECT_CLOSED	2	3	0	0
OR109	RECT_CLOSED	2	6	0	0
OR11	RECT_CLOSED	30	361.79	0	0
OR110	RECT_CLOSED	2	6	0	0
OR111	RECT_CLOSED	2	6	0	0
OR112	RECT_CLOSED	2	6	0	0
OR113	RECT_CLOSED	2	6	0	0
OR114	RECT_CLOSED	2	3	0	0
OR115	RECT_CLOSED	30	493.49	0	0
OR116	RECT_CLOSED	30	230.09	0	0
OR117	RECT_CLOSED	30	373.92	0	0
OR118	RECT_CLOSED	2	6	0	0
OR119	RECT_CLOSED	2	6	0	0
OR12	RECT_CLOSED	30	361.79	0	0
OR120	RECT_CLOSED	2	9	0	0
OR121	RECT_CLOSED	2	9	0	0
OR122	RECT_CLOSED	2	6	0	0
OR123	RECT_CLOSED	2	6	0	0
OR124	RECT_CLOSED	2	9	0	0
OR125	RECT_CLOSED	30	246.02	0	0
OR126	RECT_CLOSED	2	6	0	0
OR127	RECT_CLOSED	2	6	0	0
OR128	RECT_CLOSED	2	6	0	0
OR129	RECT_CLOSED	2	6	0	0
OR13	RECT_CLOSED	2	9	0	0
OR131	RECT_CLOSED	2	9	0	0
OR132	RECT_CLOSED	2	9	0	0
OR133	RECT_CLOSED	2	9	0	0
OR134	RECT_CLOSED	2	9	0	0
OR135	RECT_CLOSED	2	9	0	0
OR136	RECT_CLOSED	2	9	0	0
OR137	RECT_CLOSED	2	9	0	0

OR138	RECT_CLOSED	2	9	0	0
OR139	RECT_CLOSED	2	9	0	0
OR14	RECT_CLOSED	2	6	0	0
OR140	RECT_CLOSED	2	9	0	0
OR141	RECT_CLOSED	2	9	0	0
OR142	RECT_CLOSED	2	9	0	0
OR143	RECT_CLOSED	2	9	0	0
OR144	RECT_CLOSED	2	9	0	0
OR145	RECT_CLOSED	2	9	0	0
OR146	RECT_CLOSED	2	9	0	0
OR147	RECT_CLOSED	2	9	0	0
OR148	RECT_CLOSED	2	9	0	0
OR149	RECT_CLOSED	2	9	0	0
OR15	RECT_CLOSED	2	6	0	0
OR150	RECT_CLOSED	2	9	0	0
OR151	RECT_CLOSED	2	9	0	0
OR152	RECT_CLOSED	2	9	0	0
OR153	RECT_CLOSED	2	9	0	0
OR154	RECT_CLOSED	30	469.006	0	0
OR155	RECT_CLOSED	30	236.592	0	0
OR156	RECT_CLOSED	2	12	0	0
OR157	RECT_CLOSED	2	6	0	0
OR158	RECT_CLOSED	2	6	0	0
OR16	RECT_CLOSED	2	3	0	0
OR17	RECT_CLOSED	2	9	0	0
OR18	RECT_CLOSED	2	9	0	0
OR19	RECT_CLOSED	2	9	0	0
OR2	RECT_CLOSED	30	222.86	0	0
OR20	RECT_CLOSED	2	9	0	0
OR21	RECT_CLOSED	2	9	0	0
OR22	RECT_CLOSED	30	317.94	0	0
OR23	RECT_CLOSED	2	6	0	0
OR24	RECT_CLOSED	2	9	0	0
OR25	RECT_CLOSED	2	9	0	0
OR26	RECT_CLOSED	30	222.86	0	0
OR27	RECT_CLOSED	2	6	0	0
OR28	RECT_CLOSED	2	9	0	0
OR29	RECT_CLOSED	2	9	0	0
OR3	RECT_CLOSED	30	717.93	0	0
OR30	RECT_CLOSED	2	6	0	0
OR31	RECT_CLOSED	2	6	0	0
OR32	RECT_CLOSED	2	9	0	0
OR33	RECT_CLOSED	2	6	0	0
OR34	RECT_CLOSED	2	9	0	0
OR35	RECT_CLOSED	2	3	0	0
OR36	RECT_CLOSED	2	9	0	0

OR37	RECT_CLOSED	2	6	0	0
OR38	RECT_CLOSED	2	6	0	0
OR39	RECT_CLOSED	2	9	0	0
OR4	RECT_CLOSED	30	717.93	0	0
OR40	RECT_CLOSED	2	9	0	0
OR41	RECT_CLOSED	2	9	0	0
OR42	RECT_CLOSED	2	6	0	0
OR43	RECT_CLOSED	2	6	0	0
OR44	RECT_CLOSED	2	9	0	0
OR45	RECT_CLOSED	2	9	0	0
OR46	RECT_CLOSED	2	9	0	0
OR47	RECT_CLOSED	2	9	0	0
OR48	RECT_CLOSED	2	6	0	0
OR49	RECT_CLOSED	2	6	0	0
OR5	RECT_CLOSED	30	222.9	0	0
OR50	RECT_CLOSED	2	9	0	0
OR51	RECT_CLOSED	2	6	0	0
OR52	RECT_CLOSED	2	6	0	0
OR53	RECT_CLOSED	2	6	0	0
OR54	RECT_CLOSED	2	6	0	0
OR55	RECT_CLOSED	2	6	0	0
OR56	RECT_CLOSED	2	6	0	0
OR57	RECT_CLOSED	2	9	0	0
OR58	RECT_CLOSED	2	6	0	0
OR59	RECT_CLOSED	2	6	0	0
OR6	RECT_CLOSED	30	396.73	0	0
OR60	RECT_CLOSED	2	6	0	0
OR61	RECT_CLOSED	2	6	0	0
OR62	RECT_CLOSED	2	6	0	0
OR63	RECT_CLOSED	2	6	0	0
OR64	RECT_CLOSED	2	9	0	0
OR65	RECT_CLOSED	2	6	0	0
OR66	RECT_CLOSED	2	6	0	0
OR67	RECT_CLOSED	2	9	0	0
OR68	RECT_CLOSED	2	6	0	0
OR69	RECT_CLOSED	2	9	0	0
OR7	RECT_CLOSED	2	9	0	0
OR70	RECT_CLOSED	2	6	0	0
OR71	RECT_CLOSED	2	6	0	0
OR72	RECT_CLOSED	2	6	0	0
OR73	RECT_CLOSED	2	9	0	0
OR74	RECT_CLOSED	2	9	0	0
OR75	RECT_CLOSED	2	9	0	0
OR76	RECT_CLOSED	30	1422.76	0	0
OR77	RECT_CLOSED	2	9	0	0
OR78	RECT_CLOSED	30	303.57	0	0

```
OR79             RECT_CLOSED  2                9          0          0
OR8              RECT_CLOSED  30               129.74     0          0
OR80             RECT_CLOSED  2                9          0          0
OR81             RECT_CLOSED  30               561.44     0          0
OR82             RECT_CLOSED  30               506.58     0          0
OR83             RECT_CLOSED  30               458.11     0          0
OR84             RECT_CLOSED  30               195.03     0          0
OR85             RECT_CLOSED  2                6          0          0
OR86             RECT_CLOSED  2                9          0          0
OR87             RECT_CLOSED  2                9          0          0
OR88             RECT_CLOSED  2                6          0          0
OR89             RECT_CLOSED  2                9          0          0
OR9              RECT_CLOSED  2                9          0          0
OR90             RECT_CLOSED  30               335.44     0          0
OR91             RECT_CLOSED  2                9          0          0
OR92             RECT_CLOSED  2                9          0          0
OR93             RECT_CLOSED  2                9          0          0
OR94             RECT_CLOSED  2                9          0          0
OR95             RECT_CLOSED  2                3          0          0
OR96             RECT_CLOSED  2                6          0          0
OR97             RECT_CLOSED  2                12         0          0
OR98             RECT_CLOSED  2                9          0          0
OR99             RECT_CLOSED  30               200.74     0          0

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
48inch_1         0          1          0          NO         0
48inch_2         0          1          0          NO         0
C2               0          0.5        0          NO         0
C3               0          1          0          NO         0
C8               0          1          0          NO         0
C9               0          1          0          NO         0
Culvert1         0          1          0          NO         0
Culvert2         0          1          0          NO         0
DP-025-10        0          1          0          NO         0
DP-025-10_B      0          1          0          NO         0
......
Too many conduit entities (68753 in total).

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Adjusted July 14 tides to simulate 10 yr DS tides
July_14_Tides_ADJ 7/14/2020  0:00       1.14
July_14_Tides_ADJ 7/14/2020  0:06       1.1
```

July_14_Tides_ADJ	7/14/2020	0:12	1.06
July_14_Tides_ADJ	7/14/2020	0:18	1.04
July_14_Tides_ADJ	7/14/2020	0:24	0.97
July_14_Tides_ADJ	7/14/2020	0:30	0.89
July_14_Tides_ADJ	7/14/2020	0:36	0.82
July_14_Tides_ADJ	7/14/2020	0:42	0.76
July_14_Tides_ADJ	7/14/2020	0:48	0.7
July_14_Tides_ADJ	7/14/2020	0:54	0.64
July_14_Tides_ADJ	7/14/2020	1:00	0.59
July_14_Tides_ADJ	7/14/2020	1:06	0.51
July_14_Tides_ADJ	7/14/2020	1:12	0.44
July_14_Tides_ADJ	7/14/2020	1:18	0.37
July_14_Tides_ADJ	7/14/2020	1:24	0.28
July_14_Tides_ADJ	7/14/2020	1:30	0.21
July_14_Tides_ADJ	7/14/2020	1:36	0.11
July_14_Tides_ADJ	7/14/2020	1:42	0.03
July_14_Tides_ADJ	7/14/2020	1:48	-0.02
July_14_Tides_ADJ	7/14/2020	1:54	-0.08
July_14_Tides_ADJ	7/14/2020	2:00	-0.15
July_14_Tides_ADJ	7/14/2020	2:06	-0.24
July_14_Tides_ADJ	7/14/2020	2:12	-0.3
July_14_Tides_ADJ	7/14/2020	2:18	-0.35
July_14_Tides_ADJ	7/14/2020	2:24	-0.41
July_14_Tides_ADJ	7/14/2020	2:30	-0.49
July_14_Tides_ADJ	7/14/2020	2:36	-0.5
July_14_Tides_ADJ	7/14/2020	2:42	-0.56
July_14_Tides_ADJ	7/14/2020	2:48	-0.58
July_14_Tides_ADJ	7/14/2020	2:54	-0.63
July_14_Tides_ADJ	7/14/2020	3:00	-0.71
July_14_Tides_ADJ	7/14/2020	3:06	-0.7
July_14_Tides_ADJ	7/14/2020	3:12	-0.76
July_14_Tides_ADJ	7/14/2020	3:18	-0.76
July_14_Tides_ADJ	7/14/2020	3:24	-0.78
July_14_Tides_ADJ	7/14/2020	3:30	-0.8
July_14_Tides_ADJ	7/14/2020	3:36	-0.81
July_14_Tides_ADJ	7/14/2020	3:42	-0.85
July_14_Tides_ADJ	7/14/2020	3:48	-0.82
July_14_Tides_ADJ	7/14/2020	3:54	-0.84
July_14_Tides_ADJ	7/14/2020	4:00	-0.85
July_14_Tides_ADJ	7/14/2020	4:06	-0.87
July_14_Tides_ADJ	7/14/2020	4:12	-0.88
July_14_Tides_ADJ	7/14/2020	4:18	-0.86
July_14_Tides_ADJ	7/14/2020	4:24	-0.85
July_14_Tides_ADJ	7/14/2020	4:30	-0.8
July_14_Tides_ADJ	7/14/2020	4:36	-0.8
July_14_Tides_ADJ	7/14/2020	4:42	-0.78

July_14_Tides_ADJ	7/14/2020	4:48	-0.74
July_14_Tides_ADJ	7/14/2020	4:54	-0.77
July_14_Tides_ADJ	7/14/2020	5:00	-0.75
July_14_Tides_ADJ	7/14/2020	5:06	-0.69
July_14_Tides_ADJ	7/14/2020	5:12	-0.68
July_14_Tides_ADJ	7/14/2020	5:18	-0.65
July_14_Tides_ADJ	7/14/2020	5:24	-0.62
July_14_Tides_ADJ	7/14/2020	5:30	-0.58
July_14_Tides_ADJ	7/14/2020	5:36	-0.56
July_14_Tides_ADJ	7/14/2020	5:42	-0.57
July_14_Tides_ADJ	7/14/2020	5:48	-0.53
July_14_Tides_ADJ	7/14/2020	5:54	-0.52
July_14_Tides_ADJ	7/14/2020	6:00	-0.49
July_14_Tides_ADJ	7/14/2020	6:06	-0.46
July_14_Tides_ADJ	7/14/2020	6:12	-0.4
July_14_Tides_ADJ	7/14/2020	6:18	-0.35
July_14_Tides_ADJ	7/14/2020	6:24	-0.32
July_14_Tides_ADJ	7/14/2020	6:30	-0.27
July_14_Tides_ADJ	7/14/2020	6:36	-0.28
July_14_Tides_ADJ	7/14/2020	6:42	-0.24
July_14_Tides_ADJ	7/14/2020	6:48	-0.21
July_14_Tides_ADJ	7/14/2020	6:54	-0.16
July_14_Tides_ADJ	7/14/2020	7:00	-0.13
July_14_Tides_ADJ	7/14/2020	7:06	-0.1
July_14_Tides_ADJ	7/14/2020	7:12	-0.09
July_14_Tides_ADJ	7/14/2020	7:18	-0.06
July_14_Tides_ADJ	7/14/2020	7:24	0.01
July_14_Tides_ADJ	7/14/2020	7:30	0.08
July_14_Tides_ADJ	7/14/2020	7:36	0.09
July_14_Tides_ADJ	7/14/2020	7:42	0.11
July_14_Tides_ADJ	7/14/2020	7:48	0.18
July_14_Tides_ADJ	7/14/2020	7:54	0.22
July_14_Tides_ADJ	7/14/2020	8:00	0.25
July_14_Tides_ADJ	7/14/2020	8:06	0.29
July_14_Tides_ADJ	7/14/2020	8:12	0.35
July_14_Tides_ADJ	7/14/2020	8:18	0.44
July_14_Tides_ADJ	7/14/2020	8:24	0.49
July_14_Tides_ADJ	7/14/2020	8:30	0.53
July_14_Tides_ADJ	7/14/2020	8:36	0.57
July_14_Tides_ADJ	7/14/2020	8:42	0.61
July_14_Tides_ADJ	7/14/2020	8:48	0.66
July_14_Tides_ADJ	7/14/2020	8:54	0.73
July_14_Tides_ADJ	7/14/2020	9:00	0.79
July_14_Tides_ADJ	7/14/2020	9:06	0.86
July_14_Tides_ADJ	7/14/2020	9:12	0.96
July_14_Tides_ADJ	7/14/2020	9:18	1.03

July_14_Tides_ADJ	7/14/2020	9:24	1.09
July_14_Tides_ADJ	7/14/2020	9:30	1.17
July_14_Tides_ADJ	7/14/2020	9:36	1.22
July_14_Tides_ADJ	7/14/2020	9:42	1.26
July_14_Tides_ADJ	7/14/2020	9:48	1.32
July_14_Tides_ADJ	7/14/2020	9:54	1.36
July_14_Tides_ADJ	7/14/2020	10:00	1.42
July_14_Tides_ADJ	7/14/2020	10:06	1.47
July_14_Tides_ADJ	7/14/2020	10:12	1.44
July_14_Tides_ADJ	7/14/2020	10:18	1.51
July_14_Tides_ADJ	7/14/2020	10:24	1.6
July_14_Tides_ADJ	7/14/2020	10:30	1.65
July_14_Tides_ADJ	7/14/2020	10:36	1.83
July_14_Tides_ADJ	7/14/2020	10:42	1.71
July_14_Tides_ADJ	7/14/2020	10:48	1.71
July_14_Tides_ADJ	7/14/2020	10:54	1.65
July_14_Tides_ADJ	7/14/2020	11:00	1.53
July_14_Tides_ADJ	7/14/2020	11:06	1.64
July_14_Tides_ADJ	7/14/2020	11:12	1.67
July_14_Tides_ADJ	7/14/2020	11:18	1.72
July_14_Tides_ADJ	7/14/2020	11:24	1.82
July_14_Tides_ADJ	7/14/2020	11:30	1.81
July_14_Tides_ADJ	7/14/2020	11:36	1.81
July_14_Tides_ADJ	7/14/2020	11:42	1.81
July_14_Tides_ADJ	7/14/2020	11:48	1.85
July_14_Tides_ADJ	7/14/2020	11:54	1.72
July_14_Tides_ADJ	7/14/2020	12:00	1.7
July_14_Tides_ADJ	7/14/2020	12:06	1.65
July_14_Tides_ADJ	7/14/2020	12:12	1.61
July_14_Tides_ADJ	7/14/2020	12:18	1.59
July_14_Tides_ADJ	7/14/2020	12:24	1.5
July_14_Tides_ADJ	7/14/2020	12:30	1.46
July_14_Tides_ADJ	7/14/2020	12:36	1.43
July_14_Tides_ADJ	7/14/2020	12:42	1.47
July_14_Tides_ADJ	7/14/2020	12:48	1.42
July_14_Tides_ADJ	7/14/2020	12:54	1.36
July_14_Tides_ADJ	7/14/2020	13:00	1.33
July_14_Tides_ADJ	7/14/2020	13:06	1.19
July_14_Tides_ADJ	7/14/2020	13:12	1.16
July_14_Tides_ADJ	7/14/2020	13:18	1.11
July_14_Tides_ADJ	7/14/2020	13:24	1.07
July_14_Tides_ADJ	7/14/2020	13:30	1.03
July_14_Tides_ADJ	7/14/2020	13:36	0.96
July_14_Tides_ADJ	7/14/2020	13:42	0.95
July_14_Tides_ADJ	7/14/2020	13:48	0.89
July_14_Tides_ADJ	7/14/2020	13:54	0.81

July_14_Tides_ADJ	7/14/2020	14:00	0.66
July_14_Tides_ADJ	7/14/2020	14:06	0.57
July_14_Tides_ADJ	7/14/2020	14:12	0.51
July_14_Tides_ADJ	7/14/2020	14:18	0.48
July_14_Tides_ADJ	7/14/2020	14:24	0.47
July_14_Tides_ADJ	7/14/2020	14:30	0.38
July_14_Tides_ADJ	7/14/2020	14:36	0.32
July_14_Tides_ADJ	7/14/2020	14:42	0.27
July_14_Tides_ADJ	7/14/2020	14:48	0.19
July_14_Tides_ADJ	7/14/2020	14:54	0.09
July_14_Tides_ADJ	7/14/2020	15:00	0.03
July_14_Tides_ADJ	7/14/2020	15:06	-0.05
July_14_Tides_ADJ	7/14/2020	15:12	-0.15
July_14_Tides_ADJ	7/14/2020	15:18	-0.14
July_14_Tides_ADJ	7/14/2020	15:24	-0.22
July_14_Tides_ADJ	7/14/2020	15:30	-0.3
July_14_Tides_ADJ	7/14/2020	15:36	-0.31
July_14_Tides_ADJ	7/14/2020	15:42	-0.36
July_14_Tides_ADJ	7/14/2020	15:48	-0.42
July_14_Tides_ADJ	7/14/2020	15:54	-0.41
July_14_Tides_ADJ	7/14/2020	16:00	-0.46
July_14_Tides_ADJ	7/14/2020	16:06	-0.44
July_14_Tides_ADJ	7/14/2020	16:12	-0.46
July_14_Tides_ADJ	7/14/2020	16:18	-0.51
July_14_Tides_ADJ	7/14/2020	16:24	-0.56
July_14_Tides_ADJ	7/14/2020	16:30	-0.57
July_14_Tides_ADJ	7/14/2020	16:36	-0.6
July_14_Tides_ADJ	7/14/2020	16:42	-0.61
July_14_Tides_ADJ	7/14/2020	16:48	-0.6
July_14_Tides_ADJ	7/14/2020	16:54	-0.61
July_14_Tides_ADJ	7/14/2020	17:00	-0.6
July_14_Tides_ADJ	7/14/2020	17:06	-0.64
July_14_Tides_ADJ	7/14/2020	17:12	-0.67
July_14_Tides_ADJ	7/14/2020	17:18	-0.66
July_14_Tides_ADJ	7/14/2020	17:24	-0.68
July_14_Tides_ADJ	7/14/2020	17:30	-0.66
July_14_Tides_ADJ	7/14/2020	17:36	-0.66
July_14_Tides_ADJ	7/14/2020	17:42	-0.66
July_14_Tides_ADJ	7/14/2020	17:48	-0.66
July_14_Tides_ADJ	7/14/2020	17:54	-0.65
July_14_Tides_ADJ	7/14/2020	18:00	-0.71
July_14_Tides_ADJ	7/14/2020	18:06	-0.71
July_14_Tides_ADJ	7/14/2020	18:12	-0.71
July_14_Tides_ADJ	7/14/2020	18:18	-0.73
July_14_Tides_ADJ	7/14/2020	18:24	-0.74
July_14_Tides_ADJ	7/14/2020	18:30	-0.67

July_14_Tides_ADJ	7/14/2020	18:36	-0.66
July_14_Tides_ADJ	7/14/2020	18:42	-0.64
July_14_Tides_ADJ	7/14/2020	18:48	-0.63
July_14_Tides_ADJ	7/14/2020	18:54	-0.65
July_14_Tides_ADJ	7/14/2020	19:00	-0.64
July_14_Tides_ADJ	7/14/2020	19:06	-0.6
July_14_Tides_ADJ	7/14/2020	19:12	-0.62
July_14_Tides_ADJ	7/14/2020	19:18	-0.61
July_14_Tides_ADJ	7/14/2020	19:24	-0.58
July_14_Tides_ADJ	7/14/2020	19:30	-0.57
July_14_Tides_ADJ	7/14/2020	19:36	-0.55
July_14_Tides_ADJ	7/14/2020	19:42	-0.49
July_14_Tides_ADJ	7/14/2020	19:48	-0.49
July_14_Tides_ADJ	7/14/2020	19:54	-0.45
July_14_Tides_ADJ	7/14/2020	20:00	-0.41
July_14_Tides_ADJ	7/14/2020	20:06	-0.37
July_14_Tides_ADJ	7/14/2020	20:12	-0.3
July_14_Tides_ADJ	7/14/2020	20:18	-0.27
July_14_Tides_ADJ	7/14/2020	20:24	-0.27
July_14_Tides_ADJ	7/14/2020	20:30	-0.26
July_14_Tides_ADJ	7/14/2020	20:36	-0.15
July_14_Tides_ADJ	7/14/2020	20:42	-0.16
July_14_Tides_ADJ	7/14/2020	20:48	-0.11
July_14_Tides_ADJ	7/14/2020	20:54	-0.06
July_14_Tides_ADJ	7/14/2020	21:00	-0.04
July_14_Tides_ADJ	7/14/2020	21:06	0.05
July_14_Tides_ADJ	7/14/2020	21:12	0.1
July_14_Tides_ADJ	7/14/2020	21:18	0.15
July_14_Tides_ADJ	7/14/2020	21:24	0.21
July_14_Tides_ADJ	7/14/2020	21:30	0.26
July_14_Tides_ADJ	7/14/2020	21:36	0.31
July_14_Tides_ADJ	7/14/2020	21:42	0.39
July_14_Tides_ADJ	7/14/2020	21:48	0.46
July_14_Tides_ADJ	7/14/2020	21:54	0.53
July_14_Tides_ADJ	7/14/2020	22:00	0.62
July_14_Tides_ADJ	7/14/2020	22:06	0.67
July_14_Tides_ADJ	7/14/2020	22:12	0.69
July_14_Tides_ADJ	7/14/2020	22:18	0.76
July_14_Tides_ADJ	7/14/2020	22:24	0.8
July_14_Tides_ADJ	7/14/2020	22:30	0.81
July_14_Tides_ADJ	7/14/2020	22:36	0.87
July_14_Tides_ADJ	7/14/2020	22:42	0.92
July_14_Tides_ADJ	7/14/2020	22:48	0.97
July_14_Tides_ADJ	7/14/2020	22:54	1.04
July_14_Tides_ADJ	7/14/2020	23:00	1.06
July_14_Tides_ADJ	7/14/2020	23:06	1.06

```
July_14_Tides_ADJ 7/14/2020  23:12      1.09
July_14_Tides_ADJ 7/14/2020  23:18      1.15
July_14_Tides_ADJ 7/14/2020  23:24      1.2
July_14_Tides_ADJ 7/14/2020  23:30      1.21
July_14_Tides_ADJ 7/14/2020  23:36      1.21
July_14_Tides_ADJ 7/14/2020  23:42      1.23
July_14_Tides_ADJ 7/14/2020  23:48      1.23
July_14_Tides_ADJ 7/14/2020  23:54      1.19

;SCS_Type_III_5.03in design storm, total rainfall = 5.03 in, rain interval = 6 minutes, rain units = in/hr.
SCS_Type_III_5.03in            0:00       0.0503
SCS_Type_III_5.03in            0:06       0.0503
SCS_Type_III_5.03in            0:12       0.0503
SCS_Type_III_5.03in            0:18       0.0503
SCS_Type_III_5.03in            0:24       0.0503
SCS_Type_III_5.03in            0:30       0.0503
SCS_Type_III_5.03in            0:36       0.0503
SCS_Type_III_5.03in            0:42       0.0503
SCS_Type_III_5.03in            0:48       0.0503
SCS_Type_III_5.03in            0:54       0.0503
SCS_Type_III_5.03in            1:00       0.0503
SCS_Type_III_5.03in            1:06       0.0503
SCS_Type_III_5.03in            1:12       0.0503
SCS_Type_III_5.03in            1:18       0.0503
SCS_Type_III_5.03in            1:24       0.0503
SCS_Type_III_5.03in            1:30       0.0503
SCS_Type_III_5.03in            1:36       0.0503
SCS_Type_III_5.03in            1:42       0.0503
SCS_Type_III_5.03in            1:48       0.0503
SCS_Type_III_5.03in            1:54       0.0503
SCS_Type_III_5.03in            2:00       0.0508
SCS_Type_III_5.03in            2:06       0.05131
SCS_Type_III_5.03in            2:12       0.05231
SCS_Type_III_5.03in            2:18       0.05282
SCS_Type_III_5.03in            2:24       0.05382
SCS_Type_III_5.03in            2:30       0.05432
SCS_Type_III_5.03in            2:36       0.05533
SCS_Type_III_5.03in            2:42       0.05583
SCS_Type_III_5.03in            2:48       0.05684
SCS_Type_III_5.03in            2:54       0.05734
SCS_Type_III_5.03in            3:00       0.05835
SCS_Type_III_5.03in            3:06       0.05885
SCS_Type_III_5.03in            3:12       0.05986
SCS_Type_III_5.03in            3:18       0.06036
SCS_Type_III_5.03in            3:24       0.06137
SCS_Type_III_5.03in            3:30       0.06187
```

SCS_Type_III_5.03in	3:36	0.06288
SCS_Type_III_5.03in	3:42	0.06338
SCS_Type_III_5.03in	3:48	0.06438
SCS_Type_III_5.03in	3:54	0.06489
SCS_Type_III_5.03in	4:00	0.06589
SCS_Type_III_5.03in	4:06	0.0664
SCS_Type_III_5.03in	4:12	0.0674
SCS_Type_III_5.03in	4:18	0.0679
SCS_Type_III_5.03in	4:24	0.06891
SCS_Type_III_5.03in	4:30	0.06941
SCS_Type_III_5.03in	4:36	0.07042
SCS_Type_III_5.03in	4:42	0.07092
SCS_Type_III_5.03in	4:48	0.07193
SCS_Type_III_5.03in	4:54	0.07243
SCS_Type_III_5.03in	5:00	0.07344
SCS_Type_III_5.03in	5:06	0.07394
SCS_Type_III_5.03in	5:12	0.07495
SCS_Type_III_5.03in	5:18	0.07545
SCS_Type_III_5.03in	5:24	0.07646
SCS_Type_III_5.03in	5:30	0.07696
SCS_Type_III_5.03in	5:36	0.07796
SCS_Type_III_5.03in	5:42	0.07847
SCS_Type_III_5.03in	5:48	0.07947
SCS_Type_III_5.03in	5:54	0.07998
SCS_Type_III_5.03in	6:00	0.08199
SCS_Type_III_5.03in	6:06	0.084
SCS_Type_III_5.03in	6:12	0.08702
SCS_Type_III_5.03in	6:18	0.08903
SCS_Type_III_5.03in	6:24	0.09205
SCS_Type_III_5.03in	6:30	0.09406
SCS_Type_III_5.03in	6:36	0.09708
SCS_Type_III_5.03in	6:42	0.09909
SCS_Type_III_5.03in	6:48	0.10211
SCS_Type_III_5.03in	6:54	0.10412
SCS_Type_III_5.03in	7:00	0.10714
SCS_Type_III_5.03in	7:06	0.10915
SCS_Type_III_5.03in	7:12	0.11217
SCS_Type_III_5.03in	7:18	0.11418
SCS_Type_III_5.03in	7:24	0.1172
SCS_Type_III_5.03in	7:30	0.11921
SCS_Type_III_5.03in	7:36	0.12223
SCS_Type_III_5.03in	7:42	0.12424
SCS_Type_III_5.03in	7:48	0.12726
SCS_Type_III_5.03in	7:54	0.12927
SCS_Type_III_5.03in	8:00	0.1338
SCS_Type_III_5.03in	8:06	0.13933

SCS_Type_III_5.03in	8:12	0.14537
SCS_Type_III_5.03in	8:18	0.1509
SCS_Type_III_5.03in	8:24	0.15694
SCS_Type_III_5.03in	8:30	0.16247
SCS_Type_III_5.03in	8:36	0.16851
SCS_Type_III_5.03in	8:42	0.17404
SCS_Type_III_5.03in	8:48	0.18007
SCS_Type_III_5.03in	8:54	0.18561
SCS_Type_III_5.03in	9:00	0.19164
SCS_Type_III_5.03in	9:06	0.19718
SCS_Type_III_5.03in	9:12	0.20321
SCS_Type_III_5.03in	9:18	0.20874
SCS_Type_III_5.03in	9:24	0.21478
SCS_Type_III_5.03in	9:30	0.22031
SCS_Type_III_5.03in	9:36	0.22635
SCS_Type_III_5.03in	9:42	0.23188
SCS_Type_III_5.03in	9:48	0.23792
SCS_Type_III_5.03in	9:54	0.24345
SCS_Type_III_5.03in	10:00	0.25251
SCS_Type_III_5.03in	10:06	0.26458
SCS_Type_III_5.03in	10:12	0.27665
SCS_Type_III_5.03in	10:18	0.28872
SCS_Type_III_5.03in	10:24	0.30079
SCS_Type_III_5.03in	10:30	0.31287
SCS_Type_III_5.03in	10:36	0.32494
SCS_Type_III_5.03in	10:42	0.33701
SCS_Type_III_5.03in	10:48	0.34908
SCS_Type_III_5.03in	10:54	0.36115
SCS_Type_III_5.03in	11:00	0.39033
SCS_Type_III_5.03in	11:06	0.4366
SCS_Type_III_5.03in	11:12	0.48288
SCS_Type_III_5.03in	11:18	0.52916
SCS_Type_III_5.03in	11:24	0.57543
SCS_Type_III_5.03in	11:30	0.81989
SCS_Type_III_5.03in	11:36	1.26253
SCS_Type_III_5.03in	11:42	1.70517
SCS_Type_III_5.03in	11:48	2.14781
SCS_Type_III_5.03in	11:54	4.2252
SCS_Type_III_5.03in	12:00	4.2252
SCS_Type_III_5.03in	12:06	2.14781
SCS_Type_III_5.03in	12:12	1.70517
SCS_Type_III_5.03in	12:18	1.26253
SCS_Type_III_5.03in	12:24	0.81989
SCS_Type_III_5.03in	12:30	0.57543
SCS_Type_III_5.03in	12:36	0.52916
SCS_Type_III_5.03in	12:42	0.48288

SCS_Type_III_5.03in	12:48	0.4366
SCS_Type_III_5.03in	12:54	0.39033
SCS_Type_III_5.03in	13:00	0.36115
SCS_Type_III_5.03in	13:06	0.34908
SCS_Type_III_5.03in	13:12	0.33701
SCS_Type_III_5.03in	13:18	0.32494
SCS_Type_III_5.03in	13:24	0.31287
SCS_Type_III_5.03in	13:30	0.30079
SCS_Type_III_5.03in	13:36	0.28872
SCS_Type_III_5.03in	13:42	0.27665
SCS_Type_III_5.03in	13:48	0.26458
SCS_Type_III_5.03in	13:54	0.25251
SCS_Type_III_5.03in	14:00	0.24345
SCS_Type_III_5.03in	14:06	0.23792
SCS_Type_III_5.03in	14:12	0.23188
SCS_Type_III_5.03in	14:18	0.22635
SCS_Type_III_5.03in	14:24	0.22031
SCS_Type_III_5.03in	14:30	0.21478
SCS_Type_III_5.03in	14:36	0.20875
SCS_Type_III_5.03in	14:42	0.20321
SCS_Type_III_5.03in	14:48	0.19718
SCS_Type_III_5.03in	14:54	0.19164
SCS_Type_III_5.03in	15:00	0.18561
SCS_Type_III_5.03in	15:06	0.18007
SCS_Type_III_5.03in	15:12	0.17404
SCS_Type_III_5.03in	15:18	0.1685
SCS_Type_III_5.03in	15:24	0.16247
SCS_Type_III_5.03in	15:30	0.15694
SCS_Type_III_5.03in	15:36	0.1509
SCS_Type_III_5.03in	15:42	0.14537
SCS_Type_III_5.03in	15:48	0.13933
SCS_Type_III_5.03in	15:54	0.1338
SCS_Type_III_5.03in	16:00	0.12977
SCS_Type_III_5.03in	16:06	0.12676
SCS_Type_III_5.03in	16:12	0.12474
SCS_Type_III_5.03in	16:18	0.12173
SCS_Type_III_5.03in	16:24	0.11971
SCS_Type_III_5.03in	16:30	0.1167
SCS_Type_III_5.03in	16:36	0.11468
SCS_Type_III_5.03in	16:42	0.11167
SCS_Type_III_5.03in	16:48	0.10965
SCS_Type_III_5.03in	16:54	0.10664
SCS_Type_III_5.03in	17:00	0.10462
SCS_Type_III_5.03in	17:06	0.10161
SCS_Type_III_5.03in	17:12	0.09959
SCS_Type_III_5.03in	17:18	0.09658

SCS_Type_III_5.03in	17:24	0.09456
SCS_Type_III_5.03in	17:30	0.09155
SCS_Type_III_5.03in	17:36	0.08953
SCS_Type_III_5.03in	17:42	0.08652
SCS_Type_III_5.03in	17:48	0.0845
SCS_Type_III_5.03in	17:54	0.08149
SCS_Type_III_5.03in	18:00	0.07998
SCS_Type_III_5.03in	18:06	0.07947
SCS_Type_III_5.03in	18:12	0.07847
SCS_Type_III_5.03in	18:18	0.07797
SCS_Type_III_5.03in	18:24	0.07696
SCS_Type_III_5.03in	18:30	0.07646
SCS_Type_III_5.03in	18:36	0.07545
SCS_Type_III_5.03in	18:42	0.07495
SCS_Type_III_5.03in	18:48	0.07394
SCS_Type_III_5.03in	18:54	0.07344
SCS_Type_III_5.03in	19:00	0.07243
SCS_Type_III_5.03in	19:06	0.07193
SCS_Type_III_5.03in	19:12	0.07092
SCS_Type_III_5.03in	19:18	0.07042
SCS_Type_III_5.03in	19:24	0.06941
SCS_Type_III_5.03in	19:30	0.06891
SCS_Type_III_5.03in	19:36	0.06791
SCS_Type_III_5.03in	19:42	0.0674
SCS_Type_III_5.03in	19:48	0.0664
SCS_Type_III_5.03in	19:54	0.06589
SCS_Type_III_5.03in	20:00	0.06489
SCS_Type_III_5.03in	20:06	0.06489
SCS_Type_III_5.03in	20:12	0.06388
SCS_Type_III_5.03in	20:18	0.06338
SCS_Type_III_5.03in	20:24	0.06288
SCS_Type_III_5.03in	20:30	0.06237
SCS_Type_III_5.03in	20:36	0.06137
SCS_Type_III_5.03in	20:42	0.06137
SCS_Type_III_5.03in	20:48	0.06036
SCS_Type_III_5.03in	20:54	0.06036
SCS_Type_III_5.03in	21:00	0.05935
SCS_Type_III_5.03in	21:06	0.05885
SCS_Type_III_5.03in	21:12	0.05835
SCS_Type_III_5.03in	21:18	0.05784
SCS_Type_III_5.03in	21:24	0.05684
SCS_Type_III_5.03in	21:30	0.05684
SCS_Type_III_5.03in	21:36	0.05583
SCS_Type_III_5.03in	21:42	0.05583
SCS_Type_III_5.03in	21:48	0.05483
SCS_Type_III_5.03in	21:54	0.05432

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SCS_Type_III_5.03in            22:00      0.05382
SCS_Type_III_5.03in            22:06      0.05332
SCS_Type_III_5.03in            22:12      0.05231
SCS_Type_III_5.03in            22:18      0.05231
SCS_Type_III_5.03in            22:24      0.05131
SCS_Type_III_5.03in            22:30      0.05131
SCS_Type_III_5.03in            22:36      0.0503
SCS_Type_III_5.03in            22:42      0.0498
SCS_Type_III_5.03in            22:48      0.04929
SCS_Type_III_5.03in            22:54      0.04879
SCS_Type_III_5.03in            23:00      0.04779
SCS_Type_III_5.03in            23:06      0.04778
SCS_Type_III_5.03in            23:12      0.04678
SCS_Type_III_5.03in            23:18      0.04678
SCS_Type_III_5.03in            23:24      0.04577
SCS_Type_III_5.03in            23:30      0.04527
SCS_Type_III_5.03in            23:36      0.04477
SCS_Type_III_5.03in            23:42      0.04426
SCS_Type_III_5.03in            23:48      0.04326
SCS_Type_III_5.03in            23:54      0.04326

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Subcatch   A0                03252014_Import
Subcatch   A1                03252014_Import
Subcatch   A10               03252014_Import
Subcatch   A11               03252014_Import
Subcatch   A12               03252014_Import
Subcatch   A13_1             03252014_Import
Subcatch   A13_2             03252014_Import
Subcatch   A14               03252014_Import
Subcatch   A15               03252014_Import
Subcatch   A16               03252014_Import
......
Too many tags (93396 in total).

[MAP]
DIMENSIONS       376600.291683335 150475.547749986 383304.183383334 157230.895249984
UNITS            Feet
```

```
[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
10               377995.1           155032.589
12               378132.457         154733.162
15               378279.299         154417.899
16               378317.615         153731.179
17               378388.026         153470.367
18               378428.979         153689.476
23               380279.898         152318.662
24               378491.283         153886.128
27               378029.814         155038.128
4                378525.494         152325.925
......
Too many junction entities (24517 in total).

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
C8               378104.336         154784.84
C8               378026.178         155020.245
C9               377988.374         155032.038
C9               377877.538         155072.002
Culvert1         380325.142         153170.867
Culvert2         380335.574         153163.415
DP-019-1         377662.4           154874.849
DP-019-1         377642             155185.613
DP-019-2_2       377372.821         155750.73
DP-019-2_2       377319.443         155755.49
DP-019-2_3       377772.9           155197.608
DP-019-2_3       377708.545         155333.657
DP-021-25        380717.085         155514.602
DP-025-1         379224.905         154947.807
DP-025-1         379205.808         154967.772
DP-025-1         379190.183         154979.057
DP-025-1         379170.218         154991.21
DP-025-1         379155.461         154998.154
DP-025-1         379132.891         155007.703
DP-025-1         379106.85          155015.515
DP-025-1_1       379056.576         155009.671
DP-025-1_1       379035.742         155008.803
DP-025-1_1       379011.437         155002.726
DP-025-1_1       378985.395         154995.782
DP-025-1_1       378955.013         154981.893
DP-025-1_1       378934.18          154967.136
```

DP-025-1_1	378915.951	154952.379
DP-025-1_1	378897.721	154934.15
DP-025-1_1	378883.833	154917.657
DP-025-1_1	378869.944	154900.296
DP-025-1_1	378855.187	154882.934
DP-025-1_1	378842.166	154866.441
DP-025-1_2	378828.277	154843.004
DP-025-1_2	378816.992	154822.171
DP-025-1_2	378800.499	154790.053
DP-025-11	378307.486	153747.219
DP-025-11	378294.958	153767.276
DP-025-11	378266.674	153788.772
DP-025-11	378249.534	153824.766
DP-025-11	378254.676	153879.612
DP-025-11	378295.811	154129.852
DP-025-11	378302.667	154330.386
DP-025-12	378267.366	154434.119
DP-025-12	378229.644	154509.562
DP-025-13	378276.997	154438.934
DP-025-13	378238.473	154511.167
DP-025-16	377712.736	154331.686
DP-025-5	377886.081	155074.083
DP-025-7	378026.859	155039.235
DP-025-7	377997.827	155034.671
DP-025-8	378056.87	154946.112
DP-026-8	379508.833	154776.164
DP-026-8	379478.451	154782.24
DP-026-8	379459.353	154790.921
DP-026-8	379433.917	154806.415
DP-027-9	381513.658	154375.89
DP-028-09_1	382434.44	154110.844
DP-031-1	378379.482	153420.79
DP-031-3	378411.531	153682.159
DP-031-3	378321.564	153712.599
DP-031-5	378420.01	153706.266
DP-031-5	378329.744	153736.943
DP-031-9	377775.772	152762.234
DP-031-9	377768.881	152941.69
DP-031-9	377766.06	153015.8
DP-031-9	377791.667	153031.425
DP-031-9	377791.25	153130.027
DP-031-9	377780.383	153144.272
DP-031-9	377770.834	153205.036
DP-031-9	377769.098	153253.213
DP-032-2	379163.284	153822.103
DP-033-16	380810.781	153857.081

DP-033-2	380770.706	153926.236
DP-033-7	380840.504	153569.431
DP-037-10	378158.198	152627.268
DP-037-10	378159.935	152682.824
DP-037-10_1	378165.143	152745.324
DP-037-10_1	378173.824	152792.199
DP-037-10_1	378185.976	152833.865
DP-037-10_1	378201.601	152872.06
DP-037-10_1	378222.435	152905.046
DP-037-10_1	378251.949	152936.296
DP-037-17	378804.272	152277.208
DP-038-10	379354.746	152516.496
DP-038-15	379179.251	152724.982
DP-038-16	379037.88	152340.94
DP-038-8	379243.365	152503.735
DP-039-18	380410.144	153395.299
DP-039-18	380405.172	153376.413
DP-039-20	380396.172	152952.928
DP-039-20	380373.721	153068.126
DP-039-21	380439.684	152657.161
DP-044-11	378681.04	151902.893
DP-044-28	378525.518	152325.833
DP-044-29	378626.118	151887.42
DP-044-6	378646.393	151892.189
DP-045-10	379471.709	151742.254
DP-045-13	379679.866	151798.399
DP-045-26	379735.048	152171.026
DP-045-26	379672.195	152156.195
DP-045-31	379448.283	151744.679
DP-045-31	379361.81	152066.123
DP-045-36	379728.745	151636.135
DP-045-39	379965.734	151523.971
DP-045-7	378891.67	151925.666
DP-051-19_2	379876.391	151141.394
DP-C13-044	378166.994	152120.313
DP-C13-044	378158.875	152218.109
DP-WS7-A39	378724.433	154655.28
DP-WS7-A39	378711.629	154690.625
DP-WS7-A39	378702.901	154699.283
DP-WS7-A39	378686.142	154704.587
DP-WS7-A39	378667.392	154700.542
DP-WS7-A39	378655.343	154695.844
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A14	380139.353	152662.925
A14	380116.303	152665.54
A14	380060.461	152667.206
A14	380047.439	152663.548
A14	380027.858	152659.699
A14	380014.836	152656.04
A14	379991.786	152658.656
A14	379975.58	152651.623
A14	379965.837	152648.059
A14	379952.91	152641.121
A14	379841.509	152634.616
A14	379831.766	152631.052
A14	379822.024	152627.488
A14	379812.281	152623.925
A14	379796.074	152616.892
A14	379770.03	152609.574
A14	379760.097	152612.569
A14	379750.165	152615.563
A14	379740.232	152618.558
A14	379720.366	152624.548
A14	379714.092	152614.52
A14	379704.444	152607.677
A14	379698.36	152591.091

A14	379681.869	152593.896
A14	379668.562	152600.075
A14	379658.535	152606.349
A14	379645.228	152612.528
A14	379631.921	152618.707
A14	379621.989	152621.702
A14	379582.543	152623.842
A14	379575.7	152633.49
A14	379565.672	152639.764
A14	379558.829	152649.412
A14	379551.891	152662.34
A14	379548.327	152672.083
A14	379538.394	152675.077
A14	379528.367	152681.351
A14	379518.34	152687.625
A14	379508.312	152693.899
A14	379491.726	152699.983
A14	379481.793	152702.978
A14	379471.766	152709.252
A14	379470.722	152745.324
A14	379467.063	152758.346
A14	379457.036	152764.62
A14	379456.087	152797.412
A14	379452.523	152807.155
A14	379442.496	152813.429
A14	379432.468	152819.703
A14	379425.53	152832.63
A14	379415.503	152838.904
A14	379408.66	152848.552
A14	379398.632	152854.826
A14	379391.789	152864.474
A14	379381.761	152870.748
A14	379374.918	152880.396
A14	379364.891	152886.67
A14	379358.048	152896.318
A14	379344.741	152902.497
A14	379331.434	152908.676
A14	379321.407	152914.95
A14	379308.1	152921.129
A14	379298.072	152927.403
A14	379291.229	152937.051
A14	379281.202	152943.325
A14	379274.359	152952.973
A14	379264.331	152959.247
A14	379257.488	152968.895
A14	379247.46	152975.169

A14	379240.617	152984.817
A14	379230.59	152991.091
A14	379223.747	153000.739
A14	379213.719	153007.013
A14	379206.876	153016.661
A14	379196.849	153022.935
A14	379190.006	153032.583
A14	379182.244	153187.425
A14	379231.616	153182.513
A14	379244.782	153181.203
A14	379265.245	153179.167
A14	379304.074	153173.727
A14	379310.917	153164.079
A14	379320.59	153161.076
A14	379330.815	153154.737
A14	379346.864	153159.322
A14	379351.449	153162.991
A14	379366.759	153162.412
A14	379376.692	153159.418
A14	379376.218	153175.814
A14	379389.335	153176.194
A14	379408.916	153180.042
A14	379411.91	153189.975
A14	379421.558	153196.817
A14	379427.832	153206.845
A14	379441.322	153201.049
A14	379447.887	153194.297
A14	379457.82	153191.303
A14	379469.963	153198.218
A14	379487.238	153195.436
A14	379506.863	153192.721
A14	379505.402	153248.276
A14	379527.357	153231.419
A14	379548.232	153211.243
A15	380392.816	153781.859
A15	380407.585	153487.905
A15	380383.248	153421.56
A15	380347.448	153184.22
A15	379835.795	153064.472
A15	379732.67	153095.353
A15	379548.232	153211.243
A15	379527.357	153231.419
A15	379505.402	153248.276
A15	379505.028	153261.191
A15	379503.593	153310.779
A15	379641.322	153314.764

A15	379946.389	153320.307
A15	379959.316	153327.245
A15	379965.59	153337.273
A15	379975.332	153340.837
A15	379978.327	153350.77
A15	379984.506	153364.076
A15	379990.685	153377.383
A15	380000.333	153384.226
A15	380006.607	153394.254
A15	380016.255	153401.097
A15	380022.529	153411.124
A15	380032.177	153417.968
A15	380038.451	153427.995
A15	380048.099	153434.838
A15	380050.904	153451.329
A15	380060.552	153458.173
A15	380066.826	153468.2
A15	380076.474	153475.043
A15	380079.374	153488.255
A15	380082.368	153498.188
A15	380088.642	153508.215
A15	380091.352	153527.986
A15	380100.906	153538.108
A15	380110.554	153544.951
A15	380116.828	153554.979
A15	380123.101	153565.006
A15	380126.096	153574.939
A15	380135.744	153581.782
A15	380141.923	153595.089
A15	380151.571	153601.932
A15	380155.853	153680.824
A15	380162.127	153690.852
A15	380168.401	153700.879
A15	380171.111	153720.65
A15	380167.167	153743.51
A15	380176.815	153750.353
A15	380179.81	153760.286
A15	380189.458	153767.129
A15	380195.732	153777.156
A15	380198.726	153787.089
A15	380204.811	153803.675
A15	380211.085	153813.702
A15	380217.264	153827.009
A15	380227.006	153830.573
A15	380236.749	153834.137
A15	380243.023	153844.165

A15	380252.671	153851.008
A15	380258.945	153861.035
A15	380268.593	153867.878
A15	380274.867	153877.906
A15	380284.61	153881.47
A15	380290.694	153898.056
A15	380300.342	153904.899
A15	380306.616	153914.927
A15	380316.264	153921.77
A15	380322.538	153931.797
A15	380342.024	153938.925
A15	380392.816	153781.859
A16	380038.451	153427.995
A16	380032.177	153417.968
A16	380022.529	153411.124
A16	380016.255	153401.097
A16	380006.607	153394.254
A16	380000.333	153384.226
A16	379990.685	153377.383
A16	379984.506	153364.076
A16	379978.327	153350.77
A16	379975.332	153340.837
A16	379965.59	153337.273
A16	379959.316	153327.245
A16	379946.389	153320.307
A16	379641.322	153314.764
A16	379503.593	153310.779
A16	379505.028	153261.191
A16	379488.748	153291.464
A16	379436.575	153426.76
A16	379414.917	153426.366
A16	379436.575	153426.76
A16	379542.619	153436.624
A16	379552.267	153443.468
A16	379558.541	153453.495
A16	379564.815	153463.522
A16	379574.557	153467.086
A16	379584.3	153470.65
A16	379600.602	153474.404
A16	379610.345	153477.968
A16	379626.551	153485.001
A16	379701.879	153490.462
A16	379990.359	153502.09
A16	380000.008	153508.933
A16	380006.281	153518.961
A16	380026.3	153519.54

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A16              380071.867         153520.858
A16              380078.141         153530.886
A16              380100.906         153538.108
A16              380091.352         153527.986
A16              380088.642         153508.215
A16              380082.368         153498.188
A16              380079.374         153488.255
A16              380076.474         153475.043
A16              380066.826         153468.2
A16              380060.552         153458.173
A16              380050.904         153451.329
A16              380048.099         153434.838
A16              380038.451         153427.995
......
Too many subcatchment entities (97 in total).

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
```

Model Inputs – Proposed Conditions

```
[TITLE]
;;Project Title/Notes
This model builds off the baseline conditions model, which contains the updates from RIDOT's Reconstruction of the Pell Bridge Ap

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           07/14/2020
START_TIME           00:00:00
REPORT_START_DATE    07/14/2020
REPORT_START_TIME    00:00:00
END_DATE             07/15/2020
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:01:00
DRY_STEP             00:05:00
ROUTING_STEP         0.5
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         1
MAX_TRIALS           30
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.001
THREADS              5

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
```

```
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- -------- -------- ----------
10yr_24hr_DS_6min_INT INTENSITY 0:06     1.0      TIMESERIES SCS_Type_III_5.03in

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
;Updated by EO on 3.28.22: changed outlet
A0               10yr_24hr_DS_6min_INT J1732       9.862046 18.322   441.972  10.984   0
;Updated by EO on 3.28.22: changed outlet
A1               10yr_24hr_DS_6min_INT J2599       9.271104 1.1      506.12   14.097   0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A10              10yr_24hr_DS_6min_INT A39_J       5.556311 56.82    398.539  11.265   0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A11              10yr_24hr_DS_6min_INT CB-026-76   2.595391 32.396   271.48   8.369    0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A12              10yr_24hr_DS_6min_INT Dum_031-9   55.14121 63.173   2227.866 2.981    0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A13_1            10yr_24hr_DS_6min_INT DMH-032-33  17.406937 95      592.899  3.16     0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A13_2            10yr_24hr_DS_6min_INT A28_J       1.605553 25       110.316  3.16     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A14              10yr_24hr_DS_6min_INT DMH-Gar-1   12.1153  37.993   683.693  4.51     0
A15              10yr_24hr_DS_6min_INT MalboneChannel1 7.215144 1.575 368.561 5.66     0
A16              10yr_24hr_DS_6min_INT SU3         2.189369 0        143.709  5.49     0
A17              10yr_24hr_DS_6min_INT SU3         3.1865   69.303   250.765  7.126    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A18              10yr_24hr_DS_6min_INT J10097      6.349541 45.64    270.887  4.818    0
A19              10yr_24hr_DS_6min_INT DMH-045-33  5.981308 53.475   274.251  5.296    0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_1             10yr_24hr_DS_6min_INT A55_J       0.567842 45       94.33    12.558   0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_2             10yr_24hr_DS_6min_INT CB-025-19   0.877582 38.958   184.55   12.558   0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure.
A2_3             10yr_24hr_DS_6min_INT IN-WS-7     2.778846 20       207.339  12.558   0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_4             10yr_24hr_DS_6min_INT A12_J       0.507651 45       107.669  12.558   0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A2_5             10yr_24hr_DS_6min_INT A11_J       0.488535 38.958   103.039  12.558   0
;Updated by EO on 6.21.22: updated outlet.
A20              10yr_24hr_DS_6min_INT SU2         9.0555   67.646   607.27   4.098    0
;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A21_1            10yr_24hr_DS_6min_INT A37_J       5.337168 65       168.973  8.523    0
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;Split by EO on 6.21.22 due to new RIDOT Pell Bridge infrastructure
A21_2            10yr_24hr_DS_6min_INT A13         1.285716 30       168.368  8.523    0
A22              10yr_24hr_DS_6min_INT 12          17.874451 82.552  680.974  3.563    0
A23              10yr_24hr_DS_6min_INT DMH-044-69  6.517371 47.926   246.564  5.146    0
;Updated by EO on 3.29.22: changed outlet
A24              10yr_24hr_DS_6min_INT DMH-045-49  6.767905 57.154   329.403  1.634    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A25              10yr_24hr_DS_6min_INT C13         5.574783 55.874   205.798  4.297    0
A26              10yr_24hr_DS_6min_INT CB-044-75   3.231058 66.449   237.189  3.387    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A27              10yr_24hr_DS_6min_INT CB-050-34   3.396114 50.372   219.987  6.835    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A28              10yr_24hr_DS_6min_INT CB-037-86   6.024608 14.471   454.357  5.399    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A29              10yr_24hr_DS_6min_INT CB-026-91   4.261817 37.121   199.84   14.737   0
A3               10yr_24hr_DS_6min_INT SU2         24.451847 58.13   622.032  4.541    0
;Updated by EO on 6.21.22: updated outlet.
A30              10yr_24hr_DS_6min_INT DMH-025-62  4.653138 70.007   390.714  3.186    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A31              10yr_24hr_DS_6min_INT J9512       1.9465   61.794   342.242  2.042    0
A32              10yr_24hr_DS_6min_INT DMH-038-8   0.912043 41.901   123.7    1.213    0
A33              10yr_24hr_DS_6min_INT DMH-038-8   1.486232 34.417   199.172  3.08     0
A34              10yr_24hr_DS_6min_INT DMH-038-24  0.803157 54.226   113.745  2.846    0
A35              10yr_24hr_DS_6min_INT DMH-038-24  1.764976 65.124   138.682  3.626    0
A36              10yr_24hr_DS_6min_INT DMH-045-26  0.892069 69.151   103.724  2.615    0
A37              10yr_24hr_DS_6min_INT DMH-045-23  1.642409 69.918   94.915   4.334    0
A38              10yr_24hr_DS_6min_INT DMH-045-23  0.378077 85.95    118.735  3.285    0
A39              10yr_24hr_DS_6min_INT DMH-045-35  1.711119 71.042   233.21   3.155    0
A4               10yr_24hr_DS_6min_INT SU3         12.974479 8.103   442.53   7.461    0
A40              10yr_24hr_DS_6min_INT DMH-045-35  1.129771 64.246   141.242  3.597    0
A41              10yr_24hr_DS_6min_INT DMH-045-35  1.798022 82.191   202.696  3.621    0
A42              10yr_24hr_DS_6min_INT DMH-051-39  5.07769  66.912   249.529  3.043    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A43              10yr_24hr_DS_6min_INT J13620      3.743771 64.961   156.317  1.28     0
A44              10yr_24hr_DS_6min_INT DMH-045-40  6.907604 55.872   303.036  4.289    0
A45              10yr_24hr_DS_6min_INT DMH-045-45  4.686171 75.248   375.848  1.473    0
A46              10yr_24hr_DS_6min_INT CB-045-38   1.181965 61.064   108.986  3.561    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A47              10yr_24hr_DS_6min_INT J11663      1.948188 66.348   234.783  3.489    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A48              10yr_24hr_DS_6min_INT J11782      3.186529 73.813   200.832  3.226    0
A49              10yr_24hr_DS_6min_INT DMH-038-15  1.9485   77.32    189.801  1.306    0
A5               10yr_24hr_DS_6min_INT DMH-045-24  8.076291 63.396   362.664  3.853    0
A50              10yr_24hr_DS_6min_INT DMH-038-15  0.781215 53.268   151.41   0.358    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A51              10yr_24hr_DS_6min_INT C3          9.184796 35.632   356.37   3.787    0
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A52               10yr_24hr_DS_6min_INT DMH-037-89  1.392598 56.602   166.057  1.917    0
A53               10yr_24hr_DS_6min_INT D1          5.4754   91.894   404.023  3.212    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A54               10yr_24hr_DS_6min_INT CB-044-74   1.575882 47.389   112.285  14.644   0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
A55               10yr_24hr_DS_6min_INT M60         3.094246 40.925   294.568  5.16     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A56               10yr_24hr_DS_6min_INT J12750      3.322986 49.166   178.476  3.837    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
A57               10yr_24hr_DS_6min_INT J12970      3.111877 39.089   208.067  4.451    0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 6.21.22: changed outlet and width/flow length for added RI
A58               10yr_24hr_DS_6min_INT M26         2.342303 35.727   226.308  8.606    0
A59               10yr_24hr_DS_6min_INT DMH-044-21  1.399596 66.697   163.804  4.025    0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A6                10yr_24hr_DS_6min_INT DMH-026-4   5.808772 76.959   131.581  5.999    0
;Updated by EO on 3.28.22: changed width/flow length
A60               10yr_24hr_DS_6min_INT 9           27.685575 69.686  517.916  4.406    0
;Updated by EO on 3.28.22: changed outlet
A7                10yr_24hr_DS_6min_INT J2287       5.624072 1.148    306.483  14.275   0
;Updated by EO on 3.28.22: changed outlet and width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length fo
A8                10yr_24hr_DS_6min_INT DMH-026-4   3.353072 46.841   130.644  6.176    0
;Updated by EO on 4.4.22: changed outlet and width/flow length for added RIDOT infrastructure
A9                10yr_24hr_DS_6min_INT DMH-026-4   3.122486 81.883   165.885  3.795    0
Beacon            10yr_24hr_DS_6min_INT DMH-016-21  4.188447 68       482      5.29     0
;Updated by EO on 3.28.22: changed width/flow length
Beacon_Middletown 10yr_24hr_DS_6min_INT DMH-016-21 5.223106 44       115.272  5.29     0
Bedlow            10yr_24hr_DS_6min_INT DMH-033-35  17.136437 67      975      5.47     0
;Updated by EO on 3.29.22: changed outlet to account for street flow Split subcatchment 20220707 MMD
Burdick_1         10yr_24hr_DS_6min_INT J8591       2.619685 57       281.615  13.12    0
;Updated by EO on 3.29.22: changed outlet to account for street flow, Split subcatchment 20220707 MMD
Burdick_2         10yr_24hr_DS_6min_INT J7891       2.180337 57       234.385  13.12    0
Cumming           10yr_24hr_DS_6min_INT DMH-033-37  3.560011 56       444      4.69     0
Dexter            10yr_24hr_DS_6min_INT DMH-027-7   11.879784 47      812      7.93     0
;Updated by EO on 3.28.22: changed outlet
Dexter_Middletown_Lower 10yr_24hr_DS_6min_INT J23936 13.052338 61    851      7.93     0
;Updated by EO on 3.28.22: changed width/flow length
Dexter_Middletown_Upper 10yr_24hr_DS_6min_INT DMH-027-7 18.317223 52 282.603  5.59     0
;Updated by EO on 3.28.22: changed outlet
Dexter_Stormwall 10yr_24hr_DS_6min_INT J15904      2.871491 1        399      10.19    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Dudley            10yr_24hr_DS_6min_INT J3790       8.025331 26       667      7.02     0
;Updated by EO on 3.28.22: changed outlet
Dudley_Middletown 10yr_24hr_DS_6min_INT J23263     1.561469 29       294      7.02     0
;Updated by EO on 3.28.22: changed outlet
Dudley_Stormwall 10yr_24hr_DS_6min_INT J15670      5.455658 2        550      8.97     0
Eisenhower        10yr_24hr_DS_6min_INT DMH-021-45  12.844843 60      844      5.59     0
```

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;Updated by EO on 3.28.22: changed outlet
Eisenhower_Middletown 10yr_24hr_DS_6min_INT J1298  0.828575 44       214      5.29     0
;Updated by EO on 3.28.22: changed outlet
Eisenhower_Stormwall 10yr_24hr_DS_6min_INT J15862  4.882416 2        520      7.72     0
Hillside_L       10yr_24hr_DS_6min_INT DMH-033-45  2.822726 40       396      5.56     0
Hillside_R       10yr_24hr_DS_6min_INT DMH-033-45  3.652676 69       450      6.11     0
;Updated by EO on 4.4.22: changed outlet due to added RIDOT infrastructure; Updated by EO on 4.4.22: changed outlet and width/flo
Kalbfus          10yr_24hr_DS_6min_INT DMH-027-15  11.797277 52      558.478  6.82     0
;Updated by EO on 3.28.22: changed width/flow length; Updated by EO on 4.4.22: changed outlet and width/flow length for added RID
Kalbfus_Middletown 10yr_24hr_DS_6min_INT CB-028-101 14.735068 67     783.271  6.82     0
;Updated by EO on 3.28.22: changed outlet; Updated by EO on 4.4.22: changed outlet due to added RIDOT infrastructure
Kalbfus_Stormwall 10yr_24hr_DS_6min_INT CB-027-2   0.403628 9        150      12.38    0
Kennedy          10yr_24hr_DS_6min_INT Kennedy_MH  7.682963 60       653      7.03     0
;Updated by EO on 3.28.22: changed outlet
Kennedy_Middletown 10yr_24hr_DS_6min_INT J23738    1.000335 34       236      7.03     0
Kennedy_Stormwall 10yr_24hr_DS_6min_INT J15790     2.846935 26       397      12.33    0
Madeline         10yr_24hr_DS_6min_INT DMH-046-61  4.786957 51       515      8.34     0
Malbone          10yr_24hr_DS_6min_INT DMH-039-42  1.400517 67       279      12.31    0
Pennacook_L      10yr_24hr_DS_6min_INT DMH-033-38  4.690246 76       510      6.37     0
Pennacook_R      10yr_24hr_DS_6min_INT DMH-033-38  13.694345 57     872      5.68     0
;Updated by EO on 3.29.22: changed outlet to account for street flow Split subcatchment 20220707 MMD
Russell_1        10yr_24hr_DS_6min_INT J9480       3.114373 55       298.767  6.89     0
;Updated by EO on 3.29.22: changed outlet to account for street flow Split subcatchment 20220707 MMD
Russell_2        10yr_24hr_DS_6min_INT J8454       2.92118  55       280.234  6.89     0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Smith            10yr_24hr_DS_6min_INT DMH-Sm-2    5.120813 54       467.617  16.24    0
;Updated by EO on 3.29.22: changed outlet to account for street flow
Thurston         10yr_24hr_DS_6min_INT J8304       2.92801  58       403      3.64     0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A0               0.018      0.2        0.05       0.1        25         OUTLET
A1               0.018      0.2        0.05       0.1        25         OUTLET
A10              0.018      0.2        0.05       0.1        25         OUTLET
A11              0.018      0.2        0.05       0.1        25         OUTLET
A12              0.018      0.2        0.05       0.1        25         OUTLET
A13_1            0.018      0.2        0.05       0.1        25         OUTLET
A13_2            0.018      0.2        0.05       0.1        25         OUTLET
A14              0.018      0.2        0.05       0.1        25         OUTLET
A15              0.018      0.2        0.05       0.1        25         OUTLET
A16              0.018      0.2        0.05       0.1        25         OUTLET
A17              0.018      0.2        0.05       0.1        25         OUTLET
A18              0.018      0.2        0.05       0.1        25         OUTLET
A19              0.018      0.2        0.05       0.1        25         OUTLET
A2_1             0.018      0.2        0.05       0.1        25         OUTLET
```

A2_2	0.018	0.2	0.05	0.1	25	OUTLET
A2_3	0.018	0.2	0.05	0.1	25	OUTLET
A2_4	0.018	0.2	0.05	0.1	25	OUTLET
A2_5	0.018	0.2	0.05	0.1	25	OUTLET
A20	0.018	0.2	0.05	0.1	25	OUTLET
A21_1	0.018	0.2	0.05	0.1	25	OUTLET
A21_2	0.018	0.2	0.05	0.1	25	OUTLET
A22	0.018	0.2	0.05	0.1	25	OUTLET
A23	0.018	0.2	0.05	0.1	25	OUTLET
A24	0.018	0.2	0.05	0.1	25	OUTLET
A25	0.018	0.2	0.05	0.1	25	OUTLET
A26	0.018	0.2	0.05	0.1	25	OUTLET
A27	0.018	0.2	0.05	0.1	25	OUTLET
A28	0.018	0.2	0.05	0.1	25	OUTLET
A29	0.018	0.2	0.05	0.1	25	OUTLET
A3	0.018	0.2	0.05	0.1	25	OUTLET
A30	0.018	0.2	0.05	0.1	25	OUTLET
A31	0.018	0.2	0.05	0.1	25	OUTLET
A32	0.018	0.2	0.05	0.1	25	OUTLET
A33	0.018	0.2	0.05	0.1	25	OUTLET
A34	0.018	0.2	0.05	0.1	25	OUTLET
A35	0.018	0.2	0.05	0.1	25	OUTLET
A36	0.018	0.2	0.05	0.1	25	OUTLET
A37	0.018	0.2	0.05	0.1	25	OUTLET
A38	0.018	0.2	0.05	0.1	25	OUTLET
A39	0.018	0.2	0.05	0.1	25	OUTLET
A4	0.018	0.2	0.05	0.1	25	OUTLET
A40	0.018	0.2	0.05	0.1	25	OUTLET
A41	0.018	0.2	0.05	0.1	25	OUTLET
A42	0.018	0.2	0.05	0.1	25	OUTLET
A43	0.018	0.2	0.05	0.1	25	OUTLET
A44	0.018	0.2	0.05	0.1	25	OUTLET
A45	0.018	0.2	0.05	0.1	25	OUTLET
A46	0.018	0.2	0.05	0.1	25	OUTLET
A47	0.018	0.2	0.05	0.1	25	OUTLET
A48	0.018	0.2	0.05	0.1	25	OUTLET
A49	0.018	0.2	0.05	0.1	25	OUTLET
A5	0.018	0.2	0.05	0.1	25	OUTLET
A50	0.018	0.2	0.05	0.1	25	OUTLET
A51	0.018	0.2	0.05	0.1	25	OUTLET
A52	0.018	0.2	0.05	0.1	25	OUTLET
A53	0.018	0.2	0.05	0.1	25	OUTLET
A54	0.018	0.2	0.05	0.1	25	OUTLET
A55	0.018	0.2	0.05	0.1	25	OUTLET
A56	0.018	0.2	0.05	0.1	25	OUTLET
A57	0.018	0.2	0.05	0.1	25	OUTLET

```
A58             0.018      0.2        0.05       0.1        25         OUTLET
A59             0.018      0.2        0.05       0.1        25         OUTLET
A6              0.018      0.2        0.05       0.1        25         OUTLET
A60             0.018      0.2        0.05       0.1        25         OUTLET
A7              0.018      0.2        0.05       0.1        25         OUTLET
A8              0.018      0.2        0.05       0.1        25         OUTLET
A9              0.018      0.2        0.05       0.1        25         OUTLET
Beacon          0.018      0.2        0.05       0.1        25         OUTLET
Beacon_Middletown 0.018    0.2        0.05       0.1        25         OUTLET
Bedlow          0.018      0.2        0.05       0.1        25         OUTLET
Burdick_1       0.018      0.2        0.05       0.1        25         OUTLET
Burdick_2       0.018      0.2        0.05       0.1        25         OUTLET
Cumming         0.018      0.2        0.05       0.1        25         OUTLET
Dexter          0.018      0.2        0.05       0.1        25         OUTLET
Dexter_Middletown_Lower 0.018 0.2     0.05       0.1        25         OUTLET
Dexter_Middletown_Upper 0.018 0.2     0.05       0.1        25         OUTLET
Dexter_Stormwall 0.018     0.35       0.05       0.5        25         OUTLET
Dudley          0.018      0.2        0.05       0.1        25         OUTLET
Dudley_Middletown 0.018    0.2        0.05       0.1        25         OUTLET
Dudley_Stormwall 0.018     0.35       0.05       0.5        25         OUTLET
Eisenhower      0.018      0.2        0.05       0.1        25         OUTLET
Eisenhower_Middletown 0.018 0.2       0.05       0.1        25         OUTLET
Eisenhower_Stormwall 0.018  0.35      0.05       0.5        25         OUTLET
Hillside_L      0.018      0.2        0.05       0.1        25         OUTLET
Hillside_R      0.018      0.2        0.05       0.1        25         OUTLET
Kalbfus         0.018      0.2        0.05       0.1        25         OUTLET
Kalbfus_Middletown 0.018   0.2        0.05       0.1        25         OUTLET
Kalbfus_Stormwall 0.018    0.2        0.05       0.1        25         OUTLET
Kennedy         0.018      0.2        0.05       0.1        25         OUTLET
Kennedy_Middletown 0.018   0.2        0.05       0.1        25         OUTLET
Kennedy_Stormwall 0.018    0.35       0.05       0.5        25         OUTLET
Madeline        0.018      0.2        0.05       0.1        25         OUTLET
Malbone         0.018      0.2        0.05       0.1        25         OUTLET
Pennacook_L     0.018      0.2        0.05       0.1        25         OUTLET
Pennacook_R     0.018      0.2        0.05       0.1        25         OUTLET
Russell_1       0.018      0.2        0.05       0.1        25         OUTLET
Russell_2       0.018      0.2        0.05       0.1        25         OUTLET
Smith           0.018      0.2        0.05       0.1        25         OUTLET
Thurston        0.018      0.2        0.05       0.1        25         OUTLET

[INFILTRATION]
;;Subcatchment   Param1     Param2     Param3     Param4     Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
A0              6.69       0.26       0.15       0          0
A1              6.61       0.27       0.15       0          0
A10             4.47       0.42       0.15       0          0
```

A11	4.37	0.43	0.15	0	0
A12	6.24	0.61	0.15	0	0
A13_1	7.71	0.07	0.15	0	0
A13_2	7.71	0.07	0.15	0	0
A14	6.12	0.3	0.15	0	0
A15	6.33	0.29	0.15	0	0
A16	5.46	0.35	0.15	0	0
A17	5.75	0.28	0.15	0	0
A18	6.69	0.26	0.15	0	0
A19	6.69	0.26	0.15	0	0
A2_1	4.33	0.43	0.15	0	0
A2_2	4.33	0.43	0.15	0	0
A2_3	4.33	0.43	0.15	0	0
A2_4	4.33	0.43	0.15	0	0
A2_5	4.33	0.43	0.15	0	0
A20	6.08	0.24	0.15	0	0
A21_1	6.92	0.17	0.15	0	0
A21_2	6.92	0.17	0.15	0	0
A22	7.45	0.11	0.15	0	0
A23	5.33	0.35	0.15	0	0
A24	6.69	0.26	0.15	0	0
A25	5.98	0.31	0.15	0	0
A26	6.61	0.27	0.15	0	0
A27	4.45	0.42	0.15	0	0
A28	4.33	0.43	0.15	0	0
A29	6.15	0.3	0.15	0	0
A3	5.6	0.34	0.15	0	0
A30	5.38	0.32	0.15	0	0
A31	7.05	0.2	0.15	0	0
A32	6.69	0.26	0.15	0	0
A33	6.69	0.26	0.15	0	0
A34	6.69	0.26	0.15	0	0
A35	6.69	0.26	0.15	0	0
A36	6.69	0.26	0.15	0	0
A37	6.69	0.26	0.15	0	0
A38	6.69	0.26	0.15	0	0
A39	6.69	0.26	0.15	0	0
A4	6.53	0.25	0.15	0	0
A40	6.69	0.26	0.15	0	0
A41	6.69	0.26	0.15	0	0
A42	6.69	0.26	0.15	0	0
A43	6.69	0.26	0.15	0	0
A44	6.69	0.26	0.15	0	0
A45	6.69	0.26	0.15	0	0
A46	6.69	0.26	0.15	0	0
A47	6.69	0.26	0.15	0	0

A48	6.69	0.26	0.15	0	0
A49	6.33	0.29	0.15	0	0
A5	6.69	0.26	0.15	0	0
A50	6.13	0.3	0.15	0	0
A51	6.67	0.26	0.15	0	0
A52	6.56	0.27	0.15	0	0
A53	7.5	0.09	0.15	0	0
A54	4.33	0.43	0.15	0	0
A55	4.33	0.43	0.15	0	0
A56	6.69	0.26	0.15	0	0
A57	6.69	0.26	0.15	0	0
A58	4.33	0.43	0.15	0	0
A59	6.69	0.26	0.15	0	0
A6	6.69	0.26	0.15	0	0
A60	6.63	0.21	0.15	0	0
A7	6.42	0.28	0.15	0	0
A8	6.12	0.3	0.15	0	0
A9	6.34	0.29	0.15	0	0
Beacon	8.27	0.1	0.15	0	0
Beacon_Middletown	8.27	0.15	0.15	0	0
Bedlow	8.27	0.1	0.15	0	0
Burdick_1	8.27	0.1	0.15	0	0
Burdick_2	8.27	0.1	0.15	0	0
Cumming	7.92	0.11	0.17	0	0
Dexter	8.27	1.89	0.15	0	0
Dexter_Middletown_Lower	8.27	0.18	0.15	0	0
Dexter_Middletown_Upper	8.27	0.64	0.15	0	0
Dexter_Stormwall	6.26	0.86	0.22	0	0
Dudley	8.27	1.3	0.15	0	0
Dudley_Middletown	8.27	0.1	0.15	0	0
Dudley_Stormwall	6.79	0.51	0.21	0	0
Eisenhower	8.27	0.1	0.15	0	0
Eisenhower_Middletown	8.27	0.1	0.15	0	0
Eisenhower_Stormwall	6.28	0.79	0.22	0	0
Hillside_L	7.58	0.15	0.18	0	0
Hillside_R	8.27	0.1	0.15	0	0
Kalbfus	8.2	0.11	0.16	0	0
Kalbfus_Middletown	8.27	0.1	0.15	0	0
Kalbfus_Stormwall	6.71	0.33	0.22	0	0
Kennedy	8.27	0.1	0.15	0	0
Kennedy_Middletown	8.27	0.1	0.15	0	0
Kennedy_Stormwall	6.86	0.52	0.21	0	0
Madeline	8.27	0.1	0.15	0	0
Malbone	7.43	0.1	0.19	0	0
Pennacook_L	6.84	0.16	0.21	0	0
Pennacook_R	8.27	0.1	0.15	0	0

```
Russell_1        8.27       0.1        0.15       0          0
Russell_2        8.27       0.1        0.15       0          0
Smith            8.06       0.1        0.16       0          0
Thurston         8.27       0.1        0.15       0          0

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
;Phase2_Alternative
10               -2.27      11.82      0          30         0
;Phase2_Alternative
12               -1.92      8.81       0          30         0
;Phase2_Alternative
15               -1.51      8.81       0          30         0
;Updated by EO on 5.10.22: changed flow direction & invert/rim elevations as per the City's GIS.
23               49.949     9          0          30         0
;Phase2_Alternative
27               -2.22      12.22      0          30         0
;Phase1A_Alternative
4                5.363      5.373      0          30         0
;Updated by EO on 6.8.22: changed invert.
6                -2.72      8.72       0          30         0
;Updated by EO on 6.8.22: changed invert.
7                -3.33      8.73       0          30         0
;Phase2_Alternative
9                -2.42      9.12       0          30         0
;Proposed (RIDOT Pell Bridge Improvement Plans)
A10              3.39       5.64       0          30         0
......
Too many junction entities (24511 in total).

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
;Updated by EO on 6.10.22: Changed the invert elevation from 1 to -4 ft to account for the new inverts from RIDOT plans.
8                -4         TIMESERIES July_14_Tides_ADJ NO
;Added by EO on 4.25.22 to fix glass wall effect.
Dum_GW_Outfall   1          FREE                        NO

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------          -------- -----
;Alternative 1 MMD 20220707
SU1              1.595    9          0          TABULAR    SU1                          0        0
;Alternative 1 MMD 20220707
SU2              -1.51    8          0          TABULAR    SU2                          0        0
```

```
;Added on 7.15.22
SU3              2.27     11         0          TABULAR    SU3                      30       0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
;GENERAL DRAINAGE MAP
....             DMH-027-11       DMH-027-14       202.557    0.018      0          0          0          0
C10              J14350           J14356           13.409     0.012      0          0          0          0
C100             J16296           J16314           29.424     0.05       0          0          0          0
C1000            J16976           J16980           27.833     0.16       0          0          0          0
C10000           J17517           J17499           28.323     0.16       0          0          0          0
C10001           J17500           J17517           28.418     0.16       0          0          0          0
C10002           J17510           J11900           17.724     0.16       0          0          0          0
C10003           J11900           J11899           12.516     0.012      0          0          0          0
C10004           J11900           J11848           11.392     0.012      0          0          0          0
C10005           J17407           J17406           25.194     0.16       0          0          0          0
......
Too many conduit entities (68749 in total).

[ORIFICES]
;;Name           From Node        To Node          Type         Offset     Qcoeff     Gated    CloseTime
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- ----------
OR1              J22194           10               BOTTOM       0          0.65       NO       0
OR10             J11018           4                BOTTOM       0          0.65       NO       0
OR100            J3319            Dum_025-1        BOTTOM       0          0.65       NO       0
OR101            J22270           Dum_019-1        BOTTOM       0          0.65       NO       0
OR102            J19719           Dum_025-16       BOTTOM       0          0.65       NO       0
OR103            J9735            Dum_031-9        BOTTOM       0          0.65       NO       0
OR104            J10080           CB-037-88_BB     BOTTOM       0          0.65       NO       0
;Phase1A_Alternative
OR105            J8689            M60              BOTTOM       0          0.65       NO       0
;Phase1B_Alternative
OR106            J9917            DMH-038-15       BOTTOM       0          0.65       NO       0
OR107            J5878            CB-034-66        BOTTOM       0          0.65       NO       0
OR108            J21914           CB-026-70        BOTTOM       0          0.65       NO       0
OR109            J21042           CB-026-86        BOTTOM       0          0.65       NO       0
OR11             J14972           6                BOTTOM       0          0.65       NO       0
OR110            J3500            CB-026-87        BOTTOM       0          0.65       NO       0
OR111            J3571            CB-026-91        BOTTOM       0          0.65       NO       0
OR112            J3706            CB-027-2         BOTTOM       0          0.65       NO       0
OR113            J3694            CB-026-74        BOTTOM       0          0.65       NO       0
OR114            J21944           CB-026-75        BOTTOM       0          0.65       NO       0
OR115            J14947           CB-026-76        BOTTOM       0          0.65       NO       0
;Phase1A_Alternative
OR116            J19665           CB-037-86        BOTTOM       0          0.65       NO       0
```

;Added to convey flow in non-modeled channel.							
OR117	J19701	M26	BOTTOM	0	0.65	NO	0
OR118	J11202	CB-044-74	BOTTOM	0	0.65	NO	0
OR119	J12254	C13	BOTTOM	0	0.65	NO	0
OR12	J22186	9	BOTTOM	0	0.65	NO	0
OR120	J13361	C3	BOTTOM	0	0.65	NO	0
OR121	J13650	CB-050-34	BOTTOM	0	0.65	NO	0
OR122	J3286	CB-028-101	BOTTOM	0	0.65	NO	0
OR123	J4799	CB-028-105	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR124	J10395	DMH-039-34_US	BOTTOM	0	0.65	NO	0
;Added to convey flow in non-modeled channel.							
OR125	J19936	M26	BOTTOM	0	0.65	NO	0
OR126	J19425	Dum_GW_J3	BOTTOM	0	0.65	NO	0
OR127	J19406	Dum_GW_J2	BOTTOM	0	0.65	NO	0
OR128	J15771	Dum_GW_J1	BOTTOM	0	0.65	NO	0
OR129	J19647	C25	BOTTOM	0	0.65	NO	0
OR13	J20435	CB-037-83	BOTTOM	0	0.65	NO	0
;Phase1A_Alternative							
OR130	SU1	J24369	SIDE	0	0.65	YES	0
OR131	J7763	D1	BOTTOM	0	0.65	NO	0
OR132	J20988	M27	BOTTOM	0	0.65	NO	0
OR133	J21009	D5	BOTTOM	0	0.65	NO	0
OR134	J9055	D9	BOTTOM	0	0.65	NO	0
OR135	J9044	D10	BOTTOM	0	0.65	NO	0
OR136	J8578	M28	BOTTOM	0	0.65	NO	0
;Phase1A_Alternative							
OR137	J7082	A27_J	BOTTOM	0	0.65	NO	0
OR138	J6524	A28_J	BOTTOM	0	0.65	NO	0
OR139	J5134	A37_J	BOTTOM	0	0.65	NO	0
OR14	SU3	SU3_Out	SIDE	0	0.65	NO	0
OR140	J4699	A13	BOTTOM	0	0.65	NO	0
OR141	J4393	A15	BOTTOM	0	0.65	NO	0
OR142	J4477	A14_J	BOTTOM	0	0.65	NO	0
OR143	J4385	M4	BOTTOM	0	0.65	NO	0
OR144	J4380	M3	BOTTOM	0	0.65	NO	0
OR145	J4176	A10	BOTTOM	0	0.65	NO	0
OR146	J4372	CB-025-02	BOTTOM	0	0.65	NO	0
OR147	J4620	A7	BOTTOM	0	0.65	NO	0
OR148	J22036	M2	BOTTOM	0	0.65	NO	0
OR149	J4068	A55_J	BOTTOM	0	0.65	NO	0
OR15	J9042	CB-037-85	BOTTOM	0	0.65	NO	0
OR150	J4324	A12_J	BOTTOM	0	0.65	NO	0
OR151	J21988	CB-025-19	BOTTOM	0	0.65	NO	0
OR152	J3806	A11_J	BOTTOM	0	0.65	NO	0
OR153	J3805	M5	BOTTOM	0	0.65	NO	0

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OR154            J21984           IN-WS-7          BOTTOM       0          0.65       NO        0
OR155            J22002           A39_J            BOTTOM       0          0.65       NO        0
OR156            J14969           J2               BOTTOM       0          0.65       NO        0
;Added by EO on 6.20.22 to represent additional catch basins.
OR157            J11826           C13              BOTTOM       0          0.65       NO        0
;Added by EO on 6.20.22 to represent additional catch basins.
OR158            J11541           CB-044-74        BOTTOM       0          0.65       NO        0
;Phase1A_Alternative
OR159            SU1              J24369           BOTTOM       3          0.65       YES       0
;Phase1B_Alternative
OR16             J10022           CB-037-88_BB     BOTTOM       0          0.65       NO        0
;Phase1B_Alternative
OR160            J9760            DMH-038-8        BOTTOM       0          0.65       NO        0
;Phase1B_Alternative
OR161            J9918            DMH-038-15       BOTTOM       0          0.65       NO        0
;Phase1B_Alternative
OR162            J9757            DMH-038-8        BOTTOM       0          0.65       NO        0
;Phase1B_Alternative
OR163            J10265           DMH-037-89       BOTTOM       0          0.65       NO        0
;Phase1A_Alternative
OR164            J17595           CB-044-75        BOTTOM       0          0.65       NO        0
;Phase2_Alternative
OR165            J7345            J24371           BOTTOM       0          0.65       NO        0
;Phase2_Alternative
OR166            J14819           SU3              BOTTOM       0          0.65       NO        0
;Phase1A_Alternative
OR167            J19632           SU1              BOTTOM       0          0.65       NO        0
;Phase1B_Alternative
OR168            J20128           SU2              BOTTOM       0          0.65       NO        0
;Phase1B_Alternative
OR169            J9859            DMH-038-15       BOTTOM       0          0.65       NO        0
OR17             J12596           CB-044-14        BOTTOM       0          0.65       NO        0
OR18             J12361           CB-044-5         BOTTOM       0          0.65       NO        0
;Phase1A_Alternative
OR19             J17591           CB-044-74        BOTTOM       0          0.65       YES       0
OR2              J3543            12               BOTTOM       0          0.65       NO        0
OR20             J12504           CB-044-8         BOTTOM       0          0.65       NO        0
OR21             J12160           CB-045-38        BOTTOM       0          0.65       NO        0
;Phase2_Alternative
OR22             J14869           Culvert_Outlet   BOTTOM       0          0.65       NO        0
OR23             J6372            Cummings_MH      BOTTOM       0          0.65       NO        0
OR24             J763             DMH-016-21       BOTTOM       0          0.65       NO        0
OR25             J2171            DMH-021-45       BOTTOM       0          0.65       NO        0
OR26             J4613            DMH-025-62       BOTTOM       0          0.65       NO        0
OR27             J3434            DMH-027-11       BOTTOM       0          0.65       NO        0
;Phase2_Alternative
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OR28	J3897	DMH-027-14	BOTTOM	0	0.65	NO	0
OR29	J15904	DMH-027-7	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR3	J4820	15	BOTTOM	0	0.65	NO	0
;Phase1A_Alternative							
OR30	J17591	J4_New	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR31	J6990	DMH-033-35	BOTTOM	0	0.65	NO	0
OR32	J7089	DMH-033-37	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR33	J5255	DMH-033-38	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR34	J6380	DMH-033-45	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR35	J6485	DMH-033-47	BOTTOM	0	0.65	NO	0
OR36	J20321	DMH-037-2	BOTTOM	0	0.65	NO	0
;Phase1A_Alternative							
OR37	J10142	DMH-037-89	BOTTOM	0	0.65	NO	0
;Phase1B_Alternative							
OR38	J9615	DMH-038-15	BOTTOM	0	0.65	NO	0
;Phase1B_Alternative							
OR39	J10538	DMH-038-19	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR4	J7886	DMH-Sm-2	BOTTOM	0	0.65	NO	0
;Phase1B_Alternative							
OR40	J9867	DMH-038-21_BB	BOTTOM	0	0.65	NO	0
;Phase1B_Alternative							
OR41	J10327	DMH-038-24	BOTTOM	0	0.65	NO	0
;Phase1B_Alternative							
OR42	J9805	DMH-038-8	BOTTOM	0	0.65	NO	0
OR43	J8048	DMH-039-26	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR44	J9763	DMH-039-34	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR45	J9135	DMH-039-41	BOTTOM	0	0.65	NO	0
OR46	J7512	DMH-039-42	BOTTOM	0	0.65	NO	0
;Phase2_Alternative							
OR47	J8329	DMH-039-43	BOTTOM	0	0.65	NO	0
OR48	J17983	DMH-044-21	BOTTOM	0	0.65	NO	0
OR49	J12257	DMH-044-6	BOTTOM	0	0.65	NO	0
;Phase1B_Alternative							
OR5	J10079	DMH-037-89	BOTTOM	0	0.65	NO	0
OR50	J10953	DMH-044-69	BOTTOM	0	0.65	NO	0
OR51	J11387	DMH-044-71	BOTTOM	0	0.65	NO	0
OR52	J11674	DMH-045-23	BOTTOM	0	0.65	NO	0
OR53	J13352	DMH-045-24	BOTTOM	0	0.65	NO	0

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OR54             J13211           DMH-045-25       BOTTOM       0          0.65       NO       0
;Phase1B_Alternative
OR55             J10725           DMH-045-26       BOTTOM       0          0.65       NO       0
OR56             J10771           DMH-045-30       BOTTOM       0          0.65       NO       0
OR57             J11354           DMH-045-33       BOTTOM       0          0.65       NO       0
;Phase1B_Alternative
OR58             J11840           DMH-045-35       BOTTOM       0          0.65       NO       0
OR59             J11945           DMH-045-37       BOTTOM       0          0.65       NO       0
;Phase1B_Alternative
OR6              J10205           DMH-037-89       BOTTOM       0          0.65       NO       0
OR60             J12693           DMH-045-40       BOTTOM       0          0.65       NO       0
OR61             J12869           DMH-045-44       BOTTOM       0          0.65       NO       0
;Phase1B_Alternative
OR62             J12791           DMH-045-45       BOTTOM       0          0.65       NO       0
OR63             J12824           DMH-045-48       BOTTOM       0          0.65       NO       0
OR64             J12466           DMH-045-51       BOTTOM       0          0.65       NO       0
OR65             J11285           DMH-045-59       BOTTOM       0          0.65       NO       0
OR66             J11227           DMH-045-60       BOTTOM       0          0.65       NO       0
;Phase2_Alternative
OR67             J10853           DMH-046-61       BOTTOM       0          0.65       NO       0
OR68             J13542           DMH-051-36       BOTTOM       0          0.65       NO       0
OR69             J14063           DMH-051-37       BOTTOM       0          0.65       NO       0
OR7              J11176           23               BOTTOM       0          0.65       NO       0
OR70             J14214           DMH-051-38       BOTTOM       0          0.65       NO       0
OR71             J13953           DMH-051-39       BOTTOM       0          0.65       NO       0
OR72             J14247           DMH-051-41       BOTTOM       0          0.65       NO       0
OR73             J14264           DMH-051-43       BOTTOM       0          0.65       NO       0
OR74             J13945           DMH-051-67       BOTTOM       0          0.65       NO       0
OR75             J9792            J1               BOTTOM       0          0.65       NO       0
OR76             J22551           J2               BOTTOM       0          0.65       NO       0
OR77             J20244           J3               BOTTOM       0          0.65       NO       0
;Phase2_Alternative
OR78             SU3              SU3_Out          BOTTOM       3.25       0.65       NO       0
;Phase2_Alternative
OR79             J9002            DMH-039-41       BOTTOM       0          0.65       NO       0
;Phase2_Alternative
OR8              J14897           Overflow_MH      BOTTOM       0          0.65       NO       0
OR80             J1358            Kennedy_MH       BOTTOM       0          0.65       NO       0
OR81             J14904           MalboneChannel1  BOTTOM       0          0.65       NO       0
OR82             J14914           MalboneChannel2  BOTTOM       0          0.65       NO       0
OR83             J14836           MalboneChannel3  BOTTOM       0          0.65       NO       0
;Phase2_Alternative
OR84             J9198            DMH-039-41       BOTTOM       0          0.65       NO       0
OR85             J12755           DMH-045-49       BOTTOM       0          0.65       NO       0
;Phase2_Alternative
OR86             J9005            DMH-039-41       BOTTOM       0          0.65       NO       0
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;Phase2_Alternative
OR87             J20787           DMH-032-33       BOTTOM       0          0.65       NO       0
;Phase1B_Alternative
OR88             J9245            DMH-Gar-1        BOTTOM       0          0.65       NO       0
OR89             J22002           DMH-025-61       BOTTOM       0          0.65       NO       0
OR9              J3020            27               BOTTOM       0          0.65       NO       0
;Phase1B_Alternative
OR90             J9465            DMH-Gar-2        BOTTOM       0          0.65       NO       0
OR91             J4404            DMH-027-19       BOTTOM       0          0.65       NO       0
OR92             J4718            DMH-027-22       BOTTOM       0          0.65       NO       0
OR93             J23148           DMH-034-64       BOTTOM       0          0.65       NO       0
OR94             J5817            DMH-034-66       BOTTOM       0          0.65       NO       0
OR95             J6027            DMH-034-70       BOTTOM       0          0.65       NO       0
OR96             J5731            DMH-034-68       BOTTOM       0          0.65       NO       0
OR97             J21779           DMH-026-4        BOTTOM       0          0.65       NO       0
OR98             J3782            DMH-027-15       BOTTOM       0          0.65       NO       0
OR99             J21881           Dum_026-5        BOTTOM       0          0.65       NO       0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
....             CIRCULAR     3                0          0          0          1
C10              RECT_OPEN    30               13.409     2          0          1
C100             RECT_OPEN    30               24.52      2          0          1
C1000            RECT_OPEN    30               21.41      2          0          1
C10000           RECT_OPEN    30               23.602     2          0          1
C10001           RECT_OPEN    30               23.682     2          0          1
C10002           RECT_OPEN    30               16.113     2          0          1
C10003           RECT_OPEN    30               12.516     2          0          1
C10004           RECT_OPEN    30               10.357     2          0          1
C10005           RECT_OPEN    30               22.903     1          0          1
......
Too many conduit entities (68749 in total).
OR1              RECT_CLOSED  2                9          0          0
OR10             RECT_CLOSED  2                9          0          0
OR100            RECT_CLOSED  30               525.16     0          0
OR101            RECT_CLOSED  30               1004.9     0          0
OR102            RECT_CLOSED  30               1594.45    0          0
OR103            RECT_CLOSED  30               1594.45    0          0
OR104            RECT_CLOSED  2                3          0          0
OR105            RECT_CLOSED  2                9          0          0
OR106            RECT_CLOSED  2                6          0          0
OR107            RECT_CLOSED  2                3          0          0
OR108            RECT_CLOSED  2                3          0          0
OR109            RECT_CLOSED  2                6          0          0
OR11             RECT_CLOSED  30               361.79     0          0
```

OR110	RECT_CLOSED	2	6	0	0
OR111	RECT_CLOSED	2	6	0	0
OR112	RECT_CLOSED	2	6	0	0
OR113	RECT_CLOSED	2	6	0	0
OR114	RECT_CLOSED	2	3	0	0
OR115	RECT_CLOSED	30	493.49	0	0
OR116	RECT_CLOSED	2	9	0	0
OR117	RECT_CLOSED	30	373.92	0	0
OR118	RECT_CLOSED	2	6	0	0
OR119	RECT_CLOSED	2	6	0	0
OR12	RECT_CLOSED	30	361.79	0	0
OR120	RECT_CLOSED	2	9	0	0
OR121	RECT_CLOSED	2	9	0	0
OR122	RECT_CLOSED	2	6	0	0
OR123	RECT_CLOSED	2	6	0	0
OR124	RECT_CLOSED	2	9	0	0
OR125	RECT_CLOSED	30	246.02	0	0
OR126	RECT_CLOSED	2	6	0	0
OR127	RECT_CLOSED	2	6	0	0
OR128	RECT_CLOSED	2	6	0	0
OR129	RECT_CLOSED	2	6	0	0
OR13	RECT_CLOSED	2	9	0	0
OR130	CIRCULAR	2	0	0	0
OR131	RECT_CLOSED	2	9	0	0
OR132	RECT_CLOSED	2	9	0	0
OR133	RECT_CLOSED	2	9	0	0
OR134	RECT_CLOSED	2	9	0	0
OR135	RECT_CLOSED	2	9	0	0
OR136	RECT_CLOSED	2	9	0	0
OR137	RECT_CLOSED	2	9	0	0
OR138	RECT_CLOSED	2	9	0	0
OR139	RECT_CLOSED	2	9	0	0
OR14	RECT_CLOSED	3	3.25	0	0
OR140	RECT_CLOSED	2	9	0	0
OR141	RECT_CLOSED	2	9	0	0
OR142	RECT_CLOSED	2	9	0	0
OR143	RECT_CLOSED	2	9	0	0
OR144	RECT_CLOSED	2	9	0	0
OR145	RECT_CLOSED	2	9	0	0
OR146	RECT_CLOSED	2	9	0	0
OR147	RECT_CLOSED	2	9	0	0
OR148	RECT_CLOSED	2	9	0	0
OR149	RECT_CLOSED	2	9	0	0
OR15	RECT_CLOSED	2	6	0	0
OR150	RECT_CLOSED	2	9	0	0
OR151	RECT_CLOSED	2	9	0	0

OR152	RECT_CLOSED	2	9	0	0
OR153	RECT_CLOSED	2	9	0	0
OR154	RECT_CLOSED	30	469.006	0	0
OR155	RECT_CLOSED	30	236.592	0	0
OR156	RECT_CLOSED	2	12	0	0
OR157	RECT_CLOSED	2	6	0	0
OR158	RECT_CLOSED	2	6	0	0
OR159	RECT_CLOSED	3.5	3.5	0	0
OR16	RECT_CLOSED	2	3	0	0
OR160	RECT_CLOSED	2	6	0	0
OR161	RECT_CLOSED	2	3	0	0
OR162	RECT_CLOSED	2	3	0	0
OR163	RECT_CLOSED	2	3	0	0
OR164	RECT_CLOSED	2	9	0	0
OR165	RECT_CLOSED	2	9	0	0
OR166	RECT_CLOSED	30	2415	0	0
OR167	RECT_CLOSED	30	1733	0	0
OR168	RECT_CLOSED	30	3231	0	0
OR169	RECT_CLOSED	2	3	0	0
OR17	RECT_CLOSED	2	9	0	0
OR18	RECT_CLOSED	2	9	0	0
OR19	RECT_CLOSED	2	6	0	0
OR2	RECT_CLOSED	30	222.86	0	0
OR20	RECT_CLOSED	2	9	0	0
OR21	RECT_CLOSED	2	9	0	0
OR22	RECT_CLOSED	30	317.94	0	0
OR23	RECT_CLOSED	2	6	0	0
OR24	RECT_CLOSED	2	9	0	0
OR25	RECT_CLOSED	2	9	0	0
OR26	RECT_CLOSED	30	222.86	0	0
OR27	RECT_CLOSED	2	6	0	0
OR28	RECT_CLOSED	2	9	0	0
OR29	RECT_CLOSED	2	9	0	0
OR3	RECT_CLOSED	30	20	0	0
OR30	RECT_CLOSED	2	3	0	0
OR31	RECT_CLOSED	2	6	0	0
OR32	RECT_CLOSED	2	9	0	0
OR33	RECT_CLOSED	2	6	0	0
OR34	RECT_CLOSED	2	9	0	0
OR35	RECT_CLOSED	2	3	0	0
OR36	RECT_CLOSED	2	9	0	0
OR37	RECT_CLOSED	2	9	0	0
OR38	RECT_CLOSED	2	3	0	0
OR39	RECT_CLOSED	2	9	0	0
OR4	RECT_CLOSED	2	9	0	0
OR40	RECT_CLOSED	2	9	0	0

OR41	RECT_CLOSED	2	9	0	0
OR42	RECT_CLOSED	2	3	0	0
OR43	RECT_CLOSED	2	6	0	0
OR44	RECT_CLOSED	2	9	0	0
OR45	RECT_CLOSED	2	9	0	0
OR46	RECT_CLOSED	2	9	0	0
OR47	RECT_CLOSED	2	9	0	0
OR48	RECT_CLOSED	2	6	0	0
OR49	RECT_CLOSED	2	6	0	0
OR5	RECT_CLOSED	2	3	0	0
OR50	RECT_CLOSED	2	9	0	0
OR51	RECT_CLOSED	2	6	0	0
OR52	RECT_CLOSED	2	6	0	0
OR53	RECT_CLOSED	2	6	0	0
OR54	RECT_CLOSED	2	6	0	0
OR55	RECT_CLOSED	2	6	0	0
OR56	RECT_CLOSED	2	6	0	0
OR57	RECT_CLOSED	2	9	0	0
OR58	RECT_CLOSED	2	6	0	0
OR59	RECT_CLOSED	2	6	0	0
OR6	RECT_CLOSED	2	3	0	0
OR60	RECT_CLOSED	2	6	0	0
OR61	RECT_CLOSED	2	6	0	0
OR62	RECT_CLOSED	2	6	0	0
OR63	RECT_CLOSED	2	6	0	0
OR64	RECT_CLOSED	2	9	0	0
OR65	RECT_CLOSED	2	6	0	0
OR66	RECT_CLOSED	2	6	0	0
OR67	RECT_CLOSED	2	9	0	0
OR68	RECT_CLOSED	2	6	0	0
OR69	RECT_CLOSED	2	9	0	0
OR7	RECT_CLOSED	2	9	0	0
OR70	RECT_CLOSED	2	6	0	0
OR71	RECT_CLOSED	2	6	0	0
OR72	RECT_CLOSED	2	6	0	0
OR73	RECT_CLOSED	2	9	0	0
OR74	RECT_CLOSED	2	9	0	0
OR75	RECT_CLOSED	2	9	0	0
OR76	RECT_CLOSED	30	1422.76	0	0
OR77	RECT_CLOSED	2	9	0	0
OR78	RECT_CLOSED	4	4	0	0
OR79	RECT_CLOSED	2	3	0	0
OR8	RECT_CLOSED	30	489.795	0	0
OR80	RECT_CLOSED	2	9	0	0
OR81	RECT_CLOSED	30	561.44	0	0
OR82	RECT_CLOSED	30	506.58	0	0

OR83	RECT_CLOSED	30	458.11	0	0
OR84	RECT_CLOSED	2	3	0	0
OR85	RECT_CLOSED	2	6	0	0
OR86	RECT_CLOSED	2	2	0	0
OR87	RECT_CLOSED	2	9	0	0
OR88	RECT_CLOSED	2	9	0	0
OR89	RECT_CLOSED	2	9	0	0
OR9	RECT_CLOSED	2	9	0	0
OR90	RECT_CLOSED	2	9	0	0
OR91	RECT_CLOSED	2	9	0	0
OR92	RECT_CLOSED	2	9	0	0
OR93	RECT_CLOSED	2	9	0	0
OR94	RECT_CLOSED	2	9	0	0
OR95	RECT_CLOSED	2	3	0	0
OR96	RECT_CLOSED	2	6	0	0
OR97	RECT_CLOSED	2	12	0	0
OR98	RECT_CLOSED	2	9	0	0
OR99	RECT_CLOSED	30	200.74	0	0

[LOSSES]

;;Link	Kentry	Kexit	Kavg	Flap Gate	Seepage
C2	0	0.5	0	NO	0
C3	0	1	0	NO	0
C4_2	0	0.5	0	NO	0
C8	0	1	0	NO	0
C9	0	1	0	NO	0
DP-025-10	0	1	0	NO	0
DP-025-10_B	0	1	0	NO	0
DP-025-12	0	1	0	NO	0
DP-025-13	0	1	0	NO	0
DP-025-16	0	1	0	NO	0

......
Too many conduit entities (68749 in total).

[CURVES]

;;Name	Type	X-Value	Y-Value
SU1	Storage	0	132584.84
SU1		1	137195.84
SU1		2	141876.08
SU1		3	146625.57
SU1		4	151444.3
SU1		5	156332.27
SU1		6	161289.49
SU1		7	166315.95

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SU1                         8          171411.66
SU1                         9          176576.6

SU2              Storage    0          188313.5
SU2                         1          197466.69
SU2                         2          206694.39
SU2                         3          216007.59
SU2                         4          225389.72
SU2                         5          234840.63
SU2                         6          244361.41
SU2                         7          253950.72
SU2                         8          263607.91

SU3              Storage    0          197810.83
SU3                         1          204318.79
SU3                         2          210896.86
SU3                         3          217545.03
SU3                         4          224263.31
SU3                         5          231051.69
SU3                         6          237910.03
SU3                         7          244838.59
SU3                         8          251837.36
SU3                         9          258906.15
SU3                         10         266044.97
SU3                         11         273254.05

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Adjusted July 14 tides to simulate 10 yr DS tides
July_14_Tides_ADJ 7/14/2020  0:00       1.14
July_14_Tides_ADJ 7/14/2020  0:06       1.1
July_14_Tides_ADJ 7/14/2020  0:12       1.06
July_14_Tides_ADJ 7/14/2020  0:18       1.04
July_14_Tides_ADJ 7/14/2020  0:24       0.97
July_14_Tides_ADJ 7/14/2020  0:30       0.89
July_14_Tides_ADJ 7/14/2020  0:36       0.82
July_14_Tides_ADJ 7/14/2020  0:42       0.76
July_14_Tides_ADJ 7/14/2020  0:48       0.7
July_14_Tides_ADJ 7/14/2020  0:54       0.64
July_14_Tides_ADJ 7/14/2020  1:00       0.59
July_14_Tides_ADJ 7/14/2020  1:06       0.51
July_14_Tides_ADJ 7/14/2020  1:12       0.44
July_14_Tides_ADJ 7/14/2020  1:18       0.37
July_14_Tides_ADJ 7/14/2020  1:24       0.28
July_14_Tides_ADJ 7/14/2020  1:30       0.21
```

July_14_Tides_ADJ	7/14/2020	1:36	0.11
July_14_Tides_ADJ	7/14/2020	1:42	0.03
July_14_Tides_ADJ	7/14/2020	1:48	-0.02
July_14_Tides_ADJ	7/14/2020	1:54	-0.08
July_14_Tides_ADJ	7/14/2020	2:00	-0.15
July_14_Tides_ADJ	7/14/2020	2:06	-0.24
July_14_Tides_ADJ	7/14/2020	2:12	-0.3
July_14_Tides_ADJ	7/14/2020	2:18	-0.35
July_14_Tides_ADJ	7/14/2020	2:24	-0.41
July_14_Tides_ADJ	7/14/2020	2:30	-0.49
July_14_Tides_ADJ	7/14/2020	2:36	-0.5
July_14_Tides_ADJ	7/14/2020	2:42	-0.56
July_14_Tides_ADJ	7/14/2020	2:48	-0.58
July_14_Tides_ADJ	7/14/2020	2:54	-0.63
July_14_Tides_ADJ	7/14/2020	3:00	-0.71
July_14_Tides_ADJ	7/14/2020	3:06	-0.7
July_14_Tides_ADJ	7/14/2020	3:12	-0.76
July_14_Tides_ADJ	7/14/2020	3:18	-0.76
July_14_Tides_ADJ	7/14/2020	3:24	-0.78
July_14_Tides_ADJ	7/14/2020	3:30	-0.8
July_14_Tides_ADJ	7/14/2020	3:36	-0.81
July_14_Tides_ADJ	7/14/2020	3:42	-0.85
July_14_Tides_ADJ	7/14/2020	3:48	-0.82
July_14_Tides_ADJ	7/14/2020	3:54	-0.84
July_14_Tides_ADJ	7/14/2020	4:00	-0.85
July_14_Tides_ADJ	7/14/2020	4:06	-0.87
July_14_Tides_ADJ	7/14/2020	4:12	-0.88
July_14_Tides_ADJ	7/14/2020	4:18	-0.86
July_14_Tides_ADJ	7/14/2020	4:24	-0.85
July_14_Tides_ADJ	7/14/2020	4:30	-0.8
July_14_Tides_ADJ	7/14/2020	4:36	-0.8
July_14_Tides_ADJ	7/14/2020	4:42	-0.78
July_14_Tides_ADJ	7/14/2020	4:48	-0.74
July_14_Tides_ADJ	7/14/2020	4:54	-0.77
July_14_Tides_ADJ	7/14/2020	5:00	-0.75
July_14_Tides_ADJ	7/14/2020	5:06	-0.69
July_14_Tides_ADJ	7/14/2020	5:12	-0.68
July_14_Tides_ADJ	7/14/2020	5:18	-0.65
July_14_Tides_ADJ	7/14/2020	5:24	-0.62
July_14_Tides_ADJ	7/14/2020	5:30	-0.58
July_14_Tides_ADJ	7/14/2020	5:36	-0.56
July_14_Tides_ADJ	7/14/2020	5:42	-0.57
July_14_Tides_ADJ	7/14/2020	5:48	-0.53
July_14_Tides_ADJ	7/14/2020	5:54	-0.52
July_14_Tides_ADJ	7/14/2020	6:00	-0.49
July_14_Tides_ADJ	7/14/2020	6:06	-0.46

July_14_Tides_ADJ	7/14/2020	6:12	-0.4
July_14_Tides_ADJ	7/14/2020	6:18	-0.35
July_14_Tides_ADJ	7/14/2020	6:24	-0.32
July_14_Tides_ADJ	7/14/2020	6:30	-0.27
July_14_Tides_ADJ	7/14/2020	6:36	-0.28
July_14_Tides_ADJ	7/14/2020	6:42	-0.24
July_14_Tides_ADJ	7/14/2020	6:48	-0.21
July_14_Tides_ADJ	7/14/2020	6:54	-0.16
July_14_Tides_ADJ	7/14/2020	7:00	-0.13
July_14_Tides_ADJ	7/14/2020	7:06	-0.1
July_14_Tides_ADJ	7/14/2020	7:12	-0.09
July_14_Tides_ADJ	7/14/2020	7:18	-0.06
July_14_Tides_ADJ	7/14/2020	7:24	0.01
July_14_Tides_ADJ	7/14/2020	7:30	0.08
July_14_Tides_ADJ	7/14/2020	7:36	0.09
July_14_Tides_ADJ	7/14/2020	7:42	0.11
July_14_Tides_ADJ	7/14/2020	7:48	0.18
July_14_Tides_ADJ	7/14/2020	7:54	0.22
July_14_Tides_ADJ	7/14/2020	8:00	0.25
July_14_Tides_ADJ	7/14/2020	8:06	0.29
July_14_Tides_ADJ	7/14/2020	8:12	0.35
July_14_Tides_ADJ	7/14/2020	8:18	0.44
July_14_Tides_ADJ	7/14/2020	8:24	0.49
July_14_Tides_ADJ	7/14/2020	8:30	0.53
July_14_Tides_ADJ	7/14/2020	8:36	0.57
July_14_Tides_ADJ	7/14/2020	8:42	0.61
July_14_Tides_ADJ	7/14/2020	8:48	0.66
July_14_Tides_ADJ	7/14/2020	8:54	0.73
July_14_Tides_ADJ	7/14/2020	9:00	0.79
July_14_Tides_ADJ	7/14/2020	9:06	0.86
July_14_Tides_ADJ	7/14/2020	9:12	0.96
July_14_Tides_ADJ	7/14/2020	9:18	1.03
July_14_Tides_ADJ	7/14/2020	9:24	1.09
July_14_Tides_ADJ	7/14/2020	9:30	1.17
July_14_Tides_ADJ	7/14/2020	9:36	1.22
July_14_Tides_ADJ	7/14/2020	9:42	1.26
July_14_Tides_ADJ	7/14/2020	9:48	1.32
July_14_Tides_ADJ	7/14/2020	9:54	1.36
July_14_Tides_ADJ	7/14/2020	10:00	1.42
July_14_Tides_ADJ	7/14/2020	10:06	1.47
July_14_Tides_ADJ	7/14/2020	10:12	1.44
July_14_Tides_ADJ	7/14/2020	10:18	1.51
July_14_Tides_ADJ	7/14/2020	10:24	1.6
July_14_Tides_ADJ	7/14/2020	10:30	1.65
July_14_Tides_ADJ	7/14/2020	10:36	1.83
July_14_Tides_ADJ	7/14/2020	10:42	1.71

July_14_Tides_ADJ	7/14/2020	10:48	1.71
July_14_Tides_ADJ	7/14/2020	10:54	1.65
July_14_Tides_ADJ	7/14/2020	11:00	1.53
July_14_Tides_ADJ	7/14/2020	11:06	1.64
July_14_Tides_ADJ	7/14/2020	11:12	1.67
July_14_Tides_ADJ	7/14/2020	11:18	1.72
July_14_Tides_ADJ	7/14/2020	11:24	1.82
July_14_Tides_ADJ	7/14/2020	11:30	1.81
July_14_Tides_ADJ	7/14/2020	11:36	1.81
July_14_Tides_ADJ	7/14/2020	11:42	1.81
July_14_Tides_ADJ	7/14/2020	11:48	1.85
July_14_Tides_ADJ	7/14/2020	11:54	1.72
July_14_Tides_ADJ	7/14/2020	12:00	1.7
July_14_Tides_ADJ	7/14/2020	12:06	1.65
July_14_Tides_ADJ	7/14/2020	12:12	1.61
July_14_Tides_ADJ	7/14/2020	12:18	1.59
July_14_Tides_ADJ	7/14/2020	12:24	1.5
July_14_Tides_ADJ	7/14/2020	12:30	1.46
July_14_Tides_ADJ	7/14/2020	12:36	1.43
July_14_Tides_ADJ	7/14/2020	12:42	1.47
July_14_Tides_ADJ	7/14/2020	12:48	1.42
July_14_Tides_ADJ	7/14/2020	12:54	1.36
July_14_Tides_ADJ	7/14/2020	13:00	1.33
July_14_Tides_ADJ	7/14/2020	13:06	1.19
July_14_Tides_ADJ	7/14/2020	13:12	1.16
July_14_Tides_ADJ	7/14/2020	13:18	1.11
July_14_Tides_ADJ	7/14/2020	13:24	1.07
July_14_Tides_ADJ	7/14/2020	13:30	1.03
July_14_Tides_ADJ	7/14/2020	13:36	0.96
July_14_Tides_ADJ	7/14/2020	13:42	0.95
July_14_Tides_ADJ	7/14/2020	13:48	0.89
July_14_Tides_ADJ	7/14/2020	13:54	0.81
July_14_Tides_ADJ	7/14/2020	14:00	0.66
July_14_Tides_ADJ	7/14/2020	14:06	0.57
July_14_Tides_ADJ	7/14/2020	14:12	0.51
July_14_Tides_ADJ	7/14/2020	14:18	0.48
July_14_Tides_ADJ	7/14/2020	14:24	0.47
July_14_Tides_ADJ	7/14/2020	14:30	0.38
July_14_Tides_ADJ	7/14/2020	14:36	0.32
July_14_Tides_ADJ	7/14/2020	14:42	0.27
July_14_Tides_ADJ	7/14/2020	14:48	0.19
July_14_Tides_ADJ	7/14/2020	14:54	0.09
July_14_Tides_ADJ	7/14/2020	15:00	0.03
July_14_Tides_ADJ	7/14/2020	15:06	-0.05
July_14_Tides_ADJ	7/14/2020	15:12	-0.15
July_14_Tides_ADJ	7/14/2020	15:18	-0.14

July_14_Tides_ADJ	7/14/2020	15:24	-0.22
July_14_Tides_ADJ	7/14/2020	15:30	-0.3
July_14_Tides_ADJ	7/14/2020	15:36	-0.31
July_14_Tides_ADJ	7/14/2020	15:42	-0.36
July_14_Tides_ADJ	7/14/2020	15:48	-0.42
July_14_Tides_ADJ	7/14/2020	15:54	-0.41
July_14_Tides_ADJ	7/14/2020	16:00	-0.46
July_14_Tides_ADJ	7/14/2020	16:06	-0.44
July_14_Tides_ADJ	7/14/2020	16:12	-0.46
July_14_Tides_ADJ	7/14/2020	16:18	-0.51
July_14_Tides_ADJ	7/14/2020	16:24	-0.56
July_14_Tides_ADJ	7/14/2020	16:30	-0.57
July_14_Tides_ADJ	7/14/2020	16:36	-0.6
July_14_Tides_ADJ	7/14/2020	16:42	-0.61
July_14_Tides_ADJ	7/14/2020	16:48	-0.6
July_14_Tides_ADJ	7/14/2020	16:54	-0.61
July_14_Tides_ADJ	7/14/2020	17:00	-0.6
July_14_Tides_ADJ	7/14/2020	17:06	-0.64
July_14_Tides_ADJ	7/14/2020	17:12	-0.67
July_14_Tides_ADJ	7/14/2020	17:18	-0.66
July_14_Tides_ADJ	7/14/2020	17:24	-0.68
July_14_Tides_ADJ	7/14/2020	17:30	-0.66
July_14_Tides_ADJ	7/14/2020	17:36	-0.66
July_14_Tides_ADJ	7/14/2020	17:42	-0.66
July_14_Tides_ADJ	7/14/2020	17:48	-0.66
July_14_Tides_ADJ	7/14/2020	17:54	-0.65
July_14_Tides_ADJ	7/14/2020	18:00	-0.71
July_14_Tides_ADJ	7/14/2020	18:06	-0.71
July_14_Tides_ADJ	7/14/2020	18:12	-0.71
July_14_Tides_ADJ	7/14/2020	18:18	-0.73
July_14_Tides_ADJ	7/14/2020	18:24	-0.74
July_14_Tides_ADJ	7/14/2020	18:30	-0.67
July_14_Tides_ADJ	7/14/2020	18:36	-0.66
July_14_Tides_ADJ	7/14/2020	18:42	-0.64
July_14_Tides_ADJ	7/14/2020	18:48	-0.63
July_14_Tides_ADJ	7/14/2020	18:54	-0.65
July_14_Tides_ADJ	7/14/2020	19:00	-0.64
July_14_Tides_ADJ	7/14/2020	19:06	-0.6
July_14_Tides_ADJ	7/14/2020	19:12	-0.62
July_14_Tides_ADJ	7/14/2020	19:18	-0.61
July_14_Tides_ADJ	7/14/2020	19:24	-0.58
July_14_Tides_ADJ	7/14/2020	19:30	-0.57
July_14_Tides_ADJ	7/14/2020	19:36	-0.55
July_14_Tides_ADJ	7/14/2020	19:42	-0.49
July_14_Tides_ADJ	7/14/2020	19:48	-0.49
July_14_Tides_ADJ	7/14/2020	19:54	-0.45

```
July_14_Tides_ADJ 7/14/2020  20:00      -0.41
July_14_Tides_ADJ 7/14/2020  20:06      -0.37
July_14_Tides_ADJ 7/14/2020  20:12      -0.3
July_14_Tides_ADJ 7/14/2020  20:18      -0.27
July_14_Tides_ADJ 7/14/2020  20:24      -0.27
July_14_Tides_ADJ 7/14/2020  20:30      -0.26
July_14_Tides_ADJ 7/14/2020  20:36      -0.15
July_14_Tides_ADJ 7/14/2020  20:42      -0.16
July_14_Tides_ADJ 7/14/2020  20:48      -0.11
July_14_Tides_ADJ 7/14/2020  20:54      -0.06
July_14_Tides_ADJ 7/14/2020  21:00      -0.04
July_14_Tides_ADJ 7/14/2020  21:06      0.05
July_14_Tides_ADJ 7/14/2020  21:12      0.1
July_14_Tides_ADJ 7/14/2020  21:18      0.15
July_14_Tides_ADJ 7/14/2020  21:24      0.21
July_14_Tides_ADJ 7/14/2020  21:30      0.26
July_14_Tides_ADJ 7/14/2020  21:36      0.31
July_14_Tides_ADJ 7/14/2020  21:42      0.39
July_14_Tides_ADJ 7/14/2020  21:48      0.46
July_14_Tides_ADJ 7/14/2020  21:54      0.53
July_14_Tides_ADJ 7/14/2020  22:00      0.62
July_14_Tides_ADJ 7/14/2020  22:06      0.67
July_14_Tides_ADJ 7/14/2020  22:12      0.69
July_14_Tides_ADJ 7/14/2020  22:18      0.76
July_14_Tides_ADJ 7/14/2020  22:24      0.8
July_14_Tides_ADJ 7/14/2020  22:30      0.81
July_14_Tides_ADJ 7/14/2020  22:36      0.87
July_14_Tides_ADJ 7/14/2020  22:42      0.92
July_14_Tides_ADJ 7/14/2020  22:48      0.97
July_14_Tides_ADJ 7/14/2020  22:54      1.04
July_14_Tides_ADJ 7/14/2020  23:00      1.06
July_14_Tides_ADJ 7/14/2020  23:06      1.06
July_14_Tides_ADJ 7/14/2020  23:12      1.09
July_14_Tides_ADJ 7/14/2020  23:18      1.15
July_14_Tides_ADJ 7/14/2020  23:24      1.2
July_14_Tides_ADJ 7/14/2020  23:30      1.21
July_14_Tides_ADJ 7/14/2020  23:36      1.21
July_14_Tides_ADJ 7/14/2020  23:42      1.23
July_14_Tides_ADJ 7/14/2020  23:48      1.23
July_14_Tides_ADJ 7/14/2020  23:54      1.19

;SCS_Type_III_5.03in design storm, total rainfall = 5.03 in, rain interval = 6 minutes, rain units = in/hr.
SCS_Type_III_5.03in            0:00       0.0503
SCS_Type_III_5.03in            0:06       0.0503
SCS_Type_III_5.03in            0:12       0.0503
SCS_Type_III_5.03in            0:18       0.0503
```

SCS_Type_III_5.03in	0:24	0.0503
SCS_Type_III_5.03in	0:30	0.0503
SCS_Type_III_5.03in	0:36	0.0503
SCS_Type_III_5.03in	0:42	0.0503
SCS_Type_III_5.03in	0:48	0.0503
SCS_Type_III_5.03in	0:54	0.0503
SCS_Type_III_5.03in	1:00	0.0503
SCS_Type_III_5.03in	1:06	0.0503
SCS_Type_III_5.03in	1:12	0.0503
SCS_Type_III_5.03in	1:18	0.0503
SCS_Type_III_5.03in	1:24	0.0503
SCS_Type_III_5.03in	1:30	0.0503
SCS_Type_III_5.03in	1:36	0.0503
SCS_Type_III_5.03in	1:42	0.0503
SCS_Type_III_5.03in	1:48	0.0503
SCS_Type_III_5.03in	1:54	0.0503
SCS_Type_III_5.03in	2:00	0.0508
SCS_Type_III_5.03in	2:06	0.05131
SCS_Type_III_5.03in	2:12	0.05231
SCS_Type_III_5.03in	2:18	0.05282
SCS_Type_III_5.03in	2:24	0.05382
SCS_Type_III_5.03in	2:30	0.05432
SCS_Type_III_5.03in	2:36	0.05533
SCS_Type_III_5.03in	2:42	0.05583
SCS_Type_III_5.03in	2:48	0.05684
SCS_Type_III_5.03in	2:54	0.05734
SCS_Type_III_5.03in	3:00	0.05835
SCS_Type_III_5.03in	3:06	0.05885
SCS_Type_III_5.03in	3:12	0.05986
SCS_Type_III_5.03in	3:18	0.06036
SCS_Type_III_5.03in	3:24	0.06137
SCS_Type_III_5.03in	3:30	0.06187
SCS_Type_III_5.03in	3:36	0.06288
SCS_Type_III_5.03in	3:42	0.06338
SCS_Type_III_5.03in	3:48	0.06438
SCS_Type_III_5.03in	3:54	0.06489
SCS_Type_III_5.03in	4:00	0.06589
SCS_Type_III_5.03in	4:06	0.0664
SCS_Type_III_5.03in	4:12	0.0674
SCS_Type_III_5.03in	4:18	0.0679
SCS_Type_III_5.03in	4:24	0.06891
SCS_Type_III_5.03in	4:30	0.06941
SCS_Type_III_5.03in	4:36	0.07042
SCS_Type_III_5.03in	4:42	0.07092
SCS_Type_III_5.03in	4:48	0.07193
SCS_Type_III_5.03in	4:54	0.07243

SCS_Type_III_5.03in	5:00	0.07344
SCS_Type_III_5.03in	5:06	0.07394
SCS_Type_III_5.03in	5:12	0.07495
SCS_Type_III_5.03in	5:18	0.07545
SCS_Type_III_5.03in	5:24	0.07646
SCS_Type_III_5.03in	5:30	0.07696
SCS_Type_III_5.03in	5:36	0.07796
SCS_Type_III_5.03in	5:42	0.07847
SCS_Type_III_5.03in	5:48	0.07947
SCS_Type_III_5.03in	5:54	0.07998
SCS_Type_III_5.03in	6:00	0.08199
SCS_Type_III_5.03in	6:06	0.084
SCS_Type_III_5.03in	6:12	0.08702
SCS_Type_III_5.03in	6:18	0.08903
SCS_Type_III_5.03in	6:24	0.09205
SCS_Type_III_5.03in	6:30	0.09406
SCS_Type_III_5.03in	6:36	0.09708
SCS_Type_III_5.03in	6:42	0.09909
SCS_Type_III_5.03in	6:48	0.10211
SCS_Type_III_5.03in	6:54	0.10412
SCS_Type_III_5.03in	7:00	0.10714
SCS_Type_III_5.03in	7:06	0.10915
SCS_Type_III_5.03in	7:12	0.11217
SCS_Type_III_5.03in	7:18	0.11418
SCS_Type_III_5.03in	7:24	0.1172
SCS_Type_III_5.03in	7:30	0.11921
SCS_Type_III_5.03in	7:36	0.12223
SCS_Type_III_5.03in	7:42	0.12424
SCS_Type_III_5.03in	7:48	0.12726
SCS_Type_III_5.03in	7:54	0.12927
SCS_Type_III_5.03in	8:00	0.1338
SCS_Type_III_5.03in	8:06	0.13933
SCS_Type_III_5.03in	8:12	0.14537
SCS_Type_III_5.03in	8:18	0.1509
SCS_Type_III_5.03in	8:24	0.15694
SCS_Type_III_5.03in	8:30	0.16247
SCS_Type_III_5.03in	8:36	0.16851
SCS_Type_III_5.03in	8:42	0.17404
SCS_Type_III_5.03in	8:48	0.18007
SCS_Type_III_5.03in	8:54	0.18561
SCS_Type_III_5.03in	9:00	0.19164
SCS_Type_III_5.03in	9:06	0.19718
SCS_Type_III_5.03in	9:12	0.20321
SCS_Type_III_5.03in	9:18	0.20874
SCS_Type_III_5.03in	9:24	0.21478
SCS_Type_III_5.03in	9:30	0.22031

SCS_Type_III_5.03in	9:36	0.22635
SCS_Type_III_5.03in	9:42	0.23188
SCS_Type_III_5.03in	9:48	0.23792
SCS_Type_III_5.03in	9:54	0.24345
SCS_Type_III_5.03in	10:00	0.25251
SCS_Type_III_5.03in	10:06	0.26458
SCS_Type_III_5.03in	10:12	0.27665
SCS_Type_III_5.03in	10:18	0.28872
SCS_Type_III_5.03in	10:24	0.30079
SCS_Type_III_5.03in	10:30	0.31287
SCS_Type_III_5.03in	10:36	0.32494
SCS_Type_III_5.03in	10:42	0.33701
SCS_Type_III_5.03in	10:48	0.34908
SCS_Type_III_5.03in	10:54	0.36115
SCS_Type_III_5.03in	11:00	0.39033
SCS_Type_III_5.03in	11:06	0.4366
SCS_Type_III_5.03in	11:12	0.48288
SCS_Type_III_5.03in	11:18	0.52916
SCS_Type_III_5.03in	11:24	0.57543
SCS_Type_III_5.03in	11:30	0.81989
SCS_Type_III_5.03in	11:36	1.26253
SCS_Type_III_5.03in	11:42	1.70517
SCS_Type_III_5.03in	11:48	2.14781
SCS_Type_III_5.03in	11:54	4.2252
SCS_Type_III_5.03in	12:00	4.2252
SCS_Type_III_5.03in	12:06	2.14781
SCS_Type_III_5.03in	12:12	1.70517
SCS_Type_III_5.03in	12:18	1.26253
SCS_Type_III_5.03in	12:24	0.81989
SCS_Type_III_5.03in	12:30	0.57543
SCS_Type_III_5.03in	12:36	0.52916
SCS_Type_III_5.03in	12:42	0.48288
SCS_Type_III_5.03in	12:48	0.4366
SCS_Type_III_5.03in	12:54	0.39033
SCS_Type_III_5.03in	13:00	0.36115
SCS_Type_III_5.03in	13:06	0.34908
SCS_Type_III_5.03in	13:12	0.33701
SCS_Type_III_5.03in	13:18	0.32494
SCS_Type_III_5.03in	13:24	0.31287
SCS_Type_III_5.03in	13:30	0.30079
SCS_Type_III_5.03in	13:36	0.28872
SCS_Type_III_5.03in	13:42	0.27665
SCS_Type_III_5.03in	13:48	0.26458
SCS_Type_III_5.03in	13:54	0.25251
SCS_Type_III_5.03in	14:00	0.24345
SCS_Type_III_5.03in	14:06	0.23792

SCS_Type_III_5.03in	14:12	0.23188
SCS_Type_III_5.03in	14:18	0.22635
SCS_Type_III_5.03in	14:24	0.22031
SCS_Type_III_5.03in	14:30	0.21478
SCS_Type_III_5.03in	14:36	0.20875
SCS_Type_III_5.03in	14:42	0.20321
SCS_Type_III_5.03in	14:48	0.19718
SCS_Type_III_5.03in	14:54	0.19164
SCS_Type_III_5.03in	15:00	0.18561
SCS_Type_III_5.03in	15:06	0.18007
SCS_Type_III_5.03in	15:12	0.17404
SCS_Type_III_5.03in	15:18	0.1685
SCS_Type_III_5.03in	15:24	0.16247
SCS_Type_III_5.03in	15:30	0.15694
SCS_Type_III_5.03in	15:36	0.1509
SCS_Type_III_5.03in	15:42	0.14537
SCS_Type_III_5.03in	15:48	0.13933
SCS_Type_III_5.03in	15:54	0.1338
SCS_Type_III_5.03in	16:00	0.12977
SCS_Type_III_5.03in	16:06	0.12676
SCS_Type_III_5.03in	16:12	0.12474
SCS_Type_III_5.03in	16:18	0.12173
SCS_Type_III_5.03in	16:24	0.11971
SCS_Type_III_5.03in	16:30	0.1167
SCS_Type_III_5.03in	16:36	0.11468
SCS_Type_III_5.03in	16:42	0.11167
SCS_Type_III_5.03in	16:48	0.10965
SCS_Type_III_5.03in	16:54	0.10664
SCS_Type_III_5.03in	17:00	0.10462
SCS_Type_III_5.03in	17:06	0.10161
SCS_Type_III_5.03in	17:12	0.09959
SCS_Type_III_5.03in	17:18	0.09658
SCS_Type_III_5.03in	17:24	0.09456
SCS_Type_III_5.03in	17:30	0.09155
SCS_Type_III_5.03in	17:36	0.08953
SCS_Type_III_5.03in	17:42	0.08652
SCS_Type_III_5.03in	17:48	0.0845
SCS_Type_III_5.03in	17:54	0.08149
SCS_Type_III_5.03in	18:00	0.07998
SCS_Type_III_5.03in	18:06	0.07947
SCS_Type_III_5.03in	18:12	0.07847
SCS_Type_III_5.03in	18:18	0.07797
SCS_Type_III_5.03in	18:24	0.07696
SCS_Type_III_5.03in	18:30	0.07646
SCS_Type_III_5.03in	18:36	0.07545
SCS_Type_III_5.03in	18:42	0.07495

SCS_Type_III_5.03in	18:48	0.07394
SCS_Type_III_5.03in	18:54	0.07344
SCS_Type_III_5.03in	19:00	0.07243
SCS_Type_III_5.03in	19:06	0.07193
SCS_Type_III_5.03in	19:12	0.07092
SCS_Type_III_5.03in	19:18	0.07042
SCS_Type_III_5.03in	19:24	0.06941
SCS_Type_III_5.03in	19:30	0.06891
SCS_Type_III_5.03in	19:36	0.06791
SCS_Type_III_5.03in	19:42	0.0674
SCS_Type_III_5.03in	19:48	0.0664
SCS_Type_III_5.03in	19:54	0.06589
SCS_Type_III_5.03in	20:00	0.06489
SCS_Type_III_5.03in	20:06	0.06489
SCS_Type_III_5.03in	20:12	0.06388
SCS_Type_III_5.03in	20:18	0.06338
SCS_Type_III_5.03in	20:24	0.06288
SCS_Type_III_5.03in	20:30	0.06237
SCS_Type_III_5.03in	20:36	0.06137
SCS_Type_III_5.03in	20:42	0.06137
SCS_Type_III_5.03in	20:48	0.06036
SCS_Type_III_5.03in	20:54	0.06036
SCS_Type_III_5.03in	21:00	0.05935
SCS_Type_III_5.03in	21:06	0.05885
SCS_Type_III_5.03in	21:12	0.05835
SCS_Type_III_5.03in	21:18	0.05784
SCS_Type_III_5.03in	21:24	0.05684
SCS_Type_III_5.03in	21:30	0.05684
SCS_Type_III_5.03in	21:36	0.05583
SCS_Type_III_5.03in	21:42	0.05583
SCS_Type_III_5.03in	21:48	0.05483
SCS_Type_III_5.03in	21:54	0.05432
SCS_Type_III_5.03in	22:00	0.05382
SCS_Type_III_5.03in	22:06	0.05332
SCS_Type_III_5.03in	22:12	0.05231
SCS_Type_III_5.03in	22:18	0.05231
SCS_Type_III_5.03in	22:24	0.05131
SCS_Type_III_5.03in	22:30	0.05131
SCS_Type_III_5.03in	22:36	0.0503
SCS_Type_III_5.03in	22:42	0.0498
SCS_Type_III_5.03in	22:48	0.04929
SCS_Type_III_5.03in	22:54	0.04879
SCS_Type_III_5.03in	23:00	0.04779
SCS_Type_III_5.03in	23:06	0.04778
SCS_Type_III_5.03in	23:12	0.04678
SCS_Type_III_5.03in	23:18	0.04678

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SCS_Type_III_5.03in            23:24      0.04577
SCS_Type_III_5.03in            23:30      0.04527
SCS_Type_III_5.03in            23:36      0.04477
SCS_Type_III_5.03in            23:42      0.04426
SCS_Type_III_5.03in            23:48      0.04326
SCS_Type_III_5.03in            23:54      0.04326

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Subcatch   A0               03252014_Import
Subcatch   A1               03252014_Import
Subcatch   A10              03252014_Import
Subcatch   A11              03252014_Import
Subcatch   A12              03252014_Import
Subcatch   A13_1            Phase1A_Alternative
Subcatch   A13_2            03252014_Import
Subcatch   A14              Phase1B_Alternative
Subcatch   A15              03252014_Import
Subcatch   A16              Phase2_Alternative
......
Too many tags (93463 in total).

[MAP]
DIMENSIONS       376600.29165     150475.54775     383304.18335     157230.89525
UNITS            Feet

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
10               377995.1           155032.589
12               378132.457         154733.162
15               378279.299         154417.899
23               380279.898         152318.662
27               378029.814         155038.128
4                378525.494         152325.925
6                377683.403         155395.463
7                377444.311         155745.459
9                377858.652         155081.222
A10              378612.416         154574.353
```

```
......
Too many junction entities (24511 in total).

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
C68606           380778.349         153459.938
C8               378104.336         154784.84
C8               378026.178         155020.245
C9               377988.374         155032.038
C9               377877.538         155072.002
DP-019-1         377662.4           154874.849
DP-019-1         377642             155185.613
DP-019-2_2       377372.821         155750.73
DP-019-2_2       377319.443         155755.49
DP-019-2_3       377772.9           155197.608
DP-019-2_3       377708.545         155333.657
DP-021-25        380717.085         155514.602
DP-025-1         379224.905         154947.807
DP-025-1         379205.808         154967.772
DP-025-1         379190.183         154979.057
DP-025-1         379170.218         154991.21
DP-025-1         379155.461         154998.154
DP-025-1         379132.891         155007.703
DP-025-1         379106.85          155015.515
DP-025-1_1       379056.576         155009.671
DP-025-1_1       379035.742         155008.803
DP-025-1_1       379011.437         155002.726
DP-025-1_1       378985.395         154995.782
DP-025-1_1       378955.013         154981.893
DP-025-1_1       378934.18          154967.136
DP-025-1_1       378915.951         154952.379
DP-025-1_1       378897.721         154934.15
DP-025-1_1       378883.833         154917.657
DP-025-1_1       378869.944         154900.296
DP-025-1_1       378855.187         154882.934
DP-025-1_1       378842.166         154866.441
DP-025-1_2       378828.277         154843.004
DP-025-1_2       378816.992         154822.171
DP-025-1_2       378800.499         154790.053
DP-025-12        378267.366         154434.119
DP-025-12        378229.644         154509.562
DP-025-13        378276.997         154438.934
DP-025-13        378238.473         154511.167
DP-025-16        377712.736         154331.686
DP-025-5         377886.081         155074.083
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DP-025-7	378026.859	155039.235
DP-025-7	377997.827	155034.671
DP-025-8	378056.87	154946.112
DP-026-8	379508.833	154776.164
DP-026-8	379478.451	154782.24
DP-026-8	379459.353	154790.921
DP-026-8	379433.917	154806.415
DP-027-9	381513.658	154375.89
DP-028-09_1	382434.44	154110.844
DP-031-10	378496.727	153951.599
DP-031-9	377775.772	152762.234
DP-031-9	377768.881	152941.69
DP-031-9	377766.06	153015.8
DP-031-9	377791.667	153031.425
DP-031-9	377791.25	153130.027
DP-031-9	377780.383	153144.272
DP-031-9	377770.834	153205.036
DP-031-9	377769.098	153253.213
DP-033-16	380810.781	153857.081
DP-033-2	380770.706	153926.236
DP-037-17	378804.272	152277.208
DP-038-10	379354.746	152516.496
DP-038-15	379179.251	152724.982
DP-038-16	379037.88	152340.94
DP-038-8	379243.365	152503.735
DP-039-18	380410.144	153395.299
DP-039-18	380405.172	153376.413
DP-039-20	380396.172	152952.928
DP-039-20	380373.721	153068.126
DP-039-21	380439.684	152657.161
DP-044-11	378681.04	151902.893
DP-044-28	378525.518	152325.833
DP-044-29	378626.118	151887.42
DP-044-6	378646.393	151892.189
DP-045-10	379471.709	151742.254
DP-045-13	379679.866	151798.399
DP-045-26	379735.048	152171.026
DP-045-26	379672.195	152156.195
DP-045-31	379448.283	151744.679
DP-045-31	379361.81	152066.123
DP-045-36	379728.745	151636.135
DP-045-39	379965.734	151523.971
DP-045-7	378891.67	151925.666
DP-051-19_2	379876.391	151141.394
DP-C13-044	378166.994	152120.313
DP-C13-044	378158.875	152218.109

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DP-Sm-2          380558.716         153259.628
DP-Sm-2          380436.301         153187.199
DP-WS7-A39       378724.433         154655.28
DP-WS7-A39       378711.629         154690.625
DP-WS7-A39       378702.901         154699.283
DP-WS7-A39       378686.142         154704.587
DP-WS7-A39       378667.392         154700.542
DP-WS7-A39       378655.343         154695.844
DP-WS7-A39       378641.963         154687.139
DP-WS7-A39       378633.984         154659.091
DP-WS7-A39       378626.653         154641.055
DP-WS7-A39       378619.982         154627.693
DP-WS7-A39       378617.314         154622.347
sLink_12         378027.198         155036.683
sLink_12         377997.724         155032.068
sLink_7          377636.149         155399.253
sLink_7          377612.261         155423.937
sLink_7          377613.854         155477.287
sLink_7          377602.965         155489.81
sLink_7          377596.75          155499.978
sLink_7          377578.818         155524.266
sLink_7          377533.335         155598.896
sLink_7          377527.106         155615.357
sLink_7          377519.988         155626.035
sLink_7          377508.421         155637.157
sLink_7          377499.968         155650.949
sLink_7          377484.841         155671.414
sLink_7          377475.943         155685.65
sLink_7          377466.601         155698.107
OR159            378377.998         152694.982
OR78             379140.397         153773.341

[POLYGONS]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
A0               379390.605         155627.887
A0               379390.532         155627.885
A0               379390.122         155629.967
A0               379390.114         155630.252
A0               379390.536         155630.264
A0               379235.792         156426.596
A0               379233.631         156426.533
A0               379232.814         156430.694
A0               379235.671         156430.777
A0               379235.792         156426.596
A0               379236.067         156430.788
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A0	379236.093	156430.789
A0	379235.903	156437.347
A0	379239.183	156437.443
A0	379238.898	156447.28
A0	379242.177	156447.375
A0	379242.082	156450.654
A0	379245.361	156450.749
A0	379245.172	156457.308
A0	379248.451	156457.402
A0	379248.356	156460.682
A0	379251.635	156460.777
A0	379251.541	156464.056
A0	379258.099	156464.246
A0	379258.004	156467.525
A0	379261.283	156467.62
A0	379261.188	156470.899
A0	379264.468	156470.994
A0	379264.373	156474.274
A0	379267.652	156474.368
A0	379267.557	156477.648
A0	379283.954	156478.122
A0	379283.859	156481.401
A0	379310.093	156482.16
A0	379310.188	156478.881
A0	379316.746	156479.071
A0	379316.841	156475.792
A0	379323.4	156475.981
A0	379323.494	156472.702
A0	379333.332	156472.987
A0	379333.427	156469.708
A0	379484.273	156474.072
A0	379483.988	156483.91
A0	379503.664	156484.48
A0	379503.569	156487.759
A0	379506.848	156487.854
A0	379506.753	156491.133
A0	379513.312	156491.323
A0	379513.217	156494.602
A0	379516.496	156494.697
A0	379516.401	156497.976
A0	379519.681	156498.071
A0	379519.491	156504.629
A0	379522.77	156504.724
A0	379522.58	156511.283
A0	379525.86	156511.378
A0	379525.765	156514.657

A0	379529.044	156514.752
A0	379528.854	156521.311
A0	379532.133	156521.405
A0	379531.944	156527.964
A0	379535.223	156528.059
A0	379535.128	156531.338
A0	379538.407	156531.433
A0	379538.123	156541.271
A0	379541.402	156541.366
A0	379541.212	156547.924
A0	379544.491	156548.019
A0	379544.302	156554.577
A0	379550.86	156554.767
A0	379550.765	156558.046
A0	379557.324	156558.236
A0	379557.229	156561.515
A0	379560.508	156561.61
A0	379560.413	156564.89
A0	379563.692	156564.985
A0	379563.598	156568.264
A0	379566.877	156568.359
A0	379566.782	156571.638
A0	379570.061	156571.733
A0	379569.966	156575.012
A0	379573.246	156575.107
A0	379573.151	156578.386
A0	379576.43	156578.481
A0	379576.335	156581.761
A0	379579.614	156581.855
A0	379579.52	156585.135
A0	379599.195	156585.704
A0	379599.575	156572.587
A0	379602.854	156572.682
A0	379603.044	156566.123
A0	379606.323	156566.218
A0	379606.418	156562.939
A0	379609.697	156563.034
A0	379609.792	156559.754
A0	379613.071	156559.849
A0	379613.166	156556.57
A0	379616.445	156556.665
A0	379616.54	156553.386
A0	379619.819	156553.481
A0	379619.914	156550.201
A0	379623.194	156550.296
A0	379623.288	156547.017

A0	379626.568	156547.112
A0	379626.662	156543.832
A0	379629.942	156543.928
A0	379630.037	156540.648
A0	379633.316	156540.743
A0	379633.411	156537.464
A0	379636.69	156537.559
A0	379636.785	156534.28
A0	379643.344	156534.469
A0	379643.438	156531.19
A0	379653.276	156531.475
A0	379653.371	156528.195
A0	379663.209	156528.48
A0	379663.304	156525.201
A0	379669.862	156525.391
A0	379669.957	156522.111
A0	379676.516	156522.301
A0	379677.18	156499.346
A0	379680.459	156499.441
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A15	380195.732	153777.156
A15	380198.726	153787.089
A15	380204.811	153803.675
A15	380211.085	153813.702
A15	380217.264	153827.009
A15	380227.006	153830.573
A15	380236.749	153834.137
A15	380243.023	153844.165
A15	380252.671	153851.008
A15	380258.945	153861.035
A15	380268.593	153867.878
A15	380274.867	153877.906
A15	380284.61	153881.47
A15	380290.694	153898.056
A15	380300.342	153904.899
A15	380306.616	153914.927
A15	380316.264	153921.77
A15	380322.538	153931.797
A15	380342.024	153938.925
A15	380392.816	153781.859
A16	380038.451	153427.995
A16	380032.177	153417.968
A16	380022.529	153411.124
A16	380016.255	153401.097
A16	380006.607	153394.254
A16	380000.333	153384.226
A16	379990.685	153377.383
A16	379984.506	153364.076
A16	379978.327	153350.77
A16	379975.332	153340.837
A16	379965.59	153337.273
A16	379959.316	153327.245
A16	379946.389	153320.307
A16	379641.322	153314.764
A16	379503.593	153310.779
A16	379505.028	153261.191
A16	379488.748	153291.464
A16	379436.575	153426.76
A16	379414.917	153426.366
A16	379436.575	153426.76

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A16              379542.619         153436.624
A16              379552.267         153443.468
A16              379558.541         153453.495
A16              379564.815         153463.522
A16              379574.557         153467.086
A16              379584.3           153470.65
A16              379600.602         153474.404
A16              379610.345         153477.968
A16              379626.551         153485.001
A16              379701.879         153490.462
A16              379990.359         153502.09
A16              380000.008         153508.933
A16              380006.281         153518.961
A16              380026.3           153519.54
A16              380071.867         153520.858
A16              380078.141         153530.886
A16              380100.906         153538.108
A16              380091.352         153527.986
A16              380088.642         153508.215
A16              380082.368         153498.188
A16              380079.374         153488.255
A16              380076.474         153475.043
A16              380066.826         153468.2
A16              380060.552         153458.173
A16              380050.904         153451.329
A16              380048.099         153434.838
A16              380038.451         153427.995
......
Too many subcatchment entities (99 in total).

[SYMBOLS]
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
```

Appendix E. Additional Model Development Information

Orifice Sizing

Since one orifice is assigned to each manhole, and oftentimes there are more than one catch basin associated with any given manhole, a review of the catch basin quantity assigned to each manhole was performed. This was conducted by reviewing various areas in the watershed based on manhole location and determining the observed average of catch basins per manhole. The width of the orifice was then calculated from average number of catch basins per manhole based on location and the predetermined orifice size for one catch basin. Table E-1 below indicates the values of catch basins per manhole used throughout the watershed.

Table E-1. 2D Orifice Sizing based on Manhole Location

Location Description	Average Number of Catch Basins per Manhole	Orifice Size
Intersection of two minor streets	2	6-ft x 2-ft
Intersection of two major streets	3	9-ft x 2-ft
On a minor street	3	9-ft x 2-ft
On a major street	1	3-ft x 2-ft
On a RIDOT owned street	3	9-ft x 2-ft

Junctions that are connected to open channels, either on the downstream or upstream end, are sized differently in order to properly model waters ability overtopping the channel bank. Orifices linked to junctions that are connected to open channels are given a constant height of 30-feet, and the width is determined based on half the total length of open channel upstream and/or downstream of the junction.

2D Mesh and Open Channels

Since open channels are represented by 1D conduits in the model, alterations to the 2D mesh were necessary so that the flow in the channels was not being double counted. To allow the mesh to more accurately account for water conveyed through the open channels, the elevation data in the area surrounding the open channel was raised to the elevation on top of the bank. A cell elevation was selected to represent the bottom of the channel. The channel height was then used to determine a cell elevation that would represent the top of bank. The cells with elevations that were impacted by the channel were then raise to the top of bank elevation. Figure E-1 indicates the cells where elevations were raised to properly account for flow through open channels in the Existing Conditions model.

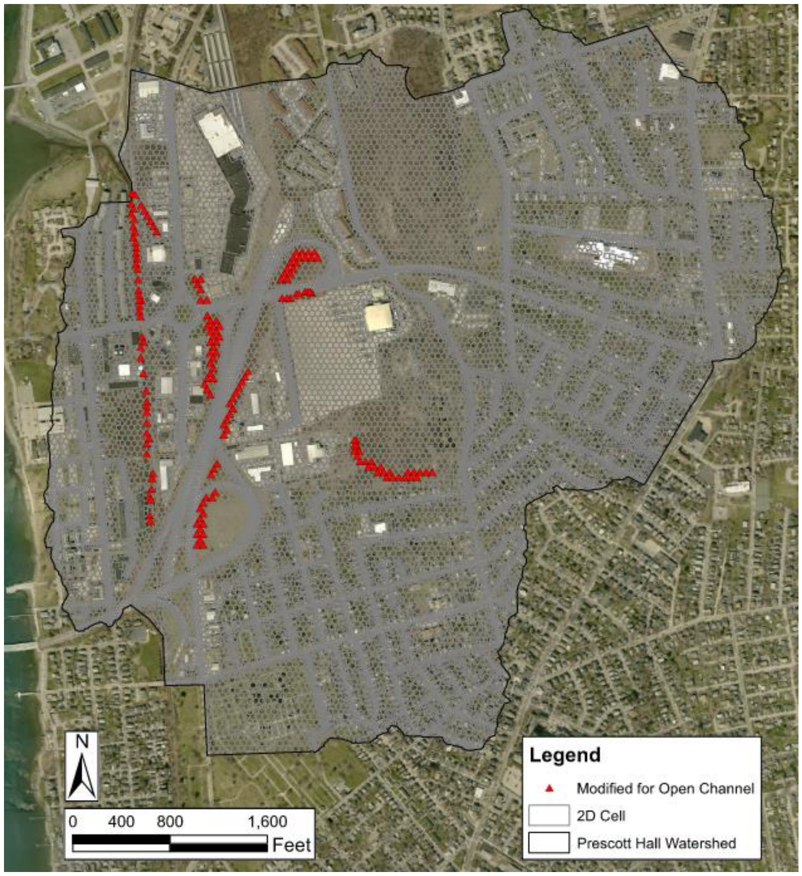

Figure E-1. 2D Cells Raised for Open Channels

Additional Supporting Figures and Tables

Table E-2. Tropical Storm Ida Validation Results without Photos

Location	Reported Depth (ft)*	Peak Model Depth (ft)
32 Prescott Hall Rd	4 ft	1.62 – 2.04 ft
33 Prescott Hall Rd	More than 2 ft	1.62 – 2.04 ft
35 Prescott Hall Rd	5 ft	2.08 – 2.63 ft
37 Prescott Hall Rd	More than 2 ft	2.29 – 3.06 ft
Garfield @ Prescott Hall Rd	4.5 ft	1.89 – 3.06 ft
81 Garfield St	More than 2 ft	1.63 – 2.75 ft
75-80 Garfield St	More than 2 ft	1.18 ft – 2.27 ft
45-47 Homer St	6 inches to 1 ft	0.26 – 0.9 ft
55 Garfield St	3.5 ft	0.03 – 0.26 ft
39 Garfield St	Less than 6 inches	0.05 – 0.19 ft
24 Southmayd St	Less than 6 inches	0.01 ft

**Resident reported information that has no method of verification*

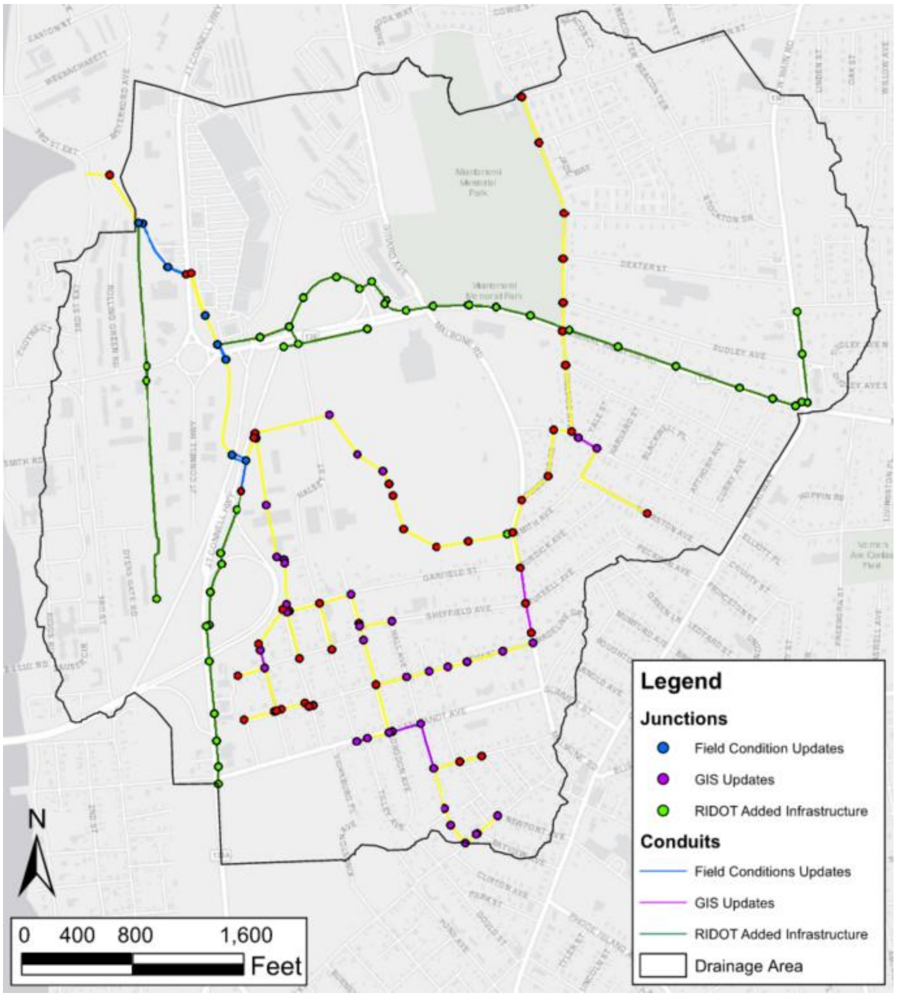

Figure E-2. 1D Changes between 2014 Existing Conditions Model and 2022 Existing Conditions Model

Table E-3. Manning's n Values used for 1D Model Components

Conduit Type	Manning's n
Existing PVC Pipe	0.01
New RCP	0.013
Existing RCP	0.018
Existing Concrete Culvert	0.02
Existing Box Culvert	0.02
New Box Culvert	0.013
Stone Lined Channel	0.02
New/Restored Grass Lined Channel	0.032
Grass Lined Channel*	0.045 – 0.08

**Based on field observations*

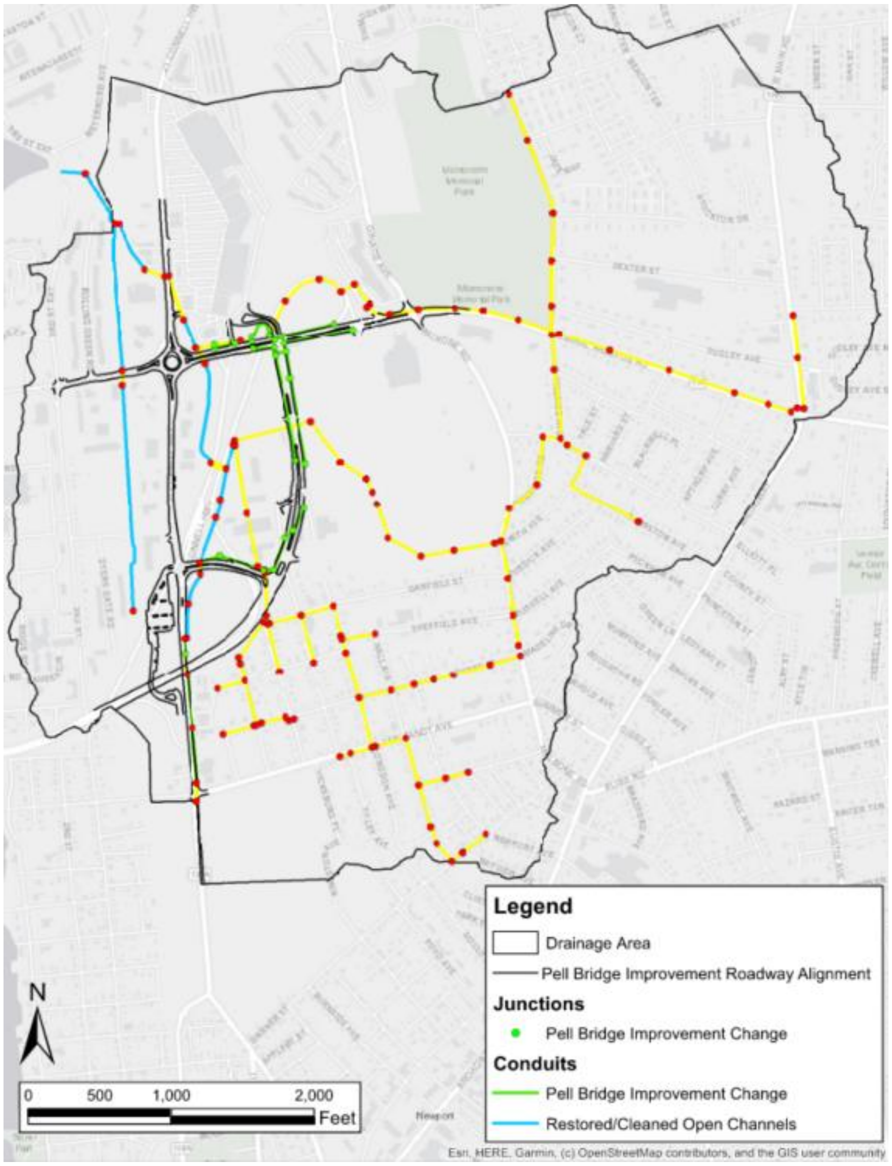

Figure E-3. 1D Network Model Changes due to Pell Bridge Interchange Improvement Project

Appendix F. Conceptual Construction Cost Estimates

Conceptual Estimate - AACEI Class 5					
Project Name:	Prescott Hall Drainage Study			**Date:**	9/8/2022
Location:	Newport, RI			**Estimator:**	M. Banahan; M. Gnandt
Description:	Drainage Improvements in Prescott Hall and Malbone Watersheds - Phase 1			**Version:**	R00
DIRECT: SUBTOTAL CONSTRUCTION COSTS					
Item No.	**Item Description**	**Quantity**	**Units**	**Unit Cost**	**Item Cost**
1	S-1: Detention Area 1	1	LS	$ 4,021,000	$ 4,021,000
2	S-2: Detention Area 2	1	LS	$ 7,142,400	$ 7,142,400
3	C-1: Drainage Improvements on Butler St & Southmayd	1	LS	$ 616,000	$ 616,000
4	C-2: Redirect 42" Outlet from Prescott Hall to New Detention Area (S-2)	1	LS	$ 496,000	$ 496,000
5	C-11: Line 42" Outlet Pipe from Prescott Hall	1	LS	$ 184,000	$ 184,000
6	C-13: Drainage Improvements on Garfield St	1	LS	$ 738,000	$ 738,000
7	C-14: Drainage Improvements on Homer St and Sheffield Ave	1	LS	$ 649,000	$ 649,000
8	Site Restoration and Traffic Control Allowance	1	LS	$ 85,000	$ 85,000
9	Mobilization/Demobilization (5%)	1	LS	$ 697,000	$ 697,000
				Subtotal Construction Costs	***$ 14,628,000***
DIRECT: SUBTOTAL ADDITIONAL CONSTRUCTION COSTS					
				Design Allowance (Class 5 Estimate, Planning Level Design, 30%)	$ 4,388,000
				Escalation Multiplier to Year 2024 (8.2%)	$ 1,194,000
				Engineers Opinion of Probable Construction Cost	***$ 20,210,000***

	Construction Cost Opinion Range		
	-50%	**Median Cost**	**+100%**
Engineers Opinion of Probable Construction Cost =	$10,100,000	**$20,210,000**	$40,400,000

Conceptual Estimate - AACEI Class 5					
Project Name:	Prescott Hall Drainage Study			**Date:**	9/8/2022
Location:	Newport, RI			**Estimator:**	M. Banahan; M. Gnandt
Description:	Drainage Improvements in Prescott Hall and Malbone Watersheds - Phase 1			**Version:**	R00
CONSTRUCTION COSTS					
Item No.	**Item Description**	**Quantity**	**Units**	**Unit Cost**	**Item Cost**
1	**S-1: Detention Area 1**				
2	Cut Volume	54,122	CY	$ 36.00	$ 1,948,000
3	Fill Volume	296	CY	$ 66.25	$ 20,000
4	Hauling and Disposal	53,826	CY	$ 37.50	$ 2,018,000
5	Overflow Structure (4-ft square, 7-ft depth)	1	EA	$ 12,500.00	$ 13,000
6	New 60" RCP (Avg depth 5.7 ft)	20	LF	$ 782.00	$ 16,000
7	New 42" RCP (Avg depth 7.5 ft)	10	LF	$ 620.00	$ 6,000
8	**S-2: Detention Area 2**				
9	Cut Volume	96,970	CY	$ 36.00	$ 3,491,000
10	Fill Volume	162	CY	$ 66.25	$ 11,000
11	Hauling and Disposal	96,808	CY	$ 37.50	$ 3,630,000
12	Demolish existing twin 60" culverts	270	LF	$ 37.50	$ 10,000
13	Excavate new grassed channel (20 ft base width x 5 ft depth x 20 ft length)	47	CY	$ 8.50	$ 400
14	**C-1: Drainage Improvements on Butler St & Southmayd**				
15	Install new 24" RCP (Avg depth 5.7 ft)	200	LF	$ 314.00	$ 63,000
16	Install new 42" RCP (Avg depth 7.4 ft)	380	LF	$ 620.00	$ 236,000
17	Remove and replace existing 24" pipe with 48" RCP (Avg depth 5.6 ft)	210	LF	$ 595.00	$ 125,000
18	Remove and replace existing 24" pipe with 30" RCP (Avg depth 5.3 ft)	180	LF	$ 402.00	$ 72,000
19	Abandon existing 12" pipe (Southmayd)	200	LF	$ 75.00	$ 15,000
20	Abandon existing 24" pipe (Garfield to Butler)	320	LF	$ 124.00	$ 40,000
21	Install new 4-ft diameter manhole	1	EA	$ 10,690.00	$ 11,000
22	Install new 5-ft diameter manhole	1	EA	$ 12,690.00	$ 13,000
23	Install new catch basin	2	EA	$ 7,500.00	$ 15,000
24	Replace 4-ft diameter manhole	1	EA	$ 12,190.00	$ 12,000
25	Replace 4-ft diameter manhole with 5-ft diameter manhole	1	EA	$ 14,190.00	$ 14,000
26	**C-2: Redirect 42" Outlet from Prescott Hall to New Detention Area (S-2)**				
27	Remove and replace 42" pipe with 48" pipe (Avg depth 8.5 ft)	25	LF	$ 742.00	$ 19,000
28	Install new 72" pipe (Avg depth 9.2 ft) - CITY	205	LF	$ 1,157.00	$ 237,000
29	Install new 72" pipe (Avg depth 10.5 ft) - RIDOT	196	LF	$ 1,224.00	$ 240,000
30	**C-11: Line 42" Outlet Pipe from Prescott Hall**				
31	Install CIPP Liner on 42" Pipe	410	LF	$ 448.40	$ 184,000
32	**C-13: Drainage Improvements on Garfield St**				
33	Remove and replace 42" pipe with 48" RCP (Avg depth 6.7 ft)	130	LF	$ 668.00	$ 87,000
34	Remove and replace 36" pipe with 42" RCP (Avg depth 7.3 ft)	250	LF	$ 651.00	$ 163,000
35	Install new 36" RCP (Avg depth 6.8 ft)	730	LF	$ 503.00	$ 367,000
36	Install new 5-ft diameter manhole	2	EA	$ 12,690.00	$ 25,000
37	Install new catch basin	7	EA	$ 7,500.00	$ 53,000
38	Replace 5-ft diameter manhole	3	EA	$ 14,190.00	$ 43,000
39	**C-14: Drainage Improvements on Homer St and Sheffield Ave**				
40	Remove and replace 24" pipe with 30" RCP (Avg depth 9.3 ft)	360	LF	$ 557.00	$ 201,000
41	Remove and replace 30" pipe with 36" RCP (Avg depth 4.8 ft)	440	LF	$ 427.00	$ 188,000
42	Remove and replace 30" pipe with 42" RCP (Avg depth 4.8 ft)	240	LF	$ 496.00	$ 119,000
43	Remove and replace 18" pipe with 24" RCP (Avg depth 4.5 ft)	230	LF	$ 286.00	$ 66,000
44	Replace 4-ft diameter manhole	3	EA	$ 10,690.00	$ 32,000
45	Replace 4-ft diameter manhole with 5-ft diameter manhole	3	EA	$ 14,190.00	$ 43,000
46	**Site Restoration and Traffic Control Allowance**	1	LS	$ 85,000.00	$ 85,000
				Item Subtotal Construction Costs (Year 2022)	$ 13,931,000
	Mobilization/Demobilization		5%		$ 697,000
	Design Contingency (Class 4 Estimate, Planning Level Design, 30%)		30%		$ 4,388,000
	Escalation to Year 2024		8.2%		$ 1,194,000
				Item Subtotal Construction Costs (Year 2024)	$ 20,210,000
				Direct: Subtotal Construction Costs	***$ 20,210,000***

Conceptual Estimate - AACEI Class 5					
Project Name:	Prescott Hall Drainage Study			**Date:**	9/8/2022
Location:	Newport, RI			**Estimator:**	M. Banahan; M. Gnandt
Description:	Drainage Improvements in Prescott Hall and Malbone Watersheds - Phase 2			**Version:**	R00
DIRECT: SUBTOTAL CONSTRUCTION COSTS					
Item No.	**Item Description**	**Quantity**	**Units**	**Unit Cost**	**Item Cost**
1	S-3: Detention Area 3	1	LS	$ 10,505,000	$ 10,505,000
2	C-3: New Pipe/Channel from Garfield to New Detention Area (S-3)	1	LS	$ 452,000	$ 452,000
3	C-4: Upgrade Existing RIDOT Culverts	1	LS	$ 5,270,000	$ 5,270,000
4	C-5: Drainage Improvements on Hillside Ave & Smith Ave	1	LS	$ 2,194,000	$ 2,194,000
5	C-6: Drainage Improvements on Malbone Rd	1	LS	$ 343,000	$ 343,000
6	C-12: Malbone Channel Box Culvert	1	LS	$ 73,000	$ 73,000
7	Site Restoration and Traffic Control Allowance	1	LS	$ 85,000	$ 85,000
8	Mobilization/Demobilization (5%)	1	LS	$ 946,000	$ 946,000
				Subtotal Construction Costs	***$ 19,868,000***
DIRECT: SUBTOTAL ADDITIONAL CONSTRUCTION COSTS					
				Design Allowance (Class 5 Estimate, Planning Level Design, 30%)	$ 5,960,000
				Escalation Multiplier to Year 2024 (26.5%)	$ 5,271,000
				Engineers Opinion of Probable Construction Cost	***$ 31,099,000***

	Construction Cost Opinion Range		
	-50%	**Median Cost**	**+100%**
Engineers Opinion of Probable Construction Cost =	$15,600,000	**$31,100,000**	$62,200,000

Conceptual Estimate - AACEI Class 5					
Project Name:	Prescott Hall Drainage Study			**Date:**	9/8/2022
Location:	Newport, RI			**Estimator:**	M. Banahan; M. Gnandt
Description:	Drainage Improvements in Prescott Hall and Malbone Watersheds - Phase 2			**Version:**	R00
CONSTRUCTION COSTS					
Item No.	**Item Description**	**Quantity**	**Units**	**Unit Cost**	**Item Cost**
1	**S-3: Detention Area 3**				
2	Site Clearing	273,254	SF	$ 0.42	$ 115,000
3	Cut Volume	138,846	CY	$ 36.00	$ 4,998,000
4	Hauling and Disposal	138,846	CY	$ 37.50	$ 5,207,000
5	Overflow Structure (4-ft square, 8-ft depth)	1	EA	$ 12,500.00	$ 13,000
6	Demolish existing 48" pipe	650	LF	$ 250.00	$ 163,000
7	Install new 42" RCP (Avg depth 12.9 ft)	10	LF	$ 862.00	$ 9,000
8	**C-3: New Pipe/Channel from Garfield to New Detention Area (S-3)**				
9	Install new 48" RCP (Avg depth 10.1 ft)	340	LF	$ 742.00	$ 252,000
10	Excavate new grassed channel (8 ft base width x 3 ft depth x 510 ft length)	21,476	CY	$ 8.50	$ 183,000
11	Install new 6-ft diameter manhole	1	EA	$ 17,450.00	$ 17,000
12	**C-4: Upgrade Existing RIDOT Culverts**				
13	Remove and replace twin 5-ft culverts with twin 8-ft culverts	1,350	LF	$ 3,904.00	$ 5,270,000
14	**C-5: Drainage Improvements on Hillside Ave & Smith Ave**				
15	Remove and replace 36" pipe with 48" pipe (Avg depth 11.3 ft)	730	LF	$ 931.00	$ 680,000
16	Remove and replace 18" pipe with 48" pipe (Avg depth 15.6 ft)	470	LF	$ 1,160.00	$ 545,000
17	Install new 48" pipe (Avg depth 16.5 ft)	650	LF	$ 1,212.00	$ 788,000
18	Install new 6-ft diameter manhole	2	EA	$ 17,450.00	$ 35,000
19	Install new catch basin	4	EA	$ 7,500.00	$ 30,000
20	Replace 4-ft diameter manhole with 6-ft diameter manhole	3	EA	$ 19,450.00	$ 58,000
21	Replace 5-ft diameter manhole with 6-ft diameter manhole	3	EA	$ 19,450.00	$ 58,000
22	**C-6: Drainage Improvements on Malbone Rd**				
23	Remove and replace 12" pipe with 18" RCP (Avg depth 6.3 ft)	220	LF	$ 326.00	$ 72,000
24	Remove and replace 18" pipe with 24" RCP (Avg depth 7.1 ft)	530	LF	$ 398.00	$ 211,000
25	Replace 4-ft diameter manhole	3	EA	$ 12,190.00	$ 37,000
26	Install new catch basin	3	EA	$ 7,500.00	$ 23,000
27	**C-12: Malbone Channel Box Culvert**				
28	Remove twin 30" pipes (Avg depth 6.4 ft)	50	LF	$ 195.00	$ 10,000
29	Install 8' x 5' box culvert (6-ft depth from top of ground to bottom of culvert)	50	LF	$ 1,250.00	$ 63,000
30	**Site Restoration and Traffic Control Allowance**	1	LS	$ 85,000.00	$ 85,000
	Item Subtotal Construction Costs (Year 2022)				$ 18,922,000
	Mobilization/Demobilization		5%		$ 946,000
	Design Contingency (Class 4 Estimate, Planning Level Design, 30%)		30%		$ 5,960,000
	Escalation to Year 2028		26.5%		$ 5,271,000
	Item Subtotal Construction Costs (Year 2028)				$ 31,099,000
	Direct: Subtotal Construction Costs				***$ 31,099,000***