Chesapeake Boulevard
(between East Little Creek Rd & Fishermans Rd)
Pedestrian & Drainage
Preliminary Engineering Report

Prepared For:

City of Norfolk, Virginia

Department of Public Works

Presented November 14, 2013

Report Submitted November 10, 2104

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Executive Summary

The City of Norfolk Department of Public Works tasked Timmons Group to provide a pedestrian analysis of the Chesapeake Boulevard corridor between East Little Creek Road and Fishermans Road as well as a drainage analysis storm system along and downstream of Chesapeake Boulevard from East Little Creek Road to Fishermans Road. Both pedestrian and drainage improvement options were explored along Chesapeake Boulevard and parallel streets. This report details the results of the investigation of the existing pedestrian options and drainage system and provides recommendations for improvement.

Pedestrian Analysis

Timmons Group conducted a walkability audit and found little to no constructed sidewalks available on either the northern or southbound lanes of the Chesapeake Boulevard corridor. There are adequate walking facilities along the entire stretch of Pythian Avenue between East Little Creek Road and Fishermans Road with ample connectivity to Chesapeake Boulevard via concrete walks. Timmons Group developed three options to improve walking (and even bicycling) safety and mobility within public right-of-way, including:

1) Install sidewalks on both sides of Chesapeake Boulevard. The cost to construct this option is approximately $2,650,000.
2) Install sidewalks down one side of Chesapeake Boulevard. The cost to construct this option is approximately $1,275,000.
3) Construct a multi-use path along the center median. The cost to construct this option is approximately $860,000.
4) Provide an accessible path down Pythian Avenue. The cost to construct this option is approximately $400,000.

Drainage Analysis

Using the Bentley SewerGEMS (V8i Select Series 2) watershed modeling program, a 10yr, 24hr design storm was modeled for this watershed to develop recommendations to alleviate flooding throughout the study area. The watershed encompasses 260 acres and consists of two sub-watersheds that drain to unnamed streams that eventually outfall to Little Creek.

The northbound and southbound corridors of Chesapeake Boulevard between East Little Creek Road and Fishermans Road have been identified as a critical location recommended for improvement within the Chesapeake Boulevard watershed based on discussions with City staff and property owners, and confirmed by field observations and modeling results during both a 10yr, 24hr storm event. In both sub-watersheds, insufficient pipe capacity at the outfalls,

insufficiently sized infrastructure upstream, as well as clogged pipes and ditches lead to surcharging and flood conditions.

Timmons recommends a phased approach to improvements. Phase 1 should include upgrades to downstream culverts which will alleviate some of the flooding upstream. The estimated costs for these improvements are approximately $424,000 in sub-watershed 1 and $168,000 in sub-watershed 2. Phase 2 should include capacity upgrades in both sub-watersheds as well as upgrading existing branch sections to reroute flow from upstream to the outfalls. The estimated costs for Phase 2 improvements are approximately $4,700,000 for sub-watershed 1, and $3,600,000 for sub-watershed 2.

It is recommended that the City further investigate options to improve pedestrian accessibility within the Chesapeake Boulevard corridor and proceed with detailed design of Phase 1 and 2 recommended drainage improvements for sub-watersheds 1 and 2.

1.0 Purpose and Scope

Purpose

The City of Norfolk Department of Public Works is interested in providing improved drainage and pedestrian options along Chesapeake Boulevard between East Little Creek Road and Fishermans Road. Timmons Group observed the site and analyzed the stormwater network to identify the drainage problems and recommend potential mitigation measures. In addition, Timmons Group examined the potential for various pedestrian options including but not limited to: traditional sidewalks along the east and/or west sides of Chesapeake Boulevard; a multiuse path down the median; and how to connect these options to the existing pedestrian walkways.

Scope

The scope of services included an observation of the pedestrian options along the Chesapeake Boulevard corridor and the existing storm system. A walkability audit and drainage analysis were completed. The drainage analysis included the investigation of existing system conditions and potential modifications to mitigate the drainage issues, and recommendations for improvement with corresponding cost estimates. A field survey of the existing stormwater infrastructure was performed by Timmons Group on August 27, 28 and 29, 2013 which included data collection of storm structures in the drainage basin (each structure in the critical location and only those structures along the main trunk line downstream) including location, dimensions, connectivity, and general condition assessment. The field survey utilized a Real Time Kinematic (RTK) Global Positioning System (GPS) collection method that measured and referenced data horizontally on the NAD '83 datum and vertically on NAVD '88[1]. Using the RTK GPS surveying system allowed for real time corrections through GPS satellite observations at sub-centimeter accuracy. Where data were missing or incomplete, assumptions were made to provide hydraulic connectivity to complete the model.

Using Bentley SewerGEMS V8i (SELECT Series 2), the 10yr, 24hr design storm event was applied to the existing stormwater system. A fixed Mean Higher High Water (MHHW) tailwater condition of 1.6' (NAVD '88) was applied to the outfall of the system. This tailwater elevation applies to the Little Creek Watershed (no. 4) and is based on gauge relationships in reference to Sewells Point and were developed by Fugro Atlantic as part of the 2010 *Preliminary Coastal Flooding Evaluation and Implications for Flood Defense Design*[1] report.

[1] [1] As referenced from the *Preliminary Coastal Flooding Evaluation and Implications for Flood Defense Design*, prepared by Fugro Atlantic for the Department of Public Works, City of Norfolk, July 2010.

2.0 Background

Watershed Description

The project limits consist of two sub-watersheds that drain to unnamed streams that eventually outfall to Little Creek. Sub-watershed 1 is roughly bounded to the north by Sheppard Avenue; Merritt Street to the west; Briarwood Circle and Pythian Avenue to the east; and East Little Creek Road to the south. The watershed outfalls to a creek along Templar Boulevard. Sub-watershed 2 is roughly bounded to the north by Fishermans Road; Old Ocean View Road to the east; Toby Lane and Dickson Drive to the west; and Sheppard Avenue to the south. The watershed outfalls to a creek behind private properties between Sunset Drive and Tallwood Street. Both watersheds are composed mainly of residential land use along Chesapeake Boulevard and corresponding neighborhood side streets, with commercial land use to the south of sub-watershed 1. Topography ranges from ±2.0' at the outfalls of the watershed at a small stream draining to Little Creek, to ±16.0' in the southern portion of sub-watershed1 along East Little Creek Road. Table 1 lists the physical characteristics of each sub-watershed.

Table 1. Watershed Characteristics

Physical Characteristics	Chesapeake Blvd Sub- Watershed 1	Chesapeake Blvd Sub- Watershed 2
Total Acreage	Approx. ± 145 ac	Approx. ± 115 ac
Basin Perimeter	Approx. ± 2.3 miles	Approx. ± 2.08 miles
Linear Footage Stormwater pipe	Approx. ± 1.98 miles	Approx. ± 1.45 miles
Linear Footage Stormwater ditch	Approx. ± 0.36 miles	Approx. ± 0.20 miles
Number of Structures	138	107

Figure 1 outlines the watershed boundaries graphically in an aerial view, including the outfalls and critical locations of the watershed. Figure 2 outlines the boundaries of the pedestrian corridor study.

Chesapeake Boulevard between East Little Creek Road and Fishermans Road has been identified based on City input and flooding complaints from property owners within the area as critical locations within both sub-watersheds.

Figure 1. The Chesapeake Boulevard Watershed Study Limits.

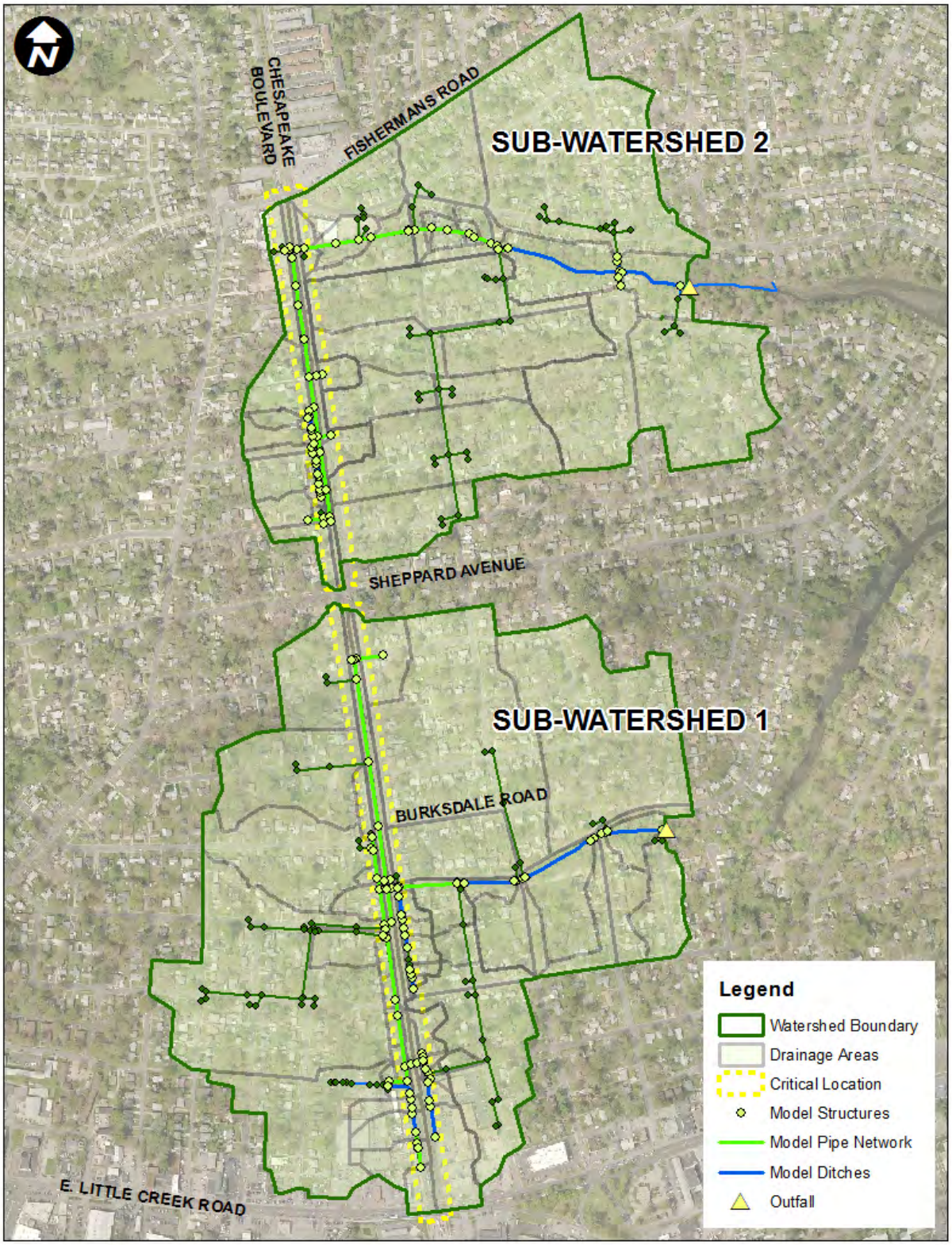
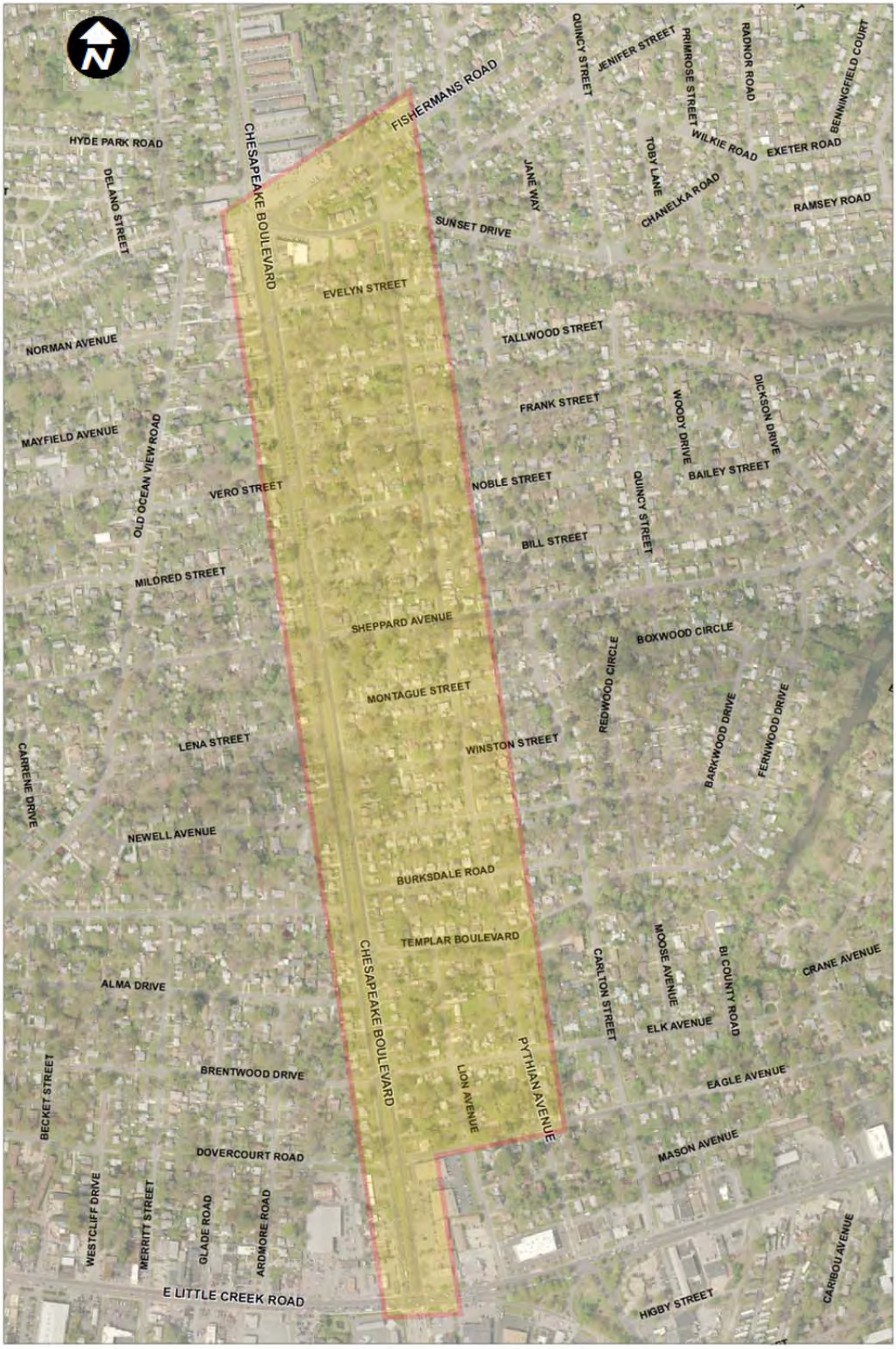


Figure 2. The Chesapeake Boulevard Pedestrian Corridor Study Limits.



Field Observations

Pedestrian Observations

The corridor can be described as having a hostile pedestrian environment. Sidewalks are present east and west of Chesapeake Boulevard, but the boulevard itself acts as a substantial barrier for people who wish to travel through the neighborhood. Walking along the corridor is also very challenging since there are essentially no sidewalks apart from areas at the northwest corner of the project site area. Medians often function as midblock refuges from vehicular traffic, but pedestrians are not afforded delineated areas for refuge or provided visual cues for preferred midblock crossings.

Timmons Group conducted a walkability audit. The site was visited during much of the day (8:00 – 3:00 PM) on Thursday, October 30th, 2013.

Several figures depicting filed observations have been included as Appendix A.

Drainage Observations

Local property owners along Chesapeake Boulevard between East Little Creek Road and Fishermans Road report that median ditches and yards flood significantly during storm events.

During the field observations conducted on August 27th – 29th, Timmons Group noticed multiple pipes within the piped/ditch sections along Chesapeake Boulevard that were 80 – 100% blocked by vegetation. In addition, portions of storm infrastructure (namely piped and ditch sections) were absent along Chesapeake Boulevard: between Elk Avenue and Templar Boulevard as well as between Vero and Mildred Streets.

Civic League Meeting

The South Bayview Civic League includes the portion of Chesapeake Boulevard that has been identified as a critical location. Timmons Group and the City of Norfolk presented at a South Bayview Civic League meeting on October 10, 2013. Citizens within the neighborhood were given the opportunity to identify areas of concern and present ideas for improvement. Citizen response from the meeting can be found in Appendix B.

The meeting with the South Bayview Civic League was held to better understand the user issues associated throughout this corridor in regards to pedestrian access and circulation. During the meeting, residents' feelings and observations of the overall condition of Chesapeake Boulevard were expressed.

In regards to stormwater drainage and management, many residents stated that the northbound lanes of Chesapeake Boulevard as well as the eastern portion of the public right of way currently drains overland into the front yards of the residents, sometimes accumulating in ponding areas 12' in width. Standing water has also been observed at several intersections to include the intersections of Elk Avenue and Fishermans Road. Also mentioned during the meeting were the dismal states of many of the ditches which convey drainage within the project site area. Several of the ditches were stated to be overgrown, ill maintained and harbingers of rats and other vermin.

Participants of the meeting also expressed concerns and issues with pedestrian accessibility along the boulevard. The lack of paved walks, along with excessive grades within the shoulders, make it extremely difficult for residents to walk to nearby public transportation. Furthermore, parents lack the ability to roll strollers, children cannot safely ride bicycles and the elderly and the disabled cannot utilize walkers or canes to enjoy any of the neighborhood amenities or businesses.

In closing, the residents within the project site area feel that there is much need for upgrading the infrastructure along Chesapeake Boulevard, as this corridor is a major thoroughfare for the City and carries a tremendous amount of traffic to the City's beaches, golf courses and Ocean View. The sidewalks and infrastructure upgrades enjoyed north of Fishermans Road are desired within the extents of East Little Creek Road and Fishermans Road.

3.0 Pedestrian Analysis

During the development of this study, residents were asked to provide feedback about both motorized and non-motorized circulation throughout the project site area. An overwhelming majority of the respondents agreed that pedestrian safety is a serious issue. Chesapeake Boulevard was identified by residents as one of the worst places for walking and access.

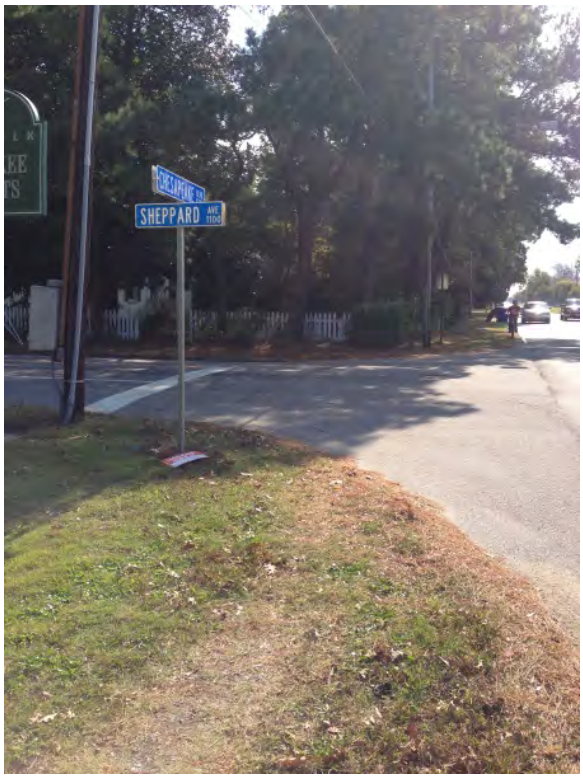


Figure 3. Example of pedestrian access along the Chesapeake Boulevard corridor.

Timmons examined alternatives for providing pedestrian, and possibly bicycle, access along the corridor along either Chesapeake Boulevard or a parallel road from to East Little Creek Road to Fishermans Road. The next phase of the investigation would involve acquiring the necessary information for a more detailed analysis and design.

There are trade-offs associated with any infrastructure modification project. Having full attention on automobile mobility generally leads to a road design that is a barrier to people walking. Conversely, giving full preference to walking accommodations will have some impact on the delay that drivers experience.

However, it is important to understand that accommodating walking and bicycling on public streets has been proven to improve the safety for *all users* of a transport network, regardless of their mode of travel.

Current Walking Conditions

Chesapeake Boulevard

An observation of the current walking conditions along Chesapeake Boulevard between East Little Creek Road and Fishermans Road has been made. Timmons Group has found that little to no constructed sidewalks are available on either the western or eastern sides of the corridor. Walking from East Little Creek Road to Fishermans Road requires traversing grass, asphalt, gravel, dirt/mud and a small stretch of concrete walks. Footpaths which have been created by high pedestrian traffic exist along the edge of asphalt on both sides of Chesapeake Boulevard. In most cases these footpaths were within a relatively clear 8-10’ grass/gravel strip just off the

edge of asphalt. Several above ground utility structures, light poles, guy wires, trees, etc. exist within the center grassed median as well as along both sides of the corridor.

Many lengths of the western side of the southbound lanes of Chesapeake Boulevard are encumbered by ditches and drainage structures which drain half of the asphalt roadway and a portion of the lots along the corridor. Much of the eastern side of the corridor lacks any drainage conveyance but does seem to accumulate runoff from half of the adjacent roadway and portions of the residential lots to the east. It appears that this runoff tends to pond in these low areas until it either evaporates or infiltrates.

Only one pedestrian crosswalk, located at Brentwood Drive or Elk Avenue, is available within the project extent which allows pedestrians to cross Chesapeake Boulevard. This crosswalk lacks a completely accessible path due to the lack of interconnectivity of the adjacent sidewalks and clearly serves pedestrians currently as determined by the footpaths observed during the site visit. Improvements to this intersection such as the implementation of a traffic signal, ADA ramps, additional sidewalk and pedestrian refuges should be assessed.

Figure 4. Panorama of Elk Ave/Brentwood Drive Intersection: Southeast Corner Looking North and West.

Pythian Avenue

An observation of the current walking conditions along Pythian Avenue between East Little Creek Road and Fishermans Road has been made. The engineer has found that adequate walking facilities exist along the entire stretch with ample connectivity to Chesapeake Boulevard via concrete walks. The sidewalks appear to be 4’-5’ in width and are in very good condition. At several locations, adjacent trees have caused portions of the walks to be lifted and inadequate to meet the Americans with Disabilities Act (ADA) accessibility guidelines and requirements. Repairs to these sections are considered to be minor and are limited to small localized areas. It shall be noted however that only a few intersections possess adequate ramps

or any ramps at all. These intersections would require the installation of code compliant ramps in order to provide ADA accessibility along the length of the study area. The installation of compliant ramps would provide the appropriate connectivity along the entire stretch of the roadway so that all pedestrians could enjoy uninterrupted access. The traffic volumes on Pythian Avenue appear to be substantially lower than those experienced on Chesapeake Boulevard, which also creates for a much more pedestrian friendly environment. Improvements to several of the intersections such as the implementation of ADA ramps and additional sidewalk should be assessed.

Pedestrian Improvement Options

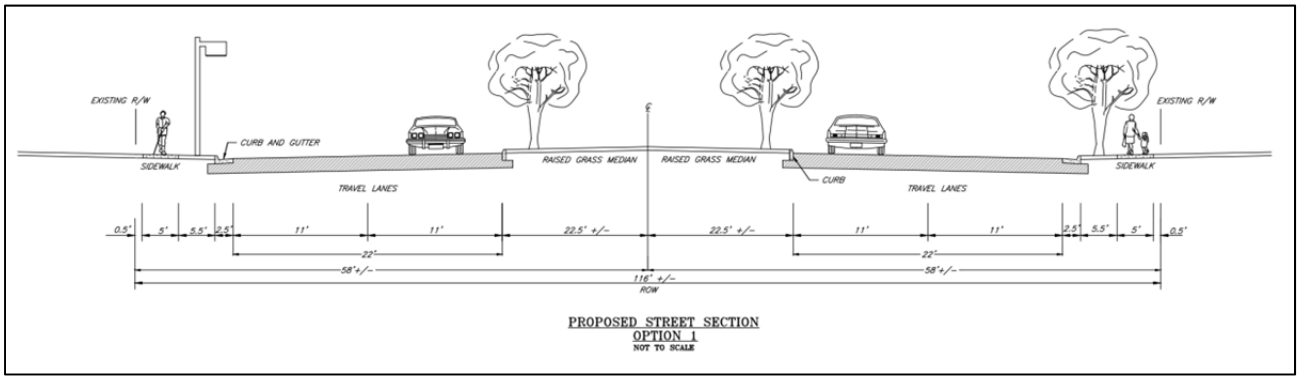
Virginia's Commonwealth Transportation Board acknowledges that walking and bicycling are fundamental ways to travel and are integral components of an efficient transportation network. It is important for decision makers to understand there will be trade-offs when considering improvements to the safety and efficiency of any particular travel mode. Ideal conditions for pedestrians are not compatible with ideal conditions for vehicular traffic.

Timmons Group developed three options to improve walking (and even bicycling) safety and mobility within public right-of-way. The feasibility of the opportunities listed below should be explored further.

Option 1 –Sidewalks along Both Sides of Chesapeake Boulevard

It does appear that constructing parallel sidewalks down Chesapeake Boulevard is a viable option for providing pedestrian access throughout the project site area. The northwest corner of the site boundary currently has sidewalk along a portion of the boulevard which appears to be in fair condition. Continuing the sidewalk on the west side of Chesapeake Boulevard would require either the relocation of existing drainage ditches or the replacement of the ditches with proposed storm sewer. Enclosing the drainage system along the western boundary would allow for the construction of paved walks. The placement of walks on the eastern side of the corridor would require the relocation of other above ground utilities and possibly the installation of storm sewer to address the current ponding issues experienced in the front yards of the residences which would in turn be exacerbated by the installation of the walk. At the southern end of Chesapeake Boulevard it seems that the best possible solution for accessing East Little Creek Road would be via Eagle and Pythian Avenues due to the presence of several commercial entrances and unique features, such as drainage ditches or light poles, on both sides of the corridor. Figure 5 illustrates an example of what the proposed street section could look like with the available dimensions.

Figure 5. Proposed Street Section - Option 1 Sidewalk along One or Both Sides of Chesapeake Boulevard



Option 2 –Sidewalk along One Side of Chesapeake Boulevard

Rather than constructing parallel sidewalks down Chesapeake Boulevard, it does appear that constructing sidewalk down either the southbound or northbound lanes of Chesapeake Boulevard is a viable option for providing pedestrian access throughout the project site area. The northwest corner of the site boundary currently has sidewalk along a portion of the boulevard which appears to be in fair condition. However, this sidewalk is anticipated to not meet current City of Norfolk standards and has been considered to be removed and replaced for the purposes of the cost estimate. Continuing the sidewalk along the southbound lanes of Chesapeake Boulevard would require either the relocation of existing drainage ditches or the replacement of the ditches with proposed storm sewer. Once the drainage is enclosed, the construction of paved walks seems feasible other than the relocation of utility poles and adjustment of any public meters and vaults. The placement of walks on the eastern side of the corridor would require the relocation of above ground utilities as well and possibly the installation of storm sewer to address the current ponding issues experienced in the front yards of the residences which would in turn be exacerbated by the installation of the walk. At the southern end of Chesapeake Boulevard it seems that the best possible solution for accessing East Little Creek Road would be via Eagle and Pythian Avenues due to the presence of several commercial entrances and unique features, such as drainage ditches or light poles, on both sides of the corridor. Crossing from the southbound lane side to access Eagle and Pythian Avenues would require some additional work in the median, to include pavement striping and a refuge in the median.

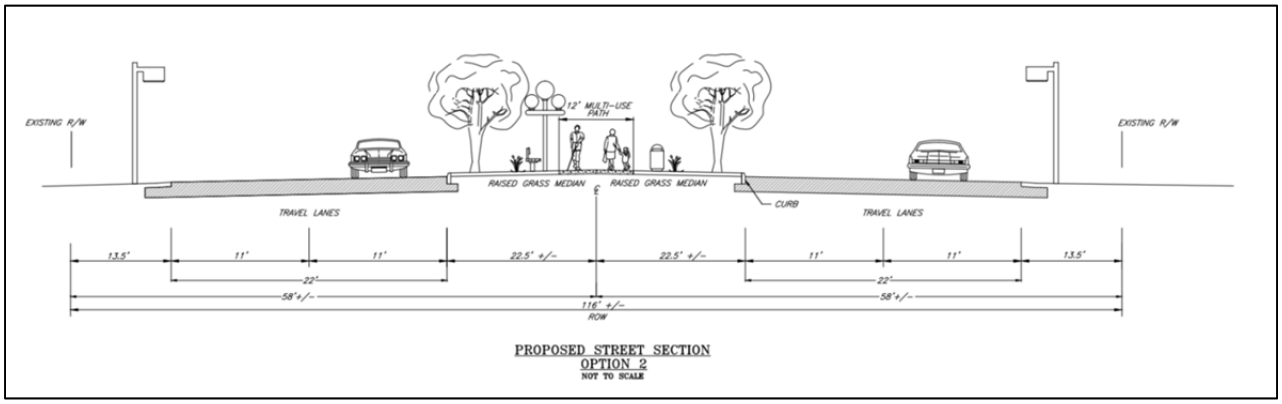
Option 3 – Multi-Use Path along Center Median

During the walkability audit, people were observed walking and biking at different locations throughout the project site. It may be advantageous to create a multiuse path within the center grass median which is more than wide enough to accommodate both bikes and pedestrians. Multiuse paths are often illustrated as asphalt paths adjacent to parks or residential subdivisions. But some municipalities across the country are experimenting with creating paths within existing (and paved) right-of-way where sidewalks, curb, and gutter do not exist. This type of treatment on Chesapeake Boulevard would still require special attention to any points where pedestrian crossings conflict with vehicular movements. Furthermore several intersections would require the implementation of sidewalk, ADA ramps and painted crosswalks for the residents to access the median from both sides of the boulevard. Currently, ditches and storm sewer exist on either both or one side of the grassed median in order to drain the median and adjacent roadway. This same system could function to collect the additional direct runoff generated by the presence of the multi-use path.

A grass median with paved path would also be a refuge for people crossing from one side of Chesapeake Boulevard to the other. Having a refuge eliminates the need to cross all four lanes at once, which is challenging even for pedestrians without any physical impairment. This is a function of typical medians on multilane roads.

If detailed survey shows that the median could provide sufficient width, it could be designed as a channelized corridor for pedestrians and bicyclists. Typically physical barriers, beyond a simple curb and gutter treatment, are utilized to separate pedestrians from motorized traffic. Portions of the median are already lined with mature trees which will not only serve this purpose of providing a barrier but also the purpose of providing shade and aesthetic beauty for users of the path. A major advantage to moving non-motorized traffic along the center of the median is people can avoid the turning and merging traffic associated with entering and exiting Chesapeake Boulevard. As mentioned previously, at the southern end of Chesapeake Boulevard it seems that the best possible solution for accessing East Little Creek Road would be via Eagle and Pythian Avenues due to the presence of several commercial entrances and unique features, such as drainage ditches or light poles, on both sides of the corridor. Figure 6 illustrates and example of the proposed street section with the available dimensions.

Figure 6. Proposed Street Section - Option 2 Multi-Use Path along Center Median



Option 4 –Sidewalks along Pythian Avenue

The final option which includes providing an accessible path down Pythian Avenue is the most unobtrusive and cost effective route. As described in the existing conditions portion of this report, the path along Pythian Avenue from East Little Creek Road to Fishermans Road is almost entirely improved with concrete walks that are in good working order. The largest feat with providing a completely ADA accessible path will be installing compliant ramps at a majority of the intersections. As stated previously, a few intersections toward the southern end of the project site area have already had ADA ramps with the necessary truncated domes installed. There were also other sporadic ramps within the bounds on Pythian Avenue that must have been installed at an earlier time. It appears that these ramps will most likely require complete replacement in order to meet revised accessibility standards. Another major hurdle involved with only providing a path for residents on Pythian Avenue is the lack of connectivity for residents and pedestrians on the western side of the boulevard. Several crossings would be required to complete the interconnectivity and allow the greater community to enjoy an unencumbered path from any location within the bounds to either East Little Creek Road or Fishermans Road.

Additional Considerations Applicable to All Options

Reduce width of travel lanes

Chesapeake Boulevard has two southbound and two northbound travel lanes which are separated by a center grassed median. The width of the travel lanes themselves were not measured in the field but are assumed to be roughly 12’ based on standard sections adopted by the City and elsewhere.

Studies recognized by FHWA and Institute of Transportation Engineers have shown that there is virtually no statistical difference in the safety of a 10.5-foot travel lane compared to a 12-foot travel lane. The traditional rule-of-thumb that wider lanes are safer lanes has been shown to be false. In fact, these studies have shown that once lanes become wider than 12-feet, crashes become more frequent and severe.

This is especially true on lower speed roads like Chesapeake Boulevard (posted at 35 MPH). Drivers feel more comfortable speeding when lanes are wider, which makes conditions for pedestrians much more dangerous. If a crash analysis is performed, it may be determined that some travel lanes can be reduced to 10-feet wide.

Travel lane width is probably the best place to begin a detailed survey and feasibility assessment. It is recommended that this be done between the two major intersections that bound the project site.

Visual cues for drivers

Signs consistent with the Manual on Uniform Traffic Control Devices (MUTCD) generally cost between $100 and 200 plus installation costs. Their purpose in relation to pedestrians would be providing regulations, giving warning, or information about what to expect on the street.

If drivers are informed that they should expect to see people walking in the area, then narrower lanes and lower speeds would be natural expectations. This is especially true where high-speed interstate off-ramps meet low-speed urban collectors. There are many types of signs and pavement markings that could improve the conditions for people walking, without creating visual clutter for drivers.

FHWA has repeatedly given the message to state departments of transportation that pedestrians need more than simple crosswalks to experience a comfortable walking environment. Engineering judgment and flexible design standards are key.

Pedestrian-scale lighting

Lighting is important for the safety of people walking. Pedestrians need to be able to see their surroundings or they won't feel safe. And drivers need to be able to see pedestrians walking in the early morning or late evening. Currently the corridor has highway-scale lighting only, which is intended for drivers to see their surroundings on high-speed corridors.

Cost Estimate

Planning-level cost estimates were prepared for the options described above. The estimates are intended to provide an order of magnitude cost for various scenarios that may be explored during the next phase of the pedestrian study.

Table 2. Cost Estimate for Pedestrian Improvement Options for the Chesapeake Boulevard Corridor.

Item	Approximate length	Cost Estimate	Comments
Option 1 – Sidewalk along Both Sides of Chesapeake Boulevard	10,000 feet (5,000 ft x 2)	$2,650,000	Estimate assumes new 5-foot wide walks down each side of road. Assumes crossings at every other intersection to include pavement striping, signage and necessary ramps as well as pedestrian lighting at 75' intervals down both sides.
Option 2 – Sidewalk along One Side of Chesapeake Boulevard	5,000 feet	$1,275,000	Estimate assumes new 5-foot wide walks down one side of road. Assumes crossings at each intersection to include pavement striping, signage and necessary ramps as well as pedestrian lighting at 75' intervals down one side.
Option 3 – Multi-Use Path along Center Median	5,000 feet	$860,000	4" thick asphalt path down center median. Estimate assumes crossings at every other intersection to include pavement striping, signage and necessary ramps as well as a single strip of pedestrian lighting down the middle at 75' intervals.
Option 4 – Sidewalks along Pythian Avenue	Existing	$400,000	Includes ramps at necessary crosswalks and two crossings of Chesapeake Boulevard between East Little Creek and Fishermans Road.

Next Steps

The first step following this assignment is for City staff to evaluate these alternatives from a practicality standpoint. It would be advisable to review the sample photographs provided and visit the site for a first-hand experience of the conditions. Seeing the experience of someone walking the Chesapeake Boulevard corridor is very different from the typical driver perspective.

The next step in the Chesapeake Boulevard Pedestrian Study would be to examine specific design strategies. Timmons Group recommends applying the principals of *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*. This document is a recommended practice by the Institute of Transportation Engineers for urban arterials. There are design parameters for walkable urban thoroughfares that also fulfill the guidance of AASHTO's Green Book and VDOT's Road Design Manual for vehicular considerations. AASHTO encourages transportation professionals to take advantage of the flexible standards inherent in the Green Book.

4.0 Drainage Analysis

Method

The watershed boundary was developed by modifying the boundaries created for the City-wide Drainage Master Plan[2] using existing contours, structures, and piping as provided by the City of Norfolk GIS and supplemental structure and conveyance data collected by Timmons Group. All infrastructure data was compiled to create a comprehensive working model for the watershed. All data use the current NAVD '88 and NAD '83 datum.

Drainage areas, or catchments, within the existing GIS watershed boundaries for the watershed were delineated in GIS using storm sewer network, topographical data and aerial photography.

Modeling Data

City of Norfolk GIS topographic and infrastructure data as well as field survey data from Timmons Group were used as the base network to create the model of the watershed. The methodology and schema employed are consistent with those used for the most recent master plan model conducted for the Ohio Creek Watershed. In instances where GIS or field data were missing or incomplete, assumptions were made to provide hydraulic connectivity to complete the model.

Field observation sheets have been included as Appendix G.

Assumptions

The following assumptions were used to fill in missing data:

- When the structure ground elevation was 0 or unknown, the ground elevation was calculated by interpolating elevations from GIS topographical data.
- When pipe or structure invert elevations were 0 or unknown, the invert elevation was calculated by interpolating elevations from Timmons Group field survey or the last known surveyed invert was utilized to back-calculate through the system using a slope of 0.2%.
- When pipe information was unknown due to inaccessibility to the structure, pipe size information was assumed from the City of Norfolk GIS data.

[2] As referenced from the *City-Wide Drainage Master Plan*, prepared by Timmons Group for the City of Norfolk Department of Public Works, May 2012.

Modeling Existing Conditions

Utilizing the field surveyed information, field-collected information, and the established assumptions, the watershed model was run to analyze existing conditions during a 10yr, 24hr design storm event with a MHHW tailwater condition for both sub-watersheds.

Rainfall Modeling Data

The drainage analysis evaluated a 10yr flood event with the respective 24hr rainfall return year event. The 24hr rainfall amount for a 10yr return period derived from the NOAA Atlas 14 Rainfall Data, SCS Type II, for the Norfolk area is 5.50 inches.

Model Reliability Evaluation

A model reliability evaluation was performed to ensure the model produced reliable results not only from a calculation standpoint, as indicated by continuity error, but also intuitively, as determined by analyzing flooding results along Chesapeake Boulevard between East Little Creek Road and Fishermans Road.

Table 2 reveals acceptable continuity error values for the existing condition scenarios as results closer to zero indicate a quality modeling exercise in SewerGEMS. An acceptable continuity error value is generally less than ten percent (10%) as referenced in the EPA SWMM5 Manual[3], and five percent (5%) for industry preferred.

Table 3. Bentley SewerGEMS Continuity Error Report for Existing Conditions Scenarios

10yr, 24hr Return Storm Event	Flow Routing Continuity Error (%)
Existing Conditions (sub-watersheds 1 & 2)	1.722

Existing Condition Drainage Results

The drainage analysis performed on the watershed during the 10yr, 24hr storm event indicates flooding throughout sub-watersheds 1 and 2.

The insufficient capacities of the outfall pipes cause a backwater effect upstream. Upstream infrastructure is also insufficiently sized with multiple pipes set at inverse slopes. In addition, the pipe and ditch sections in the upstream portions of both sub-watersheds are significantly blocked by vegetation which prevent the transport of flow.

[3] Suggested acceptable continuity error referenced in *The Environmental Protection Agency (EPA) Storm Water Management Model User's Manual Version 5.0,* by Lewis Rossman, (November 2004), Water Supply and Water Resources Division, National Risk Management Research Laboratory, Cincinnati, OH 45268.

The stormwater infrastructure along the main trunk lines of both sub-watersheds 1 and 2 are insufficient to transport water effectively downstream to the existing streams. Hydraulic grade line profiles for the main trunk system and each critical location are illustrated in Appendix C, where the blue line represents the hydraulic grade line (HGL) at the time of peak watershed flooding, the green line represents the ground elevation, and the red lines represent the maximum HGL. In the model, water within ditches does not have the option to pond on the surface; rather water that exceeds the top of bank is "lost" in the system. As a result, the height of each ditch was artificially extended to better quantify and depict flooding.

Drainage Improvement Scenarios and Recommendations

Based on input from the City and property owners along Chesapeake Boulevard, field observations, and model results, the north-and south-bound portions of Chesapeake Boulevard between East Little Creek Road and Fishermans Road have been identified as a critical location recommended for improvement within the Chesapeake Boulevard watershed.

As part of the drainage analysis performed on the portion of Chesapeake Boulevard between Fishermans Road and East Little Creek Road, Timmons recommends a phased approach to improvements in sub-watersheds 1 and 2. Phase 1 should include upgrades to the downstream culverts in both sub-watersheds 1 and 2 to reduce flooding upstream along Chesapeake Boulevard. Phase 2 should include upgrades to pipes, rerouting flow from upstream, and replacing ditch sections with pipe.

Phase 1: Downstream Culvert Upgrades

Sub-Watershed 1

Timmons recommends upgrading two culverts towards the outfall in sub-watershed 1. The first culvert is located at the intersection of Templar Boulevard and Pythian Avenue. There is currently 12 feet of dual 27-in pipes followed by 45 feet of dual 36-in pipes. Timmons recommends increasing the pipe capacity to the equivalent of 4-ft x 6-ft box culverts.

A second culvert downstream is located at the intersection of Templar Boulevard and Carlton Street. There is currently 93 feet of 48-in pipe followed by 10 feet of 60-in pipe. Timmons recommends increasing pipe capacity to the equivalent of 4-ft x 6-ft and 5-ft x 8-ft box culverts.

The total estimated cost to upgrade these culverts is approximately $424,351.00 (detailed in Appendix F).

Sub-Watershed 2

Timmons also recommends upgrading two culverts towards the outfall in sub-watershed 2. The first culvert is located at the intersection of Evelyn Street and Carlton Street. There is currently 52 feet of 42-in pipe. Timmons recommends increasing the pipe capacity to the equivalent of a 4-ft x 6-ft box culvert.

A second culvert downstream is located at the intersection of Tallwood Street and Quincy Street. There is currently 20 feet of 48-in pipe. Timmons recommends increasing pipe capacity to the equivalent of a 4-ft x 6-ft box culvert.

The total estimated cost to upgrade these culverts is approximately $168,045.00 (detailed in Appendix F).

Phase 2: Increased Capacity Upgrades

Sub-Watershed 1

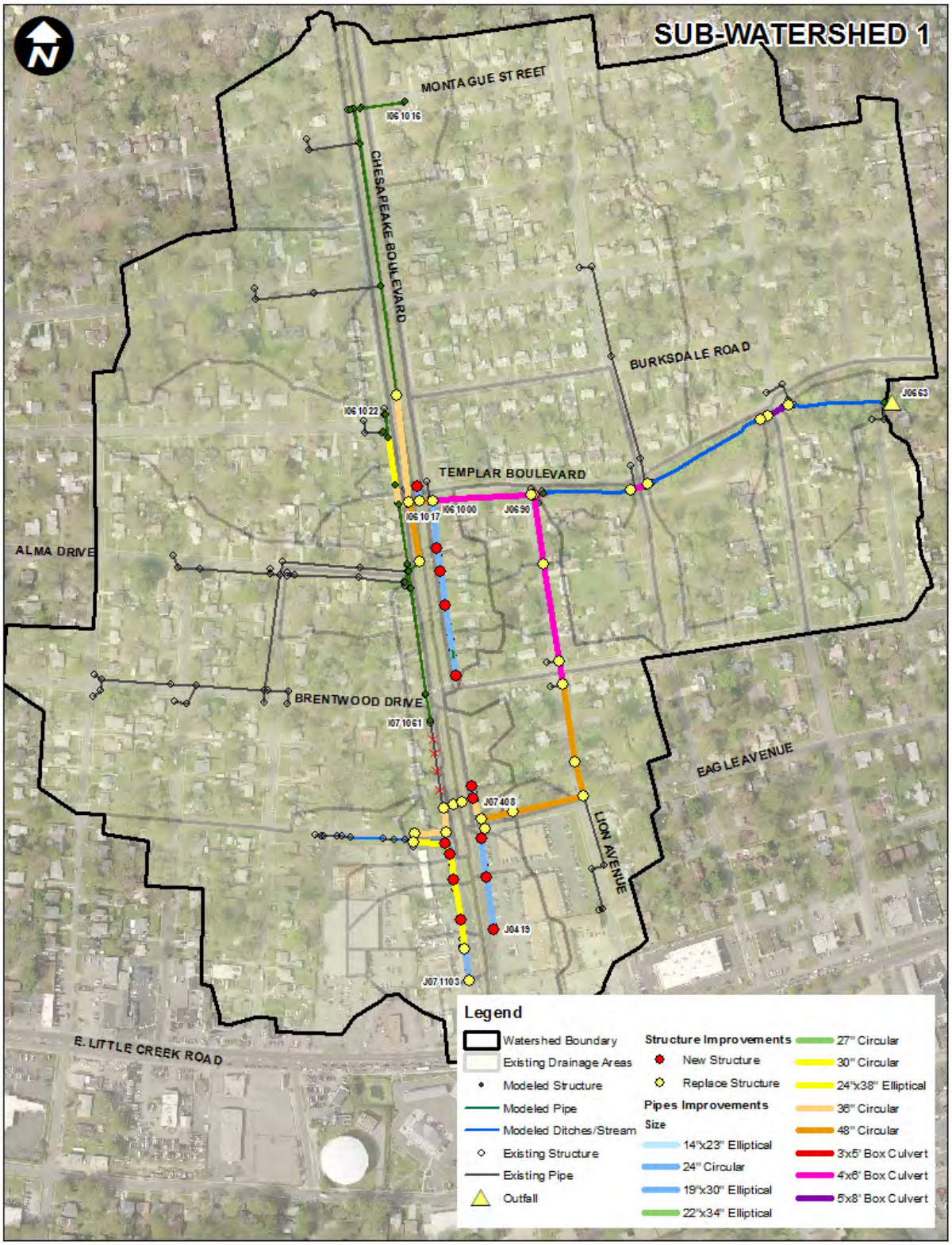
Significant flooding occurs at both upstream ends of sub-watershed 1: at the piped and ditch sections towards the intersection with East Little Cree Road, and at the structures along Montague Street.

This alternative assumes that culvert improvements have been made downstream. In order to reduce flooding within sub-watershed 1, Timmons recommends removing the upstream ditches along Chesapeake Boulevard towards the intersection with East Little Creek Road and replacing with 24” pipe. In addition, flow should be rerouted to the existing branch system along Lion Avenue. To effectively reroute flow, the pipes along Lion Avenue should be increased in capacity to the equivalent of 4’x6’ box culverts and 48” pipe respectively.

To address the flooding in the other part of this sub-watershed, stormwater structures should be replaced at lower inverts and larger stormwater pipes installed, as detailed in Figure 7. Timmons recommends replacing the structures within the intersection of Chesapeake Boulevard and Templar Boulevard, to remove inversely sloped pipes and to more effectively transport flow to the outfall. Pipe ID# I071062-I071061 is set at an inverse slope and causes a backwater effect upstream; it should be removed or plugged which will help reroute flow to the outfall more effectively and ensure that flow from pipes upstream are rerouted to the improved system along Lion Avenue.

Figure 7 illustrates the improvements recommended above. This alternative eliminates along the main trunk line but does not eliminate flooding along Montague Avenue. Hydraulic grade line profiles for the main trunk system and each critical location are illustrated in Appendix D. The total estimated cost of this alternative is $4,718,473.00. A detailed cost estimate is found in Appendix F.

Figure 7. Sub-Watershed 1 Increased Pipe Capacity Alternative



Sub-Watershed 2 Increased Capacity Alternative

Currently, significant flooding occurs along Chesapeake Boulevard between Mildred and Vero Streets, and behind the residences between Evelyn Street and Sunset Boulevard. To eliminate flooding between Mildred and Vero Streets and reduce flooding behind residences, Timmons recommends rerouting flow from upstream along the existing branch system along Pythian Avenue and Tallwood Street. This alternative assumes that culvert improvements have been made downstream.

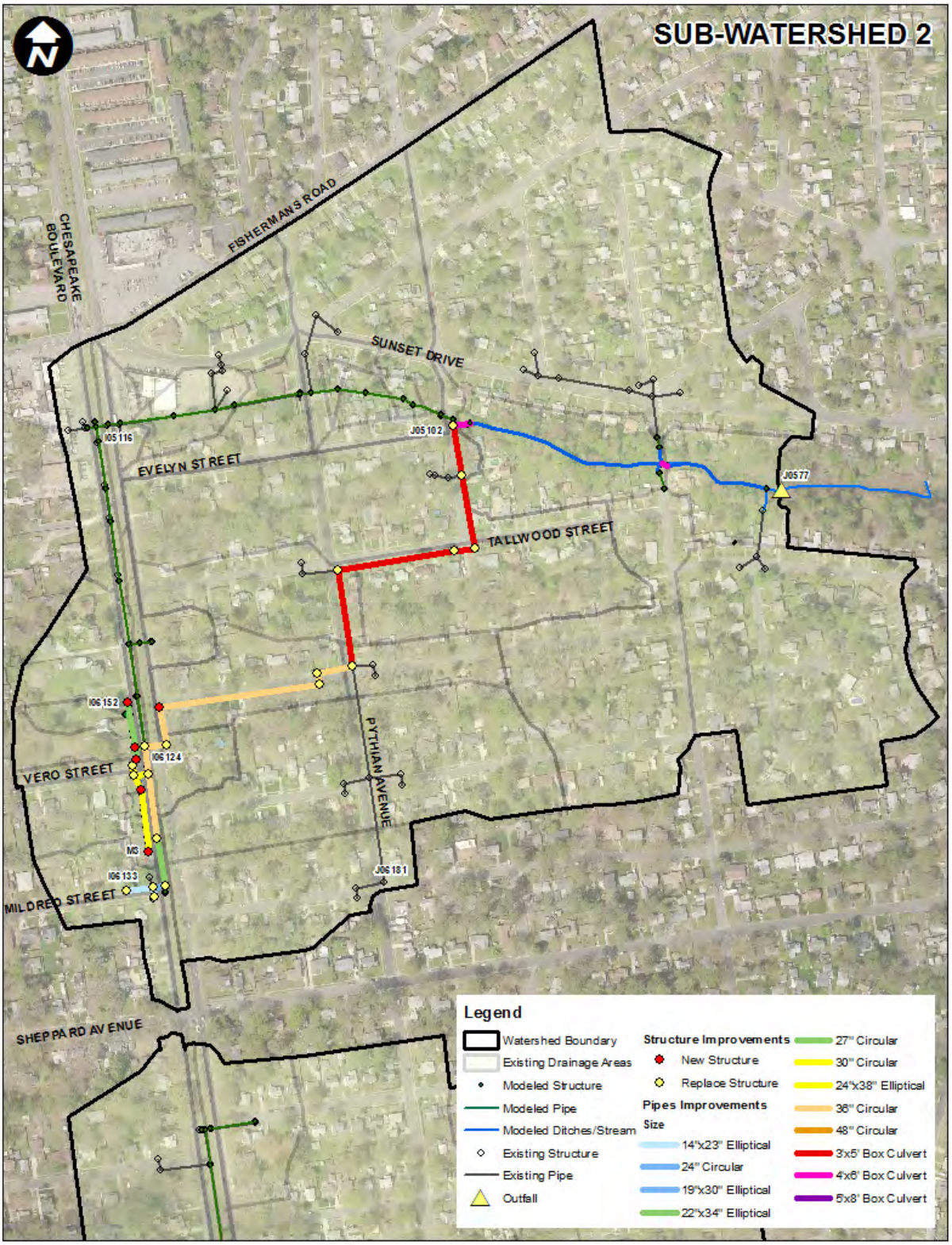
To effectively transport flow stormwater structures should be replaced at lower inverts and larger stormwater pipes installed, as detailed in Figure 8. To reroute flow along Pythian Avenue and Tallwood Street, new pipes with equivalent capacity of 36" pipe should be installed from structure #I06198 and connected to the existing branch system at structure #J06196. Consequently, structures and pipes along the branch system downstream will need to be replaced with the equivalent of 3'x5' box culvert to handle the stormwater flow.

Figure 8 on the following page illustrates the improvements recommended above. This alternative eliminates flooding along Chesapeake Boulevard and reduces flooding behind the residences between Evelyn Street and Sunset Boulevard. Hydraulic grade line profiles for the main trunk system and each critical location are illustrated in Appendix E. The total estimated cost of this alternative is $3,642,781.00. A detailed cost estimate is found in Appendix F.

Additional Recommendations

Increasing the capacity throughout both sub-watersheds by replacing stormwater infrastructure at lower inverts and with larger pipes is very costly. Box culverts were used in this analysis, however the potential cost benefit of using dual circular or dual elliptical pipes of equivalent capacity could be investigated. In addition, Timmons Group recommends looking into the use of pump stations.

Figure 8. Sub-Watershed 2 Increased Capacity Alternative



5.0 Conclusions and Recommendations

Pedestrian Study Conclusions

1. Timmons Group found little to no constructed sidewalks available on either the western or eastern sides of the Chesapeake Boulevard corridor. Walking from East Little Creek Road to Fishermans Road requires traversing grass, asphalt, gravel, dirt/mud and a small stretch of concrete walks. Footpaths which have been created by high pedestrian traffic exist along the edge of asphalt on both sides of Chesapeake Boulevard.
2. There adequate walking facilities along the entire stretch of Pythian Avenue between East Little Creek Road and Fishermans Road with ample connectivity to Chesapeake Boulevard via concrete walks.
3. Timmons Group developed three options to improve walking (and even bicycling) safety and mobility within public right-of-way, including: 1) sidewalks on one or both sides of Chesapeake Boulevard; 2) a multi-use path along the center median; or 3) providing an accessible path down Pythian Avenue which is the most unobtrusive and cost effective route.
4. Additional recommendations that could be incorporated with any of the three options are to reduce the width of travel lanes, provide visual pedestrian cues for drivers, and provide pedestrian-scale lighting.

Drainage Study Conclusions

1. Flooding occurs during the 10yr, 24hr storm event throughout the Chesapeake Boulevard Corridor, specifically between East Little Creek Road and Fishermans Road. Median ditches and yards flood significantly during storm events. Pipes throughout this area remain surcharged throughout the majority of the storm event.
2. The insufficient capacity of the stormwater system downstream at the outfall significantly affects the ability of the upstream systems to transport flow. These conditions are evident in the 10yr, 24hr storm event.
3. Timmons recommends a phased approach to stormwater improvements. Phase I should replace the culverts at the outfalls of both sub-watershed 1 and 2 with larger box culverts to reduce flooding upstream. Phase 2 involves rerouting flow from upstream portions of both sub-watershed 1 and 2 to existing branch systems. Ditches should be replaced with pipes and sections of stormwater structures and pipes should be replaced to increase capacity.
4. The recommended improvements will eliminate flooding within the critical area identified and reduce flooding elsewhere in both sub-watersheds.

Appendix A

Existing Corridor Conditions


1


2

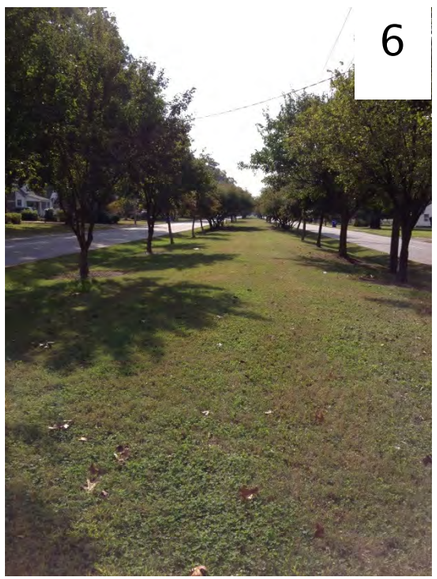

3

Chesapeake Boulevard Conditions

1. Facing east to intersection of Chesapeake Blvd and Fishermans Road (Panorama)
2. Facing west away at Bill Street Intersection
3. Facing south near Newell Street Intersection
4. Facing south away from Fishermans Road
5. Facing south at Tallwood Street Intersection
6. Facing south in center median
7. Facing north on west side of boulevard, just south of Vero Street Intersection


4


5


6


7

1

2

3

4

Pythian Avenue Conditions

1. Facing south at Frank St. intersection (see ADA ramp and non-ADA ramp in picture)
2. Facing south at Noble St. intersection (lack of ramps)
3. Facing south at Montague St. intersection
4. Facing south at Bill St. intersection (lack of ramps)

Appendix B

South Bayview Civic League Meeting

South Bayview Civic League
Chesapeake Boulevard Meeting
March 20, 2013

These are some of the issues discussed:

Lack of proper storm water drainage

1. Road is pitched so that it causes water to run into yards and driveways
2. Water can sometimes cover a 12 foot area of yard or driveway
3. One resident has recently dug his own ditch to keep water out
4. The one drain on the entire street that anyone knows about is always stopped up
5. Where there are ditches, they're often overgrown and contain trash
6. Rats are seen in the ditches and the drainage pipes under side street entrances
7. Trucks and buses continuously break off the edges of the street surface
8. People are paying high storm water fees to have the water going into their yards
9. Standing water at intersections, particularly at Elk Ave. The intersection at Fisherman's Road also has standing water and needs MAJOR work and attention.

Need for curbs and sidewalks

1. Instability of graveled and sloped shoulder makes it difficult for walking
2. Gravel and rocks wash into the yards making it hazardous to mow their lawn.
3. Children cannot walk, ride bikes; parents cannot roll strollers; elderly or disabled cannot use walkers or canes. They feel trapped unless they have a car.
4. Curbs and sidewalks would enable people to take walks, visit with neighbors, and walk to local stores and services. There are grocery, pharmacies, post office, restaurants, beauty shops, barber shops, and many others.
5. The gravel and sloping of the shoulders makes the bus stops inaccessible for handicapped persons and the elderly who are ones most likely to use the buses. There are many elderly in the neighborhood plus a high number of veterans.
6. With cars going 30-40 mph it's dangerous to walk along the street

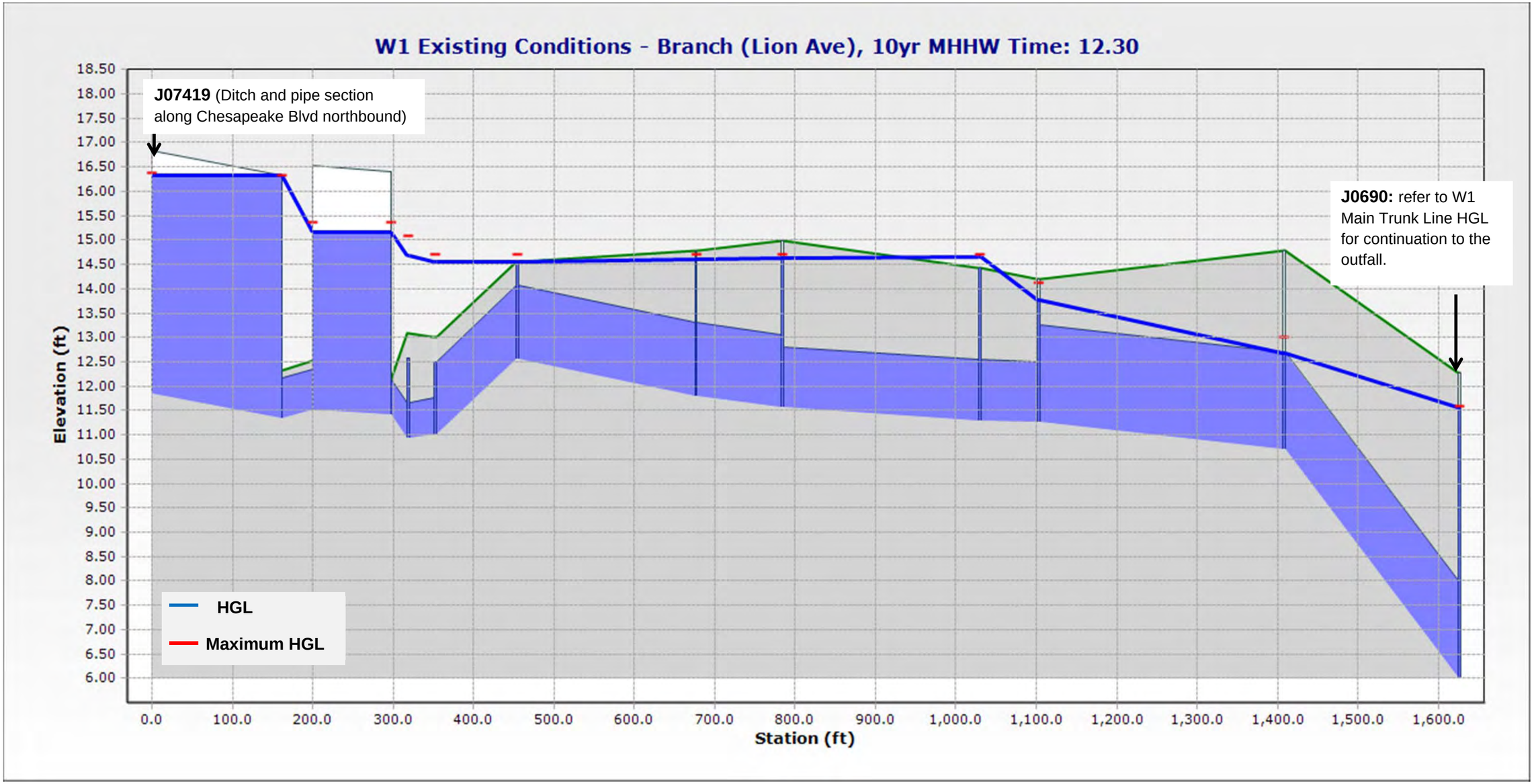
Other comments:

1. The business area at the intersection of Fisherman's Road is in such disrepair we question whether some of it is up to code. Most stores are empty; the parking lots need work. If the surrounding infrastructure looked better maybe someone would be interested in coming there.
2. Chesapeake is a major thoroughfare and leads to the city's largest public beach, a city golf course and Ocean View. It carries a tremendous amount of traffic connecting to Little Creek Road and Military Highway and on toward downtown. We're expecting a great increase when work begins on Tidewater Drive at Southern Shopping Center and it's too late to do anything about it. How will this impact Pythian Ave. that now averages nearly 2,400 cars per day?
3. We have seen a lot of time and money spent at the north end of Chesapeake Blvd. There are sidewalks on Chesapeake north of Fisherman's Road. It is past time to do something about this area between Little Creek Road and Fisherman's Road.

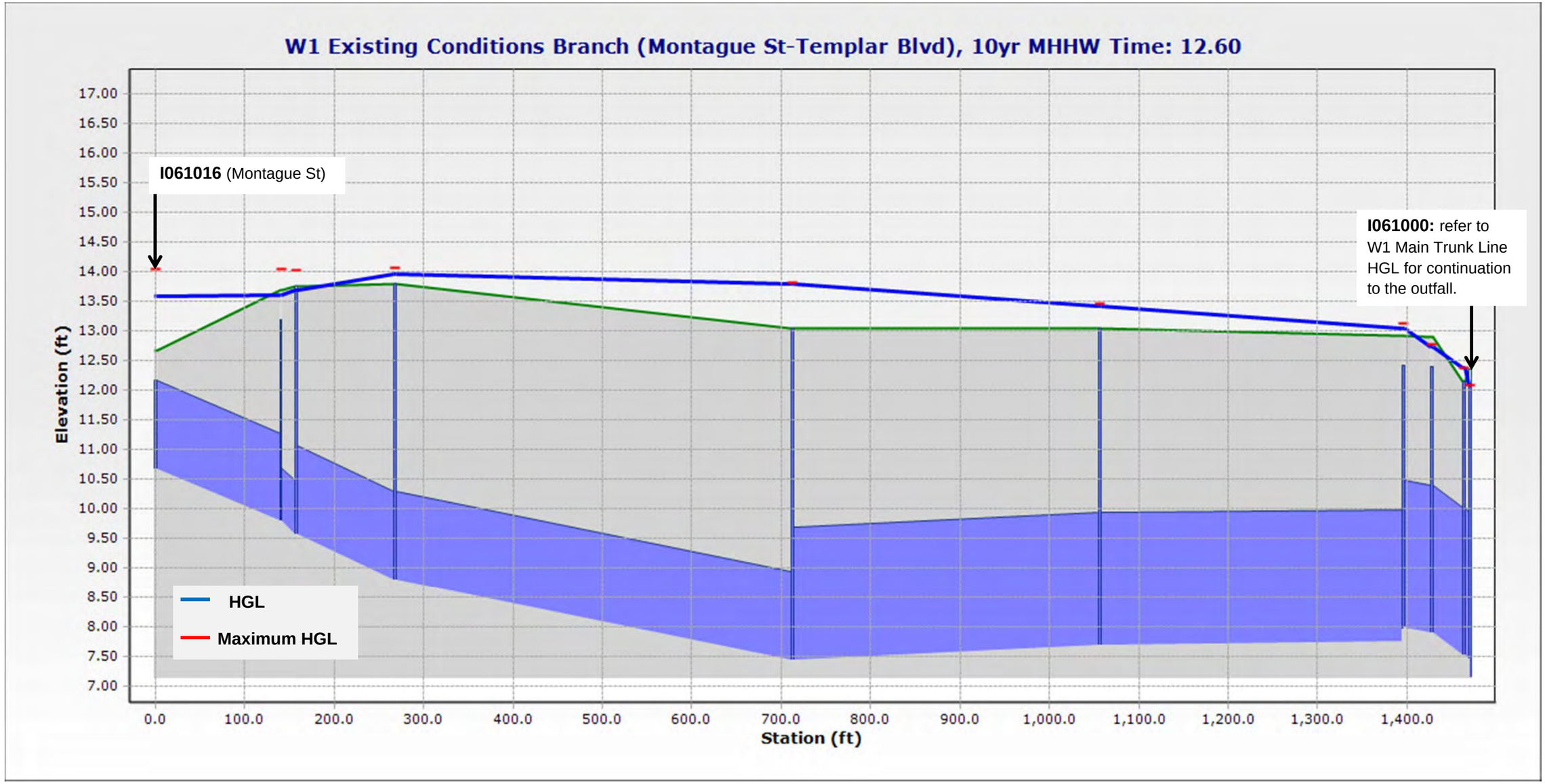
Appendix C

Existing Conditions HGL Profile Plots

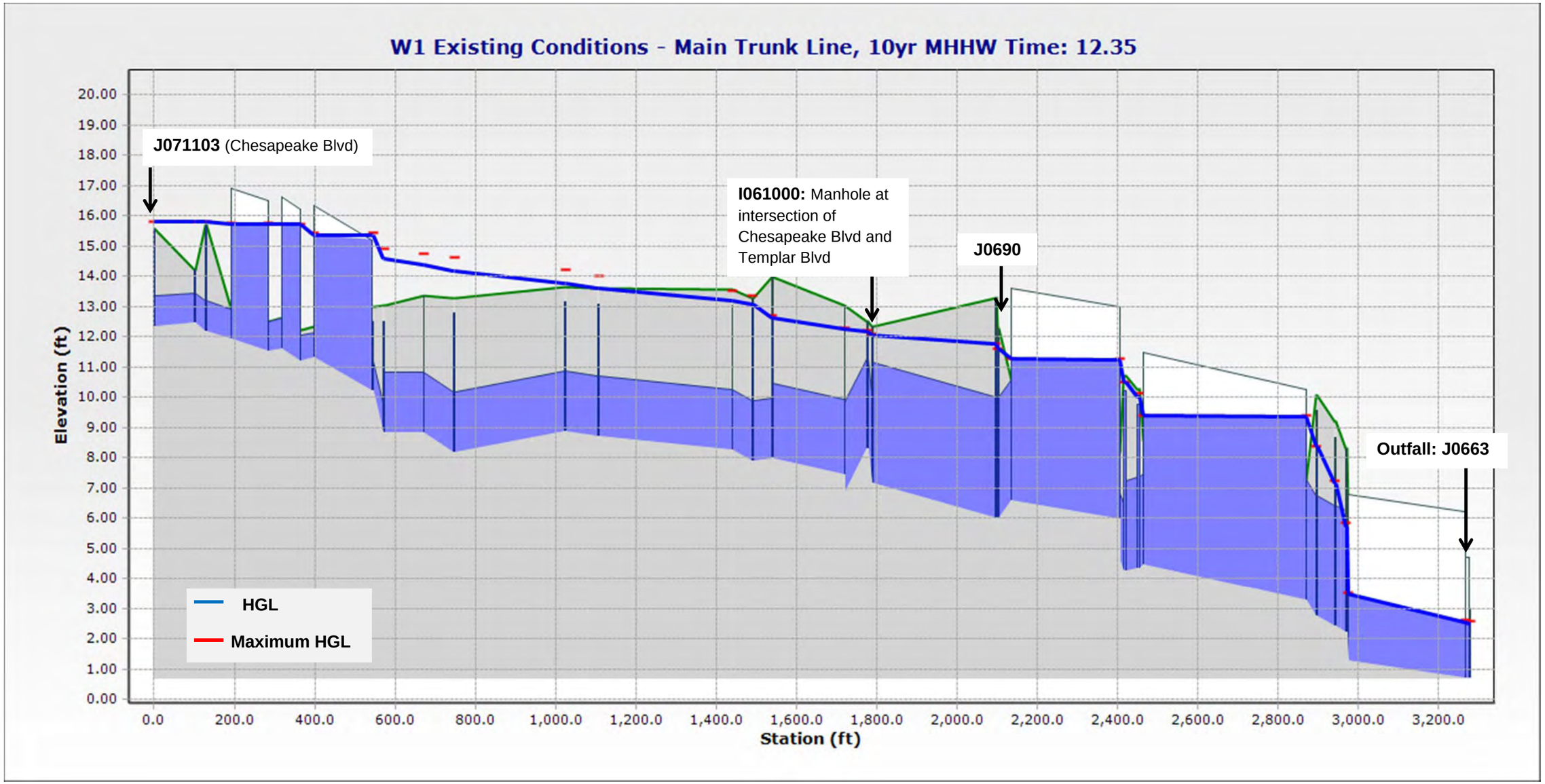
C.1. Sub-Watershed 1 - Existing Conditions along Lion Avenue Branch Section



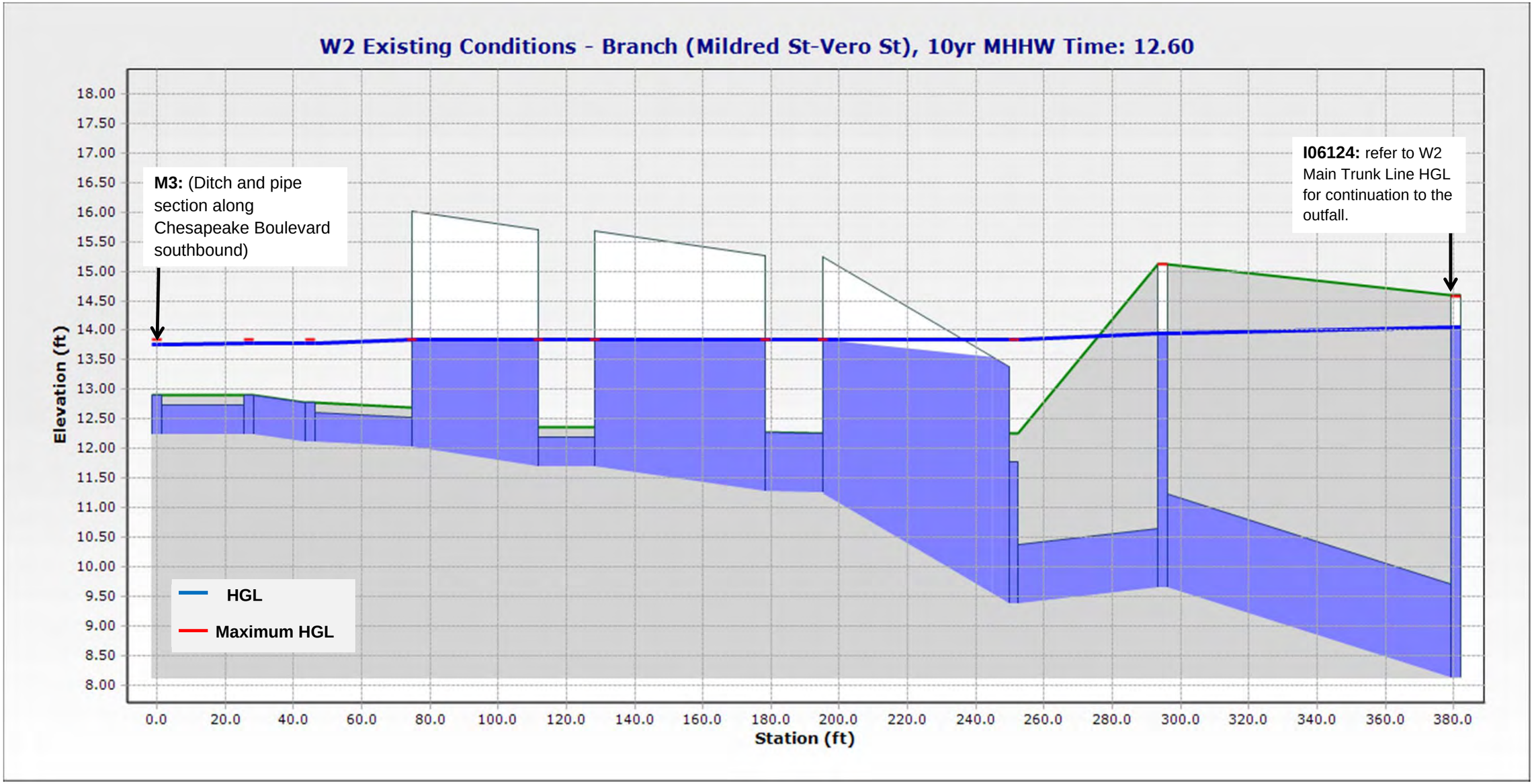
C.2. Sub-Watershed 1 - Existing Conditions along Branch Section between Montague Street and Templar Boulevard



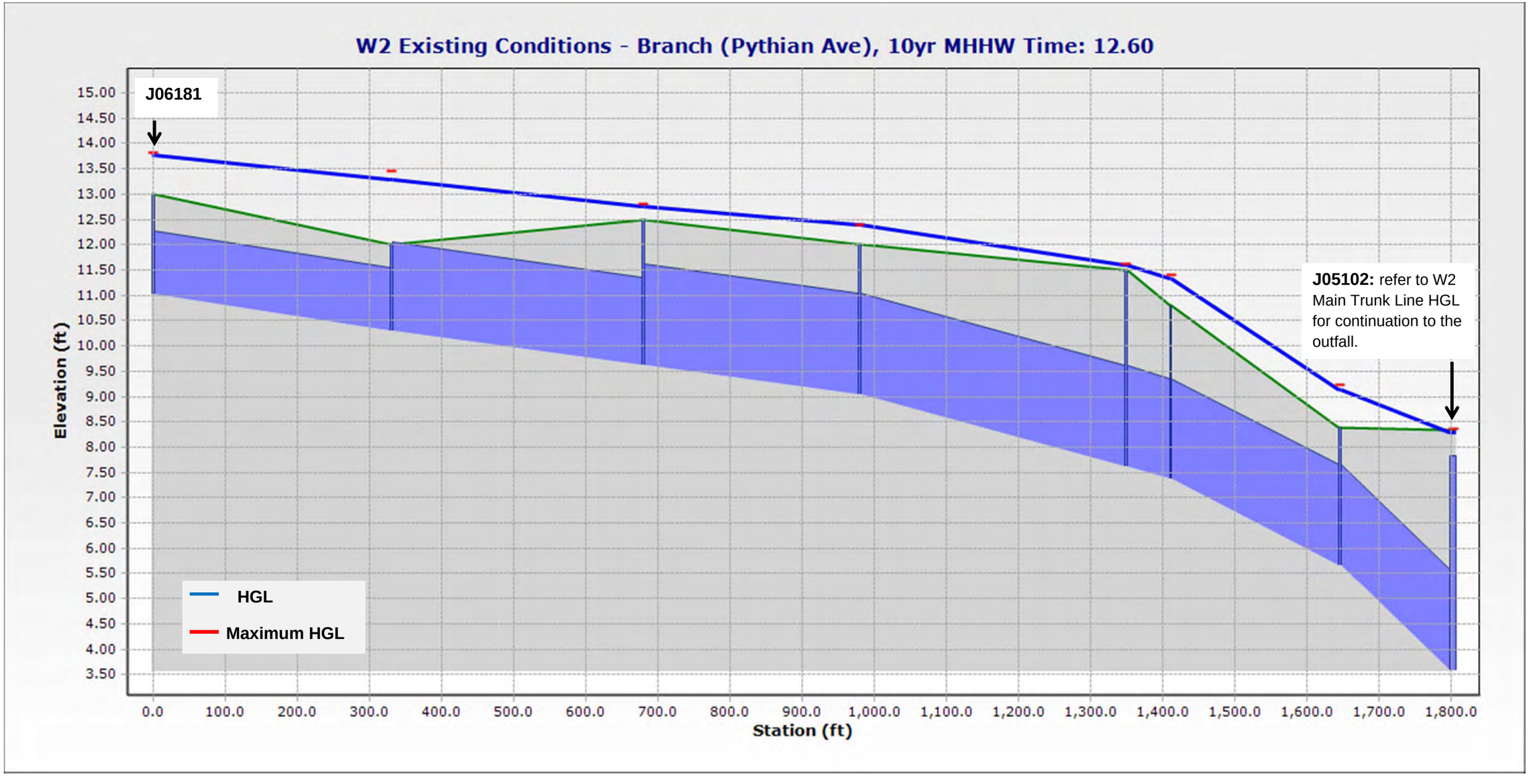
C.3. Sub-Watershed 1 - Existing Conditions along Main Trunk Line



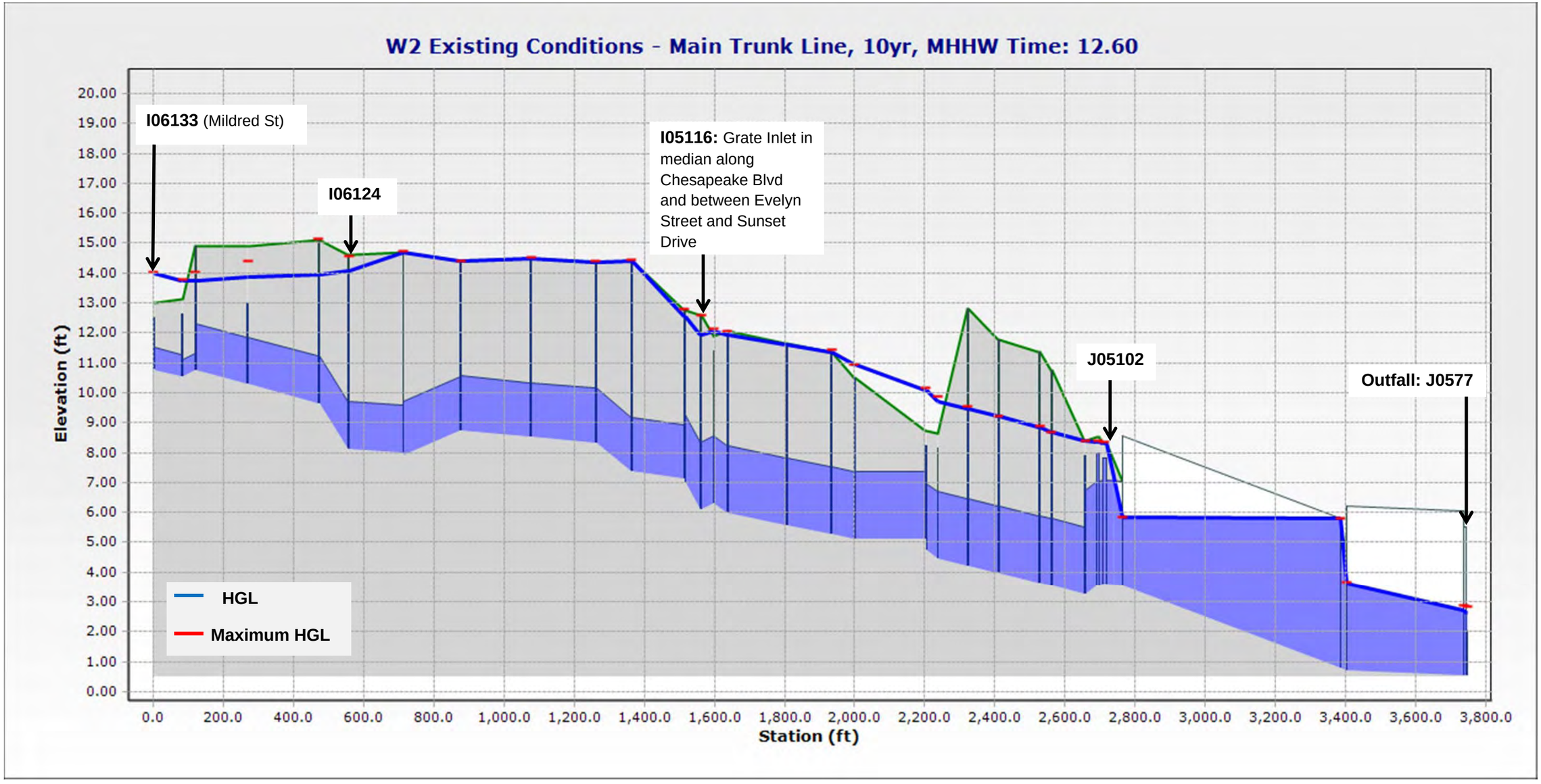
C.4. Sub-Watershed 2 - Existing Conditions along Branch Section between Mildred and Vero Streets



C.5. Sub-Watershed 2 - Existing Conditions along Pythian Avenue Branch Section



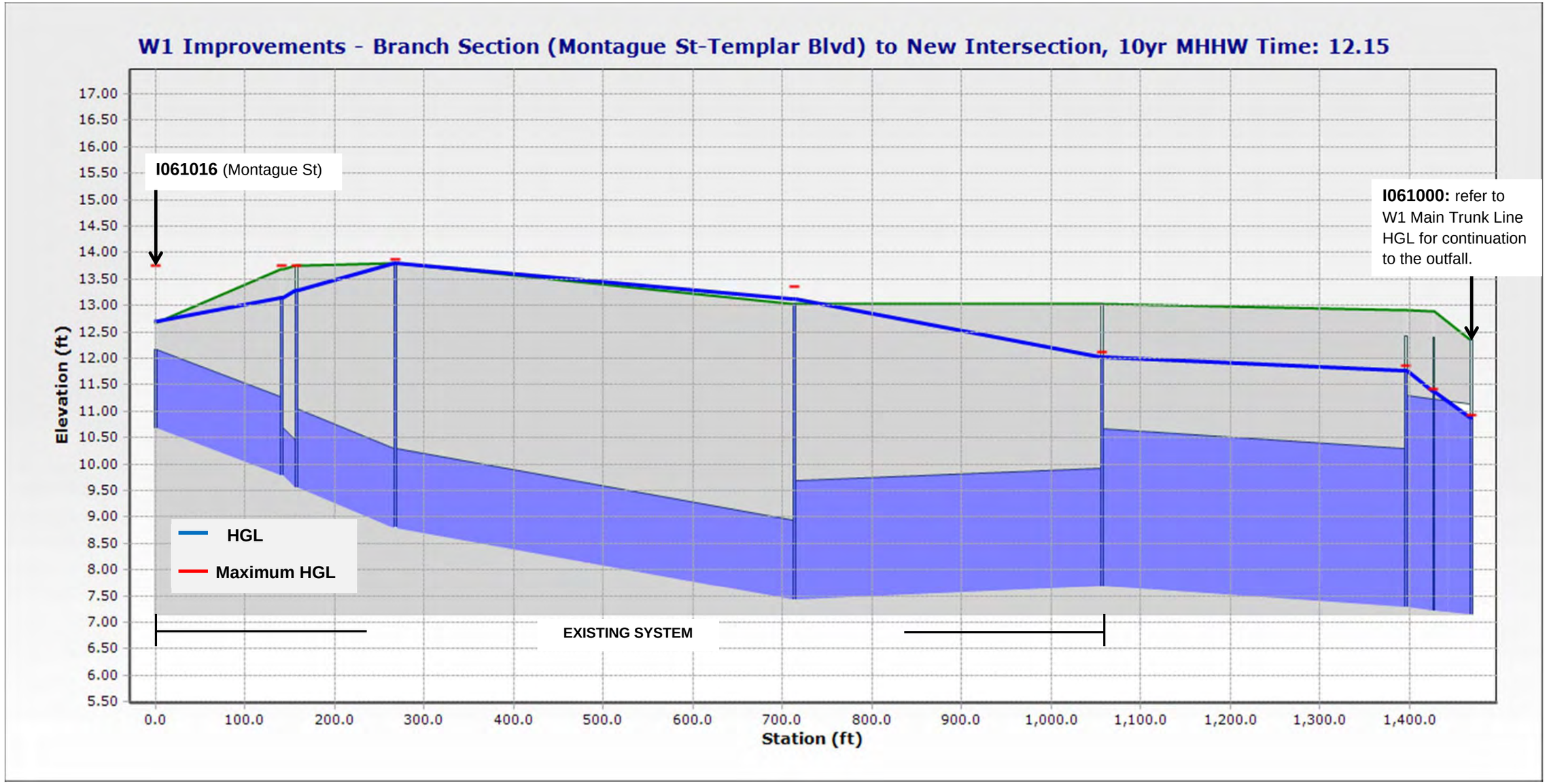
C.6. Sub-Watershed 2 - Existing Conditions along Main Trunk Line



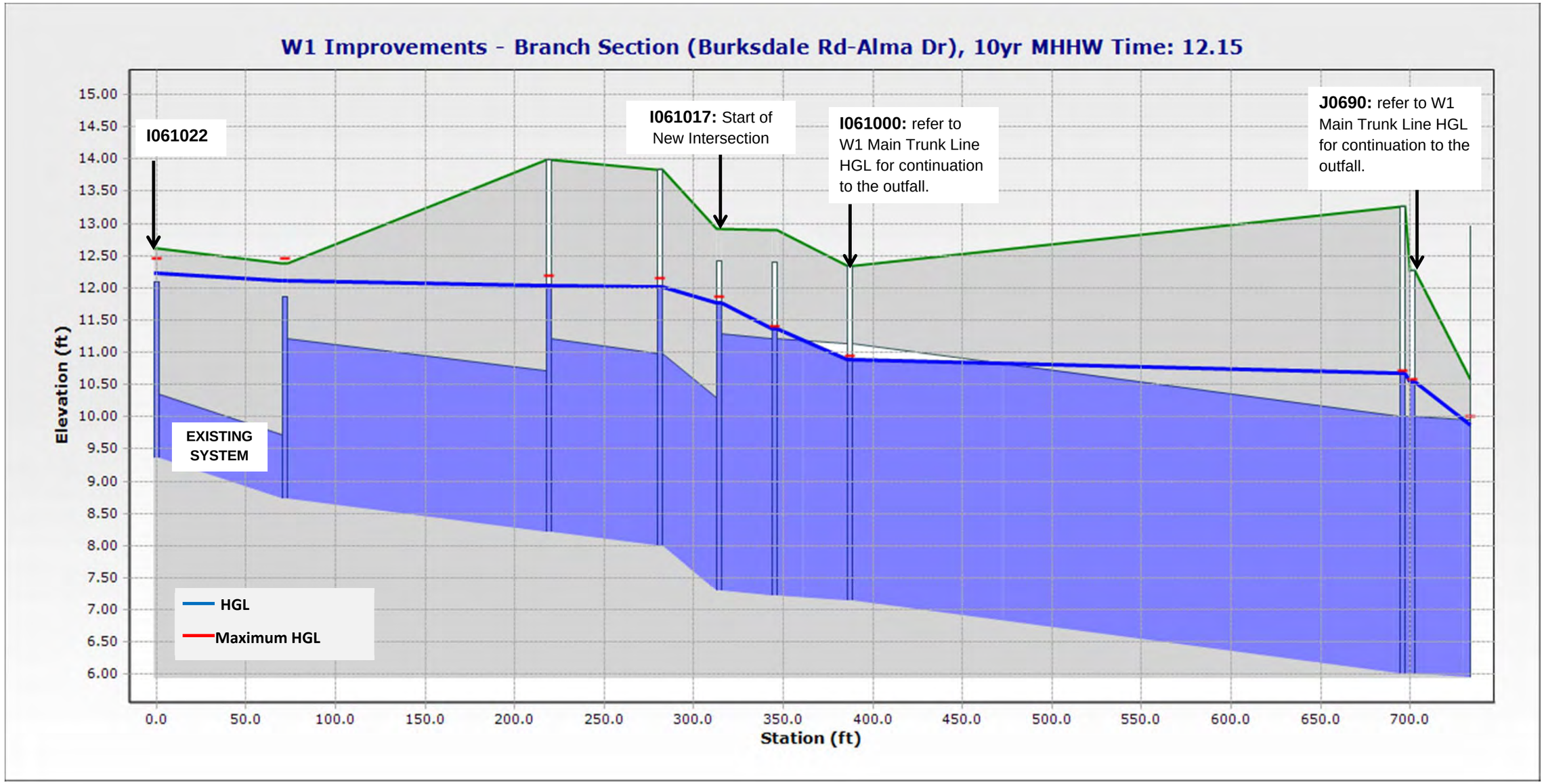
Appendix D

Sub-Watershed 1 Alternative Improvement HGL Profile Plots

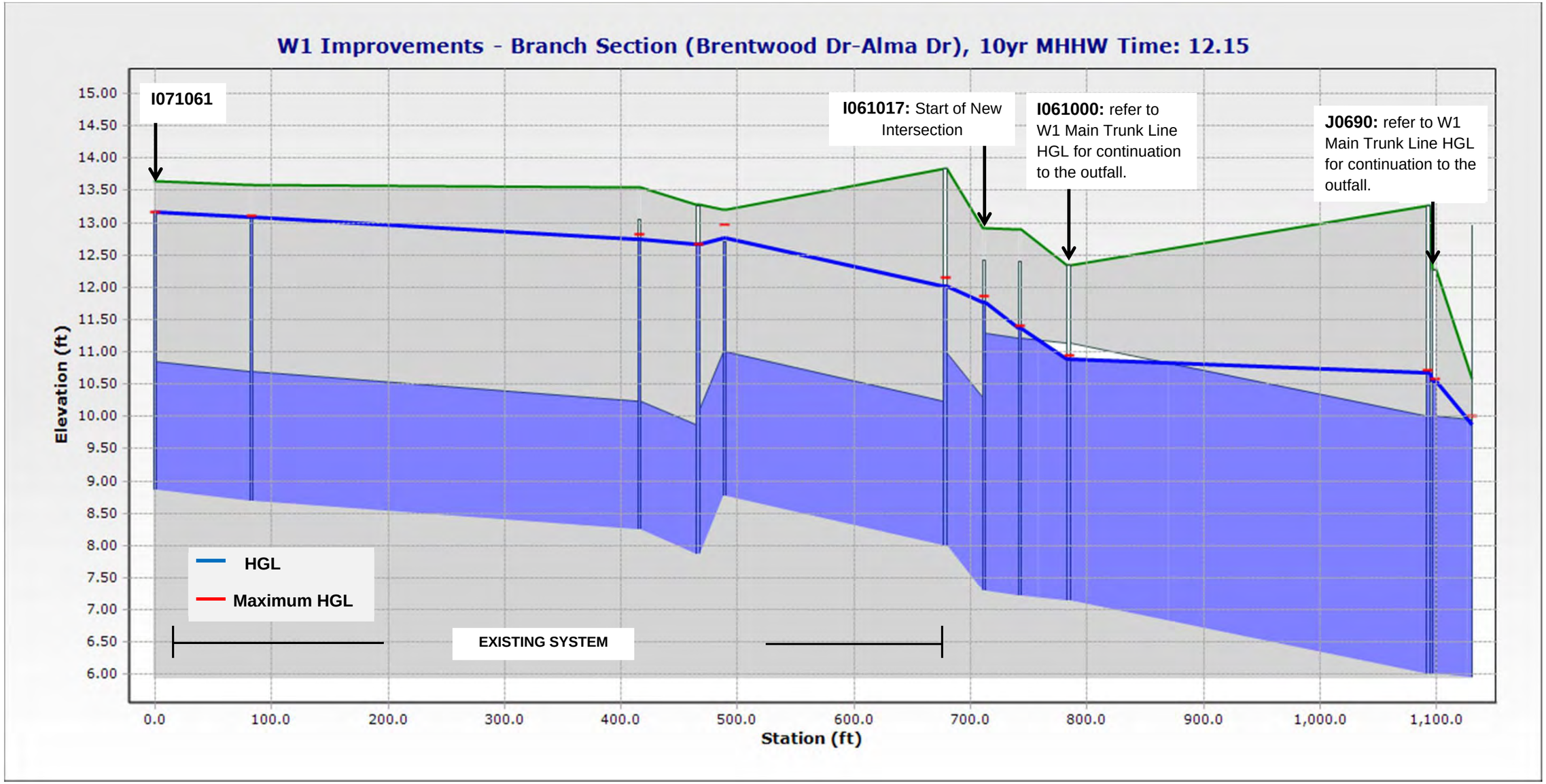
D.1. Sub-Watershed 1 Alternative Conditions along Branch Section between Montague St and Templar Boulevard through New Intersection



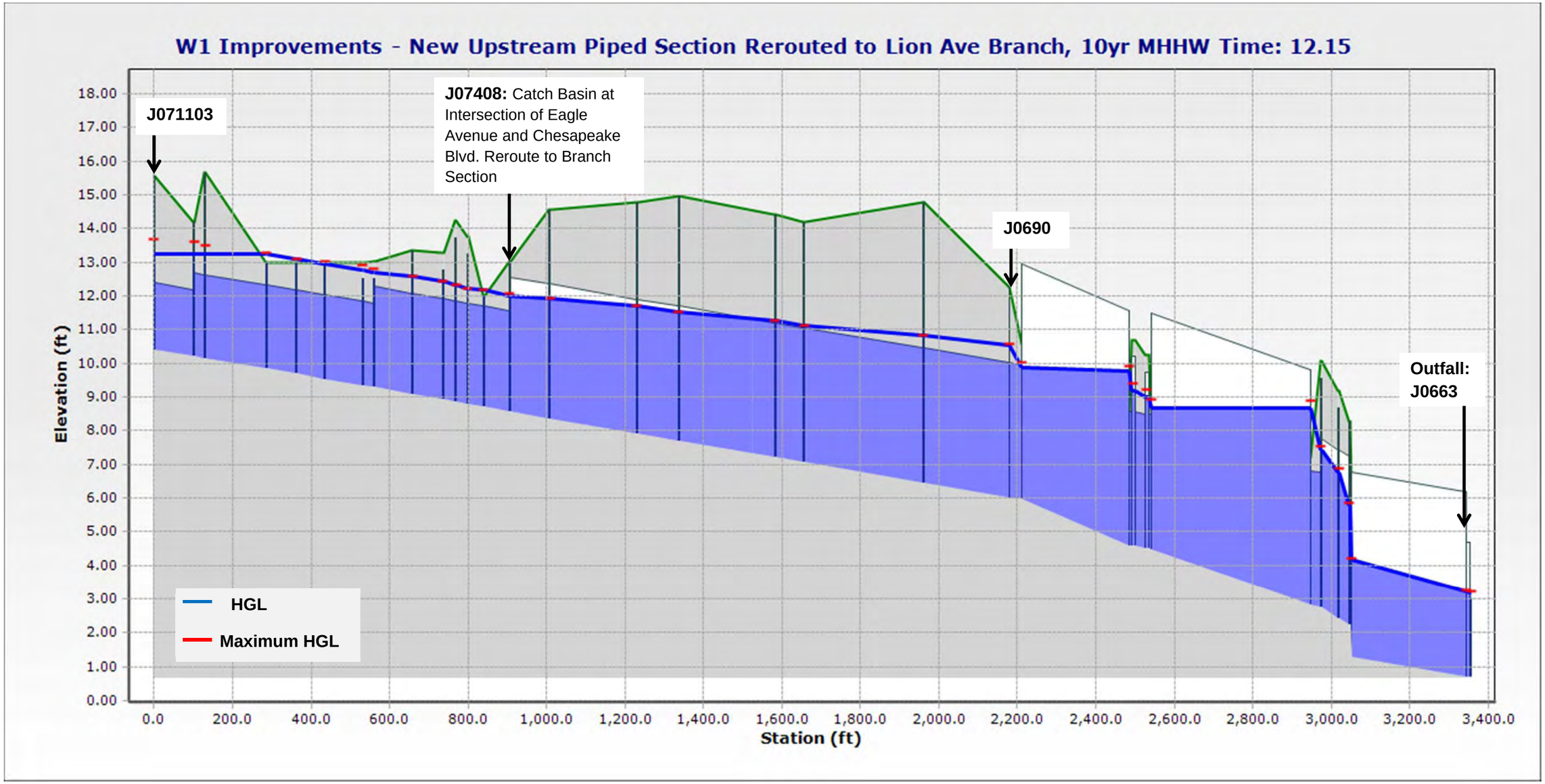
D.2. Sub-Watershed 1 Alternative Conditions along Branch Section (between Burksdale Rd and Alma Dr) through New Intersection



D.3. Sub-Watershed 1 Alternative Conditions along Branch Section (between Brentwood Dr and Alma Dr) through New Intersection



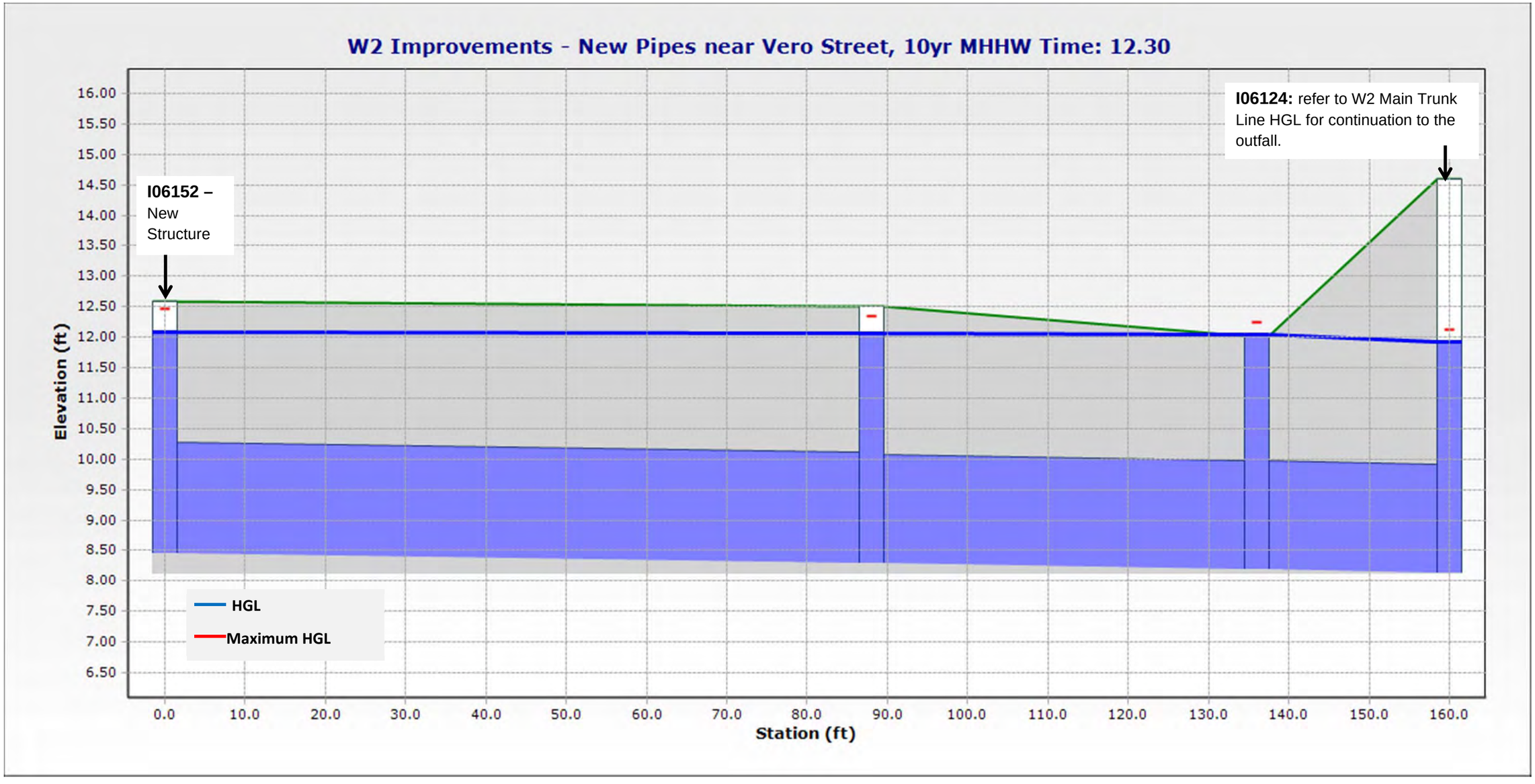
D.4. Sub-Watershed 1 Alternative Conditions along New Piped Section (between E. Little Creek Rd and Dovercourt Rd) Rerouted to Lion Avenue Branch Section to Outfall



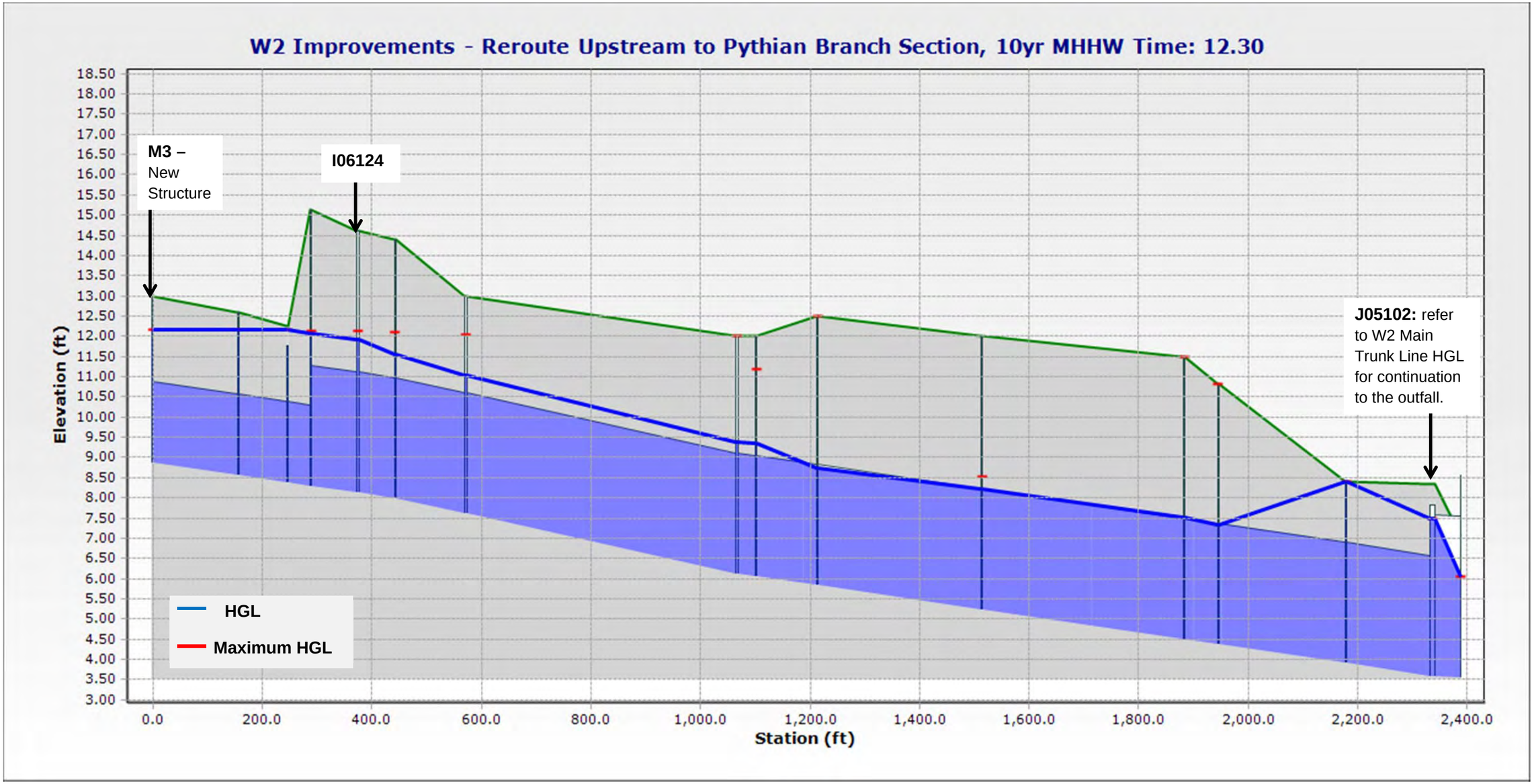
Appendix E

Sub-Watershed 2 Alternative Improvement HGL Profile Plots

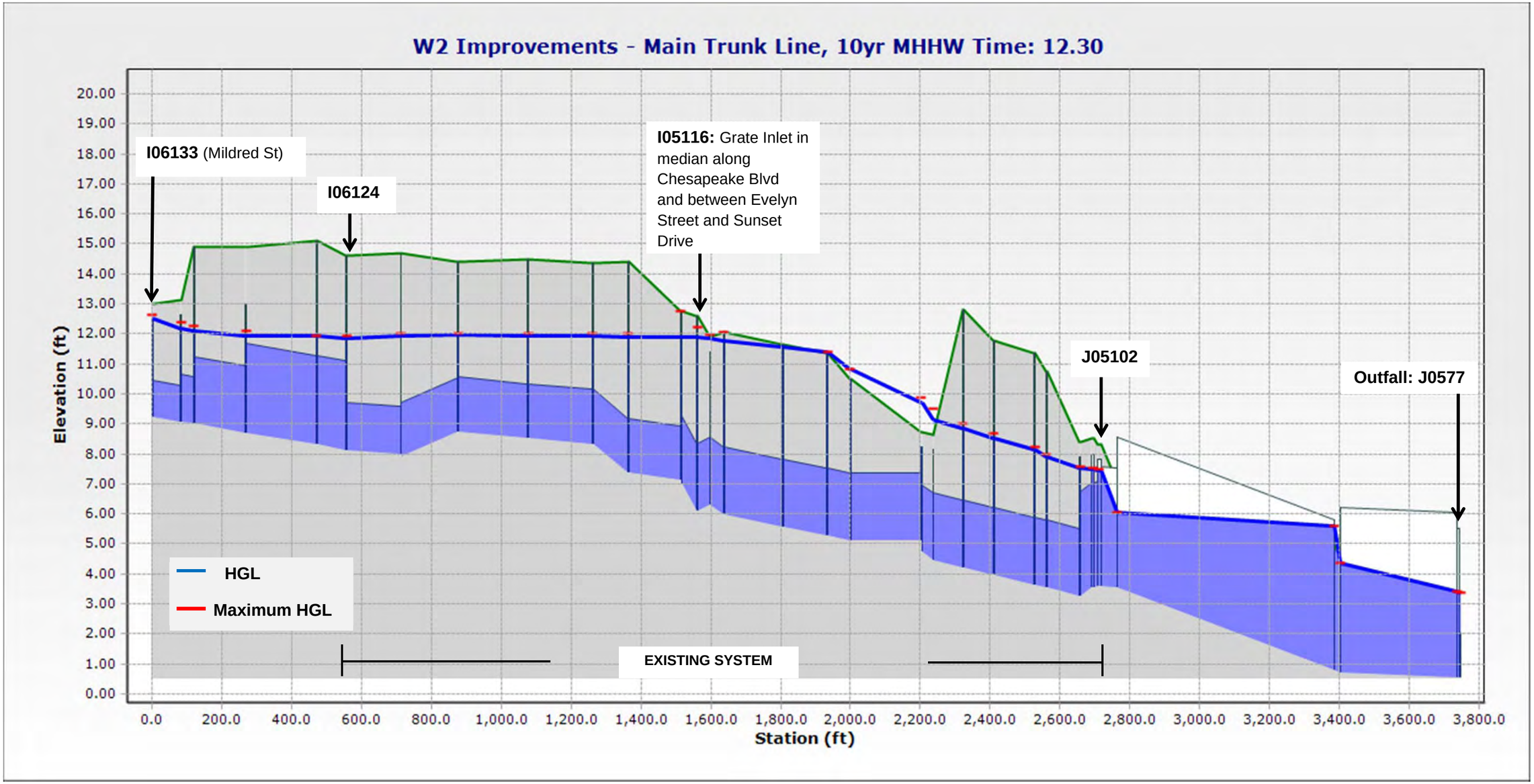
E.1. Sub-Watershed 2 Alternative Conditions along New Piped Section North of Vero St Rerouted to New Pythian Ave Branch Section



E.2. Sub-Watershed 2 Alternative Conditions along New Piped Section between Mildred St and Vero St down through Pythian Ave Branch Section



E.3. Sub-Watershed 2 Alternative Conditions along Main Trunk Line



Appendix F

Alternative Scenario Cost Estimates

F.1. Phase 1, Sub-Watershed 1 Culvert Upgrades Cost Estimate

I. Paving and Earthwork						
	Total	Unit		Unit Cost		Total
Road Mill, & Overlay	90	SY	@	$ 45.00	=	$ 4,050.00
Asphalt Pavement Patch	225	SY	@	$ 100.00	=	$ 22,500.00
Sidewalk, Norfolk Standard	55	SY	@	$ 50.00	=	$ 2,750.00
Curb Ramp (VDOT Std. CG-12A, CG-12B, or CG-12C)	4	EA	@	$ 95.00	=	$ 380.00
Undercut / Backfill	4	CY	@	$ 30.00	=	$ 120.00
Curb & Gutter	100	LF	@	$ 40.00	=	$ 4,000.00
Subtotal Paving and Earthwork						$ 33,800.00

II. Storm Drainage						
6' x 4' Box Culvert*	55	LF	@	$ 900.00	=	$ 49,500.00
8' x 5' Box Culvert*	80	LF	@	$ 1,000.00	=	$ 80,000.00
Modified Junction Box	4	EA	@	$ 15,000.00	=	$ 60,000.00
Stone Backfill	52	CY	@	$ 27.00	=	$ 1,404.00
Subtotal Storm Drainage and Excavation						$ 190,904.00

**includes bedding, excavation, and earthen backfill. Does not include stone backfill.*

III. Streetscape						
Yard Grading	85	LF	@	$ 20.00	=	$ 1,700.00
Topsoil and Seed	85	LF	@	$ 35.00	=	$ 2,975.00
Subtotal Streetscape						$ 4,675.00

IV. Mark-Ups						
Design Contingencies (12%)			@		=	$ 27,525.00
Mobilization & Demolition (8%)			@		=	$ 18,350.00
Erosion & Sediment Control (5%)			@		=	$ 11,469.00
Traffic Control (5%)			@		=	$ 11,469.00
Utility Relocations (15%)			@		=	$ 34,407.00
Environmental Permitting (3%)			@		=	$ 6,881.00
Land Acquisition (3%)**			@		=	$ -
Subtotal Mark-Ups						$ 110,102.00

***Assumes no land acquisition necessary*

General Contingency (25%)	**$ 84,870.00**
Grand Total - Items I - IV	**$ 424,351.00**

F.2. Phase 1, Sub-Watershed 2 Culvert Upgrades Cost Estimate

I. Paving and Earthwork							
	Total	Unit		Unit Cost		Total	
Pedestrian Bridge	40	LF	@	$ 200.00	=	$	8,000.00
Curb & Gutter	25	LF	@	$ 40.00	=	$	1,000.00
Subtotal Paving and Earthwork						$	9,000.00

II. Storm Drainage							
6' x 4' Box Culvert*	70	LF	@	$ 900.00	=	$	63,000.00
Modified Junction Box	1	EA	@	$ 15,000.00	=	$	15,000.00
Stone Backfill	30	CY	@	$ 27.00	=	$	810.00
Subtotal Storm Drainage and Excavation						$	78,810.00

**includes bedding, excavation, and earthen backfill. Does not include stone backfill.*

III. Streetscape							
Yard Grading	55	LF	@	$ 20.00	=	$	1,100.00
Topsoil and Seed	55	LF	@	$ 35.00	=	$	1,925.00
Subtotal Streetscape						$	3,025.00

IV. Mark-Ups							
Design Contingencies (12%)			@		=	$	10,900.00
Mobilization & Demolition (8%)			@		=	$	7,267.00
Erosion & Sediment Control (5%)			@		=	$	4,542.00
Traffic Control (5%)			@		=	$	4,542.00
Utility Relocations (15%)			@		=	$	13,625.00
Environmental Permitting (3%)			@		=	$	2,725.00
Land Acquisition (3%)**			@		=	$	-
Subtotal Mark-Ups						$	43,601.00

***Assumes no land acquisition necessary*

General Contingency (25%)	**$**	**33,609.00**
Grand Total - Items I - IV	**$**	**168,045.00**

F.3. Phase 2, Sub-Watershed 1 Capacity Upgrades Cost Estimate

I. Paving and Earthwork						
	Total	Unit		Unit Cost		Total
Road Mill, & Overlay	3730	SY	@	$ 45.00	=	$ 167,850.00
Asphalt Pavement Patch	3730	SY	@	$ 100.00	=	$ 373,000.00
Sidewalk, Norfolk Standard	790	SY	@	$ 50.00	=	$ 39,500.00
Curb Ramp (VDOT Std. CG-12A, CG-12B, or CG-12C)	5	EA	@	$ 95.00	=	$ 475.00
Undercut / Backfill	170	CY	@	$ 30.00	=	$ 5,100.00
Curb & Gutter	1290	LF	@	$ 40.00	=	$ 51,600.00
Private Entrances	14	EA	@	$ 1,000.00	=	$ 14,000.00
Subtotal Paving and Earthwork						$ 651,525.00

II. Storm Drainage						
24" RCP (Class III)*	936	LF	@	$ 160.00	=	$ 149,760.00
30" RCP (Class III)*	512	LF	@	$ 200.00	=	$ 102,400.00
36" RCP (Class III)*	792	LF	@	$ 225.00	=	$ 178,200.00
48" RCP (Class III)*	926	LF	@	$ 325.00	=	$ 300,950.00
6' x 4' Box Culvert*	947	LF	@	$ 900.00	=	$ 852,300.00
Manhole	8	EA	@	$ 4,000.00	=	$ 32,000.00
Grate Inlet	17	EA	@	$ 3,975.00	=	$ 67,575.00
Curb Inlet	6	EA	@	$ 3,000.00	=	$ 18,000.00
Junction Box	4	EA	@	$ 15,000.00	=	$ 60,000.00
Stone Backfill	230	CY	@	$ 27.00	=	$ 6,210.00
Subtotal Storm Drainage Excavation						$ 1,767,395.00

**includes bedding, excavation, and earthen backfill. Does not include stone backfill.*

III. Streetscape						
Street Trees	540	LF	@	$ 15.00	=	$ 8,100.00
Yard Grading	3205	LF	@	$ 20.00	=	$ 64,100.00
Topsoil and Seed	3205	LF	@	$ 35.00	=	$ 112,175.00
Subtotal Streetscape						$ 184,375.00

F.3. Phase 2, Sub-Watershed 1 Capacity Upgrades Cost Estimate Cont.

IV. Mark-Ups						
Design Contingencies (12%)			@		=	$ 312,395.00
Mobilization & Demolition (8%)			@		=	$ 208,264.00
Erosion & Sediment Control (5%)			@		=	$ 130,165.00
Traffic Control (5%)			@		=	$ 130,165.00
Utility Relocations (15%)			@		=	$ 390,494.00
Environmental Permitting (3%)**			@		=	$ -
Land Acquisition (3%)**			@		=	$ -
Subtotal Mark-Ups						$ 1,171,483.00

***Assumes no environmental permitting or land acquisition necessary*

General Contingency (25%)	**$ 943,694.00**
Grand Total - Items I - IV	**$ 4,718,473.00**

F.4. Phase 2, Sub-Watershed 2 Capacity Upgrades Cost Estimate

I. Paving and Earthwork						
	Total	Unit		Unit Cost		Total
Road Mill, & Overlay	1350	SY	@	$ 45.00	=	$ 60,750.00
Asphalt Pavement Patch	1350	SY	@	$ 100.00	=	$ 135,000.00
Sidewalk, Norfolk Standard	1065	SY	@	$ 50.00	=	$ 53,250.00
Curb Ramp (VDOT Std. CG-12A, CG-12B, or CG-12C)	12	EA	@	$ 95.00	=	$ 1,140.00
Undercut / Backfill	60	CY	@	$ 30.00	=	$ 1,800.00
Curb & Gutter	1700	LF	@	$ 40.00	=	$ 68,000.00
Private Entrances	15	EA	@	$ 1,000.00	=	$ 15,000.00
Subtotal Paving and Earthwork						$ 334,940.00

II. Storm Drainage						
27" RCP (Class III)*	150	LF	@	$ 170.00	=	$ 25,500.00
36" RCP (Class V)*	1123	LF	@	$ 300.00	=	$ 336,900.00
23"x14" RCP (Class III)*	117	LF	@	$ 150.00	=	$ 17,550.00
30"x19" RCP (Class III)*	38	LF	@	$ 175.00	=	$ 6,650.00
34"x22" RCP (Class III)*	211	LF	@	$ 190.00	=	$ 40,090.00
38"x24" RCP (Class III)*	323	LF	@	$ 200.00	=	$ 64,600.00
5' x 3' Box Culvert*	1126	LF	@	$ 800.00	=	$ 900,800.00
Manhole	4	EA	@	$ 4,000.00	=	$ 16,000.00
Grate Inlet	5	EA	@	$ 3,975.00	=	$ 19,875.00
Curb Inlet	10	EA	@	$ 3,000.00	=	$ 30,000.00
Junction Box	4	EA	@	$ 15,000.00	=	$ 60,000.00
Stone Backfill	130	CY	@	$ 27.00	=	$ 3,510.00
Subtotal Storm Drainage Excavation						$ 1,521,475.00

**includes bedding, excavation, and earthen backfill. Does not include stone backfill.*

III. Streetscape						
Street Trees	363	LF	@	$ 15.00	=	$ 5,445.00
Yard Grading	2690	LF	@	$ 20.00	=	$ 53,800.00
Topsoil and Seed	2690	LF	@	$ 35.00	=	$ 94,150.00
Subtotal Streetscape						$ 153,395.00

F.4. Phase 2, Sub-Watershed 2 Capacity Upgrades Cost Estimate Cont.

IV. Mark-Ups						
Design Contingencies (12%)			@		=	$ 241,177.00
Mobilization & Demolition (8%)			@		=	$ 160,785.00
Erosion & Sediment Control (5%)			@		=	$ 100,490.00
Traffic Control (5%)			@		=	$ 100,490.00
Utility Relocations (15%)			@		=	$ 301,472.00
Environmental Permitting (3%)**			@		=	$ -
Land Acquisition (3%)**			@		=	$ -
Subtotal Mark-Ups						$ 904,415.00

***Assumes no environmental permitting or land acquisition necessary*

General Contingency (25%)	**$ 728,556.00**
Grand Total - Items I - IV	**$ 3,642,781.00**

Appendix G

Structure Field Observation Sheets

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05111A**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Double Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 8.063 Structure Invert 5.113

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	22x34	RCP	N	2.95	0
1	3	27	RCP	N	2.95	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05111B**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1952

Rim Elevation 9.9 Structure Invert 6.72

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Double Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 8.212 Structure Invert 4.712

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	3.5	0
1	3	6	RCP	N	2.55	0
2	6	15	RCP	N	3.5	0
3	9	24x36	RCP	N	3.5	

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05112**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1952

Rim Elevation 11.36 Structure Invert 7.04

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Could Not Locate

Material Location ()

Rim Elevation UNK Structure Invert UNK

Size Length (ft) OR Grate size (in) OR Diam (in) Other

Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12					
1						
2						
3						

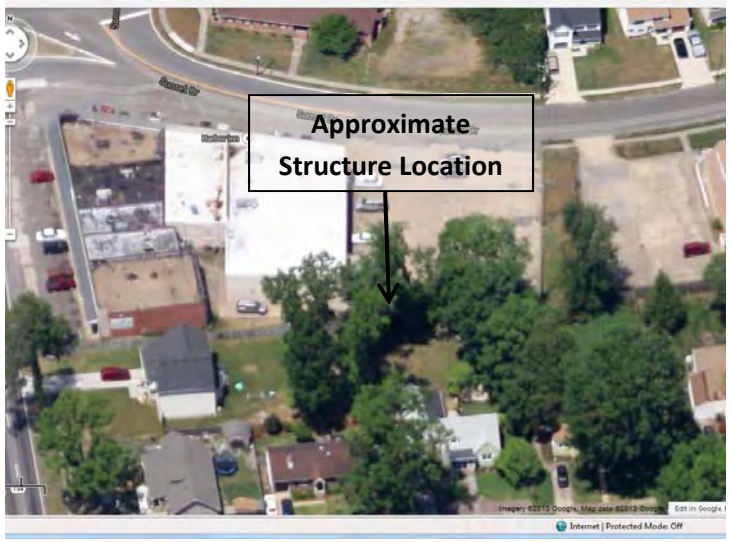
Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05113**

Pic 1 (outside of structure)



Existing GIS Information

Structure Type Gutter Basin Year Installed 1952

Rim Elevation 11.65 Structure Invert 7.22

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Could Not Locate

Material Location ()

Rim Elevation UNK Structure Invert UNK

Size Length (ft) OR Grate size (in) OR Diam (in) Other

Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12					
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05114**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1952

Rim Elevation 12.05 Structure Invert 7.49

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 10.072 Structure Invert 5.972

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 20 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	4.10	0
1	6	27	RCP	N	4.10	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: grate covered in pine straw; could not open structure

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05116**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Gutter Basin Year Installed 1952

Rim Elevation 12.5 Structure Invert 7.97

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 10.598 Structure Invert 6.098

Size Length (ft) OR 24x12 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	4.5	0
1	3	27	RCP	N	4.5	0
2	6	18	RCP	N	4.5	0
3	9	15	RCP	N	3.89	0

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05117**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Gutter Basin Year Installed 1995

Rim Elevation 0 Structure Invert 10.58

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 10.751 Structure Invert 7.001

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	CMP	N	3.75	0
1	6	22x30	CMP	N	3.65	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open structure

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05120**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Drop Inlet - Non Standard Year Installed 1995

Rim Elevation 0 Structure Invert 12.27

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 12.405 Structure Invert 7.355

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	22x34	CMP	N	5.05	0
1	6	22x34	CMP	N	5.05	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: ditches along both side; could not open structure

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05121**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 13.00 Structure Invert 8.32

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition F(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	22x34	CMP	N	4.68	0
1	6	22x34	CMP	N	4.68	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open structure; ditch on both sides

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05122**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 13 Structure Invert 8.5

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	22x34	CMP	N	4.5	0
1	6	22x34	CMP	N	4.5	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: v-ditches on either side with 4' top width and 0.5' deep

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05158**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1952

Rim Elevation 11.75 Structure Invert 7.82

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 10.267 Structure Invert 6.167

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	18	RCP	N	4.10	0
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open structure

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05161**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Pipe Entrance- Head Wall Year Installed 1952

Rim Elevation 0 Structure Invert 9.47

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 11.4 Structure Invert 6.3

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	5.10	0
1	6	27	RCP	N	5.10	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061000**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Manhole - Conflict Elect., Phone, or CATV Year Installed 1956

Rim Elevation 14.21 Structure Invert 8.99

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Conflict Elect., Phone, or CATV

Material Brick Location (NA)

Rim Elevation 12.343 Structure Invert 7.143

Size Length (ft) OR Grate size (in) OR 36 Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	48	RCP	N	5.20	0
1	6	36	RCP	N	5.20	0
2	7	30	RCP	N	4.90	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061001**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 14.04 Structure Invert 9.55

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 12.152 Structure Invert UNK

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition UNK(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked UNK Candidate for cleaning (UNK)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	30	RCP	N	UNK	UNK
1	4	30	RCP	N	UNK	UNK
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061002**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.43 Structure Invert 9.75

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.393 Structure Invert 7.893

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	30	RCP	N	4.5	0
1	6	30	RCP	N	4.5	0
2	9	18	CMP	N	3.35	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061005**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 15.2 Structure Invert 10.11

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 0 Structure Invert UNK

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	5.35	0
1	6	27	RCP	N	5.35	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061006**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 15.59 Structure Invert 10.12

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 13.03 Structure Invert 7.43

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	5.6	0
1	5	18	RCP	N	5.6	0
2	6	18	RCP	N	5.6	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061010**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 15.86 Structure Invert 10.99

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 13.788 Structure Invert 8.788

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	18	RCP	N	5	0
1	3	11x18	CMP	N	5	0
2	6	18	RCP	N	5	0
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061013**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 15.88 Structure Invert 11.85

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 13.753 Structure Invert 9.553

Size Length (ft) OR Grate size (in) OR 24 Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	18	RCP	N	4.20	0
1	3	12	CMP	N	3.45	0
2	9	0	CMP	N	4.20	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061014**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.98 Structure Invert 12.75

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.65 Structure Invert 10.3

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 5 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	CMP	N	2.35	0
1						
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061015**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: pipes squashed

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 15.25 Structure Invert 11.9

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 13.177 Structure Invert 9.777

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	11x18	CMP	N	3.4	0
1	6	11x18	CMP	N	3.4	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061016**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 13.94 Structure Invert 12.53

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.169 Structure Invert 10.669

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	11x18	CMP	N	1.5	0
1						
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061017**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.05 Structure Invert 9.77

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.415 Structure Invert 7.965

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 80 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	30	RCP	N	4.45	0
1	3	15	RCP	N	3.40	0
2	6	30	RCP	N	4.45	0
3	9	15	RCP	N	3.40	0

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061020**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 13.69 Structure Invert 9.77

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 11.838 Structure Invert 7.988

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	30	RCP	N	3.85	0
1	3	27	RCP	N	3.85	0
2	9	18	RCP	N	3.85	0
3						

Pipe information should be recorded in clockwise direction

Notes: not sure what 3 and 9'oclock pipe sizes are

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061021**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 13.79 Structure Invert 10.34

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 11.867 Structure Invert 8.717

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 5 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	15	RCP	N	3.15	5
1	5	15	RCP	N	3.15	0
2	6	15	RCP	N	3.15	5
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061022**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 13.95 Structure Invert 10.54

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.098 Structure Invert 9.348

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition F(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 30 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	RCP	N	2.75	15
1						
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061024**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 13.85 Structure Invert 10.55

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 11.99 Structure Invert 8.89

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	15	RCP	N	3.10	0
1	6	15	RCP	N	3.10	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061027**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: large opening; fairly vegetated

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.71 Structure Invert 8.76

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	3.95	0
1	6	27	RCP	N	3.95	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061029**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 14.97 Structure Invert 8.99

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 13.035 Structure Invert 6.835

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	36	RCP	N	6.20	0
1	3	30	RCP	N	5.60	0
2	9	27	RCP	N	5.30	0
3						

Pipe information should be recorded in clockwise direction

Notes: pipe at 9'oclock has concrete bar blocking 5-10% of structure opening

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061030**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: water in structure

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 15.61 Structure Invert 9.52

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 13.971 Structure Invert 7.971

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	30	RCP	N	6.00	0
1	7	24	RCP	N	6.00	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061031**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 14.89 Structure Invert 9.63

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 13.266 Structure Invert 7.866

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	24	RCP	N	5.40	0
1	2	24	RCP	N	5.40	0
2	4	18	RCP	N	4.30	0
3	11	27	RCP	N	5.40	0

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06124**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: 8' is length of structure - two grates

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Double Grate Inlet

Material Brick Location (Sag)

Rim Elevation 12.597 Structure Invert 8.117

Size Length (ft) OR 30x96 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	19x30	CMP	N	4.48	0
1	3	15	RCP	N	4.15	0
2	6	0	CMP	N	4.48	0
3	9	15	RCP	N	4.48	0

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06124.01**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 12.691 Structure Invert 7.891

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	22x34	CMP	N	4.80	0
1	6	19x30	CMP	N	4.70	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06130**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Drop Inlet - Non Standard Year Installed 1995

Rim Elevation 0 Structure Invert 12.73

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 12.878 Structure Invert 10.728

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	19x30	CMP	N	2.15	0
1	3	9x14	CMP	N	2.15	0
2	6	0	CMP	N	2.15	0
3						

Pipe information should be recorded in clockwise direction

Notes: could only open very tiny slot; could not see all pipes

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06130.01**

Pic 1 (Ditch Upstream)

Pic 2 (Pipe Downstream)

Notes: pipe at 9 o'clock a stub?

Existing GIS Information

Structure Type Catch Basin - Non Standard Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material Brick Location (Sag)

Rim Elevation 12.302 Structure Invert 10.902

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 30 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	14x24	CMP	N	1.40	0
1	9	12	RCP	N	1.40	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06131**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1959

Rim Elevation 14.56 Structure Invert 12.46

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.629 Structure Invert 10.529

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	9x14	CMP	N	2.10	10
1	4	9x14	CMP	N	2.10	0
2	6	0	CMP	N	2.10	0
3	11	9x14	CMP	N	2.10	0

Pipe information should be recorded in clockwise direction

Notes: pipes at 4 and 11 o'clock squashed; pine needles in structure

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06132**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1959

Rim Elevation 14.44 Structure Invert 12.73

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.678 Structure Invert 10.828

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 20 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	9x14	CMP	N	1.85	5
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06133**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1959

Rim Elevation 13.99 Structure Invert 12.65

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.507 Structure Invert 10.757

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 20 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	9x14	CMP	N	1.75	20
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06135**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Drop Inlet - Non Standard Year Installed 1995

Rim Elevation 0 Structure Invert 12.77

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 13.118 Structure Invert 9.638

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	19x30	CMP	N	3.48	0
1	6	19x30	CMP	N	3.48	0
2	9	12	RCP	N	3.48	0
3						

Pipe information should be recorded in clockwise direction

Notes: could not open

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06136**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Ditch Entrance Year Installed

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin

Material Brick Location (Sag)

Rim Elevation 11.871 Structure Invert 9.971

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 50 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	CMP	N	1.90	10
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes: does not connect to ditch; entrance to CBNS 50% blocked by mud/grass

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06137**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: 0.5' of water in structure

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1995

Rim Elevation 0 Structure Invert 11.47

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 11.777 Structure Invert 9.377

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	CMP	N	2.40	0
1	9	12	RCP	N	1.60	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06155**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Drop Inlet - Non Standard Year Installed 1995

Rim Elevation 0 Structure Invert 12.23

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 12.39 Structure Invert 8.74

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	22x34	CMP	N	3.65	0
1	3	11x18	CMP	N	3.65	0
2	6	0	CMP	N	3.65	0
3						

Pipe information should be recorded in clockwise direction

Notes: could not open

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06156**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1959

Rim Elevation 14.07 Structure Invert 12.36

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 12.491 Structure Invert 10.891

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 5 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	11x18	CMP	N	1.60	0
1	6	12	CMP	N	1.60	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06157**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1956

Rim Elevation 14.15 Structure Invert 13.01

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 12.129 Structure Invert 11.029

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 70 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	CMP	N	1.10	10
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06198**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1956

Rim Elevation 14.35 Structure Invert 13.35

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material UNK Location (Sag)

Rim Elevation 12.403 Structure Invert 10.903

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 50 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	15	RCP	N	1.5	50
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open but filled with muck and dirt

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071053**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.62 Structure Invert 11.27

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.943 Structure Invert 9.393

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	18	RCP	N	3.55	0
1	9	18	RCP	N	3.55	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071059**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.73 Structure Invert 9.82

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 13.043 Structure Invert 8.243

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	24	RCP	N	4.80	0
1	6	24	RCP	N	4.80	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071060**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.8 Structure Invert 10.38

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 13.08 Structure Invert UNK

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	24	RCP	N	UNK	0
1	6	24	RCP	N	UNK	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: ould not open - catch basin covered by grass

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071061**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.85 Structure Invert 10.46

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 13.153 Structure Invert 8.853

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	24	RCP	N	4.30	0
1	6	24	RCP	N	4.30	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071062**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 15.07 Structure Invert 10.45

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.765 Structure Invert 8.165

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	24	RCP	N	4.60	0
1	3	18	RCP	N	3.00	0
2	6	24	RCP	N	4.60	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071063**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 15.32 Structure Invert 11.87

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 13.724 Structure Invert 10.124

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	18	RCP	N	3.60	0
1	6	18	RCP	N	2.80	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071067**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1956

Rim Elevation 15.07 Structure Invert 11.11

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 13.357 Structure Invert 8.807

Size Length (ft) OR Grate size (in) OR 24 Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	24	RCP	N	4.55	0
1	9	24	RCP	N	4.55	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071068**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.28 Structure Invert 10.81

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Concrete Location (Sag)

Rim Elevation 12.507 Structure Invert 8.807

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	24	RCP	N	3.70	0
1	3	12	PVC	N	3.70	0
2	6	24	RCP	N	3.70	0
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071069**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1956

Rim Elevation 14.26 Structure Invert 11.17

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.50 Structure Invert 10.20

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	RCP	N	2.30	0
1	12	12	PVC	N	2.30	0
2	6	12	RCP	N	2.40	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05102**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Double Norfolk Standard Year Installed 1959

Rim Elevation 9.69 Structure Invert 5.43

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Double Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 7.825 Structure Invert 3.575

Size 8 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	42	RCP	N	4.25	0
1	3	24	RCP	N	4.25	0
2	4	8	RCP	N	4.25	0
3	9	42	RCP	N	4.25	0

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05103**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Double Norfolk Standard Year Installed 1959

Rim Elevation 9.68 Structure Invert 5.43

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Double Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 7.997 Structure Invert 3.547

Size 8 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	42	RCP	N	4.45	0
1	4	42	RCP	N	4.45	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05104**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: 0.5' of water in structure

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1959

Rim Elevation 9.68 Structure Invert 5.33

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 7.911 Structure Invert 3.261

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	42	RCP	N	4.65	0
1	7	27	RCP	N	4.65	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05105**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1959

Rim Elevation 8.72 Structure Invert 5.81

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Inaccessible

Material Location ()

Rim Elevation UNK Structure Invert UNK

Size Length (ft) OR Grate size (in) OR Diam (in) Other

Condition UNK (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked UNK Candidate for cleaning ()

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	UNK			UNK	
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes: located on private property

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05106**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1959

Rim Elevation 9.37 Structure Invert 6.03

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Inaccessible

Material Location ()

Rim Elevation UNK Structure Invert UNK

Size Length (ft) OR Grate size (in) OR Diam (in) Other

Condition UNK (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked UNK Candidate for cleaning ()

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	UNK			UNK	
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes: located on private property

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05108**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1959

Rim Elevation 9.75 Structure Invert 6.6

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Inaccessible

Material Location ()

Rim Elevation UNK Structure Invert UNK

Size Length (ft) OR Grate size (in) OR Diam (in) Other

Condition UNK (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked UNK Candidate for cleaning ()

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	UNK			UNK	
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes: located on private property

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05109**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1959

Rim Elevation 12.79 Structure Invert 8.14

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Inaccessible

Material Location ()

Rim Elevation UNK Structure Invert UNK

Size Length (ft) OR Grate size (in) OR Diam (in) Other

Condition UNK (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked UNK Candidate for cleaning ()

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	UNK			UNK	
1						
2						
3						

Pipe information should be recorded in clockwise direction

Notes: located on private property

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05110**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1959

Rim Elevation 11.43 Structure Invert 8.15

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 8.144 Structure Invert 4.444

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	3.70	0
1	6	27	RCP	N	3.70	0
2	9	15	RCP	N	3.70	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0669**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1963

Rim Elevation 8.28 Structure Invert 2.74

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Could not locate

Material UNK Location (NA)

Rim Elevation 8.28 Structure Invert UNK

Size Length (ft) OR Grate size (in) OR Diam (in) Other

Condition UNK(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked UNK Candidate for cleaning (UNK)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	60	RCP	N	UNK	0
1	4	48	RCP	N	UNK	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not locate

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0673**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1963

Rim Elevation 8.47 Structure Invert 2.37

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 8.669 Structure Invert 2.419

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	48	RCP	N	6.25	0
1	5	48	RCP	N	6.25	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0674**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1963

Rim Elevation 9.25 Structure Invert 2.53

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 9.559 Structure Invert 2.759

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	48	RCP	N	6.80	0
1	6	48	RCP	N	6.80	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0679**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: water in structure

Existing GIS Information

Structure Type Catch Basin - Double Norfolk Standard Year Installed 1963

Rim Elevation 7.8 Structure Invert 2.25

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Double Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 9.743 Structure Invert 4.343

Size 8 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	36 (x2)	RCP	N	5.40	0
1	6	36 (x2)	RCP	N	5.40	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0684**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: 0.5' feet of water in structure

Existing GIS Information

Structure Type Catch Basin - Double Norfolk Standard Year Installed 1963

Rim Elevation 8.04 Structure Invert 2.04

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Catch Basin - Double Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 10.192 Structure Invert 4.242

Size 8 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	36 (x2)	RCP	N	5.95	0
1	6	27 (x2)	RCP	N	5.95	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0690**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: large rocks at bottom of structure

Existing GIS Information

Structure Type Manhole - Non Standard Year Installed 1963

Rim Elevation 14.31 Structure Invert 7.7

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Brick Location (NA)

Rim Elevation 12.259 Structure Invert 6.009

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition G(**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	48	RCP	N	6.25	0
1	3	24	RCP	N	6.00	6
2	48	0	N	N	6.25	0
3	9	15	RCP	N	3.20	0

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0694**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Gutter Basin Year Installed 1963

Rim Elevation 13.14 Structure Invert 7.7

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 11.262 Structure Invert UNK

Size Length (ft) OR 24x12 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	48	RCP	N	UNK	UNK
1	6	48	RCP	N	UNK	UNK
2						
3						

Pipe information should be recorded in clockwise direction

Notes: could not open

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071064**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1963

Rim Elevation 14.97 Structure Invert 11.85

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 13.257 Structure Invert 10.157

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	18	RCP	N	3.10	10
1	6	18	RCP	N	3.10	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071099**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Yard Basin Year Installed 1963

Rim Elevation 15.04 Structure Invert 13.9

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 13.674 Structure Invert 12.174

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 20 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	RCP	N	1.5	40
1	6	12	RCP	N	1.5	40
2						
3						

Pipe information should be recorded in clockwise direction

Notes: Partially paved over so could not open; thick sediment in structure - approximately 4"

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071103**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes: 2 grates - one completely full of sediment

Existing GIS Information

Structure Type Yard Basin Year Installed 1963

Rim Elevation 15.8 Structure Invert 14.19

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 13.54 Structure Invert 12.34

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 80 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	RCP	N	1.2	10
1						
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07408**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1963

Rim Elevation 14.5 Structure Invert 12.99

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.509 Structure Invert 11.009

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	9x14	CMP	N	1.5	0
1	3	12	RCP	N	1.5	0
2	6	0	CMP	N	1.5	0
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07411**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Notes:

Existing GIS Information

Structure Type Catch Basin - Norfolk Standard Year Installed 1963

Rim Elevation 14.42 Structure Invert 12.95

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Catch Basin - Norfolk Standard

Material Brick Location (Sag)

Rim Elevation 12.569 Structure Invert 10.919

Size 2.5 Length (ft) OR Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	9x14	CMP	N	1.65	0
1	7	9x14	CMP	N	1.65	0
2						
3						

Pipe information should be recorded in clockwise direction

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M1**

Pic 1 (outside of structure)

Pic 2 (inside structure w/ pipe out @ 12 o'clock)

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Manhole - Non Standard

Material Location ()

Rim Elevation 14.188 Structure Invert 12.438

Size Length (ft) OR Grate size (in) OR 30 Diam (in) Other

Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 40 Candidate for cleaning (Y)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	12	RCP	N	1.75	5
1	6	12	RCP	N	1.75	20
2						
3						

Pipe information should be recorded in clockwise direction

Notes: some water in structure; sediment between pipes in structure

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M2**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 11.98 Structure Invert UNK

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	15	RCP	N	0	0
1	6	15	RCP	N	0	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes: cut through pipe

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M9**

Pic 1 (outside of structure)

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Grate Inlet

Material Brick Location (Sag)

Rim Elevation 8.496 Structure Invert 5.096

Size Length (ft) OR 30x30 Grate size (in) OR Diam (in) Other

Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pipes	Position	Size, in	Material / Lined (Y/N)		Down, ft	Block %
Out	12	27	RCP	N	3.40	0
1	6	27	RCP	N	3.40	0
2						
3						

Pipe information should be recorded in clockwise direction

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I05148**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: ditch depth decreases to 2.3'

Existing GIS Information

Structure Type Pipe Entrance- Head Wall Year Installed 1952

Rim Elevation 0 Structure Invert 9.47

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance- Head Wall

Material RCP Pipe Size 15”

Rim Elevation 8.864 Pipe Invert 7.614

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	0.5	6	3.60	0.764

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061003**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 12.45

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 18”

Rim Elevation UNK Pipe Invert UNK

Pipe Condition UNK (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
P				

Notes: could not actually find pipe opening - small ditch not draining anywhere

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061019**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 11.37

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 12”

Rim Elevation 10.325 Pipe Invert 9.325

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 50 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	8.5	2.4	1.45

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I061151**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: 0.1' of sediment in ditch; pipe squashed

Existing GIS Information

Structure Type Pipe Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 8x11”

Rim Elevation 11.74 Pipe Invert 11.07

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 20 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	4	1.5	1

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06126**

Pic 1 (Upstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1959

Rim Elevation 0 Structure Invert 11.86

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type **Does Not Exist**

Material Pipe Size

Rim Elevation Pipe Invert

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)

Pic 2 (Downstream)

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06139**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1959

Rim Elevation 0 Structure Invert 13.18

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material UNK Pipe Size UNK

Rim Elevation 12.246 Pipe Invert 11.246

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	3	0.7	1.43

Notes: ditch ends at street corner and needs to be redug around corner; could not locate actual pipe

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06142**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: could not really find pipe

Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material UNK Pipe Size UNK

Rim Elevation 12.269 Pipe Invert 11.269

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	3.5	1	1

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06143**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: ditch 10% filled with mulch

Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Ditch Entrance

Material NA Pipe Size NA

Rim Elevation NA Pipe Invert NA

Pipe Condition NA (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked NA Candidate for cleaning (NA)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
F	2	5	0.8	1.875

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06144**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: ditch at 3 and 9 o'clock

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1959

Rim Elevation 0 Structure Invert 12.17

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 15”

Rim Elevation 12.029 Pipe Invert 10.779

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (NA)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	5	2.5	0.80

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06145**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: pipe squashed

Existing GIS Information

Structure Type Ditch Cross Section Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material CMP Pipe Size 8”x11”

Rim Elevation 11.349 Pipe Invert 10.682

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 90 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	3.5	2	0.625

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06150**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1959

Rim Elevation 0 Structure Invert 12.85

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material Clay Pipe Size 8”x8”

Rim Elevation 11.973 Pipe Invert 11.306

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	2.20	1	0.60

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06151**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: short ditch coming to clay box from yard

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1959

Rim Elevation 0 Structure Invert 13.36

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material Clay Pipe Size 8x8”

Rim Elevation 12.25 Pipe Invert 11.583

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	1.5	0.667	0.375

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06152**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: portion is v-ditch; good condition

Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Ditch Entrance

Material NA Pipe Size NA

Ground Elevation 12.588 Pipe Invert NA

Pipe Condition NA (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked NA Candidate for cleaning (NA)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	0.5	2.5	0.5	2

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I06197**

Pic 1 (Upstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1956

Rim Elevation 0 Structure Invert 11.83

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type **Does Not Exist**

Material Pipe Size

Rim Elevation Pipe Invert

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Pic 2 (Downstream)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I063299**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 11.48

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 12”

Rim Elevation 10.85 Pipe Invert 8.35

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 10 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	2.5	6.5	2.5	0.80

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I063302**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 15”

Rim Elevation 12.213 Pipe Invert 10.963

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	2.20	6	1	1.9

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I063303**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 12.92

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 15”

Rim Elevation 12.50 Pipe Invert 11.25

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 70 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	4	1.4	0.92

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I063306**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1956

Rim Elevation 0 Structure Invert 13.27

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 12”

Rim Elevation 13.01 Pipe Invert 12.01

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.2	3.80	1.3	1.0

Notes: could not locate pipe entrance - blocked by concrete

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071090**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1956

Rim Elevation 0 Structure Invert 13.26

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material CMP Pipe Size 12”

Rim Elevation 12.31 Pipe Invert 11.31

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 20 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	3	4.5	1.5	0.5

Notes: 2.3' to top of bank around ditch bend; pipe squashed

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I071091**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: pipe filled with trash

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 13.18

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 12”

Rim Elevation 12.193 Pipe Invert 11.193

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	4.5	2.5	0.6

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I073307**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: covered with vegetation, dirt and trash

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 13.36

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 12”

Rim Elevation 12.343 Pipe Invert 11.343

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 50 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	3.5	1.2	0.83

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I073310**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1956

Rim Elevation 0 Structure Invert 13.52

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 12”

Rim Elevation 12.868 Pipe Invert 11.868

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 95 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	3.5	1.2	1.04

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I073311**

Pic 1 (Upstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type **Does Not Exist**

Material Pipe Size

Rim Elevation Pipe Invert

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I073314**

Pic 1 (Upstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1956

Rim Elevation 0 Structure Invert 14.46

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type **Does Not Exist**

Material Pipe Size

Rim Elevation Pipe Invert

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I073315**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 14.46

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 12”

Rim Elevation 13.58 Pipe Invert 12.58

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G				

Notes: ditch is really a swale 0.2-0.4' deep; pipe completely buried

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I073318**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: pipe completely buried; ditch really a swale

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1956

Rim Elevation 0 Structure Invert 14.19

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 12”

Rim Elevation 13.513 Pipe Invert 12.513

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	3	0.7	1.4

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **I073319**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1956

Rim Elevation 0 Structure Invert 14.22

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 12”

Rim Elevation 13.364 Pipe Invert 12.364

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G				

Notes: pipe completely buried and not collecting flow; ditch a swale 0.4' deep

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J05101**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1959

Rim Elevation 0 Structure Invert 4.86

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 42”

Rim Elevation 7.042 Pipe Invert 3.542

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	6	9	2	0.75

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0577**

Pic 1 (Ditch) Google Maps Image

Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Inaccessible

Material NA Pipe Size NA

Rim Elevation NA Pipe Invert NA

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked NA Candidate for cleaning ()

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
UNK	UNK	UNK	UNK	UNK

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0585**

Pic 1 (Upstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 2.8

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 48”

Rim Elevation 5.204 Pipe Invert 0.704

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Pic 2 (Downstream)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	6	9	2	0.75

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0586**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 2.56

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 48”

Rim Elevation 4.79 Pipe Invert 0.79

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

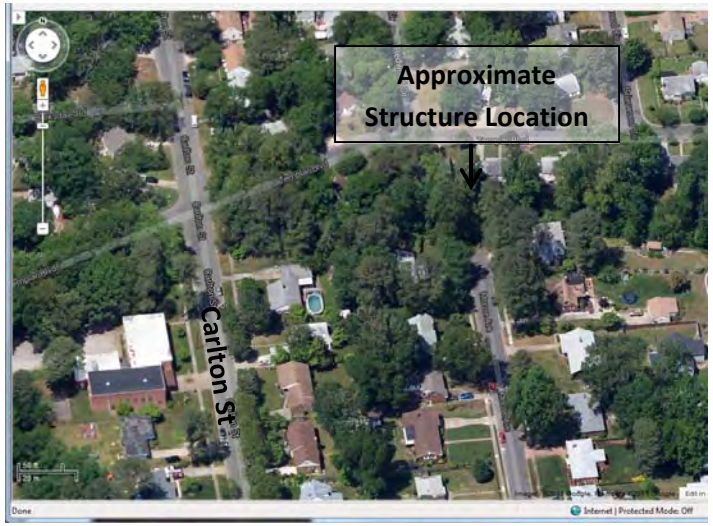
Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	6	9	2	0.75

Notes: also pipe at 3 o'clock is 27" RCP and pipe at 9 o'clock is 27" RCP

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0663**

Pic 1 (Ditch) Google Maps Image



Existing GIS Information

Structure Type Ditch Entrance Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Inaccessible

Material NA Pipe Size NA

Rim Elevation NA Pipe Invert NA

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked NA Candidate for cleaning ()

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
UNK	UNK	UNK	UNK	UNK

Notes: Inaccessible

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0668**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: water is 1-2' deep by pipe

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 2.11

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 60”

Rim Elevation 6.285 Pipe Invert 1.285

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	9	13	5	0.40

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0675**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 2.9

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 48”

Rim Elevation 7.263 Pipe Invert 3.263

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	5	18	6	1.08

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0677**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Ditch Cross Section Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 36 (x2)”

Rim Elevation 8.57 Pipe Invert 4.47

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 2 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	5	12	5.5	0.63

Notes: large rocks in front of pipe; 1.8' to lower bank; 5.5' to top of bank at deepest point

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0686**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: water flowing mainly to left pipe; 2 36" pipes

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 2.17

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 27 (x2)"

Rim Elevation 8.219 Pipe Invert 4.569

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 10 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	4	19	4	1.875

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J0689**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 8.3

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 48”

Rim Elevation 10.582 Pipe Invert 6.582

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	5	19	4	1.75

Notes: 1' to lower bank; 4' to top of bank; stream not flowing much

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071065**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 12.52

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 18”

Rim Elevation 11.994 Pipe Invert 10.494

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 0 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	3.5	5	2.3	0.3

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071094**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 13.28

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material UNK Pipe Size 12”

Rim Elevation 12.602 Pipe Invert 11.602

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	4.5	2.3	0.65

Notes: could not really locate pipe to check condition or type

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071095**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 13.43

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 12”

Rim Elevation 12.5 Pipe Invert 11.5

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 90 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	2	4.4	2	0.60

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071098**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: lots of grass clippings

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 13.64

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 12”

Rim Elevation 12.914 Pipe Invert 11.914

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 40 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	2.5	3	1.4	0.18

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071100**

Pic 1 (Upstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 14.41

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type **Does Not Exist**

Material Pipe Size

Rim Elevation Pipe Invert

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)

Pic 2 (Downstream)

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J071102**

Pic 1 (Upstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type **Does Not Exist**

Material Pipe Size

Rim Elevation Pipe Invert

Pipe Condition (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked Candidate for cleaning ()

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)

Pic 2 (Downstream)

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J073321**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Unknown Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/28/2013 Tech Initials MK

Structure Type Ditch Entrance

Material NA Pipe Size NA

Ground Elevation 13.36 Pipe Invert NA

Pipe Condition NA (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked NA Candidate for cleaning (NA)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
F	0.75	2	0.6	1.04

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07409**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 13.18

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Pipe Out

Material CMP Pipe Size 9”x14”

Rim Elevation 11.94 Pipe Invert 11.19

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 95 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	3.5	1.8	0.7

Notes:

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07412**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes:

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 13.32

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 9”x14”

Rim Elevation 12.154 Pipe Invert 11.404

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 5 Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	2	4	1.8	0.55

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07416**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 13.65

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material CMP Pipe Size 12”

Rim Elevation 12.521 Pipe Invert 11.521

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 90 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.10	4	1.5	0.96

Notes: pipe squashed and blocked by vegetation; top of bank of ditch is parking lot

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07417**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 13.95

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 12”

Rim Elevation 12.329 Pipe Invert 11.329

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 60 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	4	2	0.625

Notes: squashed pipe really 6"; blocked by vegetation

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07419**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: 1:1 side slopes; more of a swale

Existing GIS Information

Structure Type Unknown Year Installed 0

Rim Elevation 0 Structure Invert 0

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Ditch Entrance

Material NA Pipe Size NA

Rim Elevation 13.34 Pipe Invert NA

Pipe Condition NA (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked NA Candidate for cleaning (N)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	0.5	3	1.5	0.83

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07451**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: pipe blocked by vegetation

Existing GIS Information

Structure Type Pipe Out - Plain End Year Installed 1963

Rim Elevation 0 Structure Invert 12.2

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material RCP Pipe Size 15”

Rim Elevation 11.713 Pipe Invert 10.463

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 50 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	2	4.5	2.1	0.6

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **J07452**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Pipe Entrance Year Installed 1963

Rim Elevation 0 Structure Invert 12.52

Field Collected Data Date 8/27/2013 Tech Initials MK

Structure Type Pipe Entrance

Material RCP Pipe Size 15”

Rim Elevation 12.75 Pipe Invert 11.50

Pipe Condition F (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 50 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	3	2.3	0.33

Notes: rim collected is 1.5' above the top of pipe

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M8**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: pipe squashed

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material CMP Pipe Size 8”x11”

Rim Elevation 12.366 Pipe Invert 11.7

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1.5	3.5	1	1

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M7**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: pipe squashed

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 8”x11”

Rim Elevation 12.36 Pipe Invert 11.70

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 80 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	2.3	1	0.65

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M6**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material CMP Pipe Size 8”x11”

Rim Elevation 12.692 Pipe Invert 12.025

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	0.67	2	1	0.65

Notes: pipe squashed; pipe visible from ground next to driveway

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M5**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: shallow swale; french drain PVC

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 8”x11”

Rim Elevation 12.77 Pipe Invert 12.1

Pipe Condition G (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G				

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M4**

Pic 1 (Upstream)

Pic 2 (Downstream)

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Out - Plain End

Material CMP Pipe Size 8”x11”

Rim Elevation 12.89 Pipe Invert 12.23

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 100 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
NA				

Notes: french drain; could only locate top of pipe which goes to plastic french drain

Project: **Chesapeake Boulevard Pedestrian and Drainage PER**

Structure Number **M3**

Pic 1 (Upstream)

Pic 2 (Downstream)

Notes: «Notes»

Existing GIS Information

Structure Type Year Installed

Rim Elevation Structure Invert

Field Collected Data Date 8/29/2013 Tech Initials MK

Structure Type Pipe Entrance

Material CMP Pipe Size 8”x11”

Rim Elevation 12.903 Pipe Invert 12.24

Pipe Condition P (**P**oor , **F**air , **G**ood , **A**waiting Install , **R**emoved from Service)

Percent Blocked 50 Candidate for cleaning (Y)

Ditch Condition	Bottom Width, ft	Top Width, ft	Depth, ft	Side Slopes (ft/ft)
G	1	2.5	0.5	1.5