Bladensburg Flood Reduction Preliminary Design Report

October 2025

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
	1st Draft	Stantec Team	10/01/2025	F. Benitez K. Donnelly	10/15/2025	J. Smith	10/07/2025

The conclusions in the Report titled Bladensburg Flood Reduction Preliminary Design Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not account for any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Corvias Infrastructure Solutions (CIS) (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Prepared by ______________________________
Signature

Stantec Team
____
Printed Name

Reviewed by ______________________________
Signature

Kevin Donnelly
____
Printed Name

Approved by ______________________________
Signature

Fernando Benitez
____
Printed Name

Executive Summary

Residents and property owners along Edmonston Channel and Quincy Run in the Town of Bladensburg, Maryland have experienced repetitive flooding on their properties during heavy rainfall events. Corvias Infrastructure Solutions (CIS), the managing partner for the Clean Water Partnership (CWP) with Prince George's County, Maryland, selected Stantec Consulting Services Inc. (Stantec) to evaluate the causes and severity of flooding and to develop alternatives to reduce flooding which is impacting properties along Edmonston Channel and Quincy Run.

Edmonston Channel and Quincy Run are two distinct areas of concern for this project and were evaluated separately. The project limits on Edmonston Channel are from the road crossing at Edmonston Rd. to 56th Ave. and include approximately 3,740 linear feet of drainage channel. The project limits for Quincy Run consists of 1,850 linear feet of stream from the road crossing at 52nd Ave. to 55th Ave.

Stantec previously conducted a comprehensive analysis and presented its findings and recommendations in the *Bladensburg Flood Reduction Alternatives Evaluation Report,* dated October 2024. This report advances the selected alternatives for Edmonston Channel (Figure ES-1) and Quincy Run (Figure ES-2) from the evaluation study into the preliminary design phase, incorporating surveyed topographic and subsurface utility data to further refine and optimize the designs.

Edmonston Channel Preliminary Design

Table *ES-1* provides a summary of the proposed improvements along with their associated cost estimates. Multiple alternatives were evaluated for the bridges and culverts due to the structural complexity and site-specific constraints. These proposed improvements were divided into phases and ordered in priority based on hydraulic performance and impacts.

Phase 1 includes increasing the storage capacity upstream of Edmonston Rd. and creating a 50' wide weir opening to balance the additional flow released from future upstream improvements while preventing downstream impacts beyond the project limits. In addition to this improvement, Phase 1 also includes storm drain improvements along 55th Ave. and 56th Ave. to reduce local flooding that otherwise accumulates and ponds behind properties. Phase 2 includes the bridge enlargement at Varnum St. to reduce the flooding up to Upshur St. Phase 3 includes increasing the hydraulic capacity of a culvert that extends from 54th Pl. to Taussig Rd. which will reduce flooding impacts for at least seven properties and it is the most complex improvement along the whole channel given the length of the culvert and various impacts to existing utilities and public roads. Phase 4 includes three bridge enlargements at Taylor St., Spring Rd., and 54th Pl. The flood reduction benefit was minimal if each of these improvements were made individually, therefore, they had to be combined to provide the best results. Lastly, Phase 5 encompasses the most upstream culvert upgrade at 56th Avenue along with the proposed channel improvements along various segments of the channel. The channel improvement is planned for the final phase, as it will require consent from nearby private property owners due to the proximity of the construction to their homes.

Table ES-1 Edmonston Channel Proposed Improvements and Cost Estimate

Improvement	Phase	Location	Existing Conditions	*Proposed Conditions	Preliminary Construction Cost Estimate
Storage Area (S-1)	1	From Edmonston Rd. to Varnum St. GPS Coordinates: 38.943961, -76.930036	2-acre open grass area with natural channel	Excavation to increase storage and installation of 50' W notch at ex. weir	$1,634,000
Storm Drain Improvements (SD-1)	1	Along 55th Ave. and 56th Ave.	3 ex. inlets	5 new inlets	$879,000
Bridge Enlargement (BE-1)	2	Varnum St. GPS Coordinates: 38.943351, -76.927672 Existing Bridge No. P-BL05001	Ex. Opening 25'W x 6.8'H	Alt 1: 30'W x 8'H Bridge **Alt 2: Twin 15' x 8'Culvert**	Alt 1: $3,274,000 **Alt 2: $2,810,000**
Culvert Enlargement (BE-5)	3	54th Pl. to Taussig Rd. GPS Coordinates: 38.941996, -76.926987	Ex. Opening Double 72" RCP	Alt 1: 11'W x 6'H culvert Alt 2: Double 7'W x 5'H culvert **Alt 3: 8'W x 6'H diversion culvert w/ twin 8.5'W x 6'H culvert and junction boxes**	Alt 1: $7,075,000 Alt 2: $7,783,000 **Alt 3: $7,250,000**
Bridge Enlargement (BE-2)	4	Taylor St. GPS Coordinates: 38.940638, -76.925811 Existing Bridge No. P-BL03001	Ex. Opening two spans, each 10.3'W x 4.3'H	Alt 1: 25'Wx5'H bridge **Alt 2: Twin 13'x5'culvert**	Alt 1: $3,041,000 **Alt 2: $2,631,000**
Bridge Enlargement (BE-3)	4	Spring Rd. GPS Coordinates: 38.939983, -76.925220 Existing Bridge No. P-BL01001	Ex. Opening 21.9'W x 6'-8"H	Alt 1: 30'Wx7'H bridge **Alt 2: Twin 15'x7'culvert**	Alt 1: $3,471,000 **Alt 2: $3,004,000**
Bridge Enlargement (BE-4)	4	54th Pl. GPS Coordinates: 38.939658, -76.924704 Existing Bridge No. P-BL02001	Ex. Opening 20.5'W x 7'H	Alt 1: 30'Wx7'H bridge **Alt 2: Twin 15'x7'culvert**	Alt 1: $3,097,000 **Alt 2: $2,663,000**
Culvert Enlargement (CE-4)	5	56th Ave.	Ex. Opening 10.4'W x 6.5'H	Alt 1: 16'Wx6'H bridge **Alt 2: 16'x6'culvert**	Alt 1: $3,111,000 **Alt 2: $2,613,000**
Channel Improvement (CI-1)	5	• From Storage Area to Varnum St. • From Varnum St. to Upshur St. • From Upshur St. to 54th St. From 54th Pl. to 55th Ave.	Approx. 20'W Trapezoidal Concrete Channel	Approx. 862 LF of Rectangular Concrete Channel	$2,700,000

**Bolded items indicate the preferred alternatives.*

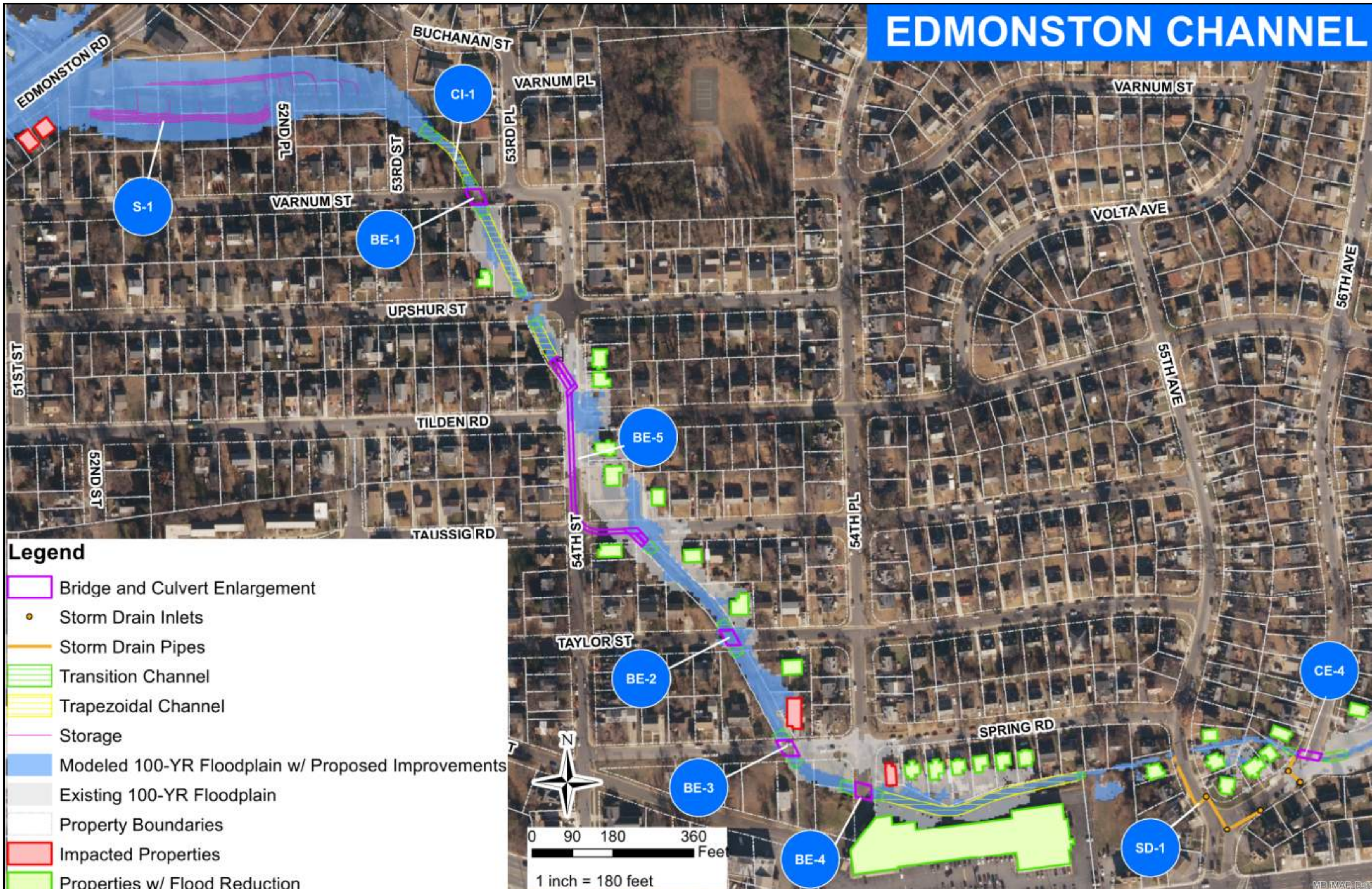


Figure ES-1 Recommended Flood Reduction Improvements for Edmonston Channel

Quincy Run Preliminary Design

Table *ES-2* provides a summary of the proposed improvements along with their associated cost estimates. Similarly to the Edmonston Channel, improvements for this site were prioritized based on hydraulic impacts downstream of each improvement. Phase 1 includes stream restoration which creates additional storage capacity within the channel and stabilizes the eroded banks. This phase also includes constructing a permanent floodwall around the impacted condominiums. These improvements need to be completed before enlarging the 55th Ave. bridge in Phase 2. The bridge enlargement will release additional flow downstream which could worsen the flooding conditions for the condominiums if the floodwall and channel improvements are not in place.

Table ES-2 Quincy Run Proposed Improvements and Cost Estimate

Improvement	Phase	Location	Existing Conditions	*Proposed Conditions	Preliminary Construction Cost Estimate
Stream Restoration (SR-1)	1	From 52nd Ave. to 55th Ave. GPS Coordinates: 38.937000, -76.927277	Approximately 12' wide entrenched channel	10' wide natural baseflow channel within a valley wide floodplain and 21' wide armored channel adjacent to the floodwall	$1,711,000
Permanent Floodwall (PF-1)	1	Behind 5204, 5206, and 5208 Newton St. GPS Coordinates: 38.936826, -76.928734	No floodwall	~400' long sheet pile floodwall and pump station(s)	Alt 1: $3,406,000 **Alt 2: $3,366,000**
Bridge Enlargement (BE-6)	2	55th Ave. GPS Coordinates: 38.937234, -76.924371. Existing Bridge No. P-1266	Ex. Opening 106"W x 78"H	**Alt 1: 28'W x 6'H CON/SPAN Arch Bridge** Alt 2: Twin 12' x 6' box culvert	**Alt 1: $5,597,000** Alt 2: $4,307,000

**Bolded items indicate the preferred alternatives.*

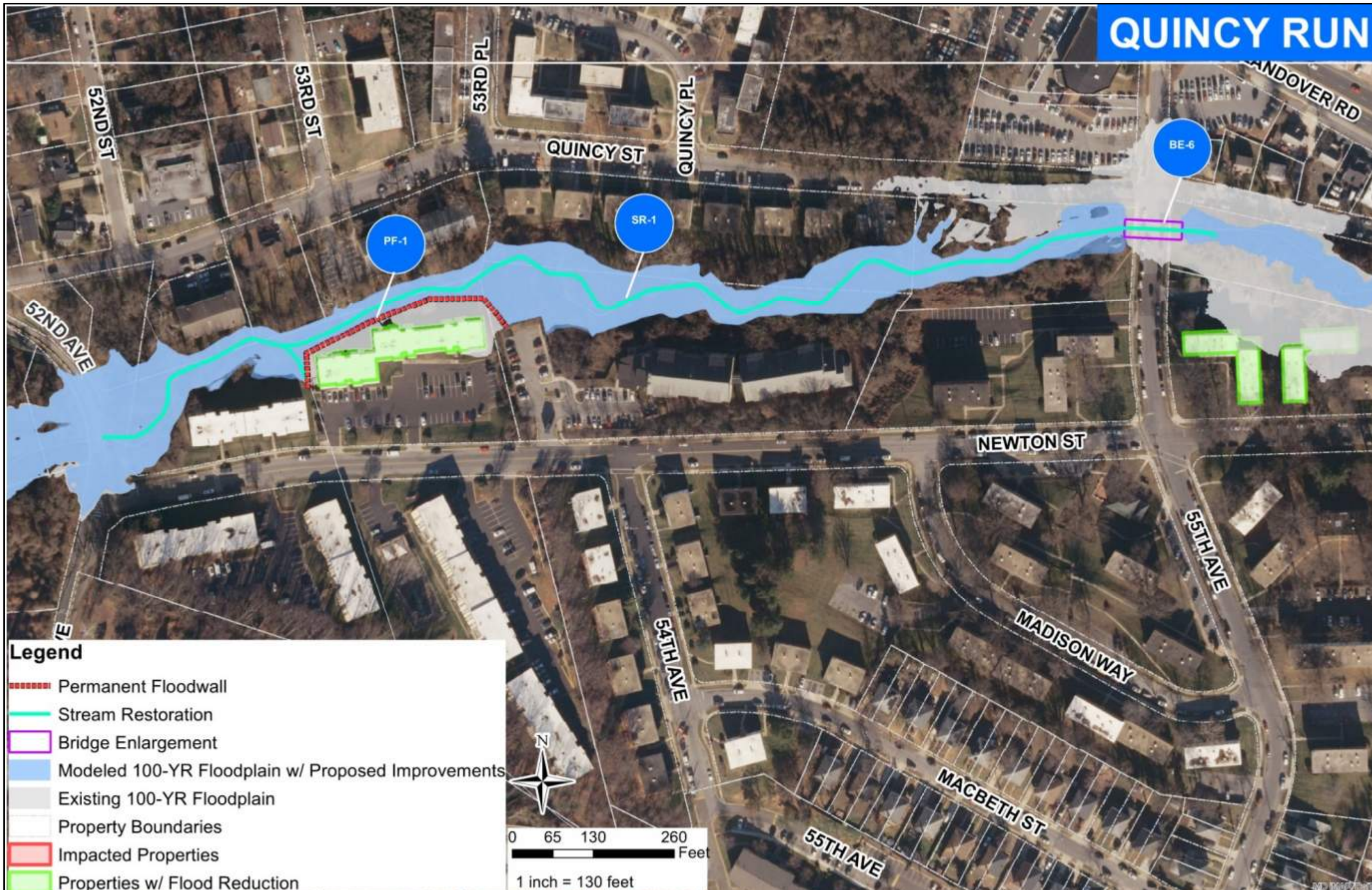


Figure ES-2 Recommended Flood Reduction Improvements for Quincy Run

Edmonston Channel Residential Site-Specific Strategies

A preliminary flood risk assessment was conducted for 28 residential properties and 1 commercial property (Save-A-Lot) in the Edmonston Channel watershed to inform strategies and actions that would reduce the risk of damage from a 100-year flood event. A site-specific flood mitigation strategy was recommended for each property for further consideration and to guide coordination with property owners. Evaluated strategies include:

- Permanent concrete flood wall or concrete curb
- Dry floodproofing of the structure to an established flood protection level
- Measures to raise elevation of structure's lowest point of entry
- Site grading adjustments
- Property acquisition
- Homeowner flood retrofits (measures intended to reduce, but not eliminate flood risk)

These strategies may be implemented independently of, or in combination with proposed enhancements to the Edmonston Channel (e.g., bridge and culvert enlargements). A summary of proposed flood mitigation strategies for each of the 29 properties is provided, including:

- Observations of the existing building construction and parcel topography, including information gained from site surveys
- A description of the proposed conceptual strategies for flood mitigation for each property
- Some of the risks and limitations associated with the selection of proposed mitigation strategies that Prince George's County and the property owner need to consider
- Rough order of magnitude cost estimates for the proposed flood mitigation strategy for each property. (These cost estimates may be affected by macroeconomic factors – such as tariff policies – and are subject to change.)

The full report for the for the site-specific strategies is included in Appendix A.

Conclusion

The preliminary designs are expected to reduce 100-year flooding impacts for 25 out of 29 structures along Edmonston Channel by implementing rectangular channel improvements, six bridge and culvert enlargements, one section of storm drain upgrades, and grading of a green space park area upstream of Edmonston Rd. to increase storage during major floods. Likewise for Quincy Run, the proposed stream restoration, permanent floodwall, and bridge enlargement will reduce flooding impacts for all the 7 impacted structures along this channel. The recommended designs for both channels should be implemented from downstream to upstream to prevent worsening flood conditions as upstream conveyance is improved and can be implemented concurrently to meet construction deadlines.

The next phase of this project will focus on developing conceptual plans which will include a more detailed evaluation of the site constraints. During this phase, coordination with utility companies, reviewing agencies, and affected property owners will need to be initiated to make sure regulatory compliances are met before advancing with the design.

Table of Contents

Figures

Tables

List of Appendices

1 Introduction

1.1 Project Overview

Residents along Edmonston Channel and Quincy Run in the Town of Bladensburg have been experiencing flooding on their properties during heavy rain events. The purpose of this project is to mitigate flooding impacts by implementing a suite of solutions along both channels which include bridge and culvert replacements, a stormwater storage area, storm drain upgrades, channel modifications, stream restoration, and a permanent floodwall.

The project limits for Edmonston Channel are from Edmonston Rd. (downstream) to 56th Ave. (upstream) and include approximately 3,700 linear feet of channel. The project area for Quincy Run consists of approximately 1,850 linear feet natural channel flowing east to west between 55th Ave. (upstream) and 52nd Ave. (downstream). A location map of the project areas is shown in Figure 1-1.

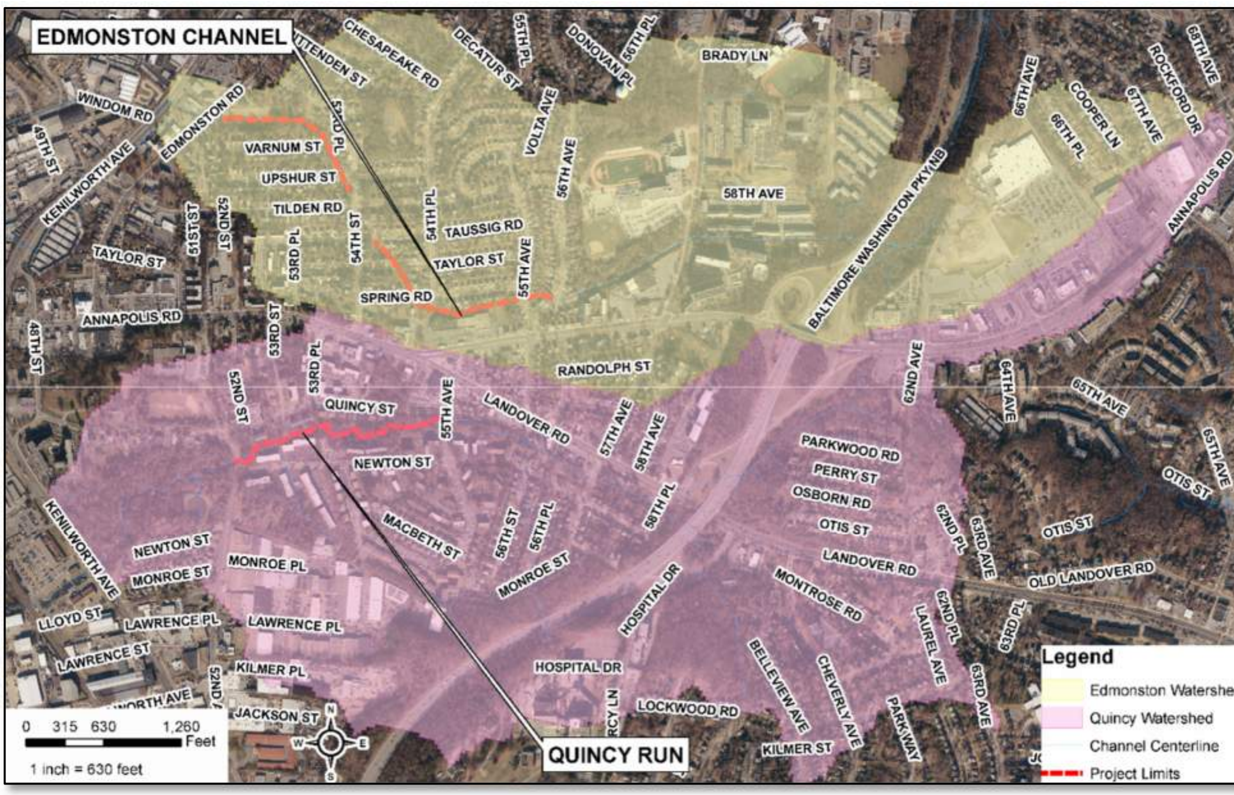


Figure 1-1 Edmonston Channel and Quincy Run Location Map

2 Existing Hydrology and Hydraulics

Edmonston Channel and Quincy Run are both narrow waterways located within densely developed residential areas. The Edmonston Channel flows generally from east to west through the town of Bladensburg before discharging into the Anacostia River south of the MD450 Annapolis Rd. bridge. Quincy Run is an urbanized watershed draining generally from east to west through a natural channel before discharging into the Anacostia River.

2.1 Edmonston Channel

The Edmonston watershed is approximately 360 acres and is predominantly within the Town of Bladensburg in Prince George's County, Maryland. The watershed is characterized by mostly dense residential land use, with commercial establishments along Annapolis Rd. Stormwater runoff drains by gravity into the Edmonston Channel, which flows predominantly east to west. There is an in-line stormwater retention feature east of Edmonston Rd. The outlet of this feature drains into a piped network that eventually discharges into the Anacostia River at the flood control pump station in Bladensburg Waterfront Park, south of the MD 450 (Annapolis Rd) bridge.

2.1.1 Edmonston Channel Hydrology

The watershed is fully developed with nearly 45% of the area covered by impervious surfaces. The soils within the watershed are classified as Hydrologic Soil Group D under the USDA system, indicating low infiltration rates and high potential for runoff. An integrated hydraulic and hydrologic model was created using the InfoWorks ICM software platform with a "rain on mesh" (also known as "rain on grid") deterministic approach to estimate surface runoff. This approach dynamically calculates the time of concentration throughout the watershed based on the intensity and depth of rainfall. The hydrologic parameters defined in the model are based on characteristics of the drainage area determined from geospatially defined GIS metadata. A LiDAR-based DEM obtained from the NOAA data access viewer based on 2018 Maryland-National Capitol Park and Planning Commission (MNPPC) efforts was used to generate the ground surface representation and simulate overland flow paths based on ground slopes. Table 2-1 summarizes the hydrologic parameters applied to the model.

Table 2-1 Edmonston Channel Hydrologic Parameters

Item	Measurement
Total Drainage Area	360 ac
Impervious Area	160 ac
Building Footprints	43.0 ac
Impervious surface manning's roughness coefficient	0.018
Pervious surface manning's roughness coefficient	0.060
Horton Initial Infiltration	1.00 in / hr
Horton Limiting Infiltration	0.10 in / hr
Horton Decay coefficient	2.00 hr^{-1}
Horton Recovery coefficient	2.00 hr^{-1}

2.1.2 Edmonston Channel Hydraulics

As stated above, an InfoWorks ICM model was created with integrated hydraulic and hydrologic capabilities. This platform allows for integrated analysis of peak flow rates and storage volume requirements with a deterministic hydrologic runoff approach. A 2-dimensional representation of the ground surface was created to assess overland flow paths and surface ponding potential, including representation of hydraulic influences of bridge structures, pipes, manholes, and surface inlets. This model also includes explicit representation of all surface inlets, manholes, and sub-surface pipes in the watershed. Pipe sizes / diameters, alignments, and invert elevations were obtained from GIS information provided by Prince George's County and MDOT. This information was supplemented with field survey information at critical locations. This approach dynamically routes overland runoff generated by the hydrologic routine described above into the main channel, replicating the nuances of actual system performance. Table 2-2 summarizes the hydraulic parameters applied to the ICM.

Table 2-2 Edmonston Channel Hydraulic Parameters

Item	Measurement
Pipe manning's roughness coefficient	0.013
Paved channel roughness coefficient	0.013
Pipe entry/exit losses	Dynamically calculated as a function of the angle of deflection at manhole and surcharge status of pipe
Bridge contraction loss coefficient	0.30
Bridge deck discharge coefficient	1.70
Bridge expansion loss coefficient	0.50
Bankline discharge coefficient	0.85
Bankline modular limit	0.67

Stormwater in the Edmonston watershed drains to the channel by a combination of overland paths and underground pipe networks. The channel includes 8 road crossings. Table 2-3 presents the flows at each road crossing during the 2-, 10- and 100-year design storms. It should be noted that the flow rates in this table are representative of existing conditions and are influenced by the hydraulic restrictions at road crossings and along the channel itself. These rates are not representative of runoff produced by the system as the ICM model includes representation of surface storage and ponding upstream of hydraulic restrictions.

Table 2-3 Existing Conditions Design Storm Flows along Edmonston Channel Road Crossings

Road Crossing	Discharge (cfs)		
	2-Year Storm	10-Year Storm	100-Year Storm
Varnum St	790	1125	1,403
Upshur St	745	1068	1,363
54th Pl & Taussig Rd	707	998	1,023
Taylor St	654	946	1,149
Spring Rd	644	943	1,199
54th Pl	613	903	1,094
55th Ave	540	813	1,178
56th Ave	526	784	954

2.2 Quincy Run

2.2.1 Quincy Run Hydrology

The Quincy Run watershed is approximately 480 acres and is located primarily within the limits of the Town of Bladensburg in Prince George's County, Maryland. The watershed is mostly comprised of dense residential land and commercial use with more than 40% of its drainage area being impervious. Quincy Run is a natural channel that runs primarily east to west before discharging to the Anacostia River.

The hydrologic evaluation of Quincy Run was performed by dividing the Quincy Run watershed into eight sub-drainage areas, each delineated using 1-foot contour data from the 2018 Maryland DEM. The Natural Resources Conservation Service (NRCS) method within WinTR-20 was used to develop flow rates used in the hydraulic analysis. The time of concentration (Tc) flow paths for each sub-watershed was estimated using aerial imagery and topographic analysis in ArcGIS Pro. Runoff Curve Number (RCN) values for each sub-drainage area were calculated using a weighted average method based on land use data from Prince George's County GIS. The WinTR-20 model was then used to simulate runoff and peak flow rates for various storm events (2-, 10-, 25-, 50-, and 100-year storms), using rainfall data from NOAA Atlas 14 and a 24-hour rainfall distribution to reflect regional precipitation patterns.

A summary of the hydrologic inputs for the project area are provided in Table 2-4. Table 2-5 presents the existing condition peak flows at each road crossing for the 2-, 10- and 100- year storms.

Table 2-4 Quincy Run Hydrologic Parameters

Drainage Area ID	Area (ac)	Weighted CN	Tc (hrs)	100-yr Peak Runoff (cfs)
Sub-Area 1	88.0	91	0.161	692.0
Sub-Area 2	105.4	90	0.208	756.4
Sub-Area 3	67.7	91	0.260	449.3
Sub-Area 4.2	40.4	89	0.267	260.7
Sub-Area 4	47.1	88	0.162	361.2
Sub-Area 5	22.5	91	0.062	212.5
Sub-Area 6	75.4	92	0.330	533.7
Sub-Area 7	32.4	85	0.126	260.7
TOTAL	**478**			*2,978

**At outlet*

Table 2-5 Existing Conditions Storm Flows at Quincy Run Road Crossings

Road Crossing	Discharge (cfs)		
	2-Year Storm	**10-Year Storm**	**100-Year Storm**
55th Ave	580	650	1,350
52nd Ave	810	880	1,678

2.2.2 Quincy Run Hydraulics

Stormwater in the Quincy Run watershed drains to the channel by a combination of overland flow and underground pipe networks. The Quincy Run project area is from 52nd Avenue to 55th Avenue and includes the two road crossings. Stantec evaluated the stream's hydraulic response to the flows for various storm events. The hydraulic evaluation was performed using the Army Corps of Engineer's HEC-RAS model (version 6.5).

A 2-dimensional model was developed with detailed representations of culverts and roadway crossings, using field survey data, terrain information from 2018 MNPPC LiDAR obtain through NOAA, and roughness coefficients derived from the USGS National Land Cover Database. The 2D flow area was divided into 15 ft x 15 ft cells for high-resolution analysis, and boundary conditions were set using FEMA flood profiles for the Anacostia River. Proposed alternatives such as culvert/bridge widening and floodwall construction were modeled by adjusting hydraulic parameters and terrain features within HEC-RAS. This modeling approach allowed for a comprehensive analysis of flow dynamics, water surface elevations, and flood inundation extents under existing and proposed conditions. The model was validated using both synthetic design storms and the July 2022 flood event, confirming its reliability in predicting flood behavior and supporting the development of effective mitigation strategies.

The modeling results show the structures at 5204, 5206, 5208, 5504, and 5506 Newton Street and at 3601 and 3603 55th Avenue are impacted by the 100-year return period storm and that the structures at 5204, 5206, and 5208 Newton Street are impacted by a 10-year storm event.

2.3 Future Flood Risk

To assess future storm impacts on the Edmonston Channel, the 100-year, 24-hr NOAA Atlas 14 precipitation data was increased by 20%. This strategy was implemented in lieu of using NOAA Atlas 15 data which has yet to be released. Under the 100-yr + 20% conditions, 34 structures are projected to be impacted. This is five more than under the existing 100-yr storm event. Implementing the proposed improvements under the 100-yr + 20% conditions would reduce the flood risk for 24 of the 34 structures. Most of the impacted structures are located between Tilden Rd. and Taylor St. therefore, further improving the capacity of the Taussig Culvert (BE-5) and Taylor St. bridge (BE-2) would reduce the flooding risk in this area. Additionally, the weir control structure at Edmonston Rd. would require further improvements to ensure that no adverse downstream impacts occur. Figure 2-1 presents the 100-yr + 20% floodplain during existing and proposed conditions and highlights the impacted structures.

Figure 2-1 Edmonston Channel 100-yr + 20% Flood Risk

3 Existing Site Conditions

3.1 Edmonston Channel

3.1.1 Varnum St. Bridge Enlargement (BE-1)

Varnum St. Bridge P-BL05001, built in 1958, is a single-span 26’-3” overall long concrete rigid-frame bridge with an asphalt wearing surface, skewed angle 20 degrees. The total superstructure depth is about 4’-1”. The vertical clearance under bridge is 6’-8”. The substructure consists of concrete rigid frame wall abutments with concrete slope and channel protection. Stream flows from south to north under the bridge. The posted speed limit is 25 mph. The bridge is posted for 6,000 LBS GVW and 6,000 LBS GCW.

3.1.2 Taussig Culvert Enlargement (BE-5)

The Taussig Culvert, built unknown (assume 1958), is a double 72” RCP culvert with a total length of approximately 483 LF. The culvert extends beneath 54th St, Tilden Rd., Taussig Rd., all of which are two-way roadways with a 50’ ROW. In addition, the culvert passes beneath two private driveways serving 5402 Taylor St. and 5211 54th St, as well as two 4’ wide sidewalks. One of the 72” culverts is located approximately 6’ away from the corner of the house at 4211 54th St.

3.1.3 Taylor St. Bridge Enlargement (BE-2)

Taylor Street Bridge P-BL03001, built in 1958, is a two-span 23’-8” overall long concrete rigid-frame bridge with an asphalt wearing surface, skewed angle 26 degrees. The total superstructure depth is about 3’. The vertical clearance under bridge is 4’-6”. The substructure consists of concrete rigid frame wall abutments with concrete slope and channel protection, and a solid shaft concrete pier. Stream flows from south to north under the bridge. The posted speed limit is 25 mph. The bridge is posted for 6,500 LBS GVW and 6,000 LBS GCW.

3.1.4 Spring Rd. Bridge Enlargement (BE-3)

Spring Rd. Bridge P-BL01001, built in 1958, is a single-span 23’-7” overall long concrete rigid-frame bridge with an asphalt wearing surface, skewed angle 26 degrees. The total superstructure depth is about 3’. The vertical clearance under bridge is 6’-8”. The substructure consists of concrete rigid frame wall abutments with concrete slope and channel protection. Stream flows from south to north under the bridge. The posted speed limit is 25 mph. The bridge is posted for 24,000 LBS GVW and 44,000 LBS GCW.

3.1.5 54th Pl. Bridge Enlargement (BE-4)

54th Pl. Bridge P-BL02001, built in 1958, is a single-span 20’-6” overall long concrete rigid-frame bridge with an asphalt wearing surface, skewed angle 16 degrees. The total superstructure depth is about 4’-2”. The vertical clearance under bridge is 7’-0”. The substructure consists of concrete rigid frame wall abutments with concrete slope and channel protection. Stream flows from east to west under the bridge. The posted speed limit is 25 mph. The bridge is posted for 28,000 LBS GVW.

3.1.6 56th Ave. Culvert Enlargement (CE-4)

56th Ave. Culvert (not in County's bridge inventory), built year unknown (assume 1958), is a 6'-6"H x 10'-5"W concrete box culvert with an asphalt wearing surface, skewed angle 18 degrees. The total superstructure depth is about 1'-8". The vertical clearance under bridge is 6'-6". Stream flows from east to west under the bridge. The posted speed limit is 25 mph. The bridge is posted for 28,000 LBS GVW and 48,000 LBS GCW.

3.1.7 Storage Area (S-1)

The Storage Area, located between Edmonston Rd. and Varnum Rd., consists of approximately 1.97 acres of open grassy space. Upstream of the storage area, the Edmonston Channel transitions from a concrete channel to a natural channel. The area is enclosed by earth berms on both sides and includes a concrete weir wall at the downstream end measuring 266' in length, 4' high at the center, and 8' high along the sides. Attached to the weir wall is a steel trash rack that intercepts debris before flow enters an existing 8.6'W x 4.6'H box culvert that conveys flow under Edmonston Rd.

3.1.8 Channel Improvements (CI-1)

The majority of Edmonston Channel consists of a trapezoidal concrete section, except for a rectangular concrete segment extending from 55th Ave. to just upstream of 56th Ave. and a natural channel segment within the storage area. The concrete channel is enclosed with 4' chain-link fences along both sides of the channel. The channel has a top width of approximately 20', a bottom width ranging from 7' to 16', and an average depth of approximately 4'. The side slopes on average are 1.8:1.

3.1.9 Storm Drain Improvement (SD-1)

Several properties between 55th Ave and 56th Ave may be experiencing flooding caused by runoff flowing from the south side of 56th Ave. The water bypasses the existing curb and gutter and accumulates in the backyards of these properties. Currently, there are two A-10 inlets along 55th Ave. and two A-5 inlets along 56th Ave., located south of the concrete channel. The curb along this section of the road is approximately 6" high.

3.2 Quincy Run

3.2.1 55th Ave. Bridge Enlargement (BE-6)

55th Ave. Bridge P-1266, built in 1989, is a single cell 106" wide x 78" high corrugated metal pipe culvert. Its overall length along invert is 97'. There is up to 7' fill over the culvert. Quincy Run flows from on a western direction through the culvert. The culvert is at the sump of a minor vertical curve. There is W-beam traffic barrier on the approaches.

3.2.2 Stream Restoration (SR-1)

Quincy Run runs approximately 1,850 linear feet between 55th Avenue and 52nd Avenue in a highly urban setting and eventually flows into the Anacostia River. The existing stream has been confined to its current location in a narrow valley that receives a high volume of water during storm events. Due to these high intensity flows from an urban watershed and the channel and floodplain encroachments; the reach will likely not be able to progress towards a more resilient and stable geometry and will continue to degrade the bed and banks.

Due to these high intensity flows, the existing stream has an approximately 12' wide entrenched channel with actively eroding banks. To better understand the existing channel substrate, two riffle pebble counts were performed within the project reach. *Table 3-1* presents the pebble count results.

Table 3-1 Pebble Count Results

		Combined Pebble Count
Particle Size (mm)	D_{50}	17
	D_{84}	38
Distribution (%)	silt/clay	2%
	sand	14%
	gravel	82%
	cobble	2%
	boulder	0%

The D50 and particle sizes were within the gravel size class for both pebble counts. These results indicate that there is no upstream supply of larger material and that fine material is being transported downstream. This provides evidence that the existing stream will likely never reach an equilibrium state.

3.2.3 Permanent Floodwall (PF-1)

There is currently no permanent flood wall protecting the residential buildings at 5204, 5206, and 5208 Newton St. along the south bank of Quincy Run. The elevation of the south bank is insufficient to safeguard the area against the 10-year or higher storm events. There is currently an existing chain link metal fence between the stream and the buildings. The stream bank is in-situ soil and is lined with overgrowth and trees. There is a short section within the project bounds where a short concrete wall exists to frame both sides of the channel.

The west side of the building has an outfall which discharges storm water into the channel. This outfall is the shortest distance where the building comes near the channel at roughly 20'. The apartment building has two other points at the building corners which are near the stream channel at roughly just over 20'. All other points along the channel exceed 20' to the building face.

Within the property limits of the residential buildings there is a short existing wall which is currently separating the green space behind the apartments into two separate drainage areas. This wall is located at roughly the center of the building and runs from the building face to the edge of the channel, ending just before the slope. The makeup and depth of this wall is currently unknown.

4 Environmental Features

4.1 Stream Classification

The Edmonston Channel is a tributary to Northeast Branch Anacostia River (MD 8-digit watershed code 02-14-02-05). Most of the stream channel bottom is paved concrete. The Anacostia River and its tributaries are designated as Use I (Water Contact and Recreation) waterways by the State of Maryland. In stream work is restricted in Use I streams from March 1 through June 15.

Quincy Run is a tributary to the Anacostia River (MD 8-digit watershed code 02-14-02-05). The channel bottom is comprised of sand, cobble, and riprap. The Anacostia River and its tributaries are designated as Use I (Water Contact and Recreation) waterways by the State of Maryland. In stream work is restricted in Use I streams from March 1 through June 15.

4.2 Wetlands

The Maryland Department of Natural Resources (DNR) wetland mapping and National Wetlands Inventory mapping was reviewed to identify the presence of wetlands within the project area. No wetlands were identified during the review of these publicly available resources for both Edmonston Channel and Quincy Run.

4.3 100-Year Floodplain

The 100-year floodplain has been mapped by Prince George's County Department of Permitting, Inspections, and Enforcement (DPIE). Both project sites along Edmonston Channel and Quincy Run are within the County's 100-year floodplain.

Additionally, a section of the Edmonston Channel between Edmonston Rd. and Upshur St. is designated as a FEMA Zone AE floodplain under the Flood Insurance Rate Map 24033C0133E (effective 9/16/2016). There is not a FEMA designated flood zone along the reach of Quincy Run included in this project area.

4.4 Tree Conservation

During the site survey, a search for any trees measuring 24 inches DBH or greater (significant trees) and 30 inches DBH or greater (specimen trees) was performed. Prince George's County's Woodland and Wildlife Conservation Ordinance (WCO) affords additional protection to significant and specimen trees. In addition, under the WCO, a variance is required for the removal of a specimen tree. Impacts to forest resources, including specimen trees, require approval from the Maryland National Capitol Park and Planning Commission (M-NCPPC) Environmental Planning Section. The significant and specimen trees identified for each site are listed below:

Edmonston Channel

- BE-1: One (1) significant tree was identified
- BE-2: One (1) significant tree and one (1) specimen tree were identified
- BE-3: One (1) specimen tree was identified
- BE-4: No significant or specimen trees were identified
- BE-5: One (1) significant tree was identified
- CE-4: No significant or specimen trees were identified
- S-1: No significant or specimen trees were identified
- SD-1: No significant or specimen trees were identified
- CI-1
  - North of Varnum Street: No significant or specimen trees were identified
  - Between Varnum St. and Upshur St.: No significant or specimen trees were identified
  - East of 54th Pl.: One (1) significant tree and one (1) specimen tree were identified

Quincy Run

- BE-6: One (1) significant tree and one (1) specimen tree were identified
- SR-1: Ten (10) significant trees and eleven (11) specimen trees were identified
- PF-1: No significant or specimen trees were identified

Site specific forest stand delineations (FSD) and tree surveys and approval for forest impacts and tree removals through a Tree Conservation Plan (TCP) will be required to meet the County's WCO requirements during subsequent design phases and prior to any site development impacts.

5 Roadway Design

The proposed typical section for each roadway will maintain the existing roadway width, lanes and sidewalks. The existing roadway layouts and profiles will not change. The roadways for which each bridge and culvert are located are all categorized as Urban Local Roadways. The posted speed limit along all roadways is 25 mph. The proposed full depth pavement section for each roadway will be comprised of 2" Hot Mix Asphalt (HMA) Surface, 2" HMA Intermediate Surface, 4" HMA Base, and 6" Graded Aggregate Base (GAB). Permanent stabilization of all disturbed roadside areas will consist of 4" topsoil, seed and mulch (turfgrass establishment).

The storage (S-1), channel improvements (CI-1), stream restoration (SR-1), and permanent floodwall (PF-1) improvements do not involve any roadway design.

5.1 Edmonston Channel

5.1.1 Varnum St. Bridge Enlargement (BE-1)

BE-1 is located along Varnum Street just west of the intersection with 53rd Place. The existing typical section is two paved travel lanes with a total clear width of 25'-6" between curbs and 4'-5" wide sidewalk on the north side. The proposed bridge construction will require full depth pavement replacement at each approach, resurfacing and restriping, removal and replacement of existing road signage, and concrete sidewalk and curb & gutter replacement. There is also an existing 36" storm drain pipe that will need to be removed and replaced to tie into the new culvert.

5.1.2 Taussig Culvert Enlargement (BE-5)

The Taussig 72" RCP culvert extends from 54th St. to Taussig Rd. Three design alternatives were evaluated for this culvert enlargement. Alternatives 1 and 2 both keep one of the existing 72" culverts while replacing the other. Alternative 1 proposes a single 11'Wx6'H culvert whereas Alternative 2 proposes double 7'Wx5'H culverts, with both alternatives maintaining the existing alignment. Alternative 3 proposes a new 8'Wx''H culvert along 54th St. and Taussig Rd. Construction of any of the proposed culvert enlargement alternatives would require reconstruction of existing curb & gutter, concrete sidewalks, full depth pavement, residential driveways, chain link fences, and grass lawn areas on public and private property. Alternative 3 proposes a new culvert along roadways which will require more reconstruction of existing surface features and pavement, as well as additional utility relocations.

5.1.3 Taylor St. Bridge Enlargement (BE-2)

BE-2 is located along Taylor Street between 54th Street and 54th Place. The existing roadway typical section is two paved travel lanes with a total clear width of 26'-0" between curbs and 4'-0" wide sidewalk on the south side. The proposed bridge construction will require full depth pavement replacement at each approach, resurfacing and restriping, removal and replacement of existing road signage, and concrete sidewalk and curb & gutter replacement. There are also some existing fences on adjacent property that will need to be removed and replaced due to the proposed construction.

5.1.4 Spring Rd. Bridge Enlargement (BE-3)

BE-3 is located along Spring Road between 54th Street and 54th Place. The existing roadway typical section is two paved travel lanes with a total clear width of 26'-8" between curbs and 4'-5" wide sidewalk on the north side. The proposed bridge construction will require full depth pavement replacement at each approach, resurfacing and restriping, removal and replacement of existing road signage, concrete sidewalk and curb & gutter replacement, and fence removal and replacement on adjacent properties. There are also some existing storm drain inlets and pipes that will have to be removed and relocated due to the proposed construction.

5.1.5 54th Pl. Bridge Enlargement (BE-4)

BE-4 is located along 54th Place between Shepherd St. and Spring Rd. The existing roadway typical section is two paved travel lanes with a total clear width of 25'-9" between curbs and 4'-0" sidewalk on the east side. The proposed bridge construction will require full depth pavement replacement at each approach, resurfacing and restriping, removal and replacement of existing road signage, and concrete sidewalk and curb & gutter replacement. There is also an existing 18" storm drain pipe that will need to be removed and replaced to tie into the new culvert.

5.1.6 56th Ave. Culvert Enlargement (CE-4)

CE-4 is located along 56th Avenue at the intersection with Spring Road. The existing typical section is two paved travel lanes with a total clear width of 32'-0" between curbs and 5'-0" wide sidewalk on the east side. The proposed bridge construction will require full depth pavement replacement at each approach, resurfacing and restriping, removal and replacement of existing road signage, and concrete sidewalk and curb & gutter replacement. There will also be some storm drain reconstruction that will need to occur due to the proposed construction, including 2 large storm drain inlets and their adjoining pipes, which may impact the existing residential driveways located along the west side of the roadway.

5.1.7 Storm Drain Improvement (SD-1)

The proposed storm drain (SD) improvements consist of 5 new inlets, 1 manhole, and approximately 360 LF of 21" RCP located along 55th Ave. and 56th Ave. 55th Ave. is approximately 26'-0" wide between curbs and 56th Ave. is approximately 32'-0" wide between curbs. Concrete sidewalks currently exist along the west side of 55th Ave. and along the east side of 56th Ave. The proposed storm drain improvements will require reconstruction of the existing curb & gutter, sidewalk, residential driveways, and full depth pavement along both roadways within the limits of work.

5.2 Quincy Run

5.2.1 55th Ave. Bridge Enlargement (BE-6)

BE-6 is located along 55th Avenue just south of the intersection with Quincy Street. The existing roadway typical section is two paved travel lanes and two paved parking lanes, with a total clear width of 36'-0" between curbs and 5' wide concrete sidewalk on each side of the roadway. Grass buffers and traffic barriers currently exist along both sides of the roadway as well. The proposed bridge/culvert construction will require full depth pavement replacement at each approach, resurfacing and restriping, removal and replacement of existing road signage, concrete sidewalk and ramp reconstruction, curb & gutter replacement, and traffic barrier removal and replacement.

6 Maintenance of Traffic Design

For guidance, MOT Design for all locations shall conform with Part VI of the MD-MUTCD and the MDOT SHA Book of Standards - for Highway & Incidental Structures, latest editions. To minimize the impact of construction activities on traffic and to permit continuous County inspection, no work shall be performed or lanes closed during weekdays before 9:00 a.m. or after 3:00 p.m., on weekends, or public holidays recognized by Prince George's County.

The bridge Average Annual Daily Traffic (AADT) is BE-1 (275), BE-2 (685), BE-3 (271), BE-4 (332), BE-6 (1,260) in the year 2023. The AADT of BE-5 and CE-4 is unknown but it is assumed that it is similar to the other structures, which is around 300. The Maintenance of Traffic Alternative Analysis (MOTAA) memorandum is not part of this study. Staged construction does not appear feasible for the bridge replacements because the bridges are narrow, and construction materials need a staging area. It is assumed the bridges will be closed to traffic during construction and the traffic will be detoured. Site-specific Maintenance of Traffic (MOT) details are as follows.

6.1 Edmonston Channel

6.1.1 Varnum St. Bridge Enlargement (BE-1)

Westbound traffic approaching the Varnum St. Bridge will be diverted to 54th St., Upshur St., and 51st St. before turning back onto Varnum St. Eastbound traffic approaching Varnum St. and 51st St. intersection will be diverted to 51st St., Upshur St., and then 54th St.

6.1.2 Taylor St. Bridge Enlargement (BE-2)

Westbound traffic approaching Taylor St. and 54th Pl. intersection will be diverted north to 54th Pl., Taussig Rd., and 54th St. before turning back onto Taylor St. Eastbound traffic approaching the intersection of Taylor St. and 54th St. will be diverted south to 54th St., Spring Rd., and 54th Pl. before turning back onto Taylor St.

6.1.3 Spring Rd. Bridge Enlargement (BE-3)

Westbound traffic approaching the Spring Rd. and 54th Pl. intersection will be diverted north to 54th Pl., Taylor St., and 54th St. before turning back onto Spring Rd. Eastbound traffic approaching the Spring Rd. and 54th St. intersection will be diverted south to Shepherd St., which transitions into 54th Pl., before turning back onto Spring Rd.

6.1.4 54th Pl. Bridge Enlargement (BE-4)

Northbound traffic approaching the 54th Pl. Bridge will be diverted west along Shepherd St., 54th St. and then Spring Rd. Southbound traffic approaching the 54th Pl. bridge will be diverted west to Spring Rd., 54th St., and then Shepherd St.

6.1.5 Taussig Culvert Enlargement (BE-5)

Culvert BE-5 for Alternative 3 shall be done in two phases – the first for the 54th St. segment of the culvert and the second for the Taussig Rd. segment.

Phase 1

Westbound traffic approaching the Tilden Rd. and 54th Pl. intersection will be diverted to 54th Pl., Taussig Rd., and 53rd Pl. before turning back onto Tilden Rd. Eastbound traffic approaching the Tilden Rd. and 53rd Pl. intersection will be diverted to 53rd Pl., Taussig Rd., and then 54th Pl. before turning back onto Tilden Rd. Southbound traffic approaching the Upshur Ct. and 54th St. intersection will be diverted to Upshur Ct., 54th Pl., and Taussig Rd. before turning back onto 54th St. Northbound traffic approaching the Taussig Rd. and 54th St. intersection will be diverted to Taussig Rd., 54th Pl., and Upshur Ct. before turning back onto 54th St.

Phase 2

Westbound traffic approaching the Taussig Rd. and 54th Pl. intersection will be diverted to 54th Pl., Tilden Rd., and 54th St. before turning back onto Taussig Rd. Eastbound traffic approaching the Taussig Rd. Bridge will be diverted to 54th St., Taylor St., and then 54th Pl. before turning back onto Taussig Rd.

6.1.6 56th Ave. Culvert Enlargement (CE-4)

Northbound traffic approaching the intersection of 55th Ave. and 56th Ave. will be diverted west to 55th Ave., Tilden Rd. and then 56th Ave. Southbound traffic approaching the intersection of Tilden Rd. and 56th Ave. will be diverted west to Tilden Rd., 55th Ave., and then 56th Ave.

6.1.7 Storage Area (S-1)

Construction Entrance MOT for Edmonston Channel Storage (S-1) will require signage along Edmonston Rd. (MD 769B) to notify motorists of work vehicles entering or exiting the construction area. Signs shall be placed according to MD SHA Shoulder Work Typical Applications. For safe ingress and egress, work zone vehicles shall display flashing warning lights as required by MDOT SHA.

6.1.8 Channel Improvements (CI-1)

Construction of the channel improvements will impact select locations at Varnum St., Upshur St., and 54th Pl. MOT for channel improvements shall utilize a Flagging Operation for 2-Lane, 2-Way Roadways. As construction progresses, signage and flaggers will relocate as needed. Channelization Devices shall be used to close both directions of an approaching lane, and along the affected site locations.

6.1.9 Storm Drain Improvement (SD-1)

MOT for Construction of Storm Drain improvements along 55th Ave. and 56th Ave. shall utilize a Flagging Operation for 2-Lane, 2-Way Roadways. As construction progresses, signage and flaggers will relocate as needed. Channelization Devices shall be used to close both directions of an approaching lane, and along the construction site. Where appropriate, a steel plate shall be utilized to allow traffic when construction site is inactive.

6.2 Quincy Run

6.2.1 55th Ave. Bridge Enlargement (BE-6)

Northbound traffic approaching the 55th Ave. Bridge will be diverted east along Newton St. to 57th Ave. to MD 202. Southbound traffic approaching 55th Ave. will be diverted eastbound on MD 202 to 57th Ave. to Newton St. to 55th Ave.

6.2.2 Stream Restoration (SR-1)

Construction entrances for the Quincy Run stream restoration will impact select locations along 55th Ave. and 52nd Ave. MOT will utilize a Flagging Operation for 1-Lane, 2-Way Roadways. As construction progresses signage and flagging will relocate as needed.

6.2.3 Permanent Floodwall (PF-1)

No maintenance of traffic on public roadways will be necessary. However, construction will be accessed through the parking lots of 5204, 5206, and the lot of 5208 Newton Street. Parking lot traffic will need to be diverted with temporary reduction in parking spaces.

7 Utility Impacts

7.1 Edmonston Channel

7.1.1 Varnum St. Bridge Enlargement (BE-1)

An 8” sewer pipe currently runs under the existing culvert and will need to be relocated to maintain the required clearance under the proposed culvert. Since there is insufficient slope to lower the sewer at the crossing, the pipe will need to be rerouted around the proposed culvert. This would involve crossing the existing channel and obtaining an easement from at least one adjacent private property. A 4” gas line terminating near the proposed culvert will need to be adjusted or shortened to accommodate the new structure. A 36” RCP storm pipe, which currently connects to and outfalls at the existing culvert, will need to be adjusted to connect to the proposed culvert. Additionally, an existing utility pole located directly over the proposed wing wall footer, this pole will need to be temporarily relocated.

The overhead power lines and communication cables on the north side of the structure may require temporary relocation to maintain the 20’ minimum clearance between the crane and the powerlines. The powerlines may also be temporarily de-energized during crane operation.

7.1.2 Taussig Culvert Enlargement (BE-5)

A 15” sewer pipe crosses the 72” culverts at 54th St. and an 8” sewer crosses at Taussig Rd. The proposed culverts will require the relocation of the sewer pipe along 54th St. to maintain the required clearance. The relocation would be within the public ROW and would not require any additional easements. The proposed culverts also cross multiple 8” water and 8” gas lines, which will require relocation to accommodate the new structures. Additionally, one 18” storm drain pipe and two 24” storm drain pipes will require field connections to the proposed culverts.

Overhead power lines and communication cables run along 54th St. over the structure and may require temporary relocation to maintain the 20-ft minimum clearance between the crane and the powerlines. The powerlines may also be temporarily de-energized during crane operation.

7.1.3 Taylor St. Bridge Enlargement (BE-2)

A 15” sewer pipe currently runs under the existing culvert and will need to be lowered to maintain the required clearance under the proposed culvert. A 6” watermain line and a 2” gas line running adjacent to the structure will also have to be relocated to accommodate the new structure. Additionally, an existing utility pole located directly over the proposed wing wall footer will need to be relocated.

The overhead power lines and communication cables on the north side of the structure may require temporary relocation to maintain the 20’ minimum clearance between the crane and the powerlines. The powerlines may also be temporarily de-energized during crane operation.

7.1.4 Spring Rd. Bridge Enlargement (BE-3)

A 15” sewer pipe currently runs under the existing culvert and will need to be relocated to maintain the required clearance under the proposed culvert. Since there is insufficient slope to lower the sewer at the crossing, the pipe will need to be rerouted around the proposed culvert. This would involve two crossings of the existing channel and obtaining easements from at least three adjacent private properties. There are 4”, 6”, and 8” watermains and 0.5”, 0.75” and 2” gas lines running adjacent to the structure that will have to be relocated. Additionally, an existing storm drain inlet and 15” and 18” storm drain pipes will need to be shifted and reconnected to the proposed culvert.

Overhead power lines and communication cables run diagonally over the structure and may require temporary relocation to maintain the 20-ft minimum clearance between the crane and the powerlines. The powerlines may also be temporarily de-energized during crane operation.

7.1.5 54th Pl. Bridge Enlargement (BE-4)

An 8” sewer pipe currently runs under the existing culvert and will need to be relocated to maintain the required clearance under the proposed culvert. Since there is insufficient slope to lower the sewer at the crossing, the pipe will need to be rerouted around the proposed culvert. This would involve a crossing of the existing channel and obtaining easements from at least one adjacent private property. A 6” watermain line and a 2” gas line running adjacent to the structure will also have to be relocated to accommodate the new structure. Additionally, an 18” RCP storm drainage pipe adjacent to the structure at the NW corner will need to be adjusted to connect to the proposed culvert.

7.1.6 56th Ave. Culvert Enlargement (CE-4)

A 15” sewer pipe currently runs under the existing culvert and will need to be relocated to maintain the required clearance under the proposed culvert. Since there is insufficient slope to lower the sewer at the crossing, the pipe will need to be rerouted around the proposed culvert. This would involve crossing the existing channel but would not require obtaining additional easements on private properties. A 6” watermain line and a 2” gas line running under the structure will also have to be relocated to accommodate the new culvert. Two existing inlets will need to be shifted north and a 21” and 24” RCP storm drainage pipes will need to be adjusted to connect to the proposed culvert. Additionally, an existing utility pole located at the SW corner of the bridge will need relocation.

The overhead power lines and communication cables on the west side of the structure may require temporary relocation to maintain the 20’ minimum clearance between the crane and the powerlines. The powerlines may also be temporarily de-energized during crane operation.

7.1.7 Storage Area (S-1)

A 15" sewer line runs parallel to the storage area and will not be affected by the proposed improvements. The construction entrance along Edmonston Rd. is located near overhead power lines and communication cables along the north side of the storage area.

7.1.8 Channel Improvements (CI-1)

A 15" sewer line crosses the channel improvement section between the storage area and Varnum St. Since the invert of the existing channel will remain unchanged, no impacts to the sewer line are anticipated. There are multiple utility poles along the channel improvements between 54^{th} Pl. and 55^{th} Ave. There are overhead power lines and communication cables along Varnum St. and Upshur St. which will be the construction access points.

7.1.9 Storm Drain Improvement (SD-1)

The proposed storm drain system crosses over a 15" sewer line at three different locations with enough clearance. The proposed storm drain pipe will also cross a 6" and 8" water line and a gas line which may need to be relocated.

7.2 Quincy Run

7.2.1 55th Ave. Bridge Enlargement (BE-6)

There is an 8" sewer line, 8" watermain, and 16" gas line crossing the stream over the existing culvert. Due to extensive excavation, the temporary relocation of these three underground utilities may be needed to provide space to demolish the existing culvert and build the proposed new structure. Additionally, there is a 24" RCP drainage pipe at the NW corner, a 24" RCP drainage pipe at the SW corner, a 15" CMP drainage pipe at the NE corner which will need to be adjusted to connect to the proposed culvert.

There are overhead power lines and communication cables at the bridge west side. The overhead utilities will have conflicts with the crane operation during construction. The overhead power lines and communication cables over the structure may need temporary relocation until the 20-ft required minimum clearance can be maintained between powerline and crane. Another option is to temporarily de-energize the power line and temporarily adjust the communication cables during crane operation.

7.2.2 Stream Restoration (SR-1)

An existing 16" water line and 6" gas line cross Quincy Run near 52^{nd} Ave. at the downstream limit of the stream restoration. Both of these utilities are not expected to be affected by the proposed grading of the channel.

7.2.3 Permanent Floodwall (PF-2)

A 48” RCP storm pipe currently runs under the proposed floodwall near the west end of the wall. The sheet piles will be installed above and around the pipe without impacting it. Careful excavation for the concrete overlay will be conducted around the RCP and should not affect it. There is an existing PEPCO utility pole and guy wire located near the proposed 15’ curb inlet in front of 5208 Newton Street that will need to be relocated in order to construct the inlet and storm drain pipe.

8 Proposed Improvements

The proposed improvements along Edmonston Channel and Quincy Run were updated using additional survey data. The hydraulic models were updated accordingly to reflect the optimized designs, with the objective of reducing flood elevations for the affected properties.

8.1 Edmonston Channel

The proposed improvements along Edmonston Channel include culvert and bridge enlargements, channel modifications, storm drain upgrades, and increased flood storage capacity. A comparison of flow rates from the existing conditions analysis and the proposed improvements is summarized in Table 8-1.

Table 8-1 Edmonston Channel Road Crossing 100-Year Design Storm Flow Rates

Road Crossing	Existing Conditions (cfs)	Proposed Conditions (cfs)
Varnum St	1,403	1,709
Upshur St	1,363	1,626
54th Pl & Taussig Rd	1,023	1,511
Taylor St	1,149	1,415
Spring Rd	1,199	1,398
54th Pl	1,094	1,367
55th Ave	1,178	1,185
56th Ave	954	1,139

Modeling analyses were performed to validate system performance and verify that improvements would not have negative impacts downstream. Based on the improvements outlined in the subsequent sections, the impact of these improvements can be categorized as such:

For storms smaller than the 10-year event, the existing bridges do not create significant hydraulic restrictions. Therefore, improving upstream bridges has no meaningful effect on water surface elevations or flooding in the channel. However, the retention facility at Edmonston Road overtops during a 2-year storm. Enhancing its storage capacity helps reduce the flow rate overtopping the dam, which in turn lowers ponding depths and extents downstream. Still, it's important to note that these improvements do not prevent overtopping of the pond, but are intended to mitigate risk to the properties downstream of the dam.

During a 25-year storm, bridges—especially Taussig—begin to restrict flow. Upgrading bridge hydraulics allows more water to pass downstream. Fortunately, the increased storage capacity upstream of the Edmonston Road dam captures this additional flow, effectively shifting flood volume from upstream areas into the retention pond. Although the pond still overtops, the downstream impacts are slightly improved compared to current conditions due to increased storage volume.

For storms with a 50-year recurrence or greater, even more flow is directed away from at-risk properties into the retention pond. While the proposed conditions produced a slightly higher peak overtopping flow, the key factor influencing the maximum downstream water surface elevation is the total volume of water overtopping the dam during the event. The downstream flooding characteristics remain the same for both existing and proposed conditions because the overtopping volume remains constant between both and Kenilworth Avenue continues to function as a secondary containment structure.

8.1.1 Bridge and Culvert Enlargements

Hydraulic modeling indicates that the existing bridges and culverts are undersized and unable to carry the 1% annual chance (100-year) flows resulting in elevated upstream flood levels. The proposed bridge and culvert improvements aim to reduce upstream flood elevations at road crossings by minimizing the hydraulic constriction caused by the existing structures.

Multiple alternatives were evaluated for these improvements. Since the existing channel is concrete-lined, the bridge and culvert foundations are not subject to scour. The following tables summarize and compare the alternatives for each structure.

Table 8-2 Varnum St. Bridge Enlargement (BE-1) – Alternatives Comparison

Structure Description	Alternative 1 Concrete Slab Bridge	*Alternative 2 Double Box Culvert
Bridge Layout	• 36’ single span concrete bridge • Thirteen 3’-wide prestressed concrete slabs • 23.5 degrees skew angle • Opening 30’x8’(average)	• Double-cell concrete box culvert • 23.5 degrees skew angle • Each cell opening is 15’x8’
Bridge Foundation	• Abutment on pile foundation	• Spread footing
Advantages	• No obstruction in the stream	• Lower initial construction cost • Does not need pile foundation
Disadvantages	• Need pile foundation • Higher construction cost	• More susceptible to catch debris • Higher maintenance cost

**Recommended alternative*

Table 8-3 Taussig Rd. Culvert Enlargement (BE-5) – Alternatives Comparison

Structure Description	Alternative 1	Alternative 2	*Alternative 3
Culvert Layout	• Keep one 72" culvert • Replace other 72" culvert with 11'Wx6'H • Total length 471'	• Keep one 72" culvert • **Replace other 72" culvert with double 7'Wx5'H • Total length 471'	• Keep double 72" culvert • Add 8'Wx6'H diversion culvert w/ twin 8.5'Wx6'H culverts and junction boxes • ***Construct cast-in-place 40-foot radius bend at Taussig Rd. and 54th Pl. in lieu of standard manhole • Total length 503'
Advantages	• Less utility relocations	• Less utility relocations	• Majority of construction is along public road, away from existing culvert.
Disadvantages	• Majority of construction is on private property. Excavation adjacent to the existing 72" RCP may cause damage to the twin RCP pipe.	• Majority of construction is on private property. Excavation adjacent to the existing 72" RCP may cause damage to the twin RCP pipe.	• Higher construction cost due to number of new structures

**Recommended alternative*
***Prince George's County requires 6' minimum vertical clearance for culvert lengths more than 75'. A design waiver will be required from DPIE and DPW&T*
****Long-radius bend is required to minimize head loss through sharp directional bends at high velocities and mitigate the impact on culvert sizing*

Table 8-4 Taylor St. Bridge Enlargement (BE-2) – Alternatives Comparison

Structure Description	Alternative 1 Concrete Slab Bridge	*Alternative 2 Double Box Culvert
Bridge Layout	• 31'-2" single span concrete bridge • Thirteen 3'-wide prestressed concrete slabs • 26 degrees skew angle • Opening 25'x5'(average)	• Double-cell concrete box culvert • 26 degrees skew angle • Each cell opening is 13'x5'
Bridge Foundation	• Abutment on pile foundation	• Spread footing
Advantages	• No obstruction in the stream	• Lower initial construction cost • Does not need pile foundation
Disadvantages	• Need pile foundation • Higher construction cost	• More susceptible to catch debris • Higher maintenance cost

**Recommended alternative*

Table 8-5 Spring Rd. Bridge Enlargement (BE-3) – Alternatives Comparison

Structure Description	Alternative 1 Concrete Slab Bridge	*Alternative 2 Double Box Culvert
Bridge Layout	• 36'-9" single span concrete bridge • Thirteen 3-ft-wide prestressed concrete slabs • 26 degrees skew angle • Opening 30'x7'(average)	• Double-cell concrete box culvert • 26 degrees skew angle • Each cell opening is 15'x7'
Bridge Foundation	• Abutment on pile foundation	• Spread footing
Advantages	• No obstruction in the stream	• Lower initial construction cost • Does not need pile foundation
Disadvantages	• Need pile foundation • Higher construction cost	• More susceptible to catch debris • Higher maintenance cost

**Recommended alternative*

Table 8-6 54th Pl. Bridge Enlargement (BE-4) – Alternatives Comparison

Structure Description	Alternative 1 Concrete Slab Bridge	*Alternative 2 Double Box Culvert
Bridge Layout	• 34'-6" single span concrete bridge • Thirteen 3-ft-wide prestressed concrete slabs • 16.5 degrees skew angle • Opening 30'x7'(average)	• Double-cell concrete box culvert • 16.5 degrees skew angle • Each cell opening is 15'x7'
Bridge Foundation	• Abutment on pile foundation	• Spread footing
Advantages	• No obstruction in the stream	• Lower initial construction cost • Does not need pile foundation
Disadvantages	• Need pile foundation • Higher construction cost	• More susceptible to catch debris • Higher maintenance cost

**Recommended alternative*

Table 8-7 56th Ave. Culvert Enlargement (CE-4) – Alternatives Comparison

Structure Description	Alternative 1 Concrete Slab Bridge	*Alternative 2 Single Box Culvert
Bridge Layout	• 19' single span concrete bridge • Sixteen 3'-wide prestressed concrete slabs • 17.5 degrees skew angle • Opening 15'x6'(average)	• Single cell concrete box culvert • 17.5 degrees skew angle • The cell opening is 16'x6'
Bridge Foundation	• Abutment on pile foundation	• Spread footing
Advantages	• Span over the channel • Less stream excavation	• Lower initial construction cost • Does not need pile foundation
Disadvantages	• Need pile foundation • Higher construction cost	• Full stream excavation • Bottom slab

**Recommended alternative*

8.1.2 Dry Storage Area (S-1)

The proposed storage area is located between Edmonston Rd. and Varnum St. within parcels owned by WSSC. To increase storage volume, a portion of the existing channel will be lowered and graded at a slope of approximately 1.4% and the existing concrete entrance flume to the outlet structure will be removed. The sides of the storage area will be excavated and graded at 3:1 slope. A 20’ horizontal clearance has been maintained from the existing 15” sanitary sewer on the north side to avoid any impacts and a 50’ horizontal clearance has been maintained from the property lines on the south side.

Because storage capacity is limited and the outlet structure ultimately controls discharge from the storage area, modifying the outlet structure would be the most effective way to prevent increased water surface elevations downstream of the project site. However, this is a complex task since the outlet pipe runs beneath two major roads and does not daylight for several hundred feet. As an alternative, a 50’ wide notch is proposed at the existing weir structure for more optimal control of dam overtopping and peak water surface elevations. This will involve replacing the existing trash rack and cutting a notch on the existing concrete weir.

This alternative offers a practical solution with fewer construction challenges. By allowing flow to be released at a different location along the dam, the notch may influence the momentum of overtopping water and the dynamics of downstream inundation. These changes offer benefits such as improved flow distribution across the face of the dam, reducing risk of dam failure due to erosion at the left abutment, and risk mitigation for properties south of the structure. While modeling analyses have shown that these changes do not adversely impact downstream properties or infrastructure, additional modeling may be conducted to evaluate effects downstream of the project limits. Post-implementation monitoring is also recommended to verify system performance and that downstream water surface elevations align with design expectations.

8.1.3 Channel Improvements (CI-1)

Channel improvements fall into two categories. The first involves replacing the existing trapezoidal channel with a rectangular channel in areas where modeling showed it would be most beneficial to reduce flooding. The proposed design maintains the existing top width and depth, so no additional easements are required. In total, four channel sections are being converted to rectangular sections. Table 8-8 summarizes these locations and their respective lengths. The second category involves in-kind replacement of the existing trapezoidal channel due to its deteriorating conditions. Table 8-9 summarizes the total length of these replacements.

Table 8-8 Proposed Rectangular Channels

Section	Location	*Total Length (ft)
Section 1	From Storage Area to Varnum St.	141
Section 2	From Varnum St. to Upshur St.	188
Section 3	From Upshur St. To 54th St.	66
Section 4	From 54th Pl. to 55th Ave.	467
TOTAL		**862**

**Includes transition channels to/from existing trapezoidal channel*

Table 8-9 Proposed In-Kind Channel Replacements

Section	Location	*Total Length (ft)
Section 1	From Storage Area to Varnum St.	298
Section 2	From Taussig Rd. to Taylor St.	184
Section 3	From Taylor St. to Spring Rd.	167
Section 4	From Spring Rd. to 54th Pl.	104
TOTAL		**753**

**Length does not include transition channels from bridge and culvert improvements*

8.1.4 Storm Drain Improvements (SD-1)

Hydraulic modeling indicates the properties between 55th Ave. and 56th Ave. may be experiencing flooding as runoff bypasses the curb and gutter, causing ponding behind the homes. To mitigate this, a new storm drain system is proposed, which involves upsizing two existing inlets and adding three new inlets to capture runoff and redirect it away from the affected properties. The system also includes approximately 365 LF of new storm drain pipe and a new manhole. All these improvements are within the public right-of-way or existing storm drain easements.

8.2 Quincy Run

The proposed improvements along Quincy Run includes a bridge enlargement, stream restoration, and construction of a permanent floodwall. Hydraulic analysis indicates that when the 55th Avenue bridge is enlarged to reduce upstream flooding at 5504, and 5506 Newton Street and 3601 and 3603 55th Avenue, higher flow rates are released downstream. Table 8-10 compares the flow rates between the existing and the proposed conditions. The stream restoration and proposed floodwall have been designed to accommodate these increased flow rates.

Table 8-10 Existing and Proposed Condition Quincy Run Channel Culverts Flows during 100-Year Return Period Storm

Road Crossing	Existing Conditions Peak Flow (cfs)	Proposed Conditions Peak Flow (cfs)
55th Ave	1,376	1,380
52nd Ave	1,679	1,759

8.2.1 55th Ave. Bridge Enlargement (BE-6)

Hydraulic modeling indicates that the existing culvert is undersized and unable to carry the 1% annual-chance (100-year) flow resulting in elevated upstream flood levels. The proposed bridge improvement aims to reduce upstream flood elevations at the road crossing by minimizing the hydraulic constriction caused by the existing structure. This culvert is located outside of the jurisdiction of the Town of Bladensburg and the structure and roadway are maintained by Prince George's County DPW&T.

Two alternatives were evaluated for this improvement. Table 8-11 summarizes and compares these alternatives.

Table 8-11 55th Ave. Bridge Enlargement (BE-6) – Alternatives Comparison

Structure Description	*Alternative 1 CON/SPAN Arch Bridge	Alternative 2 Double Box Culvert
Bridge Layout	• CON/SPAN Arch Bridge B-Series • No skew • Opening 28'x6'	• Double cell concrete box culvert • No skew • Each cell opening is 12'x6'
Bridge Foundation	• Abutment on pile foundation	• Spread footing
Advantages	• No obstruction in the stream	• Lower initial construction cost • Does not need pile foundation • Concrete bottom slab can prevent scour
Disadvantages	• Need pile foundation • Higher construction cost • Foundation needs scour protection	• More susceptible to catch debris • Higher maintenance cost

**Recommended alternative*

8.2.2 Stream Restoration (SR-1)

The proposed stream restoration design meets the goal of this project, to mitigate flooding impacts, while also reducing non-point source pollutant load reductions. Due to site restrictions, the proposed design is broken into three sections, upstream of the floodwall channel, the floodwall channel, and downstream of the floodwall channel.

The stream design upstream and downstream of the floodwall has a relatively wide valley. These portions of the design call for a flood prone bench that expands the width of the valley bottom with a nested 10’ wide low flow channel constructed using natural materials. This design provides a more resilient and stable geometry that reconnects the channel to the floodplain, thereby reducing bank erosion and providing flood relief during storm events.

The proposed floodwall channel runs approximately 280 linear feet in the existing channel footprint through the narrow valley. This section of restoration extends the entire length of the proposed floodwall with a 21’ top width. The channel will be armored with imbricated rock to withstand the high shear stresses and velocities in this highly confined area. Due to the site's steep slopes and the proposed floodwall constraints, there is not sufficient area to provide natural flood relief like the upstream and downstream portions. However, this design will provide a highly stable channel adjacent to the proposed floodwall.

8.2.3 Permanent Floodwall (PF-1)

The project includes approximately 400’ of permanent I-wall construction along the south bank of Quincy Run, forming a protective flood barrier for the adjacent residential buildings. The I-wall consists of interlocked sheet piles driven to a safe depth, with a top elevation at the 100-year flood level along the creek with consideration for one to two feet of freeboard. The exposed portion of the wall above grade is proposed to be capped with a reinforced concrete overlay for durability and provide a finished look for aesthetic purposes. The exposed face can be provided with a form liner to provide a more aesthetic appearance. The concrete cap is proposed to be on both sides of the wall and extend 3’ below grade for scour protection and for protection of the sheet piles against long-term corrosion. Considerations can be made to applying the concrete cap to only the residential side for aesthetic purposes but leave the bare sheet pile to retain against the stream.

An I-wall configuration was chosen over a more traditional cantilevered T-wall design to minimize excavation, given the wall’s proximity to the residential structures. However, a T-wall design shall be implemented over top the proposed pump stations to integrate the pump station wall into the flood wall, minimizing overall footprint. The T-wall design shall consist of reinforced concrete and shall be integrated into both adjacent I-walls and the pump station walls. It is expected that integration into the pump station will help alleviate stability concerns, excavation requirements, and minimize the overall footprint and impact of the flood wall.

To manage floodwater accumulation on the landside of the wall (interior drainage), one-way valves will be installed at two locations to release flow during common rain events up to the 100-year event, however, the stream elevation during the 100-year event is expected to submerge these one-way valves. To accommodate this, underground pumping stations will discharge excess water back into Quincy Run.

Stantec evaluated two interior drainage design alternatives, including one larger pump station versus two smaller stations. The first alternative includes 2 separate pump stations, one for each drainage area, while the second alternative diverts the flow of both drainage areas to 1 pump station. Both pump station alternatives include 2 primary pumps which shall be working in parallel to handle the 100-year flow rates with the maximum capacity of 1 pump able to handle the full 100-year flow rate should the other pump go down. There will also be a low-level maintenance pump which will work periodically to prevent stagnant water levels. The pumps are triggered by float switches which monitor both the interior water levels and the stream water levels. Water shall be fed into the pump station through a gravity line which should only become operational once water levels have exceeded the one-way valve limit.

Stantec recommends the second alternative due to its lower upfront and long-term maintenance costs, however, the pros and cons of both alternatives should be considered. The overall lump sum costs are similar in magnitude and are broken down in Appendix E. Lifetime maintenance costs are not quantified, though it can be safely assumed that the cost shall be doubled for alternative 1 in comparison to alternative 2 since there are twice the number of pumps. Also, input from the residents should be considered for the aesthetic appeal of 2 smaller pump stations vs 1 larger pump station. Alternative 1 will convert more green space into impervious concrete and will be closer to the buildings by proximity.

To reduce the amount of rainfall runoff that accumulates behind the floodwall, a new 15' curb inlet and 15" RCP storm drain system has been designed to carry flow from the northeast corner of the 5208 Newton Street parking lot directly to Quincy Run, passing through the floodwall. The RCP pipe will be installed first, then the sheet pile units will be installed around the pipe after the backfill has been compacted.

9 Right of Way (ROW) Impacts

The existing ROW was researched using available online GIS data and record plats. Table 9-1 and Table 9-2 summarize the estimated ROW and easement impacts for each preliminary improvement design. These estimates do not account for potential additional areas required for utility relocations which will be finalized during the next design phase.

Table 9-1 Edmonston Channel Estimated Right of Way Easement Needs

Improvement	*Property Impacts	Number of Properties with ROW impacts	No. of Properties w/ Temp. Easements Needed
Storage Area (S-1)	Private	0	0
	**County-Owned	1	0
Bridge Enlargement (BE-1)	Private	1	1
	**County-Owned	2	2
Culvert Enlargement (BE-5)	Private	0	4
	County-Owned	2	1
Bridge Enlargement (BE-2)	Private	4	4
	County-Owned	0	0
Bridge Enlargement (BE-3)	Private	3	3
	County-Owned	0	0
Bridge Enlargement (BE-4)	Private	3	3
	County-Owned	1	1
Culvert Enlargement (CE-4)	Private	2	2
	County-Owned	0	0
Channel Improvement (CI-1)	Private	0	11
	County-Owned	0	5
Storm Drain Improvements (SD-1)	Private	0	1
	County-Owned	0	0

**Does not include public road ROW*

***Parcels owned by WSSC and Prince George's County*

Table 9-2 Quincy Run Estimated Right of Way Easement Needs

Improvement	Property Impacts	Number of Properties with ROW impacts	No. of Properties w/ Temp. Easements Needed
Stream Restoration (SR-1)	Private	7	8
	County-Owned	1	1
Permanent Floodwall (PF-1)	Private	1	1
	County-Owned	0	0
Bridge Enlargement (BE-6)	Private	2	2
	County-Owned	0	0

10 Erosion and Sediment Control

The general approach for erosion and sediment control for the proposed projects will include the use of perimeter controls for staging/stockpile areas, same day stabilization for channel construction and floodplain grading, and pump-around practices for clear water diversion around the work zone. All sediment laden water will be passed through an approved sediment trapping device before being discharged from the work area. Disturbed area will be stabilized overnight unless runoff is directed to an approved sediment control device.

Key practices to be used during construction are:

- **Pump Around:** a temporary pump around and supporting measures to divert flow around instream construction sites. At the end of each workday, the pump around practice should be removed.
- **Temporary Same Day Stabilization:** temporary streambed stabilization may be installed at the end of each workday to stabilize the downstream limit of the daily work zone;
- **Temporary Outfall Protection:** temporary protection placed at the end of the clear water diversion to reduce the velocity for the outfall to a non-erosive rate;
- **Silt Fence/Super Silt Fence:** a temporary barrier of woven geotextile (over chain link fence) used to intercept, retain, and filter surface runoff from disturbed areas;
- **Stabilized Construction Entrance:** a layer of aggregate that is underlain with nonwoven geotextile at points of ingress and egress of the construction site used to reduce tracking sediment onto roadways;
- **Temporary Stabilized Construction Access:** a temporary access road will be used to minimize impacts to environmental features (trees, wetlands, etc.) and ground disturbance/sediment sources along construction haul roads.

11 Permitting Requirements

The proposed projects (strategies that require construction operations) will require approval and/or permits from local, state and federal agencies including MDE Wetlands and Waterways Program (MDE); US Army Corps of Engineers (USACE); MD Department of Natural Resources (DNR), Prince George's County Department of Permitting, Inspections and Enforcement (DPIE), and the Maryland-National Capital Park and Planning Commission (MNCPPC) Environmental Planning Section. Temporary and permanent impacts to regulated resources and activities are anticipated.

In general, the replacement of bridges and culverts in kind, or with only minor deviations from the existing structure, would likely be authorized by the US Army Corps of Engineers as a Category A maintenance activity under the Maryland State General Permit (MDSPGP). Permitting considerations for the proposed channel improvements was assessed using the DRAFT Maryland State Programmatic General Permit 7 (MDSPGP-7), which was released for public comment on December 13, 2024 and is to take effect on October 1, 2026.

Per the MDSPGP-6 and DRAFT MDSPGP-7 Activity b(1) General Maintenance: *"This activity authorizes discharges of dredged or fill material for the repair, rehabilitation, or replacement of any currently serviceable structure or fill that was previously authorized or did not require a permit at the time it was constructed, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for the structure or fill in the original permit or the most recently authorized modification. This activity authorizes minor deviations in the configuration of the structure or filled area, including changes in materials, construction techniques, requirements of other regulatory agencies, current construction codes, or safety standards that are necessary to the repair, rehabilitation, or replacement, provided the adverse environmental effects resulting from such repair, rehabilitation, or replacement are minimal".* Alternatives which do not meet this criteria would be reviewed as a Category B activity or through a general permit.

The MDSPGP-7 includes activities related to stream bank stabilization projects, but it appears that the Edmonston Channel stabilizations and the stream restoration proposed along Quincy Run does not qualify as Activity f(4) Nontidal Bank Stabilization Activities because Activity f(4) specifically applies to stream projects designed for the purpose of stream bank erosion protection. It is anticipated that authorizations for the stream stabilization and restoration portions of the project would likely be in the form of a Nationwide Permit 27 from the USACE and a Letter of Authorization (LOA) from MDE. Further coordination with the USACE and MDE should be conducted to determine the appropriate permitting path.

The Maryland Forest Conservation Act and the Prince George's County Woodland and Wildlife Habitat Conservation Ordinance (WCO) require review of grading or site development plans by the Maryland-National Capital Park and Planning Commission's (MNCPPC) Planning Department for compliance with the WCO. In general, approval of a Natural Resources Inventory (NRI) and a Tree Conservation Plan (TCP) is required prior to approval of the development plan. Per the WCO, stream buffers and 100-year floodplains are considered priority areas and should be retained, replanted, or afforested. Impacts to specimen trees require a variance as part of the TCP review and approval. Woodland conservation and reforestation/afforestation requirements are based on the site area (or limits of disturbance for linear projects), amount of existing forest, forest clearing, forest retained, and other factors.

The WCO provides a "modified" exemption for certain stream restoration projects as long as the design meets the avoidance/minimization criteria and achieves certain goals. Under this exemption, the replacement of trees on a one-to-one may satisfy the reforestation requirement; for the purpose of this cost estimate, Stantec has assumed that trees will be replaced one-to-one for the stream restoration portions of this project.

A summary of the anticipated permits and approvals is included in Table 11-1 Anticipated Permits and Approvals.

Table 11-1 Anticipated Permits and Approvals

Resource/Activity	Agency	Regulation	Anticipated Permit/Approval	Timeframe
Nontidal Streams/Wetlands and Floodplains	MDE Wetlands and Waterways Program- Waterway Construction Division	COMAR 26.17.04.10 General Waterway Construction Permit	Letter of Authorization	8-10 months
Nontidal Streams	USACE Regulatory Division	CWA Section 404	MDSPGP-6/7 or Nationwide Permit	8-10 months
NPDES/SWPPP	MDE	Maryland General Permit No.20-CP	NOI Permit for project limits greater than 1 Acre	1-3 months
Forest/Trees	MNCPPC PG CO Planning Dept.	Forest Conservation Act and the Prince George's County Woodland and Wildlife Habitat Conservation Ordinance	Approved Forest/Tree Conservation Plan or Exemption	12-14 months
Roadside Trees	MD DNR	DNR Roadside Tree Law	Roadside Tree Permit	2-4 months
Site Development Concept	PG CO/DPIE		Concept Approval	4-6 months
Clearing and Grading	PG CO/DPIE	Site Development Rough Grading Permit	SDRG Permit	12-14 months
Erosion and Sediment Control	PG CO/DPIE & PG(SCD)		Erosion and Sediment Control Approval	12-14 months
Street Construction Permit	PG CO/DPIE	Work in the public Right of Way (ROW)	ROW Approval	8-10 months
Floodplains	PG CO/DPIE/FEMA	Impacts or changes to existing floodplain limits	Floodplain Approval	12-14 months
Restoration Permit	PG CO/DPIE	Repair public roadway prior to permit closure	Restoration acceptance	4-6 months
Water/Sewer Utility Permit	WSSC	Relocation or work around existing WSSC utilities	Permit or approval letter	8-12 months
Special Utility Permit	Pepco/Verizon/Comcast & PG CO/DPIE	Relocation or work around existing Dry utilities	Approval letter	8-12 months

12 Cost Estimates

The proposed project is intended to be funded using several stakeholder resources. At this stage the allocation of available funds for implementation has not yet been determined. The estimate reflects standard industry best practices for construction cost estimating. It is anticipated that further development of the design and reduction in contingencies will result in construction costs and programming amounts that align with the County's available budget for project implementation. A breakdown of the preliminary construction cost estimates is included in Appendix E.

Table 12-1 Edmonston Channel Preliminary Cost Estimate

Improvement	Preliminary Design Cost Estimate	Preliminary Construction Cost Estimate	**Preliminary Total Cost Estimate
Dry Storage Area (S-1)	$205,000	$1,634,000	$1,839,000
*Bridge Enlargement (BE-1)	$421,500	$2,810,000	$3,231,500
*Culvert Enlargement (BE-5)	$870,000	$7,250,000	$8,120,000
*Bridge Enlargement (BE-2)	$394,700	$2,631,000	$3,025,700
*Bridge Enlargement (BE-3)	$450,600	$3,004,000	$3,454,600
*Bridge Enlargement (BE-4)	$399,500	$2,663,000	$3,062,500
*Culvert Enlargement (CE-4)	$392,000	$2,613,000	$3,005,000
***Channel Improvement (CI-1)	$338,000	$2,700,000	$3,038,000
Storm Drain Improvements (SD-1)	$110,000	$879,000	$989,000

**Cost for recommended alternatives*
*** Average cost of design*
****Rectangular channel improvements only*

Table 12-2 Quincy Run Preliminary Cost Estimate

Improvement	Preliminary Design Cost Estimate	Preliminary Construction Cost Estimate	**Preliminary Total Cost Estimate
Stream Restoration (SR-1)	$372,000	$1,711,000	$2,083,000
*Permanent Floodwall (PF-1)	$504,900	$3,366,000	$3,870,900
*Bridge Enlargement (BE-6)	$839,600	$5,597,000	$6,436,600

**Cost for recommended alternatives*
*** Average cost of design*

13 Construction Phasing

Since funding to construct each of the proposed improvements may not be available at once, Stantec used the hydraulic model to evaluate construction phasing and prioritize improvements.

EDMONSTON CHANNEL CONSTRUCTION PHASING

Phase 1

- **S-1** - Prioritized to avoid adverse impacts downstream of project area.
- **SD-1** - Provides flood reduction improvements without impacting areas downstream.

Phase 2

- **BE-1** - Upstream improvements made before BE-1 improvement, if completed, may worsen flooding between Varnum St. and Upshur St.

Phase 3

- **BE-5** - BE-5 is the main hydraulic restriction along channel. Offers greatest hydraulic relief but it's the most costly improvement. This improvement reduces tailwater at several upstream bridges.

Phase 4

- **BE-2, BE-3, and BE-4** - The short distance between the three culverts means individual upsgrades offer no flood relief. Therefore, combining the three culvert improvements is the most effective.

Phase 5

- **CE-4 -** Most upstream improvement.
- **CI-1 (All sections)** - Requires coordination with property owners due to proximity to homes. Channel improvements can be combined with bridge and culvert improvements as funding becomes available to reduce mobilization cost.

QUINCY RUN CONSTRUCTION PHASING

Phase 1

- **PF-1** - Provides flood reduction for 4 properties.
- **SR-1** - Provides flood storage capacity for additional flow from BE-6 improvement. Additionally, it provides bank stability for PF-1 footing.

Phase 2

- **BE-6** -Provides protection for 3 properties

Stantec recommends moving forward with proposed improvements in phases that incorporate strategies that can logically be constructed as single construction projects, require similar permitting and easements, and based on available funding. Permitting, utility coordination, and property acquisition are potential roadblocks that could be mitigated through proper planning and phasing. The maintenance cost of the new structures and improvements will also have to be evaluated.

14 Conclusion

The preliminary designs incorporate data from field assessments and updated evaluations of existing flood conditions along Edmonston Channel and Quincy Run. The designs were developed with consideration for flood risk reduction, practical feasibility, environmental factors, and cost.

14.1 Edmonston Channel

The recommended design, as discussed in this report, combines site-specific residential solutions with upstream alternatives to provide flood relief for Bladensburg residents along Edmonston Channel. It will potentially reduce flooding for 25 of the 29 affected structures in the 100-year floodplain and includes 862 linear feet of rectangular channel improvements, six bridge and culvert enlargements, one section of storm drain upgrades, and grading of a green space park area upstream of Edmonston Rd. to increase storage during major floods.

The recommended design features should be implemented from downstream to upstream to prevent worsening flood conditions as upstream conveyance is improved. The phasing section outlines the recommended implementation order based on the hydraulic performance of the system, providing a ranked list of design options. Figure 14-1 summarizes the preliminary designs along Edmonston Channel.

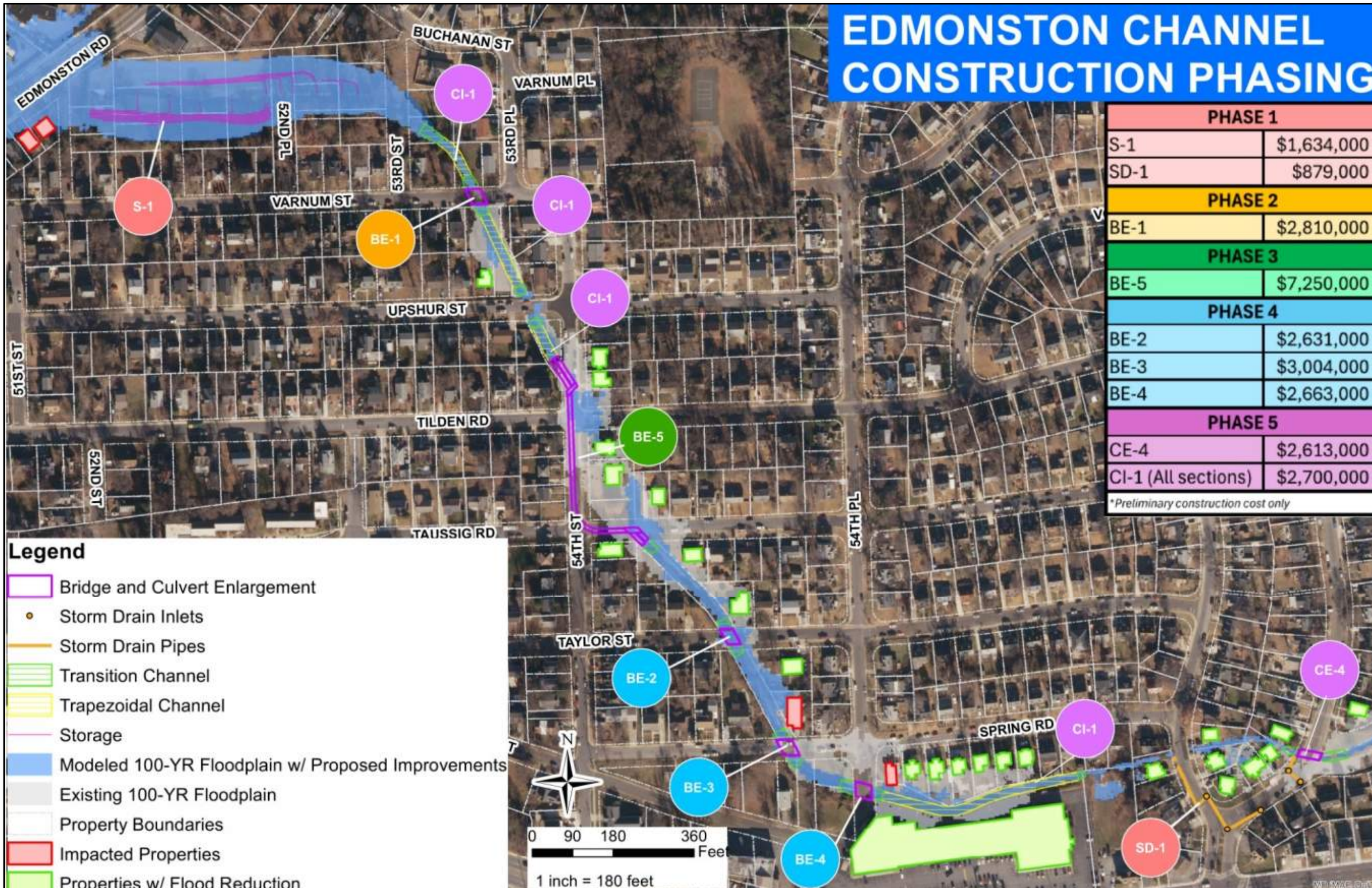


Figure 14-1 Edmonston Channel Project Phasing

14.2 Quincy Run

The design recommended in this report integrates multiple flood mitigation strategies, including expanding the 55th Avenue bridge to reduce hydraulic restrictions, implementing stream restoration to enhance hydraulic capacity and floodplain storage, and constructing a permanent floodwall for structural protection. Specifically, the floodwall will provide protection for the properties at 5204, 5206, and 5208 Newton St., while stream restoration between 52nd and 55th Avenue and the bridge enlargement at 55th Avenue will collectively improve flood resilience for residents along Quincy Run in Bladensburg.

The recommended design features should be implemented from downstream to upstream to prevent worsening flood conditions as upstream conveyance is improved. The phasing section outlines the recommended implementation order based on the hydraulic performance of the system, providing a ranked list of design options. Figure 14-2 summarizes the preliminary designs along Quincy Run.

Figure 14-2 Quincy Run Project Phasing

Appendices

Appendix A Site-Specific Flood Mitigation Strategies Report

Bladensburg Site-Specific Flood Mitigation Strategies

Flood mitigation strategies for properties located in the Town of Bladensburg, Maryland, that are at risk of flooding in the Edmonston Channel watershed.

Prepared for:
The Clean Water Partnership

Prepared by:
Stantec

October 15, 2025

Project/File:
Bladensburg Flood Reduction

Stantec Consulting Services Inc.

Revision Schedule

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date

Disclaimer

The conclusions in the report titled Bladensburg Site-Specific Flood Mitigation Strategies (Report), are Stantec's professional opinion as of the time of the Report's development, and concerning the scope described herein. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. It is not to be used or relied on for any variation or extension of the described project, or for any other project or purpose. Any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from The Clean Water Partnership (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Prepared by: ______________________
Signature
Stantec Team
Printed Name

Reviewed by: ______________________
Signature
Tim Reinhold
Printed Name

Approved by: ______________________
Signature
Matthew Holland
Printed Name

Table of Contents

List of Tables

List of Figures

Executive Summary

A preliminary flood risk assessment was conducted for 28 residential properties and 1 commercial property (Save A Lot) in the Edmonston Channel watershed to inform strategies and actions that would reduce the risk of damage from a 100-year flood event. A site-specific flood mitigation strategy was recommended for each property for further consideration and to guide coordination with property owners. Evaluated strategies include:

- Permanent flood wall (concrete flood wall or concrete curb)
- Dry floodproofing of the building to an established flood protection level
- Measures to raise elevation of building's lowest point of entry (for an exterior stairwell leading to a basement door this could involve raising or protecting the top of the stairwell entry)
- Site grading adjustments
- Property acquisition
- Homeowner flood retrofits (measures intended to reduce, but not eliminate, flood risk)

These strategies may be implemented independently of, or in combination with, proposed structural strategies to the Edmonston Channel (e.g., bridge and culvert enlargements). A summary of proposed flood mitigation strategies for each of the 29 properties is provided, including:

- Observations of the existing building construction and parcel topography, including information gained from site surveys
- A description of the proposed conceptual strategy for flood mitigation of each property
- Some of the risks and limitations associated with the selection of the conceptual strategy that Prince George's County and the property owner need to consider

Table A provides a summary of the site-specific flood reduction strategies that were deemed suitable for each of the 29 properties. When homeowner retrofits are offered as a possible strategy, they are accompanied by numbers that are defined below Table A. These site-specific flood reduction strategies can be reduced or avoided by implementing structural strategies, also provided in Table A.

Table A Summary of Strategies for Flood Reduction by Property (Numbers in parentheses keyed to homeowner retrofits listed after table)

Property	**Site-Specific Flood Reduction Strategy**	**Structural Strategies** ***(To reduce or avoid site-specific flood reduction strategy)***
Property #1: 4319 Edmonston Road	Homeowner Retrofits and Raise Lowest Point of Entry (LPE) (2, 3, 4, 5, 9)	None
Property #2: 4321 Edmonston Road	Homeowner Retrofits with Floodwall and Raise LPE (2, 4, 5, 6, 11)	None

Property	**Site-Specific Flood Reduction Strategy**	**Structural Strategies** ***(To reduce or avoid site-specific flood reduction strategy)***
Property #3: 5312 Upshur Street	Grading and Placement of Fill and Raise LPE	Bridge Enlargement (BE-1) Channel Improvement (CI-1)
Property #4: 4305 54th Street	Homeowner Retrofits and Raise LPE (2, 7)	Bridge Enlargement (BE-5) Channel Improvement (CI-1)
Property #5: 4303 54th Street	Homeowner Retrofits and Raise LPE (2, 5, 6, 7, 8)	Bridge Enlargement (BE-5) Channel Improvement (CI-1)
Property #6: 5401 Tilden Road	Property Acquisition	Bridge Enlargement (BE-5) Channel Improvement (CI-1)
Property #7: 4211 54th Street	Property Acquisition	Bridge Enlargement (BE-5) Channel Improvement (CI-1)
Property #8: 5404 Taussig Road	Homeowner Retrofits and Raise LPE (5, 13)	Bridge Enlargement (BE-5) Channel Improvement (CI-1)
Property #9: 4209 54th Street	Homeowner Retrofits and Raise LPE (2, 5, 6, 14, 15)	Bridge Enlargement (BE-5) Channel Improvement (CI-1)
Property #10: 5409 Taussig Road	Homeowner Retrofits and Raise LPE (1, 2, 3 or 14, 4, 5, 6, 11)	Bridge Enlargement (BE-5) Channel Improvement (CI-1)
Property #11: 5408 Taylor Street	Property Acquisition	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4)
Property #12: 5411 Taylor Street	Homeowner Retrofits and Raise LPE (2, 5, 6, 14, 16, 17)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4)
Property #13: 5416 Spring Road	Property Acquisition	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4)
Property #14: 5419 Spring Road	Property Acquisition	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)
Property #15: 5421 Spring Road	Homeowner Retrofits and Raise LPE (2, 3 or 14, 4, 5, 6, 7, 8, 18)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)
Property #16: 5423 Spring Road	Homeowner Retrofits and Raise LPE (2, 3, 4, 5, 6, 7, 8, 9)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)
Property #17: 5425 Spring Road	Homeowner Retrofits and Raise LPE (2, 3, 4, 5, 6, 8, 9)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)

Property	**Site-Specific Flood Reduction Strategy**	**Structural Strategies** ***(To reduce or avoid site-specific flood reduction strategy)***
Property #18: 5427 Spring Road	Homeowner Retrofits and Raise LPE (1, 2, 3, 4, 5, 6, 8)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)
Property #19: 5429 Spring Road	Homeowner Retrofits and Raise LPE (3, 4, 5, 6, 7, 8)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)
Property #20: 5431 Spring Road	Homeowner Retrofits and Raise LPE (1, 2, 3, 4, 5, 6, 8)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)
Property #21: 4106 55th Avenue	Homeowner Retrofits and Raise LPE (2, 6)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)
Property #22: 4105 55th Avenue	Homeowner Retrofits and Raise LPE (2, 4, 5, 6, 8, 16, 19)	Channel Improvement (CI-4) Storm Drain Improvement (SD-1)
Property #23: 4103 55th Avenue	Homeowner Retrofits and Raise LPE (2, 4, 5, 6, 7, 8, 16, 19)	Channel Improvement (CI-4) Storm Drain Improvement (SD-1)
Property #24: 4101 55th Avenue	Homeowner Retrofits and Raise LPE (2, 4, 6, 8)	Channel Improvement (CI-4) Storm Drain Improvement (SD-1)
Property #25: 4100 56th Avenue	Homeowner Retrofits and Raise LPE (2, 5, 6, 8, 11, 14)	Culvert Enlargement (CE-4) Storm Drain Improvement (SD-1)
Property #26: 4102 56th Avenue	Homeowner Retrofits and Raise LPE (1, 2, 3, 4, 5, 6, 7, 8)	Culvert Enlargement (CE-4) Storm Drain Improvement (SD-1)
Property #27: 4104 56th Avenue	Homeowner Retrofits and Raise LPE (2, 4, 5, 6, 8, 16, 19)	Culvert Enlargement (CE-4) Storm Drain Improvement (SD-1)
Property #28: 4111 56th Avenue	Homeowner Retrofits and Raise LPE (2, 6, 20)	Culvert Enlargement (CE-4) Storm Drain Improvement (SD-1)
Property #29: 5416 Annapolis Road	Building Owner Retrofits and Raise LPE 10, 12)	Bridge Enlargement (BE-2) Bridge Enlargement (BE-3) Bridge Enlargement (BE-4) Channel Improvement (CI-1)

The following numbered list of homeowner retrofits is keyed to the summary table above. Some of the items may be required to be used multiple times at a property. Refer to the Strategy Recommended section associated with each property for more information.

Homeowner Retrofits

1. Waterproofed penetrations at basement wall
2. New battery backup sump pump, or add battery backup to existing sump pump
3. Exterior basement stairwell walls raised with flood gate
4. Roof (cover) and/or drain for exterior basement stairwell
5. Engineering assessment of existing structure
6. Flood-damage-resistant materials for lowest level floor and wall finishes
7. Waterproofed window well with cover
8. Raised HVAC
9. Flood glass window at basement window
10. Flood door at the commercial property
11. Waterproof portion of exterior basement wall surface
12. Floor drain with battery backup sump pump connection at enclosed stairwells at the commercial property
13. Flood vents
14. Flood-resistant door (a lower cost option that offers a residential style in comparison to a flood door)
15. Flood-resistant garage door or passive flood barrier in front of garage door
16. Raised concrete landing
17. Concrete wall around exterior wall of addition
18. Raised dryer vent penetration(s) of basement wall
19. Extend stairwell wall
20. Waterproof portion of foundation wall

1 Introduction

1.1 Flood Risks

Based on a preliminary flood risk assessment described in the Bladensburg Flood Protection Alternatives Evaluation Report (dated 10/16/2024), 28 residential properties and 1 commercial property (Save A Lot) in the Edmonston Channel watershed are impacted by a 1% annual-chance flood event (100-year event). The 100-year event has more than a 39% chance of occurring or being exceeded during any 50-year period. The 29 properties identified for impact exhibit a number of different risk factors ranging from basement or ground floor flooding that could be a few inches to several feet deep. Several homes have basement doors that are accessed by exterior stairs extending 5 or more feet below ground level. When flood levels exceed the upper landing level at those stairs, the stairwell will flood, and the flood loads will likely burst open the door, leading to complete flooding of the basement. Similarly, in at least one case the driveway dips below grade and extends down to a garage door where floodwater would be expected to build up against the garage door, eventually breaching it and flooding the basement. Window wells located below the flood level would likely also allow flooding of the basement. Once water enters these basements, contents, interior finishes, and possibly structural damage to walls would occur. The time required to remove the water would likely lead to significant mold development which could extend above the basement level.

This study includes flood modeling to evaluate expected flood depths at the buildings at risk. The information is checked against height measurements of various openings that could allow water to enter the buildings. The more important openings include doors and windows which at a minimum will leak and which are likely to burst open since they are not typically designed to withstand pressures associated with a foot or more of water depth. However, smaller penetrations for vents, pipes and utilities can lead to a significant amount of water leakage if the flood conditions last for an extended period of time. Other risks include the buildup of floodwater pressure against walls. Water pressure on walls can also extend below grade as the soil next to a wall becomes saturated. When this happens, the construction of the walls becomes critical as unreinforced walls may buckle inward and fail. Even if wall failure does not occur, brick and block walls are porous, and unless they are well protected by a waterproof membrane on the outside, they can become saturated or leak water to the interior. Wet walls provide moisture for mold development, and leaks can lead to significant interior water damage. Wood frame walls are prone to significant leakage once floodwater exceeds the point where they are connected to a floor slab or a foundation.

1.2 Flood Mitigation Strategies

A variety of site-specific flood mitigation strategies have been evaluated for each of the 29 properties. The overarching goal was to reduce the risk of flood damage during a 100-year event. Evaluations began with an assessment of whether the concept behind the strategy made practical sense for that property. Site-specific strategies were evaluated independently of proposed structural improvements to the Edmonston Channel's drainage infrastructure (e.g., widening bridges and culverts) but could potentially be used to enhance such improvements. Strategies were evaluated primarily for the potential to reduce damage from a 100-year flood, and secondarily for the potential to reduce damage from more frequent flood events. For each of the 29 properties, a site-specific flood mitigation strategy was selected for further consideration and coordination with property owners. The following strategies were assessed:

- Permanent flood wall (concrete flood wall or concrete curb)
- Dry floodproofing of the building to an established flood protection level
- Measures to raise elevation of building's lowest point of entry (for an exterior stairwell leading to a basement door this could involve raising or protecting the top of the stairwell entry)
- Site grading adjustments
- Property acquisition
- Homeowner flood retrofits (measures intended to reduce, but not eliminate flood risk)

The feasibility of these flood mitigation strategies was evaluated for each property based on available data (e.g., topographic, utility), flood modeling, building components, location, and other property features. Each strategy is described in Table 1.2.1 below, including potential advantages and disadvantages of their implementation.

Table 1.2.1 Evaluated flood mitigation strategies

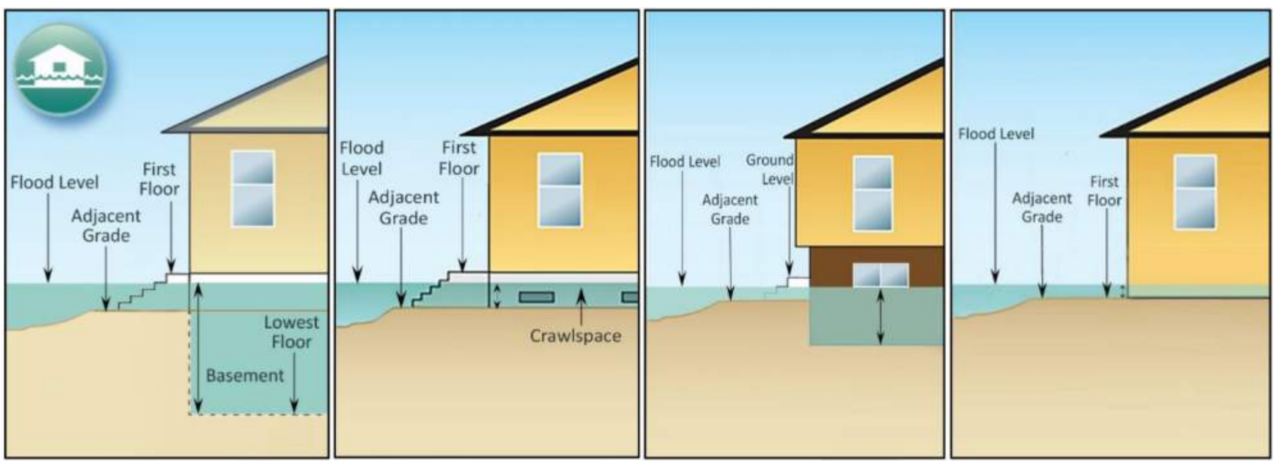
Flood Mitigation Strategy	Description	Advantages	Disadvantages
Homeowner Flood Retrofits	Homeowner flood retrofits consist of measures that can be taken to reduce but not eliminate flood risk. Homeowner flood retrofits operate as a menu of options to improve flood resistance with specific recommendations based on the property type and level of flood risk.	• This option offers a reduction of flood damage risk for internal components and contents, in combination with or in lieu of other strategies. • This option is less costly than other options. • This option can improve surface drainage and reduce localized flood risks.	• This strategy is not as consistently protective as other methods (e.g., dry floodproofing). • If a piecemeal strategy is used, it may not address all flood issues, and the structure and contents may remain at risk and ultimately sustain flood damage. • This strategy is not recommended for higher risk properties. • This strategy should be considered site-specific and findings from one assessment or feasibility study should not be extrapolated to another building.
Raising Elevation of Lowest Point of Entry	This measure involves raising the elevation of the lowest point of entry to at least the 100-year flood elevation, ensuring that the entry point remains above anticipated flood levels. This method improves flood resilience by maintaining emergency access and reducing reliance on temporary mitigation measures, especially for properties where full structural elevation is not feasible. While elevating the building and its utilities above the design flood elevation is the "gold standard" for reducing flood risks and is required for new construction, raising the elevation of the lowest entry point for flood waters represents a much less costly approach to flood mitigation for existing properties.	• This option offers a reduction in risk of flood damage to internal components and contents, in combination with or in lieu of other strategies. • This option is less costly than other options.	• This strategy is not as consistently protective as other methods (e.g., elevating the entire building or dry floodproofing). • If a piecemeal strategy is used (e.g. not assessing the strength of exterior walls that might be subjected to flood loads), it may not address all flood loads, and the structure may remain at risk and ultimately sustain flood damage. • This strategy should be considered site-specific and findings from one assessment or feasibility study should not be extrapolated to another building.
Site Grading and Placement of Fill	This measure involves the restructuring or reshaping of land surface surrounding a vulnerable building to redirect stormwater and flood flows away from the building. This strategy typically includes re-sloping surrounding terrain, constructing swales, or adding minor fill to raise low-lying areas, thereby improving surface drainage and reducing localized flood risks.	• This option is less costly than other options. • This strategy is most effective for shallow or low flood levels for redirection of surface flow.	• Re-grading is not suitable for homes where replacement of fill would impede egress/ ingress through exterior doors. • This strategy is not recommended for homes with low-lying basement windows or entryways if there are structural risks, and excessive soil load can compromise basement walls unless properly reinforced. • Increasing the amount of soil adjacent to a basement increases the soil load on the basement wall and can increase risk to the wall unless properly reinforced.
Dry Floodproofing	Dry floodproofing is a system of building retrofit measures that aims to keep floodwater from entering the interior of a building. These measures can include: waterproofing the walls; adding backflow preventers, flood doors, window flood barriers; and strengthening exterior walls and foundations to resist hydrostatic flood loads. It may be accompanied by elevating mechanical, electrical and plumbing equipment/components; and by adding sump pumps to remove any water that does enter. It is formally defined as a combination of measures that results in a structure, including the attendant utilities and equipment, being watertight with all elements substantially impermeable or above the flood level and with structural components having the capacity to resist flood loads (ASCE 24-24). • **Technical Feasibility**: Many of the properties mentioned in this report will be excluded from the use of a dry floodproofing strategy because they have basements or wood frame construction that extends below the flood level. • **Maintenance and Inspection:** Regular inspection and maintenance of barriers and seals associated with dry floodproofing systems are crucial to prevent breaches.	• Dry floodproofing designs ensure structural components can resist all flood loads up to the design level. • This strategy is most effective for non-residential buildings.	**Technical Feasibility**: Implementing dry floodproofing for these properties would require excessive costs and additional difficulties including ongoing inspection and maintenance. • Required renovations could be extensive, and include expanding the foundation size, enlarging and anchoring the lowest level concrete slab, reinforcing existing walls, installing sump pumps for internal drainage, waterproofing exterior walls, and making doors, windows, and frames watertight. • Many of the passive systems would also utilize a newly built (or separately located) support structure or foundation for proper load resistance. ▪ Active systems may require storage of parts of the system when it is not deployed. • Some of these construction efforts could require temporary relocation of the property dweller. • Implementation of dry floodproofing in homes with basements is likely to be more difficult and more expensive.

Flood Mitigation Strategy	Description	Advantages	Disadvantages
Dry Floodproofing (cont'd)			**Permitting**: The project site falls within the County-mapped Department of Permitting, Inspections and Enforcement (DPIE) floodplain. It is expected that County floodplain design and construction standards will apply to this mapped area. If the cost of dry floodproofing exceeds the trigger for substantial improvement (when the cost of the improvement equals or exceeds 50% of the market value of the building less land value) then the building code standards and county floodplain standards for new construction will apply. The County building code requires that substantially improved buildings be elevated at or above the flood design elevation and will require abandonment of the basement level. **Maintenance and Inspection**: Homeowners are not always knowledgeable of long-term maintenance needs, nor are they able to sustain regular maintenance and inspection, which can put homes at risk of flooding even when a dry floodproofing system has been properly designed and constructed.
Permanent Floodwall *(Floodwalls or Curbs)*	A concrete reinforced barrier designed to prevent floodwaters from reaching buildings or critical areas. These walls are typically engineered to withstand hydrostatic and hydrodynamic pressures (pressures due to the weight of water and due to the force of flowing water, respectively) and are constructed to a specified height, often with one foot of freeboard (extra height) above the 100-year flood level, to divert or block overland flow. A concrete curb, while smaller in scale, serves as a passive flood diversion feature that can redirect shallow flooding away from vulnerable building edges or infrastructure, and may be used in tandem with dry floodproofing or site grading adjustments.	• This strategy can offer robust protection, especially for clustered properties. • No changes to the building are typically required.	Easements may be required to access private property for floodwall construction. • If property accesses and/ or attainment of a county easement to allow for construction of the floodwall, associated footing, and maintenance activities are not obtained, then it will prevent this mitigation strategy from being used. On properties where the placement of a floodwall can increase the water volume to other neighboring properties, thus increasing their flood risk, this strategy would not be considered as a feasible option. A group of connected properties can collaborate to build a continuous floodwall that protects the group of buildings. They must agree in unison for this option to proceed; otherwise, it risks exposing the unprotected homes to worsened flood levels.
Property Acquisition	Property acquisition is a permanent flood mitigation strategy in which flood-prone properties are purchased—typically by a government agency or through grant-funded programs—and then demolished or relocated, most often preserving the land as open space to eliminate future flood risk. • FEMA's Property Acquisition Handbook emphasizes that this method is often the most cost-effective solution for high-risk areas, especially when other structural or site-specific measures are infeasible or would only offer partial protection.	• The use of transparent and frequent communication with property owners can facilitate comfortability. ▪ This communication can also support successful property acquisition by informing owners of the risk evaluation process, fair market value offer, and acquisition procedures. • This strategy may be more cost effective in the long-term, especially when other structural or site-specific measures are infeasible or would only offer partial protection. • It can provide the added benefit of creating a community amenity by replacing the residential property with a community feature on the lot, such as a park.	• This strategy may cause undue stress or discomfort with property or homeowners, especially if the owner does not have first-hand experience with flood damage and are facing the decision of moving based on potential future flood risk. • Negotiations for acquisition can be complicated and entail lengthy administration processes.

1.3 Site-Specific Flood Risk Assessment

There are several common building types in the Edmonston Channel watershed, including properties with subgrade basements, crawlspaces, split-level homes, and properties without basements (slab-on-grade). Figure 1.3.1 below depicts how these properties could be inundated during a potential 100-year flood event. Floodwater can enter these buildings through doors, windows, wall penetrations, basement wall-to-footing and floor slab joints, or other connection points (both above grade when the flood level exceeds that depth or below grade under conditions where the soil is water-saturated) where a building envelope does not have a watertight seal.

A field assessment was conducted to evaluate flood risk by collecting critical building elevations (through topographic survey or manual measurements) and comparing them to the estimated 100-year flood levels. Field assessments also included exterior visual and photographic inspections and analyses. Data or anecdotal information regarding the building interiors were not collected unless provided directly by the property owners. No destructive investigations were included in the scope of work. Some properties were not fully accessible or may have had objects blocking full and complete observations. Critical building elevations determined include main floor, adjacent grade, basement door thresholds, basement windowsills, where applicable, and lowest point of entry.



Property with Subgrade Basement | **Property with Crawlspace** | **Split level** | **Slab-on-Grade Property**

The lowest point of entry is the lowest elevation at which floodwater can pour into a lower entry point (i.e., recessed basement door at the of an exterior stairwell) or enter the building directly; (e.g., windows, doors, vents, wall/floor penetrations, or drains).

Figure 1.3.1 Flood level and critical building elevations by property type

Table 1.3.1 and Figure 1.3.2 below show an example of critical building elevations relative to the 100-year flood level, as presented for each of the 29 properties in this document.

Table 1.3.1 Example of critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.0 feet	Elevation relative to WSE
100-year Water Surface Elevation (WSE)	**58.0 feet**	**Elevation relative to sea level based on North American Vertical Datum of 1988 measurement**
Lowest Point of Entry (LPE)	-1.5 feet	Upper landing to stairs for basement door, elevation relative to WSE
Adjacent Grade	-2.0 feet	Elevation relative to WSE
Basement Door	-5.5 feet	Elevation relative to WSE

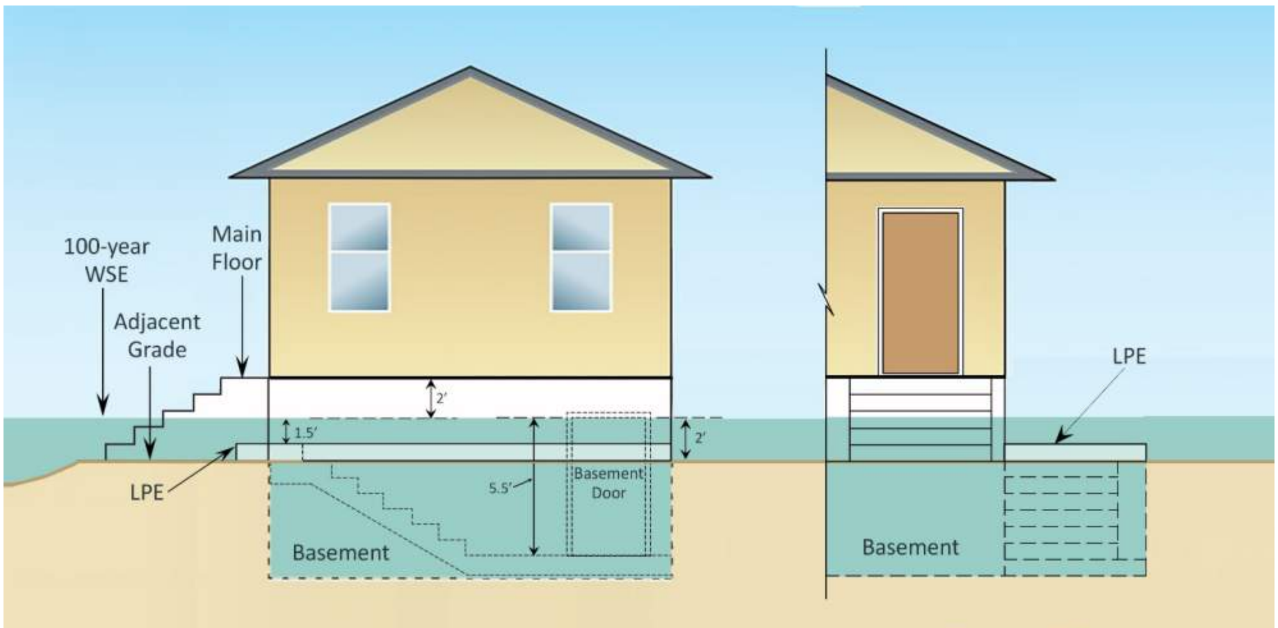


Figure 1.3.2 Example of critical building elevations relative to 100-year flood level (left: side view; right: front view)

2 Site Evaluations

The following subsections present an assessment of the 29 properties identified in the Edmonston Channel watershed as being at risk of flood damage from a potential 100-year flood event. Figure 2.1 shows the approximate location of the 29 buildings within the watershed. The assessment findings for each property include:

- **Description:** Site and building description with photos from the field assessment associated with noteworthy elements.
- **Flood Risk:** Flood risk evaluation that discusses the components and features most at risk to a 100-year flood event, including mapping results from the modeling analysis and a table of critical building elevations relative to the 100-year water surface elevation (flood level).
- **Strategy Recommended:** Flood mitigation strategy recommended to reduce flood risk for the building.
- **Strategies Considered:** Flood mitigation strategies considered but not recommended for implementation to reduce flood risk.
- **Structural Strategies:** The proposed watershed-level structural improvements that would reduce flood risk for the building or potentially remove the building from the 100-year floodplain.

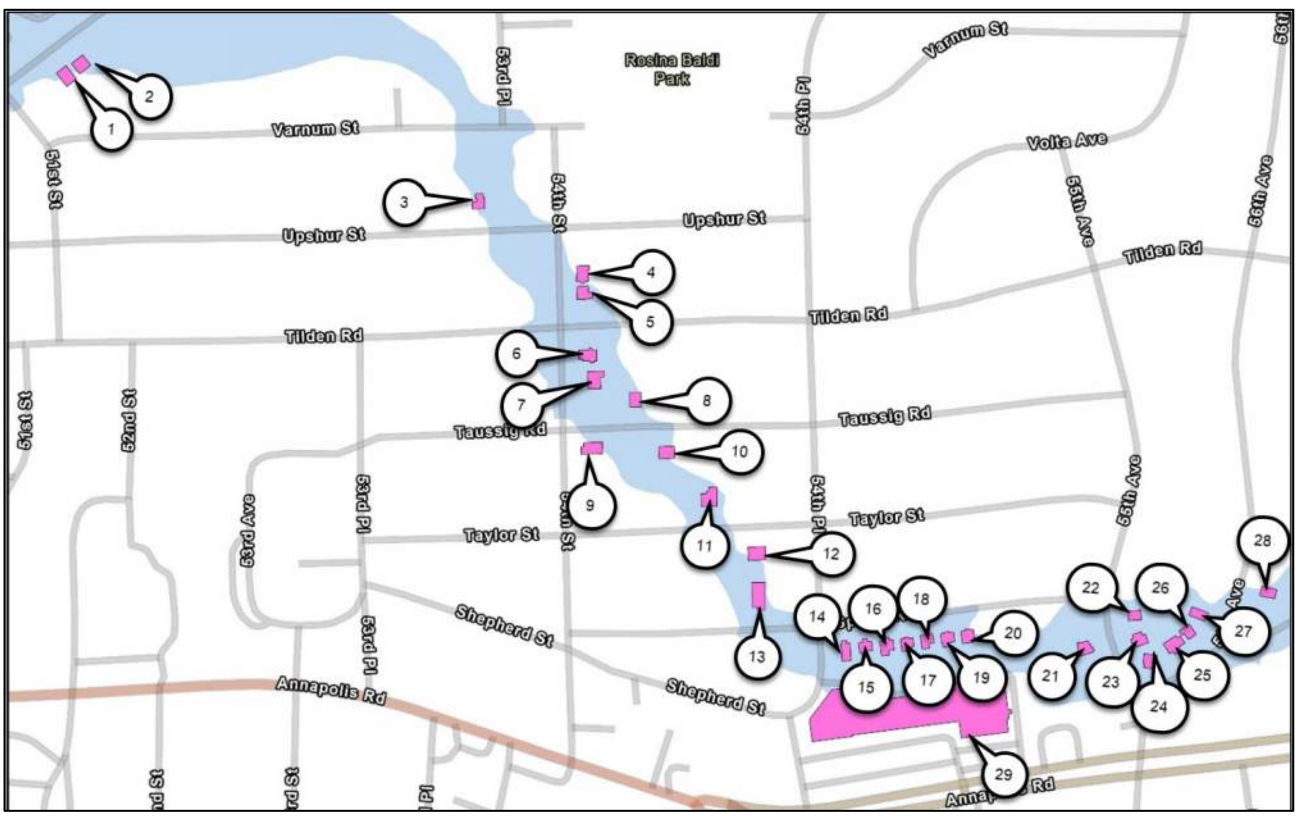


Figure 2.1 Location of the 29 flood-prone properties in the Edmonston Channel watershed

2.1 Property #1: 4319 Edmonston Road

2.1.1 Description

The property at 4319 Edmonston Road consists of a one-story building with a first-floor entrance on the northwest side and a lowest floor (basement) entrance on the northeast side. Basement windows are located at the northwest (front), northeast, and southwest sides of the building. There are several wall penetrations, such as a hose bib, dryer vent, and electrical panel. The HVAC unit is located at grade level on the southeast (back) side of the building. Figure 2.1.1.1 below provides an aerial view of the home with topographic elevation contours, and is further depicted in Figure 2.1.1.2, Figure 2.1.1.3, Figure 2.1.1.4, and Figure 2.1.1.5

Figure 2.1.1.1 Property #1: Aerial view with elevation contours and photo numbering

Figure 2.1.1.2 Property #1: Front side (northwest side)

Figure 2.1.1.3 Property #1: Side (southwest side)

Figure 2.1.1.4 Property #1: Back side (southeast side)

Figure 2.1.1.5 Property #1: Side (northeast side) with side door above and basement door below

2.1.2 Flood Risk

The property at 4319 Edmonston Road is located southwest of the Edmonston Channel retention area. Flood modeling indicates that the retention area's capacity is exceeded during the 100-year event, with overland flow moving southwest along Edmonston Road. The 100-year floodplain encroaches on the building's northeast corner at the top of the driveway. See Figure 2.1.2.1. The 100-year flood level is 3.3 feet below the first floor. However, floodwater could potentially enter the basement through a window located on the northwest side. Table 2.1.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the basement windowsill is slightly above the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation.

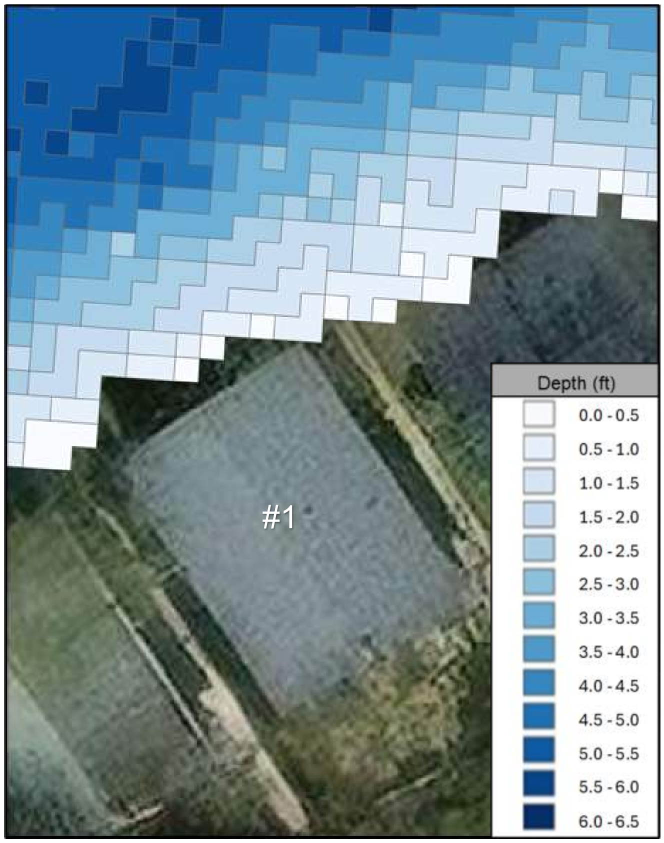


Figure 2.1.2.1 Property #1: 100-year flood depth above grade

Table 2.1.1 Property #1: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.3 feet	
Lowest Point of Entry	+0.2 feet	Basement Windowsill at Front Side
100-year Water Surface Elevation	**32.4 feet**	
Adjacent Grade	-1.0 feet	
Basement Door	-4.9 feet	

2.1.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

Since the flood level is below the lowest point of entry, none of the strategies investigated are required to meet the flood elevation associated with the 100-year flood. Nevertheless, there are some actions that can be taken to provide additional safety from flooding that exceeds this level. The following retrofits are recommended:

- Install a flood glass window at the northwest side basement window to help reduce water intrusion and raise the lowest point of entry. Egress requirements may also need to be assessed.
- Increase the height of the basement stairwell wall on the northeast side by at least 1 foot. The flood modelling indicates that the extent of 100-year flooding is not likely to breach the landing at the top of the stairs; however, an increased wall height could provide additional protection from floodwater intrusion.
- Prior to installing the two retrofits listed above, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Install a battery backup sump pump in the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.

2.1.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: This strategy is not recommended for this property since the driveway already has a significant slope and does not warrant the additional slope increase that would be caused by the addition of fill. Also, the additional soil load from the fill may require reinforcing the existing basement walls. There is also concern that additional fill would redirect floodwater to adjacent properties and increase their risk of flooding.

Permanent Floodwall: Floodwall placement is not advised for this property. Given the direction of the projected flow southwest down Edmonston Road, a floodwall could restrict access to the building and driveway.

2.1.5 Structural Strategies

Based on an evaluation of modeled alternatives, none of the proposed watershed-level strategies would reduce flood risk for this property. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.2 Property #2: 4321 Edmonston Road

2.2.1 Description

The property at 4321 Edmonston Road consists of a split-level building with the front door on the northwest side and ground floor entrance on the southeast side (back). The grade slopes from the backyard towards the front of the house. There are four ground floor windows at the northwest (front) side of the building near grade level. There is an additional window on the back (southeast) side and one on the southwest side of the building, both above grade. The HVAC unit is roughly at grade level on the southwest side of the building. Figure 2.2.1.1 below provides an aerial view of the home with topographic elevation contours, and is further depicted in Figure 2.2.1.2, Figure 2.2.1.3, Figure 2.2.1.4, and Figure 2.2.1.5.

Figure 2.2.1.1 Property #2: Aerial view with elevation contours and photo numbering

Figure 2.2.1.2 Property #2: Front side (northwest side)

Figure 2.2.1.3 Property #2: Side (northeast side)

Figure 2.2.1.4 Property #2: Back side (southeast side)

Figure 2.2.1.5 Property #2: Side (southwest side)

2.2.2 Flood Risk

The property at 4321 Edmonston Road is located southwest of the Edmonston Channel retention area. Flood modeling indicates that the retention area's capacity will be exceeded in a 100-year event, with overland flow moving southwest along Edmonston Road. The 100-year floodplain extends to the lowest level wall at the northeast and northwest sides of the building. See Figure 2.2.2.1. The 100-year flood level is 2.8 feet below the main floor. However, floodwater could potentially enter through the front door or a window located on the northwest side. Table 2.2.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the front door and ground floor windowsill is slightly below the 100-year water surface elevation. An exterior electrical outlet with an elevation similar to the windowsill at the front of the building is also slightly below the 100-year water surface elevation.

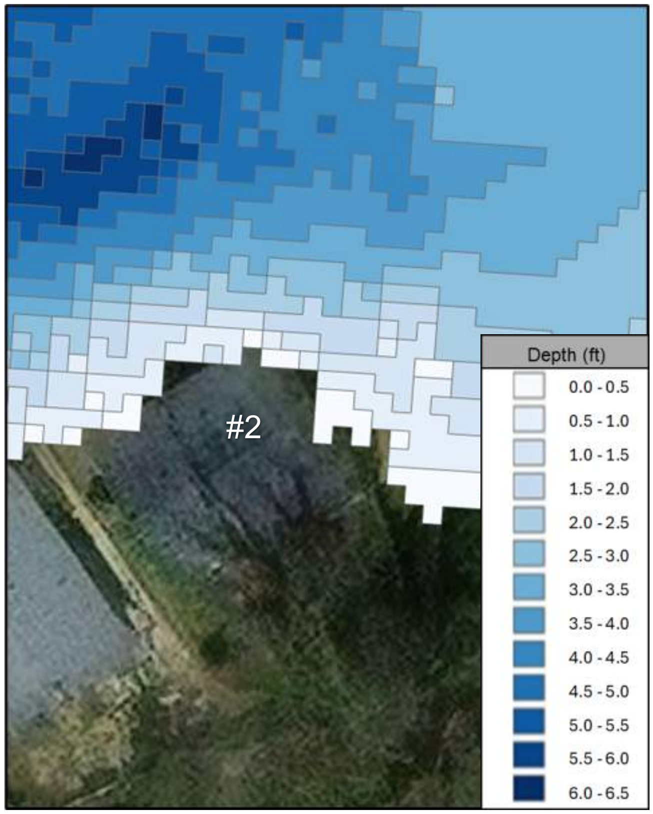


Figure 2.2.2.1 Property #2: 100-year flood depth above grade

Table 2.2.1 Property #2: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+5.3 feet	Upper Level of Split-Level Building
100-year Water Surface Elevation	**32.2 feet**	
Lowest Point of Entry	-0.1 feet	Front Door/Ground Floor Windowsills at Northwest Side
Adjacent Grade	-1.6 feet	
Ground Floor (Basement) Door	-3.5 feet	Southeast Side

2.2.3 Strategy Recommended

Homeowner Flood Retrofits with Floodwall and Raise the Lowest Point of Entry

Given the property's evaluated flood level, this strategy would help mitigate flood risk for this property. The following retrofits are recommended:

- Excavate around the property's northeast side exterior ground floor (basement) wall. Install exterior surface waterproofing to the footing and ground floor wall that is below grade. The waterproofing should extend 2 feet above grade and include the chimney area.
    - Prior to installing these retrofits, a structural evaluation should be performed to determine if the existing wall can withstand pressures associated with modelled flood loads. Wall reinforcement may be needed.
- Construct a floodwall along the front (northwest) side of the building to protect the four windows and front door. Replace the existing garden walls with a floodwall. Install a flood gate in the floodwall between floodwall segments at the walkway. These floodwall segments and flood gate will prevent water from entering the existing garden beds, front door, and ground floor windows, thereby raising the lowest point of entry, and reducing flood pressure on the northwest ground floor wall.
- Install a battery backup sump pump at the ground floor to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Replace interior ground floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Install a drain at the lower landing at the back (south) side basement door that is connected to the new sump pump.
- Construct a cover for the lower landing of the back (south) side basement door that is hung from the underside of the back deck.

2.2.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: This strategy is not recommended as the property does not have sufficient space for the necessary amount of fill needed to protect the building. Additionally, the large amount of fill would increase the soil load on the ground floor (basement) wall and put the wall at risk if additional reinforcement is not provided. It would also increase the amount of flooding to properties downstream.

2.2.5 Structural Strategies

Based on an evaluation of modeled alternatives, none of the proposed watershed-level strategies would reduce flood risk for this property. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.3 Property #3: 5312 Upshur Street

2.3.1 Description

The property at 5312 Upshur Street consists of a two-story building with a first-floor addition on the north side (back) of the home. There is a small door under the first-floor addition that likely leads into the basement. The bottom of the door is approximately at grade. There are two electrical panels, one located on the east side and one on the west side of the building, both located a few feet above grade. The east side of the building also has a vent located approximately 2.7 feet above grade along with the HVAC unit at approximately 0.3 feet above grade. The basement is partially finished. Figure 2.3.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.3.1.2, Figure 2.3.1.3, Figure 2.3.1.4, Figure 2.3.1.5 and Figure 2.3.1.6.

Figure 2.3.1.1 Property #3: Aerial view with elevation contours and photo numbering

Figure 2.3.1.2 Property #3: Front side (south side)

Figure 2.3.1.3 Property #3: Side (east side)

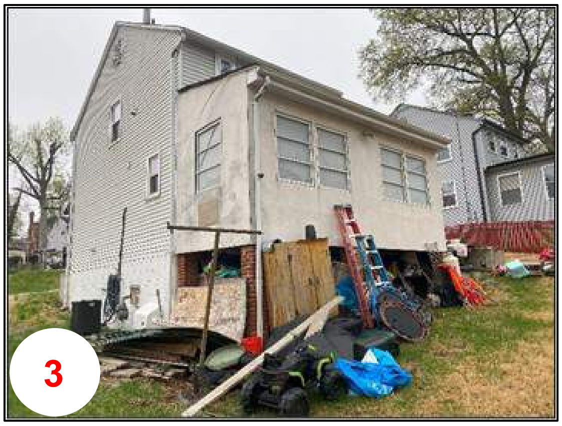


Figure 2.3.1.4 Property #3: Back side (north side)

Figure 2.3.1.5 Property #3: Back side (under first-floor addition)

Figure 2.3.1.6 Property #3: Side (west side)

2.3.2 Flood Risk

The property at 5312 Upshur Street borders the Edmonston Channel on the east side of the property. Floodwater collects in the backyard after encountering blockage at the Varnum Street bridge north of the property. The modeled 100-year flood could extend below the first-floor addition at the building's north side. See Figure 2.3.2.1. Flood modeling indicates that the 100-year flood level is 6.8 feet below the first floor. However, floodwater could potentially enter the basement through a door on the north side. Table 2.3.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the basement door is slightly below the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation. The homeowner reported no knowledge of past flooding. Note that the objects under the first-floor addition may have prevented the identification of other flood risks.

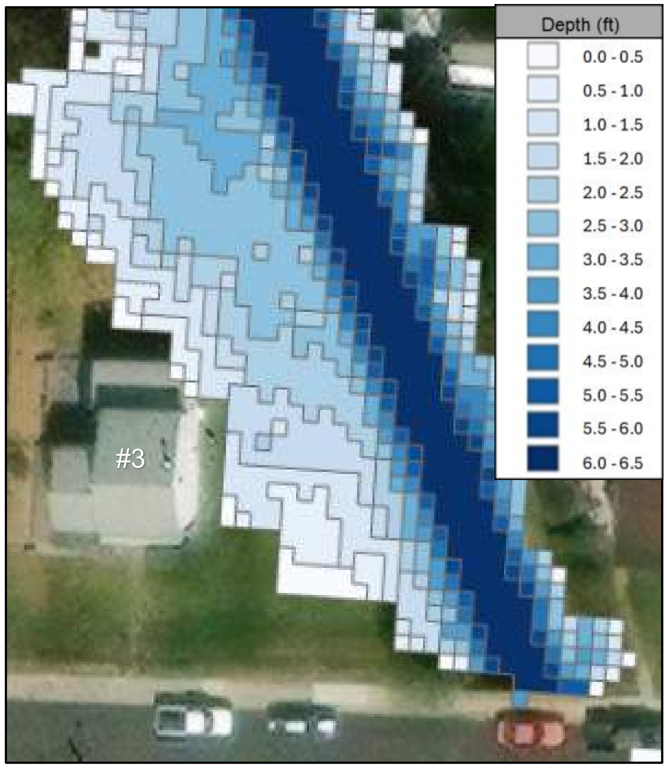


Figure 2.3.2.1 Property #3: 100-year flood depth above grade

Table 2.3.1 Property #3: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+6.8 feet	
100-year Water Surface Elevation	**44.7 feet**	
Lowest Point of Entry	-0.5 feet	Basement Door
Adjacent Grade	-0.5 feet	

2.3.3 Strategy Recommended

Grading and Placement of Fill and Raise the Lowest Point of Entry

This strategy would help mitigate flood risk for the building by creating a higher point of entry for floodwater to enter the basement. The following retrofits are recommended:

- Regrade the backyard by cutting soil from the backyard and add fill near the back patio. The additional fill will create a mound of 6 inches or more around the patio at the north side. This will raise the lowest point of entry for floodwater to the top of the mound. Plant grass at the cut and fill areas. It is important to use soil cut from the flooded area in the backyard for the construction of the 6-inch mound to avoid increasing flood depths elsewhere in the channel by hauling in fill.

2.3.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Homeowner Flood Retrofits: Given the limited risk of flooding, homeowner retrofits would be a higher cost than the addition of fill, as described above, for a similar degree of flood protection.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not needed nor recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements and are excessive given the level of a 100-year flood. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Permanent Floodwall: Given the limited risk of flooding, the building of a permanent floodwall would be a higher cost than the addition of fill, as described above, for a similar degree of flood protection.

2.3.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Varnum Street (BE-1) and channel improvements from Varnum Street to Upshur Street (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.4 Property #4: 4305 54th Street

2.4.1 Description

The property at 4305 54th Street consists of a one-story building with a basement. The basement has a newly installed sump pump system that does not include a battery power backup. According to the homeowner, the sump pump was provided by the local government and drains directly into the Edmonston Channel. The building has a front door elevated at the top of a stair landing on the front (west) side, while a side door is positioned near grade level on the south side. There are two basement windows near grade level with one located on the west side and one on the north side. There is also an electrical panel on the north side of the house positioned a few feet above grade. Figure 2.4.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.4.1.2, Figure 2.4.1.3, and Figure 2.4.1.4. Only three sides of the home were photographed as the homeowner did not grant access to the backyard of the property.

Figure 2.4.1.1 Property #4: Aerial view with elevation contours and photo numbering

Figure 2.4.1.2 Property #4: Front (west side)

Figure 2.4.1.3 Property #4: Side (north side)

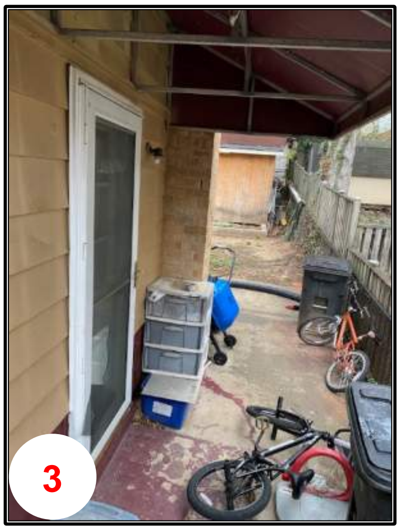


Figure 2.4.1.4 Property #4: Side (south side)

2.4.2 Flood Risk

Flood modeling indicates that the capacity of the Edmonston Channel culvert at Taussig Road will be exceeded in a 100-year event, as it will cause overland flow northward along 54th Street, with floodwater extending to the front (west) building wall of 4305 54th Street. See Figure 2.4.2.1. The 100-year flood level is approximately 3 feet below the first floor. Additionally, floodwater will be slightly below the lowest point of entry by 0.2 feet at the basement windowsill on the front (west) side of the building. Table 2.4.1 below lists the critical building elevations relative to the 100-year flood level. None of the basement wall penetrations are below the 100-year water surface elevation. Note that the objects adjacent to the exterior walls may have prevented the identification of other flood risks.

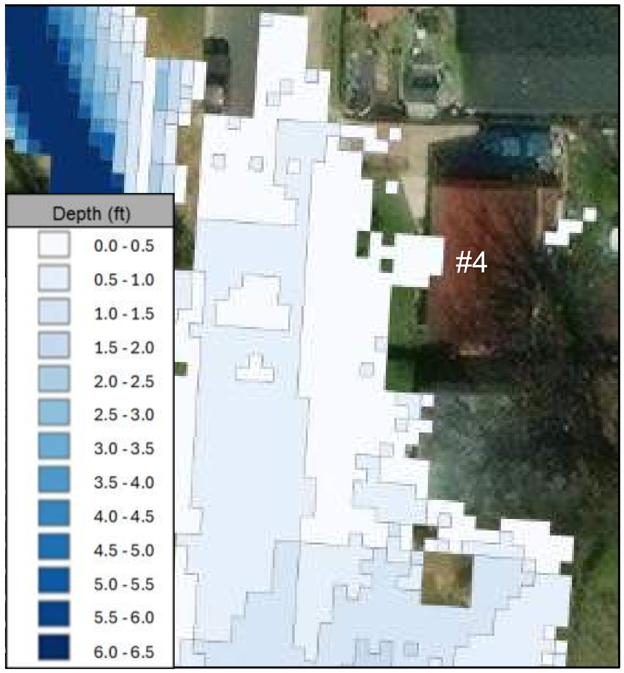


Figure 2.4.2.1 Property #4: 100-year flood depth above grade

Table 2.4.1 Property #4: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.3 feet	
Basement Door	+0.8 feet	
Lowest Point of Entry	+0.2 feet	Basement Windowsill
100-year Water Surface Elevation	**53.6 feet**	
Adjacent Grade	-0.5 feet	

2.4.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

Since the flood level is below the lowest point of entry, this strategy would help mitigate flood risk for this property. The following retrofits are recommended:

- Install a battery backup for the sump pump system.
- Install a waterproof window well with cover to protect the home's basement window on the west side. Extend the window well side walls a minimum of 1 foot above the adjacent grade to raise the lowest point of entry. If the window is needed for basement emergency egress, make sure the cover (if used) does not prevent proper egress.

2.4.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: This strategy is not recommended as the land around the home is relatively flat, especially in the front yard. This would limit the feasibility of including a suitable path for site drainage.

Permanent Floodwall: Floodwall placement is not advised for this property. Given the limited risk of flooding, the building of a permanent floodwall would be a higher cost than the homeowner retrofits, as described above, for a similar degree of flood protection. A floodwall also could restrict access to the property and driveway. It could potentially increase the amount of flooding to properties downstream.

2.4.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Taussig Road (BE-5) and channel improvements from Upshur Street to 54th Street (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.5 Property #5: 4303 54th Street

2.5.1 Description

The property at 4303 54th Street consists of a one-story building with a basement and sump pump.
The building has a front door elevated at the top of a stair landing on the front (west) side, while a side door to the building is positioned near grade level on the south side. The building has two basement windows and a hose bib on the front (west) side. A dryer vent penetrates the basement wall approximately 6 inches above grade at the south side. The HVAC unit is located at grade at the southeast corner. Figure 2.5.1.1 below provides an aerial view of the home with topographic elevation contours and the property is further depicted in Figure 2.5.1.2 and Figure 2.5.1.3.

Figure 2.5.1.1 Property #5: Aerial view with elevation contours and photo numbering

Figure 2.5.1.2 Property #5: Front side (west side)

Figure 2.5.1.3 Property #5: Side (south side)

2.5.2 Flood Risk

Flood modeling indicates that the capacity of the Edmonston Channel culvert at Taussig Road will be exceeded in a 100-year event, as it will cause overland flow northward along 54th Street with floodwater extending to the front (west) and south side building walls of 4303 54th Street. See Figure 2.5.2.1. The 100-year flood level is 2.7 feet below the first floor. Floodwater could potentially enter the basement through the basement window at the front (west) side. Table 2.5.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the basement windowsill is at the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation. Note that the restricted access to the backyard by the fence may have prevented the identification of other flood risks.

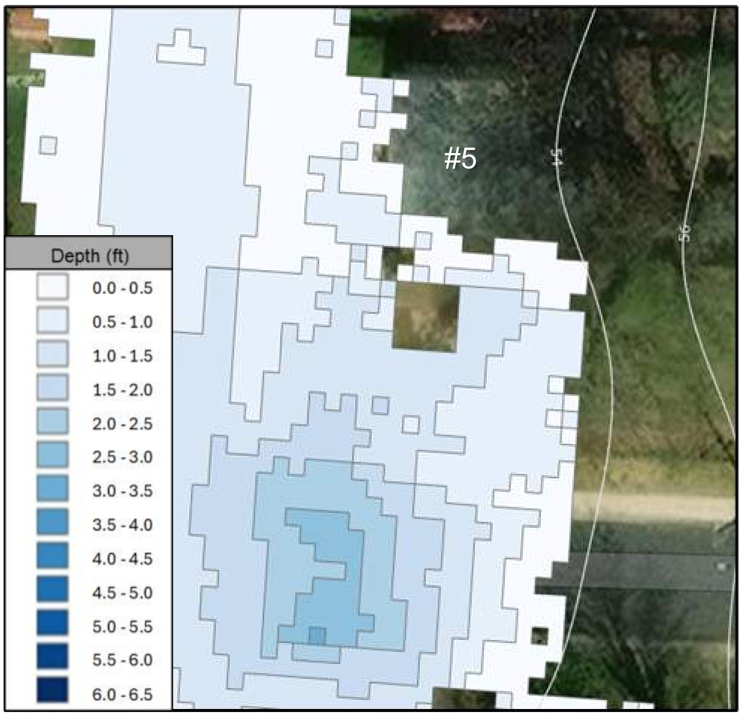


Figure 2.5.2.1 Property #5: 100-year flood depth above grade

Table 2.5.1 Property #5: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.7 feet	
Side Door	+1.0 feet	
100-year Water Surface Elevation	**54.2 feet**	
Lowest Point of Entry	-0.0 feet	Basement Windowsill
Adjacent Grade	-1.4 feet	

2.5.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

Since the flood level is at the lowest point of entry, this strategy would help mitigate flood risk for this property. The following retrofits are recommended:

- Install a battery backup for the sump pump at the basement, if one does not already exist.
- Retrofit the interior of the lowest floor with flood resistant materials to limit damage from water intrusion (e.g., replace the carpet with tiles or replace the paper-faced gypsum board with wood paneling (wainscoting)).
- Install waterproof window wells with covers around the basement windows. Make sure the window well walls extend a minimum of 1 foot up from the bottom of the window to raise the lowest point of entry. If the window is needed for basement emergency egress, make sure the cover (if used) does not prohibit proper egress.
- Prior to installing the previous retrofit, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Raise the HVAC unit so that the bottom is at least 2 feet above grade.

2.5.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: This strategy is not recommended because the land around the home is relatively flat, especially in the front yard. This would limit the feasibility of including a suitable path for site drainage. It could potentially increase the amount of flooding to properties downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. Given the direction of projected flow of floodwater, a floodwall could restrict access to the property and driveway. Constructing a permanent floodwall would be a higher cost than homeowner retrofits, as described above, for a similar degree of flood protection. It could potentially increase the amount of flooding to properties downstream as well.

2.5.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Taussig Road (BE-5) and channel improvements from Upshur Street to 54th Street (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.6 Property #6: 5401 Tilden Road

2.6.1 Description

The property at 5401 Tilden Road consists of a structural brick building with a garage and basement. Stairs at the front (north) of the house lead up to an elevated front entrance landing. The driveway slopes downward from the road to the garage door at the basement level. The garage door is more than a foot below the top of the driveway. There is a trench drain in front of the garage door. Basement windows are located near grade level at each side of the building. The building has several wall penetrations for cable penetrations, a hose bib, a dryer vent, and an electric meter. Each of these penetrations is more than 18 inches above grade. The HVAC unit is at grade along the back (south) side. Figure 2.6.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.6.1.2, Figure 2.6.1.3, Figure 2.6.1.4, and Figure 2.6.1.5.

Figure 2.6.1.1 Property #6: Aerial view with elevation contours and photo numbering

Figure 2.6.1.2 Property #6: Front side (north side)

Figure 2.6.1.3 Property #6: Side (east side)

Figure 2.6.1.4 Property #6: Back side (south side)

Figure 2.6.1.5 Property #6: Side (west side)

2.6.2 Flood Risk

Flood modeling indicates that the capacity of the Edmonston Channel culvert at Taussig Road will be exceeded in a 100-year event, as it will cause overland flow northward along 54th Street, with floodwater surrounding the building at 5401 Tilden Road. See Figure 2.6.2.1. The 100-year flood level is 2.8 feet below the first floor. However, the floodwater depth of 5.7 feet above the bottom of the garage door poses significant threat to the building. Floodwater would likely enter the basement through the garage at the front (north) side and basement windows on all four sides of the building. The basement windowsills are approximately 1 foot below the 100-year flood level. The HVAC unit at the back (south) side of the building is at risk to floodwater as well. Table 2.6.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the driveway would be the first location floodwater would exceed a critical elevation and begin to pose a flooding threat to the garage and basement. This location is approximately 4.7 feet below the 100-year water surface elevation. Also, a dryer vent with an elevation similar to the 100-year water surface elevation is at risk to floodwater. Note that the objects adjacent to the exterior walls may have prevented the identification of other flood risks.

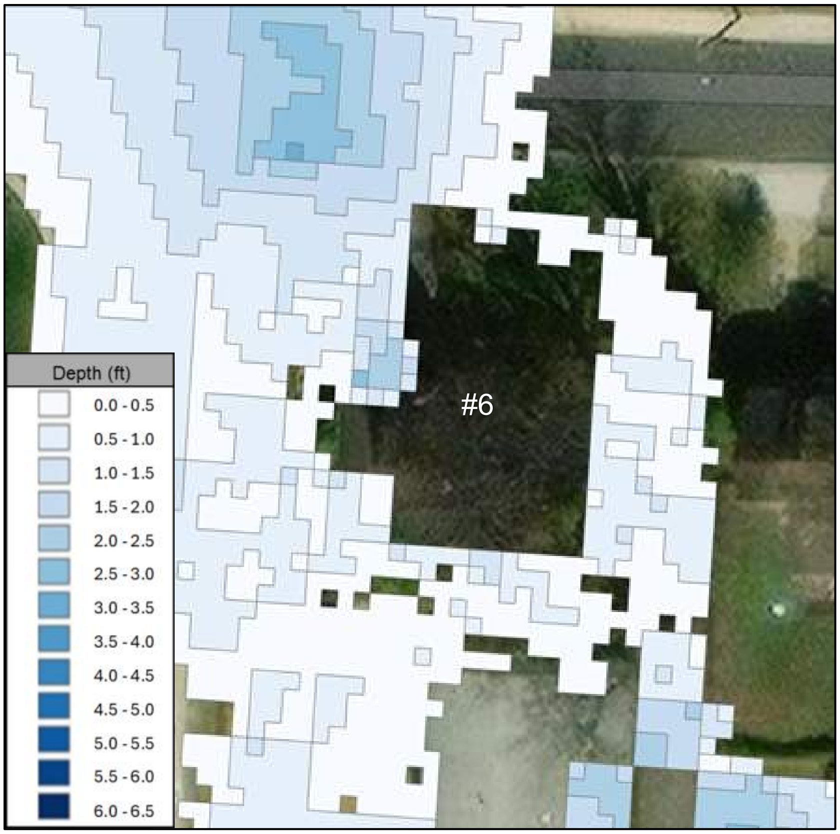


Figure 2.6.2.1 Property #6: 100-year flood depth above grade

Table 2.6.1 Property #6: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.8 feet	
100-year Water Surface Elevation	**56.8 feet**	
Basement Windowsills at North, East, South, and West Sides	-1.1 feet	
Lowest Point of Entry	-4.7 feet	Driveway
Garage Door	-5.7 feet	
Lowest Adjacent Grade	-5.7 feet	Bottom of Driveway

2.6.3 Strategy Recommended

Property Acquisition

Property acquisition is the preferred recommendation. This property has a very high risk of flooding from a 100-year event compared to many other properties in the watershed as floodwater could surround the building. To protect the basement from flooding, major retrofits would be required to resist the flood loads imposed on the basement/foundation walls. Without significant structural and soil saturation evaluations, renovations that simply block the floodwater may threaten the structural integrity of the existing basement construction and pose a risk to the building. Property acquisition can help prevent future flood damage and preserve lives that could be lost from building failure. When the building is demolished through property acquisition, it has the added benefit of creating a community amenity by replacing the residential property with a community feature on this lot, such as a park.

2.6.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Homeowner Flood Retrofits and Raise the Lowest Point of Entry: Given the extent of flooding around the building, homeowner retrofits and raising the lowest point of entry would simply block floodwater and may threaten the structural integrity of the existing basement construction while posing a risk to the building. This would likely involve exorbitant costs and require temporary relocation of the occupants for an extended period of time while the building goes through major structural renovations to resist flood loads.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Also, prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It likely would increase the amount of flooding to properties nearby and potentially to those downstream.

2.6.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Taussig Road (BE-5) and channel improvements from Upshur Street to 54th Street (CI-1) would reduce the flood risk to the property during a 100-year storm event. However, the building would still be in the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.7 Property #7: 4211 54th Street

2.7.1 Description

The property at 4211 54th Street consists of a single-story brick veneer building with a basement door on the north side. A sump pump is located next to the basement door. Basement windows are located near grade level at each side of the building. Several of the basement windows are covered with boards on the back (east) side of the home. An addition to the home was added on the northeast end, which has an additional door at grade. The HVAC unit is located on the back (east) side at grade. There are exterior basement wall penetrations on the north, east, and south sides of the building for a plumbing pipe, electrical service, cable, hose bib, and a stairwell fixture. Figure 2.7.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.7.1.2, Figure 2.7.1.3, Figure 2.7.1.4, Figure 2.7.1.5 and Figure 2.7.1.6.

Figure 2.7.1.1 Property #7: Aerial view with elevation contours and photo numbering

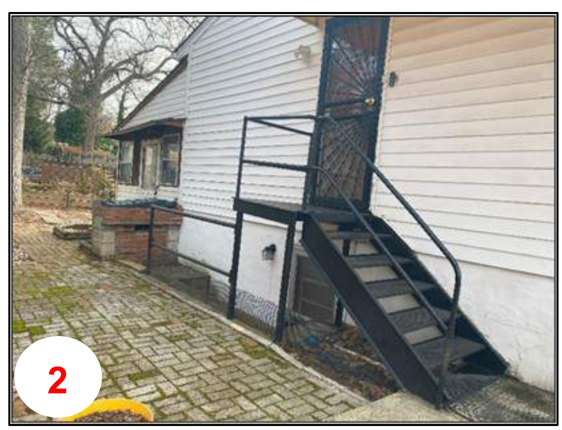


Figure 2.7.1.2 Property #7: Front side (west side)

Figure 2.7.1.3 Property #7: Side (north side)

Figure 2.7.1.4 Property #7: Side addition (north)

Figure 2.7.1.5 Property #7: Back (east side)

Figure 2.7.1.6 Property #7: Side (south)

2.7.2 Flood Risk

Flood modeling indicates that the capacity of the Edmonston Channel culvert at Taussig Road will be exceeded in a 100-year event, as it will cause overland flow northward along 54th Street with floodwater surrounding the building at 4211 54th Street. See Figure 2.7.2.1. The 100-year flood level is approximately 1.5 feet below the first floor. Floodwater will likely enter the basement through the basement door at the north side and basement windows at the south and east sides of the building. The basement windows are approximately 1.6 feet below the 100-year flood level. The addition at the back (east) side is at risk to floodwater entering the building, with the exterior door approximately 1.3 feet below the 100-year flood level. The HVAC unit at the back (east) side of the building is approximately 2 feet below the 100-year flood level. Table 2.7.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the upper stair landing to the basement door would be the first location floodwater would exceed a critical elevation and begin to pose a flooding threat to the basement. This location is below the 100-year water surface elevation by 2.4 feet. The basement door is 7 feet below the 100-year water surface elevation. Also, a couple of the basement wall penetrations are below the 100-year water surface elevation, including the plumbing pipe and cable at the south side.

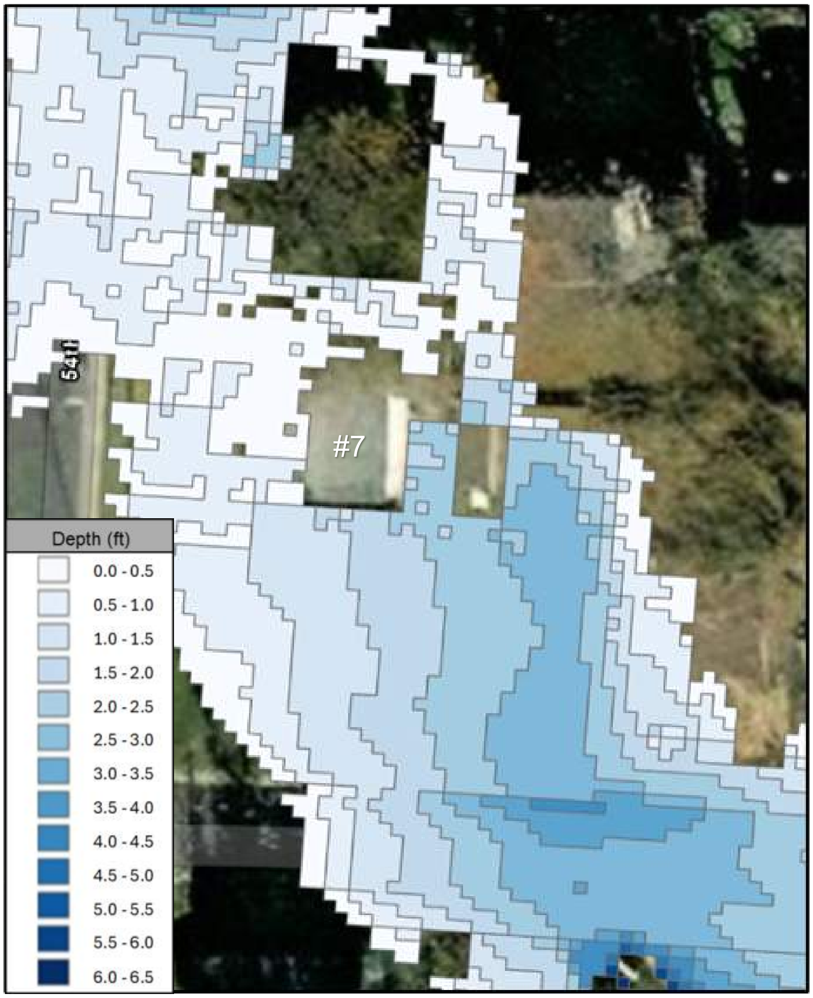


Figure 2.7.2.1 Property #7: 100-year flood depth above grade

Table 2.7.1 Property #7: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+1.5 feet	
100-year Water Surface Elevation	**58.2 feet**	
Exterior Door for Addition at North Side	-1.3 feet	
Basement Windowsills at South and East Sides	-1.6 feet	
Lowest Point of Entry	-2.9 feet	Upper Stair Landing to Basement Door
Adjacent Grade	-2.9 feet	
Basement Door	-7.0 feet	

2.7.3 Strategy Recommended

Property Acquisition

Property acquisition is the preferred recommendation. This property has very high risk of flooding from a 100-year event compared to many other properties in the watershed as floodwater could surround the building. To protect the basement from flooding, major retrofits would be required to resist the flood loads imposed on the basement/foundation walls. Without significant renovations, simply blocking the floodwater may threaten the structural integrity of the existing basement construction and pose a risk to the building. Property acquisition can help prevent future flood damage and preserve lives that could be lost from building failure. When the building is demolished through property acquisition, it has the added benefit of creating a community amenity by replacing the residential property with a community feature on this lot, such as a park.

2.7.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Homeowner Flood Retrofits and Raise the Lowest Point of Entry: Given the extent of flooding around the building, homeowner retrofits and raising the lowest point of entry would simply block the floodwater and may threaten the structural integrity of the existing basement construction while posing a risk to the building. This would likely involve exorbitant costs and require temporary relocation of the occupants for an extended period of time while the building experiences major structural renovations to resist flood loads.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It likely would increase the amount of flooding to properties nearby and potentially downstream as well. The floodwall would need to be built over the existing underground culvert which could significantly increase the cost of design and construction.

2.7.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Taussig Road (BE-5) and channel improvements from Upshur Street to 54th Street (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.8 Property #8: 5404 Taussig Road

2.8.1 Description

The property at 5404 Taussig Road consists of a one-story building with a crawlspace. The front entrance has steps leading up to the front door along the front (west) side. Nearby there is a boarded opening to the crawlspace located a few inches above grade. The building has ventilation vents for the crawlspace just below the first floor that allow airflow in and out of the crawlspace. The east side of the building has a door and HVAC unit approximately 0.5 feet above grade. Figure 2.8.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.8.1.2, Figure 2.8.1.3 and Figure 2.8.1.4. Only three sides of the home were photographed as the homeowner did not grant access to the backyard of the property.

Figure 2.8.1.1 Property #8: Aerial view with elevation contours and photo numbering

Figure 2.8.1.2 Property #8: Front side (west side)

Figure 2.8.1.3 Property #8: Side (south side)

Figure 2.8.1.4 Property #8: Side (east side)

2.8.2 Flood Risk

Flood modeling indicates that the capacity of the Edmonston Channel culvert at Taussig Road will be exceeded in a 100-year event, as it will cause overland flow northward such that floodwater extends to the front (west) and south sides of the building at 5404 Taussig Road. The 100-year flood level is approximately 1.1 feet below the first floor. A 100-year event could inundate the crawlspace with approximately 1 foot of water as it potentially enters through the boarded opening on the front (west) side of the home.
Figure 2.8.2.1 shows the modeled 100-year flood depth near the building. Table 2.8.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the crawlspace door is approximately 0.8 feet below the 100-year water surface elevation. None of the wall penetrations are below the 100-year water surface elevation.

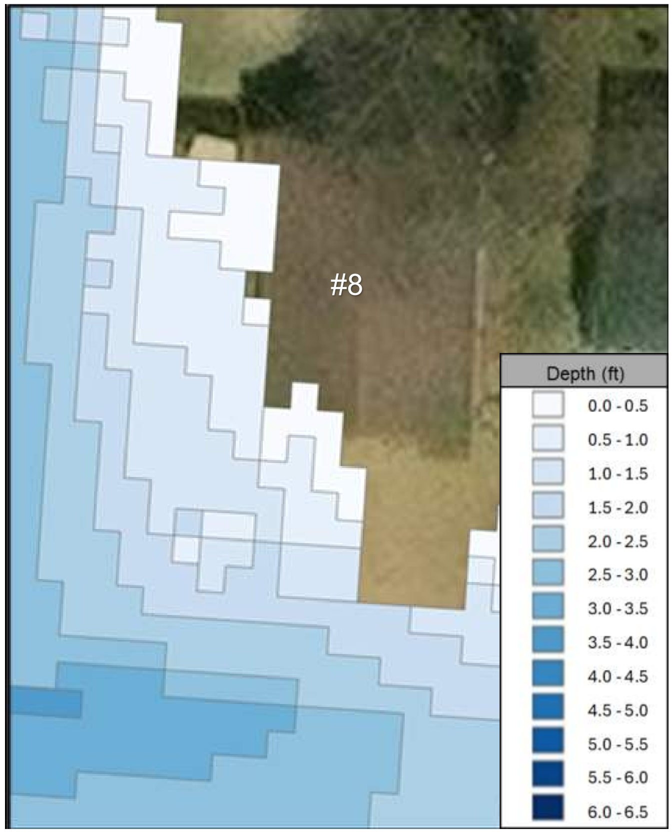


Figure 2.8.2.1 Property #8: 100-year flood depth above grade

Table 2.8.1 Property #8: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+1.1 feet	
100-year Water Surface Elevation	**58.7 feet**	
Lowest Point of Entry	-0.8 feet	Crawlspace Door
Adjacent Grade	-1.2 feet	

2.8.3 Strategy Recommended

Homeowner Flood Retrofits

The following retrofits are recommended to help mitigate flood risk for this property:

- Install flood openings to equalize water pressure on the foundation walls at the crawlspace. This would involve at least two openings on different sides of the building. The bottom of the flood opening should be within 1 foot above the adjacent grade. Typically, each flood opening is between 3 to 16 inches wide and 3 to 8 inches tall. An assessment of the crawlspace is recommended prior to the installation of flood vents to determine if additional retrofits, such as the use of flood damage resistant materials, are needed within the crawlspace. The components within the crawlspace should be suitable for exposure to floodwater.

2.8.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Raise the Lowest Point of Entry: Raising the lowest point of entry would be a higher cost than homeowner retrofits, as described above, for a similar degree of flood protection. It would require sealing the crawlspace to the 100-year water surface elevation. This would be difficult to achieve and to maintain code compliance for proper ventilation of the crawlspace.

Dry Floodproofing: Dry floodproofing is not advisable for crawlspaces. This strategy would involve adherence to rigorous standards that produce renovations with significant costs that exceed the costs for homeowner flood retrofits. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed to address dry floodproofing requirements.

Grading and Placement of Fill: This strategy is not recommended because of the limited available property on which to construct a berm. Also, it likely would increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It likely would increase the amount of flooding to properties nearby and potentially downstream as well.

2.8.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Taussig Road (BE-5) and channel improvements from Upshur Street to 54th Street (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.9 Property #9: 4209 54th Street

2.9.1 Description

The Property at 4209 54th Street consists of a one-story building with a basement. A garage door on the north side of the home is connected to the basement level and is at grade. There are two basement windows on the north side as well as several wall penetrations such as an electric meter, cable, dryer vent, and hose bib. Each of these penetrations is at least 2.5 feet above the basement floor. The HVAC unit is at grade on the south side. Figure 2.9.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.9.1.2, Figure 2.9.1.3, Figure 2.9.1.4, and Figure 2.9.1.5.

Figure 2.9.1.1 Property #9: Aerial view with elevation contours and photo numbering

Figure 2.9.1.2 Property #9: Front side (west side)

Figure 2.9.1.3 Property #9: Side (north side)

Figure 2.9.1.4 Property #9: Back side (east side)

Figure 2.9.1.5 Property #9: Side (south side)

2.9.2 Flood Risk

The property at 4209 54^{th} Street borders the Edmonston Channel on the back (east) side of the property near the Edmonston Channel culvert at Taussig Road where it transitions underground. Flood modeling indicates that the capacity of the Edmonston Channel culvert at Taussig Road will be exceeded in a 100-year event, as it will cause floodwater to encroach on the northeast corner of the building. The 100-year flood level is 8 feet below the first floor. However, floodwater could potentially enter the basement through the basement door at the back (east) side and the garage door at the north side. Figure 2.9.2.1 shows the modeled 100-year flood depth to be approximately 0.5 feet above the nearest adjacent grade to the building. Table 2.9.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the basement garage is approximately 0.4 feet below the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation. According to the resident, there has been no flooding of the building.

Figure 2.9.2.1 Property #9: 100-year flood depth above grade

Table 2.9.1 Property #9: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+8.0 feet	
100-year Water Surface Elevation	**58.6 feet**	
Basement Door	-0.1 feet	
Lowest Point of Entry	-0.4 feet	Garage Door
Adjacent Grade	-0.5 feet	

2.9.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Replace the basement door at the east side with a flood-resistant door.

- Install a flood-resistant garage door or install a passive barrier at the garage door such as a self-deploying flood barrier to raise the lowest point of entry. Typically, these systems are constructed underground. Coordination with nearby utility providers may be a large factor in the viability of this option.
- Prior to installing the two preceding retrofits above, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.

2.9.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties, especially at the driveway leading to the garage. Also, it could potentially increase the amount of flooding to properties downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. Given the limited risk of flooding, the building of a permanent floodwall would be a higher cost than the homeowner retrofits, as described above, for a similar degree of flood protection. It could potentially increase the amount of flooding to properties downstream as well.

2.9.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Taussig Road (BE-5) and channel improvements from Upshur Street to 54th Street (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.10 Property #10: 5409 Taussig Road

2.10.1 Description

The property at 5409 Taussig Road consists of a split-level building. There are ground floor windows at the front (north), east, and back (south) sides. The exterior wall at the back (south) side has penetrations for hose bibs, a dryer vent, and electrical service. At the back (south) side the basement door is below grade and accessed by way of an exterior step. Figure 2.10.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.10.1.2, Figure 2.10.1.3, Figure 2.10.1.4, and Figure 2.10.1.5.

Figure 2.10.1.1 Property #10: Aerial view with elevation contours and photo numbering

Figure 2.10.1.2 Property #10: Front side (north side) *Figure 2.10.1.3 Property #10: Side (west side)*

Figure 2.10.1.4 Property #10: Back side (south side) *Figure 2.10.1.5 Property #10: Side (east side)*

2.10.2 Flood Risk

The property at 5409 Taussig Road borders the Edmonston Channel on the west side of the property near the Edmonston Channel culvert at Taussig Road where it transitions underground. Flood modeling indicates that the capacity of the Edmonston Channel culvert at Taussig Road will be exceeded in a 100-year event, as it will cause floodwater to extend to the back (south) side and west side of the building. Flood modeling indicates that the 100-year flood level is more than 5 feet below the main floor. However, floodwater could potentially enter the ground floor (basement) through the lowest level back (south) door. Figure 2.10.2.1 shows the modeled 100-year flood depth to be approximately 2.5 feet above the nearest adjacent grade to the building. Table 2.10.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the top of basement door stairwell would be the first location floodwater would exceed a critical elevation and begin to pose a flooding threat to the basement. This location is below the 100-year water surface elevation by 2.4 feet. The basement door is 3.2 feet below the 100-year water surface elevation. A hose bib penetrating the basement wall near the door is below the 100-year water surface elevation.

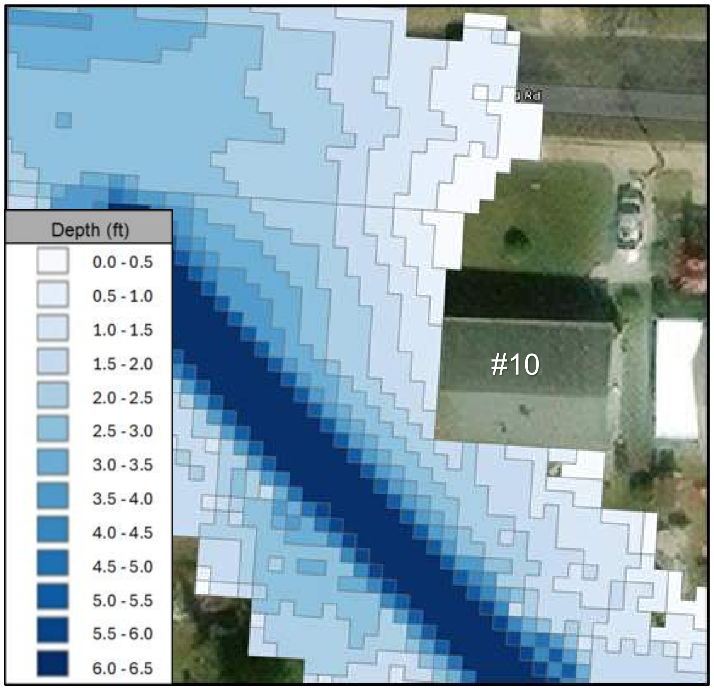


Figure 2.10.2.1 Property #10: 100-year flood depth above grade

Table 2.10.1 Property #10: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Front Door	+2.1 feet	
100-year Water Surface Elevation	**58.9 feet**	
Lowest Point of Entry	-2.4 feet	Upper Landing of Basement Door Stairwell
Adjacent Grade	-2.5 feet	
Basement Door	-3.2 feet	

2.10.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate the high risk of flooding for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Provide a waterproof seal for the hose bib penetration through the basement wall.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).

- Excavate around the property's back (south) and west side exterior ground floor (basement) walls. Install exterior surface waterproofing to the footing and ground floor wall that is below grade. The waterproofing should extend at least to the 100-year water surface elevation.
- Replace the basement door at the south side with a flood-resistant door or install a hinged flood gate at the upper landing of the basement door stairwell to raise the lowest point of entry. The hinged flood gate will require a new concrete stairwell with approximately 2.5 feet taller walls. The top of the flood gate and stairwell walls should at least match the 100-year water surface elevation.
- Prior to installing the two previous retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.

2.10.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building is not recommended because it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would likely increase the amount of flooding to properties nearby and potentially downstream as well.

2.10.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargement at Taussig Road (BE-5) and channel improvements from Upshur Street to 54th Street (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.11 Property #11: 5408 Taylor Street

2.11.1 Description

The property at 5408 Taylor Street consists of a one-story building with a basement and a sump pump system. A few steps lead to the front (south) door at an elevated landing. The back door on the back (north) side of the building is a few inches above grade. There are two basement windows along the front (south) side and two along the west side of the building approximately 1 foot and 2 feet above grade, respectively. Multiple penetrations exist at the exterior wall for electrical components along the west side. Figure 2.11.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.11.1.2 and Figure 2.11.1.3. Only two sides of the home were able to be photographed as the homeowner did not grant access to the property.

Figure 2.11.1.1 Property #11: Aerial view with elevation contours and photo numbering

Figure 2.11.1.2 Property #11: Front side (south side) *Figure 2.11.1.3 Property #11: Side (west side)*

2.11.2 Flood Risk

The property at 5408 Taylor Street borders the Edmonston Channel on the west side of the property near the Taylor Street bridge. Flood modeling indicates that the capacity of the Taylor Street bridge will be exceeded in a 100-year event, as it will cause floodwater to overtop the bridge and stretch eastward until it surrounds the building. See Figure 2.11.2.1. The main floor is 3.7 feet above the 100-year flood. However, floodwater will likely enter the basement through the basement door at the back (north) side and through basement windows at the west side of the building. The basement windows are approximately 0.5 feet below the 100-year flood level. Table 2.11.1 below lists the critical building elevations relative to the 100-year flood level. Based upon the survey, the lowest point of entry at the botttom of the basement door is 2 feet below the 100-year water surface elevation. Note that the restricted access to the backyard by the fence may have prevented the identification of other flood risks.

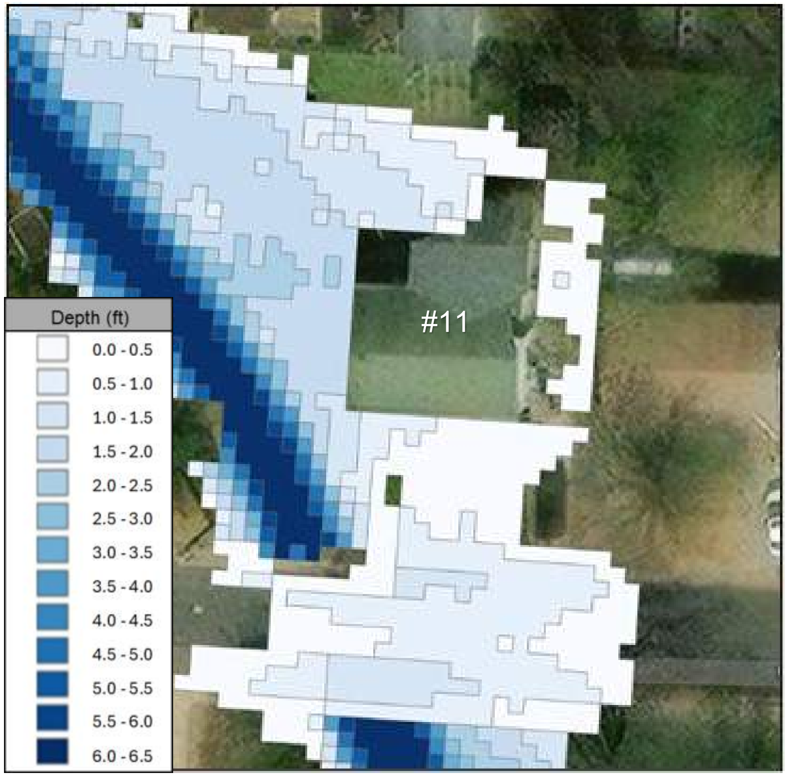


Figure 2.11.2.1 Property #11: 100-year flood depth above grade

Table 2.11.1 Property #11: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.7 feet	
100-year Water Surface Elevation	**59.1 feet**	
Basement Windowsills at West Side	-0.5 feet	
Lowest Point of Entry	-2.0 feet	Basement Door
Adjacent Grade	-2.6 feet	

2.11.3 Strategy Recommended

Property Acquisition:

Property acquisition is the preferred recommendation. This property has a very high risk of flooding from a 100-year event compared to many other properties in the watershed as floodwater could surround the building. To protect the basement from flooding, major retrofits would be required to resist the flood loads imposed on the basement/foundation walls. Without significant renovations, simply blocking the floodwater may threaten the structural integrity of the existing basement construction and pose a risk to the building. Property acquisition can help prevent future flood damage and preserve lives that could be lost from building failure. When the building is demolished through property acquisition, it has the added benefit of creating a community amenity by replacing the residential property with a community feature on this lot, such as a park.

2.11.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, and cost, among other factors, these strategies were eliminated as feasible options for this property.

Homeowner Flood Retrofits and Raise the Lowest Point of Entry: Given the extent of flooding around the building, homeowner retrofits and raising the lowest point of entry would simply block the floodwater and may threaten the structural integrity of the existing basement construction while posing a risk to the building. This would likely involve exorbitant costs and require temporary relocation of the occupants for an extended period of time while the building experiences major structural renovations to resist flood loads.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It likely would increase the amount of flooding to properties nearby and potentially downstream as well.

2.11.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.12 Property #12: 5411 Taylor Street

2.12.1 Description

The property at 5411 Taylor Street consists of a one-story building with a basement and sump pump system. There is an addition on the back (south) side at the same level as the basement. The homeowner did not grant permission for measurements and only permitted limited access for photography. As such there is limited data available and documented, apart from verbal descriptions provided by the homeowner. Figure 2.12.1.1 below provides an aerial view of the home with topographic elevation contours and the property is further depicted in Figure 2.12.1.2, Figure 2.12.1.3, and Figure 2.12.1.4.

Figure 2.12.1.1 Property #12: Aerial view with elevation contours and photo numbering

Figure 2.12.1.2 Property #12: Front side (north side) *Figure 2.12.1.3 Property #12: Front side (north side)*

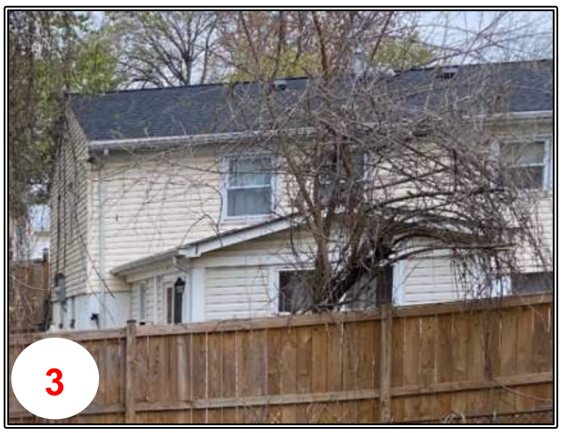


Figure 2.12.1.4 Property #12: Back side (south side)

2.12.2 Flood Risk

The property at 5411 Taylor Street borders the Edmonston Channel on the west side of the property near the Taylor Street bridge. Flood modeling indicates that floodwater encroaches on the southwest corner of the building in a 100-year event. See Figure 2.12.2.1. The main floor is 6.8 feet above the 100-year flood. However, floodwater will likely enter the addition at the back (south) side through the door and from there floodwater may extend into the basement. Table 2.12.1 below lists the critical building elevations relative to the 100-year flood level. Based upon the survey, the lowest point of entry at the botttom of the door at the addition is 0.6 feet below the 100-year water surface elevation. Note that the restricted access to the backyard by the fence may have prevented the identification of other flood risks.

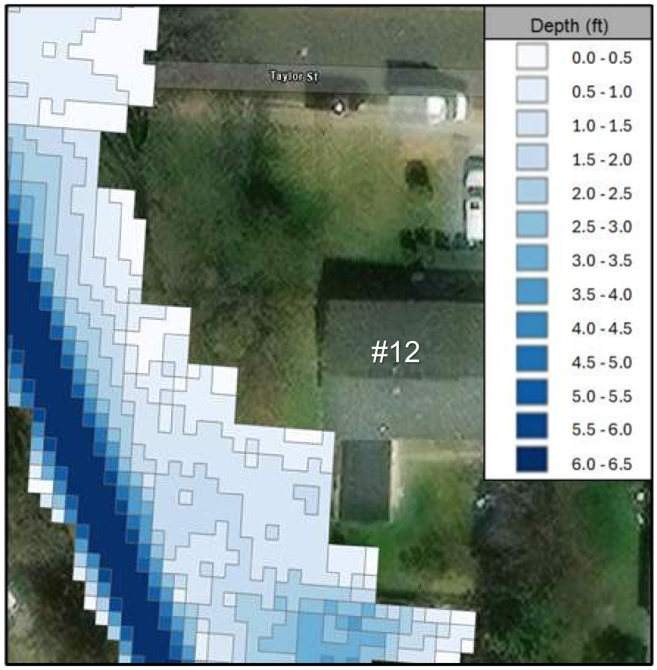


Figure 2.12.2.1 Property #12: 100-year flood depth above grade

Table 2.12.1 Property #12: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+6.8 feet	
100-year Water Surface Elevation	**60.2 feet**	
Lowest Point of Entry	-0.6 feet	East Side Door at the Addition
Adjacent Grade	-1.5 feet	

2.12.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup for the sump pump at the basement, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).

- Replace the east side door at the addition with a flood-resistant door or install a new concrete landing that is above the 100-year water surface elevation. If the threshold of the door cannot be altered, then a new concrete well with an approximately 6-inch raised patio may be used to block floodwater. Prevent rainwater from collecting at the base of the exterior well/door landing by either adding a roof extension over the door landing or adding a drain at the low point connected to the sump pump.
- Retrofit the addition's exterior walls with a concrete wall with a top that is at least as high as the 100-year water surface elevation. This may create a new exterior concrete façade for the bottom 6 to 12 inches of the walls at the addition. This retrofit along with the flood resistant door will raise the lowest point of entry.
- Prior to installing the two previous retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.

2.12.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements and wood framed construction. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements. Similar structural modifications may be needed for the addition at the back (south) side as well.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well.

2.12.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.13 Property #13: 5416 Spring Road

2.13.1 Description

The property at 5416 Spring Road consists of a one-story building with a basement. The grade is highest near the front (south) and tapers down to low points at the west side of the building. There are two basement doors at grade on the west side. Additionally, along the west side and a few steps up from the doors, the building has the HVAC unit and window at grade. The building has multiple penetrations through the exterior basement wall at the front (south), west, and back (north) sides for electrical conduits, a hose bib, dryer vents, electrical outlets, and a window A/C unit. The home has a sump pump in the backyard with a trench. Figure 2.13.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.13.1.2, Figure 2.13.1.3, Figure 2.13.1.4, and Figure 2.13.1.5.

Figure 2.13.1.1 Property #13: Aerial view with elevation contours and photo numbering

Figure 2.13.1.2 Property #13: Front side (south side)

Figure 2.13.1.3 Property #13: Side (east side)

Figure 2.13.1.4 Property #13: Back side (north side)

Figure 2.13.1.5 Property #13: Side (west side)

2.13.2 Flood Risk

The property at 5416 Spring Road borders the Edmonston Channel on the west side of the property near the Spring Road bridge. Flood modeling indicates that the capacity of the Spring Road bridge will be exceeded in a 100-year event, as it will cause floodwater to overtop the bridge and extend to the south, west, and north walls of the building. See Figure 2.13.2.1. The main floor is 4.4 feet above the 100-year flood level. However, floodwater will likely enter the basement at the west side through two basement doors. The backyard slopes down towards the building so that the bottom of the basement doors are roughly 2 feet below the top of the channel. The sump pump in the backyard will likely not help during a 100-year event because the outfall will be pumping to an area of the channel that is likely below the 100-year water surface elevation. Table 2.12.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the botttom of the southernmost basement door is 3.9 feet below the 100-year water surface elevation. The nearby basement door to the north is just a few inches above this low point. Several basement wall penetrations are below the 100-year water surface elevation, including a plumbing pipe, dryer vents, hose bib, and electrical outlet at the west side. Note that the lattice screen under the side deck may have prevented the identification of other flood risks.

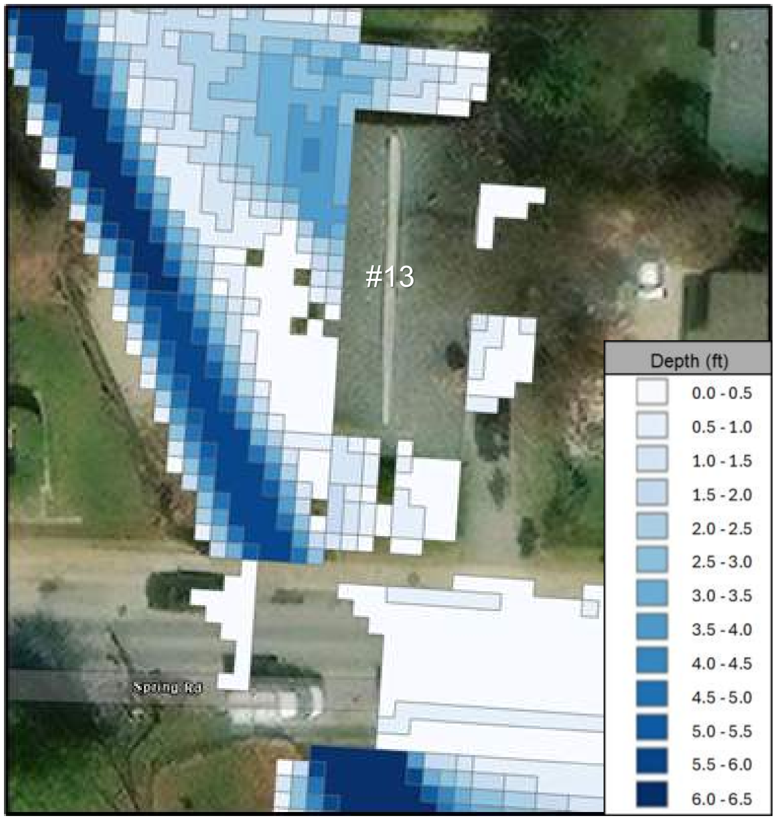


Figure 2.13.2.1 Property #13: 100-year flood depth above grade

Table 2.13.1 Property #13: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+4.4 feet	
100-year Water Surface Elevation	**60.0 feet**	
Basement Windowsill at West Side	-0.2 feet	
Basement Door at the West Side	-3.7 feet	Northernmost Basement Door
Lowest Point of Entry	-3.9 feet	Southernmost Basement Door
Adjacent Grade	-4.1 feet	

2.13.3 Strategy Recommended

Property Acquisition

Property acquisition is the preferred recommendation. This property has a very high risk of flooding from a 100-year flood as floodwater could extend to three sides of the building with floodwater depths approaching 4 feet on exposed walls in some areas. To protect the basement from flooding, major retrofits would be required to resist the flood loads imposed on the basement/foundation walls. Without significant renovations, simply blocking the floodwater may threaten the structural integrity of the existing basement construction and pose a risk to the building. Property acquisition can help prevent future flood damage and preserve lives that could be lost from building failure. When the building is demolished through property acquisition, it has the added benefit of creating a community amenity by replacing the residential property with a community feature on this lot, such as a park.

2.13.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Homeowner Flood Retrofits and Raise the Lowest Point of Entry: Given the extent of flooding around the building, homeowner retrofits and raising the lowest point of entry would simply block the floodwater and may threaten the structural integrity of the existing basement construction while posing a risk to the building. This would likely involve exorbitant costs and require temporary relocation of the occupants for an extended period of time while the building experiences major structural renovations to resist flood loads.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements and wood framed construction. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well.

2.13.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) would reduce the flood risk to the property during a 100-year storm event. However, the building would still be in the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.14 Property #14: 5419 Spring Road

2.14.1 Description

The property at 5419 Spring Road consists of a one-and-a-half story building with dormers at the roof. There are steps leading up to the front (north) door at a covered porch. The building has a finished basement. Close to the front (north) and along the west side, a basement window is at grade. The grade slopes down from the front to the back (south) of the building. Towards the back of the building, a shortened door at grade along the west side provides access to the basement. Under the back deck, a former basement opening is covered with boards. The building has two sump pumps. The HVAC unit is located a few inches above grade at the east side. Nearby, the HVAC conduit penetrates the exterior wall. Other basement wall penetrations include an electrical conduit and piping. Figure 2.14.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.14.1.2, Figure 2.14.1.3 and Figure 2.14.1.4.

Figure 2.14.1.1 Property #14: Aerial view with elevation contours and photo numbering

Figure 2.14.1.2 Property #14: Side (west side)

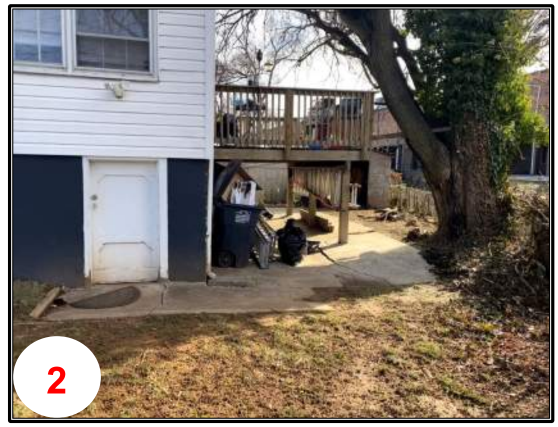


Figure 2.14.1.3 Property #14: Side (west side)

Figure 2.14.1.4 Property #14: Side (east side)

2.14.2 Flood Risk

The property at 5419 Spring Road borders the Edmonston Channel on the south side of the property near the 54th Place bridge. Flood modeling indicates that the capacity of the 54th Place bridge will be exceeded in a 100-year event, as it will cause floodwater to back up and extend to the east, south, and west walls of the building. See Figure 2.14.2.1. The main floor is 2.4 feet above the 100-year flood level. However, floodwater will likely enter the basement at the west side through a basement door as well as through boarded windows at the south side. Table 2.14.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry at the botttom of the basement door is 3.9 feet below the 100-year water surface elevation. A couple of basement wall penetrations are below the 100-year water surface elevation, including a plumbing pipe, and the HVAC conduit. Also, the HVAC unit at the east side of the building is more than a few feet below the 100-year water surface elevation. The homeowner stated no awareness of flooding to the building. Note that the objects adjacent to the exterior wall under the back (south) deck may have prevented the identification of other flood risks.

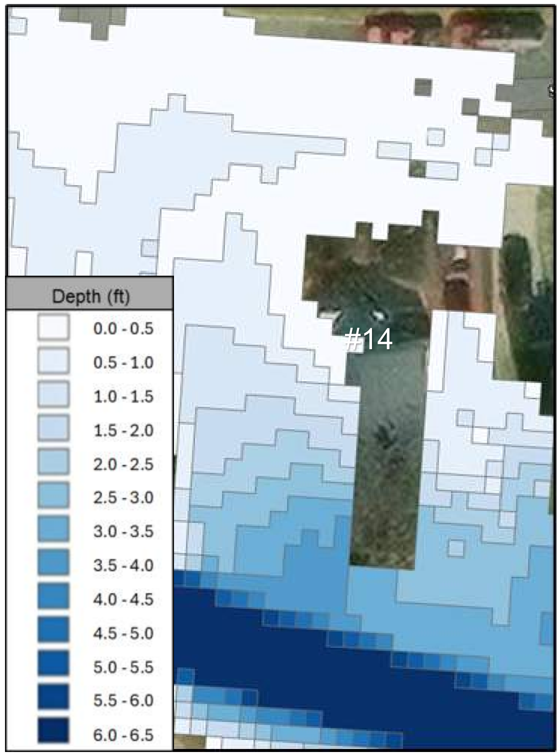


Figure 2.14.2.1 Property #14: 100-year flood depth above grade

Table 2.14.1 Property #14: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.4 feet	
100-year Water Surface Elevation	**66.0 feet**	
Basement Windowsill at East Side	-0.2 feet	
Basement Windowsill at West Side	-0.1 feet	
Boarded Basement Windowsills at South Side	-1.9 feet	
Lowest Point of Entry	-3.9 feet	Basement Door
Adjacent Grade	-4.0 feet	

2.14.3 Strategy Recommended

Property Acquisition:

Property acquisition is the preferred recommendation. This property has a very high risk of flooding from a 100-year flood as floodwater could surround the building. To protect the basement from flooding, major retrofits would be required to resist the flood loads imposed on the basement/foundation walls. Without significant renovations, simply blocking the floodwater may threaten the structural integrity of the existing basement construction and pose a risk to the building. Property acquisition can help prevent future flood damage and preserve lives that could be lost from building failure. When the building is demolished through property acquisition, it has the added benefit of creating a community amenity by replacing the residential property with a community feature on this lot, such as a park.

2.14.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Homeowner Flood Retrofits and Raise the Lowest Point of Entry: Given the extent of flooding around the building, homeowner retrofits and raising the lowest point of entry would simply block the floodwater and may threaten the structural integrity of the existing basement construction while posing a risk to the building. This would likely involve exorbitant costs and require temporary relocation of the occupants for an extended period of time while the building experiences major structural renovations to resist flood loads.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well. If constructed, it would be most effective to construct a channel floodwall for all impacted properties on Spring Road. Given the amount of water overtopping this channel, extending the channel floodwall could increase flood risk farther downstream.

2.14.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would reduce the flood risk to the property during a 100-year storm event. However, the building would still be in the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.15 Property #15: 5421 Spring Road

2.15.1 Description

The property at 5421 Spring Road consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. At the back (south) side of the building, exterior steps lead down from the adjacent grade to a basement door. The HVAC unit is at grade near the basement door. Basement windows exist on the east, south, and west sides of the building. The building also has a sump pump system. There are penetrations through the basement wall for a hose bib (west side), dryer vent (south side), and gas piping (east side). Figure 2.15.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.15.1.2, Figure 2.15.1.3, Figure 2.15.1.4, and Figure 2.15.1.5.

Figure 2.15.1.1 Property #15: Aerial view with elevation contours and photo numbering

Figure 2.15.1.2 Property #15: Front side (north side)

Figure 2.15.1.3 Property #15: Side (west side)

Figure 2.15.1.4 Property #15: Back side (south side)

Figure 2.15.1.5 Property #15: Side (east side)

2.15.2 Flood Risk

The property at 5421 Spring Road borders the Edmonston Channel on the back (south) side of the property near the 54th Place bridge. Flood modeling indicates that the capacity of the 54th Place bridge will be exceeded in a 100-year event, as it will cause floodwater to back up and extend to the east, south, and west walls of the building. See Figure 2.15.2.1. The main floor is 2.8 feet above the 100-year flood. However, floodwater will likely enter the basement at the back (south) side through a basement door as well as through a basement window at the east side. Table 2.15.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 2.0 feet below the 100-year water surface elevation, where the basement door is 4.2 feet below. A dryer vent at the south penetrates the basement wall below the 100-year water surface elevation. Also, the HVAC unit at the south side of the building is approximately a few feet below the 100-year water surface elevation.

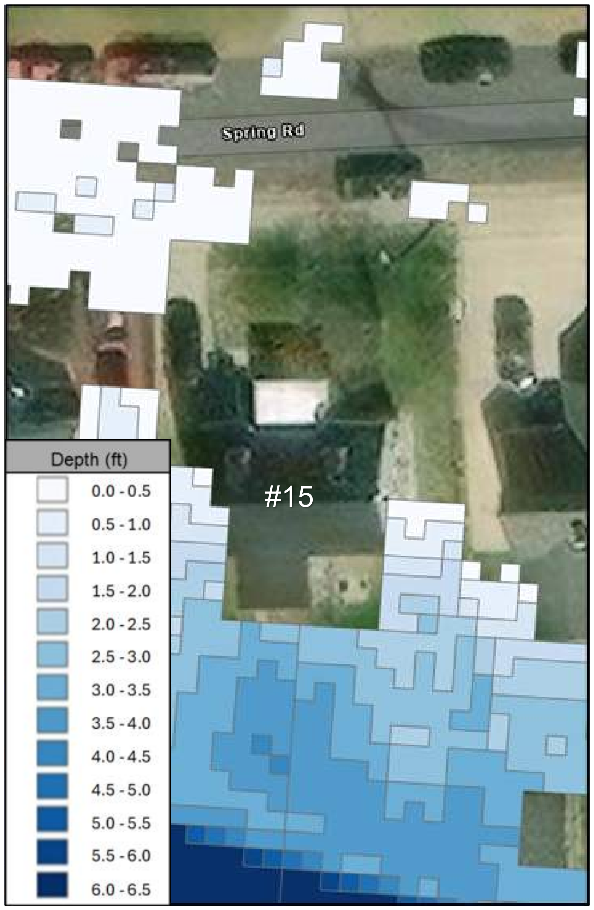


Figure 2.15.2.1 Property #15: 100-year flood depth above grade

Table 2.15.1 Property #15: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.8 feet	
100-year Water Surface Elevation	**66.1 feet**	
Basement Windowsill at East Side	-0.1 feet	Southernmost Window along East Side
Lowest Point of Entry	-2.0 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-2.1 feet	
Basement Door	-4.2 feet	

2.15.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup for the sump pump at the basement, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Raise the lowest point of entry via the following measures:
  - Install waterproof window well with cover around the southernmost basement window along the east side that extends a minimum of 1 foot up from the bottom of the window.
  - Raise the dryer vent at the back (south) wall above the 100-year water surface elevation.
  - Replace the basement door at the back (south) side with flood-resistant door or install a hinged flood gate at the upper landing of the basement door stairwell. The hinged flood gate will require a new concrete stairwell with walls approximately 2 feet taller. The top of the flood gate and stairwell walls should be at least as high as the 100-year water surface elevation.
- Prior to installing the preceding group of retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 2 feet so the bottom of the unit is above the 100-year water surface elevation.

2.15.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well. If constructed, it would be most effective to construct a channel floodwall for all impacted properties on Spring Road. Given the amount of water overtopping this channel, extending the channel floodwall could increase flood risk farther downstream.

2.15.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.16 Property #16: 5423 Spring Road

2.16.1 Description

The property at 5423 Spring Road consists of a one-and-a-half story building with dormers at the roof. There are steps leading up to the front (north) door at a covered porch. The grade slopes down from the front to the back of the building. At the back (south) side, exterior steps lead down from the adjacent grade to a basement door. A roof has been constructed over the exterior stairwell to the basement door (not pictured below). Basement windows exist on the east, south, and west sides of the building. Two of the basement windows have window wells with covers with one on the east side and one on the west side. The HVAC unit on the west side of the building is at grade. There are penetrations through the basement wall for an electrical conduit, gas piping, and HVAC conduit along the west side. Figure 2.16.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.16.1.2, Figure 2.16.1.3, Figure 2.16.1.4, and Figure 2.16.1.5.

Figure 2.16.1.1 Property #16: Aerial view with elevation contours and photo numbering

Figure 2.16.1.2 Property #16: Front side (north side)

Figure 2.16.1.3 Property #16: Side (west side)

Figure 2.16.1.4 Property #16: Back side (south side)

Figure 2.16.1.5 Property #16: Side (east side)

2.16.2 Flood Risk

The property at 5423 Spring Road borders the Edmonston Channel on the back (south) side of the property. Flood modeling indicates that floodwater from a 100-year event will extend to the east, south, and west walls of the building. See Figure 2.16.2.1. The main floor is 2.5 feet above the 100-year flood level. However, floodwater will likely enter the basement at the south side through a basement door and window, as well as through basement windows at the east and west sides. Table 2.16.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 3.0 feet below the 100-year water surface elevation, whereas the basement door is 5.3 feet below. Also, the HVAC unit at the west side of the building is a few inches below the 100-year water surface elevation.

Figure 2.16.2.1 Property #16: 100-year flood depth above grade

Table 2.16.1 Property #16: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.5 feet	
100-year Water Surface Elevation	**66.3 feet**	
Basement Windowsills at West Side	-0.8 feet	
Basement Windowsill at South Side	-1.5 feet	
Basement Windowsill at East Side	-2.0 feet	
Lowest Point of Entry	-3.0 feet	Upper Stairwell Landing to Basement Door (estimated - limited access)
Adjacent Grade	-3.1 feet	
Basement Door	-5.3 feet	

2.16.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- This group of retrofits will raise the lowest point of entry:
    - Confirm or provide waterproof seals at the existing window wells with covers at the basement windows on the east and west sides of the building.
    - Install flood glass windows at the basement windows at the back (south) side and at the southernmost west side window.
    - Install a hinged flood gate at the upper landing of the basement door stairwell. The hinged flood gate will require a new concrete stairwell with approximately 3 feet taller walls. The top of the flood gate and stairwell walls should at least match the 100-year water surface elevation.
- Prior to installing the previous group of retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 1 foot so the bottom of the unit is above the 100-year water surface elevation.

2.16.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well. If constructed, it would be most effective to construct a channel floodwall for all impacted properties on Spring Road. Given the amount of water overtopping this channel, extending the channel floodwall could increase flood risk farther downstream.

2.16.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.17 Property #17: 5425 Spring Road

2.17.1 Description

The property at 5425 Spring Road consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. At the back (south) side of the building, exterior steps lead down from the adjacent grade to a basement door with a basement window at the stairwell. The HVAC unit is at grade near the basement door. Basement windows are located a few inches above grade on the east, south, and west sides of the building. There are penetrations through the basement wall for a hose bib, a plumbing pipe, electrical conduit, gas piping, and HVAC conduit. Figure 2.17.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.17.1.2, Figure 2.17.1.3, Figure 2.17.1.4, Figure 2.17.1.5 and Figure 2.17.1.6.

Figure 2.17.1.1 Property #17: Aerial view with elevation contours and photo numbering

Figure 2.17.1.2 Property #17: Front side (north side)

Figure 2.17.1.3 Property #17: Side (west side)

Figure 2.17.1.4 Property #17: Back side (south side)

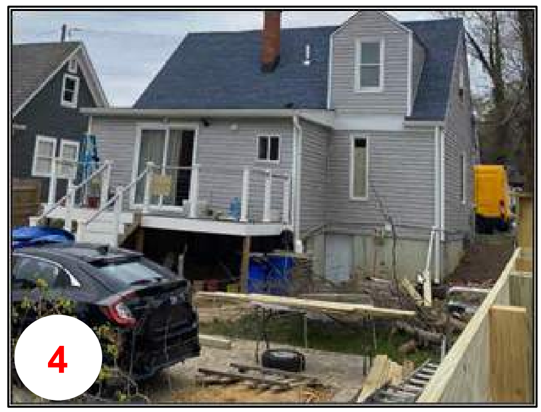


Figure 2.17.1.5 Property #17: Basement door and steps (south side)

Figure 2.17.1.6 Property #17: Side (east side)

2.17.2 Flood Risk

The property at 5425 Spring Road borders the Edmonston Channel on the back (south) side of the property. Flood modeling indicates that floodwater from a 100-year event will extend to the east, south, and west walls of the building. See Figure 2.17.2.1. The main floor is 2.6 feet above the 100-year flood level. However, floodwater will likely enter the basement at the south side through a basement door and window. Table 2.17.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 2.0 feet below the 100-year water surface elevation, whereas the basement door is 4.8 feet below. Also, the HVAC unit at the south side of the building is more than 1 foot below the 100-year water surface elevation. The homeowner reported that they've experienced no flooding in the building for the past eight years. Note that the objects under and around the back (south) deck may have prevented the identification of other flood risks.

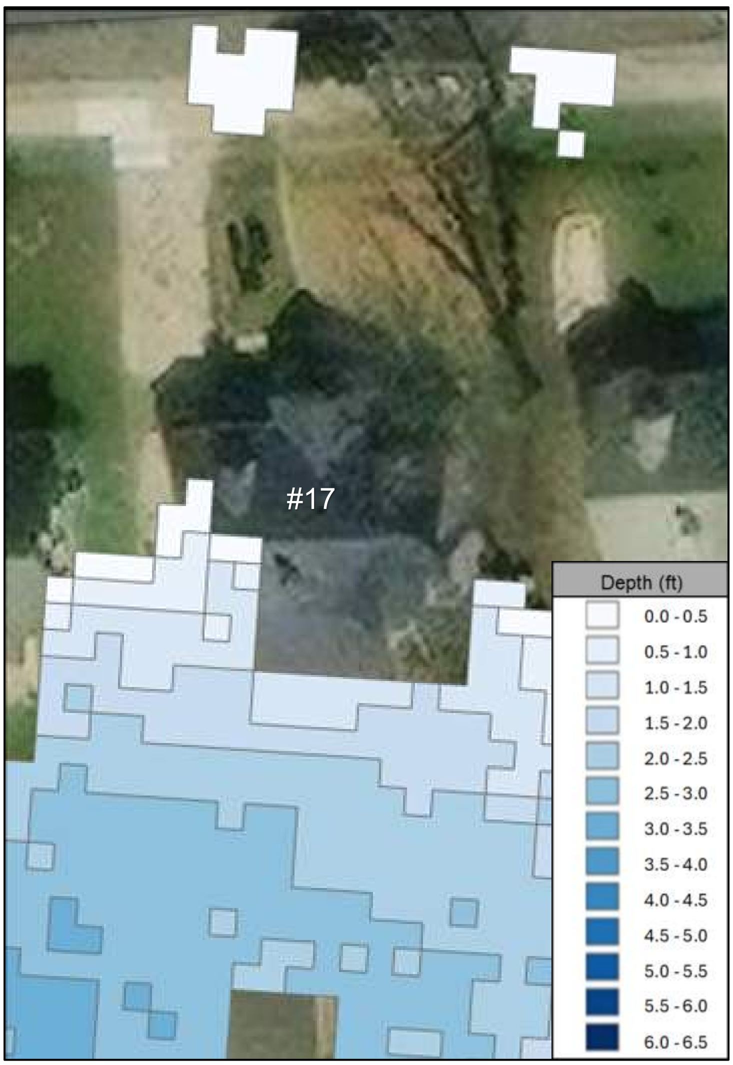


Figure 2.17.2.1 Property #17: 100-year flood depth above grade

Table 2.17.1 Property #17: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.6 feet	
100-year Water Surface Elevation	**66.3 feet**	
Lowest Point of Entry	-2.0 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-2.0 feet	
Basement Windowsill at Stairwell	-2.3 feet	
Basement Door	-4.8 feet	

2.17.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- This group of retrofits will raise the lowest point of entry:
    - Install a flood glass window at the basement window at the back (south) side stairwell.
    - Install a hinged flood gate at the upper landing of the basement door stairwell. The hinged flood gate will require a new concrete stairwell with approximately 1.5 feet taller walls. The top of the flood gate and stairwell walls should at least match the 100-year water surface elevation.
- Prior to installing the previous group of retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 2 feet so the bottom of the unit is above the 100-year water surface elevation.

2.17.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well. If constructed, it would be most effective to construct a channel floodwall for all impacted properties on Spring Road. Given the amount of water overtopping this channel, extending the channel floodwall could increase flood risk farther downstream.

2.17.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.18 Property #18: 5427 Spring Road

2.18.1 Description

The property at 5427 Spring Road consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. At the back (south) side of the building, exterior steps lead down from the adjacent grade to a basement door. The HVAC unit is at grade near the basement door. Basement windows are located a few inches above grade on the east and west sides of the building. There are penetrations through the basement wall for a vent, hose bib, plumbing pipes, and gas piping. The back of the building has a boarded-up area below the first-floor addition that could not be accessed. Figure 2.18.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.18.1.2, Figure 2.18.1.3, Figure 2.18.1.4, and Figure 2.18.1.5.

Figure 2.18.1.1 Property #18: Aerial view with elevation contours and photo numbering

Figure 2.18.1.2 Property #18: Front side (north side)

Figure 2.18.1.3 Property #18: Side (east side)

Figure 2.18.1.4 Property #18: Back side (south side)

Figure 2.18.1.5 Property #18: Side (west side)

2.18.2 Flood Risk

The property at 5427 Spring Road borders the Edmonston Channel on the back (south) side of the property. Flood modeling indicates that floodwater from a 100-year event will extend to the east and south walls of the building. See Figure 2.18.2.1. The main floor is 2.7 feet above the 100-year flood level. However, floodwater will likely enter the basement at the south side through a basement door. Table 2.18.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 1.4 feet below the 100-year water surface elevation, whereas the basement door is 4.3 feet below. A couple holes and a plumbing pipe at the west side along with a plumbing pipe at the back (south) side penetrate the basement wall below the 100-year water surface elevation. Also, the HVAC unit at the south side of the building is more than 1 foot below the 100-year water surface elevation. According to the homeowner, the basement flooded a few years ago. Note that the boarded-up area under the back (south) addition may have prevented the identification of other flood risks.

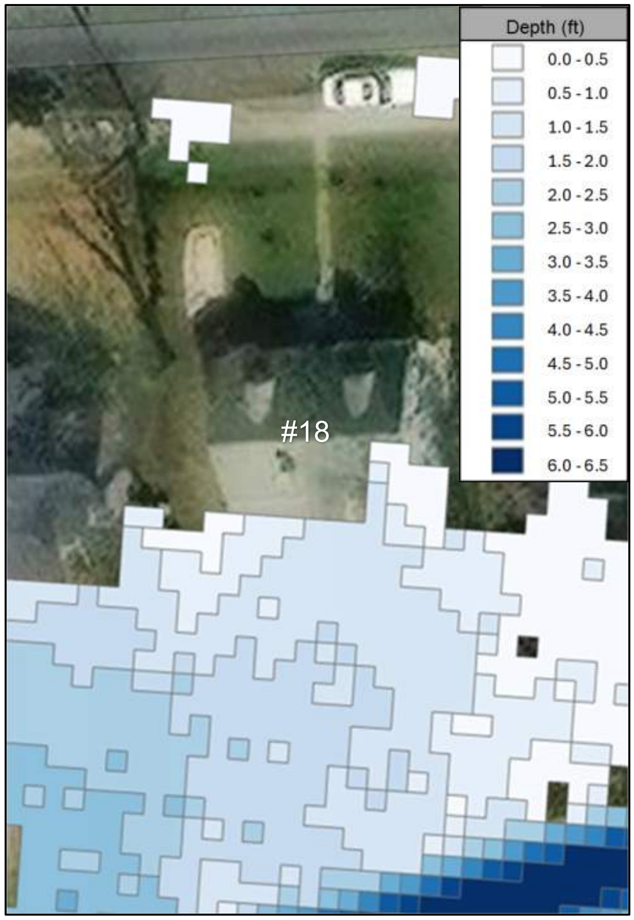


Figure 2.18.2.1 Property #18: 100-year flood depth above grade

Table 2.18.1 Property #18: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+2.7 feet	
100-year Water Surface Elevation	**67.1 feet**	
Lowest Point of Entry	-1.4 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-1.5 feet	
Basement Door	-4.3 feet	

2.18.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Install a hinged flood gate at the upper landing of the basement door stairwell to raise the lowest point of entry. The hinged flood gate will require a new concrete stairwell with approximately 1.5 feet taller walls. The top of the flood gate and stairwell walls should at least match the 100-year water surface elevation.
- Prior to installing the previous retrofit, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Provide a waterproof seal for the two holes and a plumbing pipe at the west side along with a plumbing pipe at the back (south) side that penetrate the basement wall.
- Raise the HVAC unit at least 2 feet so the bottom of the unit is above the 100-year water surface elevation.

2.18.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well. If constructed, it would be most effective to construct a channel floodwall for all impacted properties on Spring Road. Given the amount of water overtopping this channel, extending the channel floodwall could increase flood risk farther downstream.

2.18.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.19 Property #19: 5429 Spring Road

2.19.1 Description

The property at 5429 Spring Road consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. At the back (south) side of the building, exterior steps lead down from the adjacent grade to a basement door. The HVAC unit is at grade near the basement door. Basement windows are located a few inches above grade on the east and west sides of the building. The building has a sump pump with a battery backup. The back of the building has an area below the first-floor addition that has been closed in with lattice panels. There are penetrations through the basement wall for a hose bib, a plumbing pipe, and dryer vent. Figure 2.19.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.19.1.2, Figure 2.19.1.3, Figure 2.19.1.4, and Figure 2.19.1.5.

Figure 2.19.1.1 Property #19: Aerial view with elevation contours and photo numbering

Figure 2.19.1.2 Property #19: Front side (north side)

Figure 2.19.1.3 Property #19: Side (west side)

Figure 2.19.1.4 Property #19: Back side (south side)

Figure 2.19.1.5 Property #19: Basement door and steps (south side)

2.19.2 Flood Risk

The property at 5429 Spring Road borders the Edmonston Channel on the back (south) side of the property. Flood modeling indicates that floodwater from a 100-year event will extend to the east, south, and west walls of the building. See Figure 2.19.2.1. The main floor is 3.3 feet above the 100-year flood level. However, floodwater will likely enter the basement at the back (south) side through a basement door and through a basement window at the east side. Table 2.19.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 0.9 feet below the 100-year water surface elevation, whereas the basement door is 3.9 feet below. Also, the HVAC unit at the south side of the building is approximately 1 foot below the 100-year water surface elevation. The homeowner reported that minimal floodwater has been seen in the backyard. Note that the lattice screen under the back (south) addition may have prevented the identification of other flood risks.

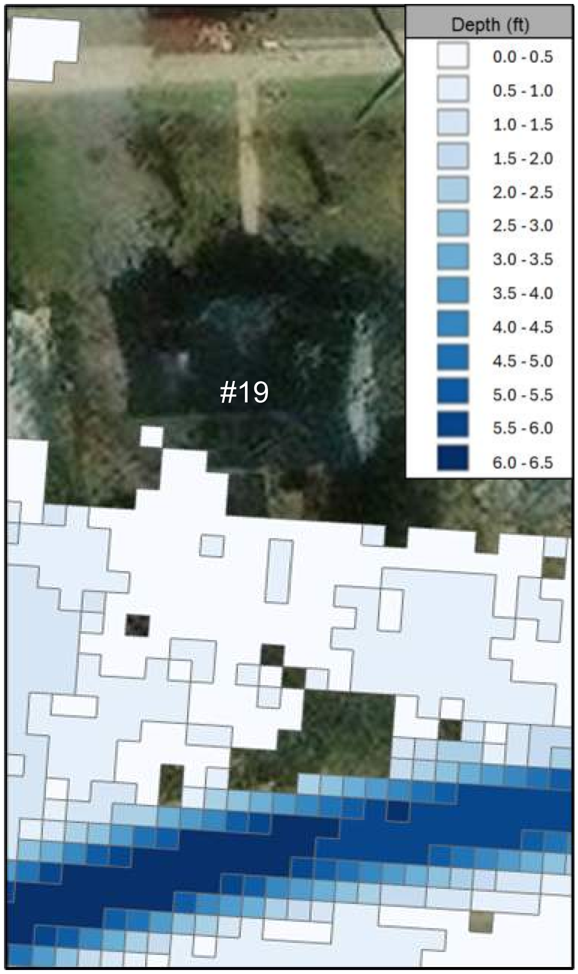


Figure 2.19.2.1 Property #19: 100-year flood depth above grade

Table 2.19.1 Property #19: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.3 feet	
100-year Water Surface Elevation	**66.7 feet**	
Basement Windowsill at East Side	-0.1 feet	
Lowest Point of Entry	-0.9 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-1.0 feet	
Basement Door	-3.9 feet	

2.19.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- This group of retrofits will raise the lowest point of entry:
  - Install a hinged flood gate at the upper landing of the basement door stairwell. The hinged flood gate will require a new concrete stairwell with approximately 1 foot taller walls. The top of the flood gate and stairwell walls should at least match the 100-year water surface elevation.
  - Install a waterproof window well with cover around the basement window at the east side that extends a minimum of 6 inches up from the bottom of the window.
- Prior to installing the previous group of retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 2 feet so the bottom of the unit is above the 100-year water surface elevation.

2.19.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well. If constructed, it would be most effective to construct a channel floodwall for all impacted properties on Spring Road. Given the amount of water overtopping this channel, extending the channel floodwall could increase flood risk farther downstream.

2.19.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.20 Property #20: 5431 Spring Road

2.20.1 Description

The property at 5431 Spring Road consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. At the back (south) side of the building, exterior steps lead down from the adjacent grade to a basement door. A dog and "beware of dog" sign was present in the yard that prevented full data collection. Figure 2.20.1.1 below provides an aerial view of the home with topographic elevation, and the property is further depicted in Figure 2.20.1.2 and Figure 2.20.1.3.

Figure 2.20.1.1 Property #20: Aerial view with elevation contours and photo numbering

Figure 2.20.1.2 Property #20: Front side (northeast side)

Figure 2.20.1.3 Property #20: Front side (northwest side)

2.20.2 Flood Risk

The property at 5431 Spring Road borders the Edmonston Channel on the back (south) side of the property. Flood modeling indicates that floodwater from a 100-year event will extend to the south wall of the building. See Figure 2.20.2.1. The main floor is 3.8 feet above the 100-year flood level. However, floodwater will likely enter the basement at the back (south) side through a basement door. Table 2.20.1 below lists the critical building elevations relative to the 100-year flood level collected during the survey. Based upon the survey, the lowest point of entry is at the upper stairwell landing to the basement door at 0.4 feet below the 100-year water surface elevation, whereas the basement door is 3.4 feet below. Note that the restricted access to the backyard may have prevented the identification of other flood risks.

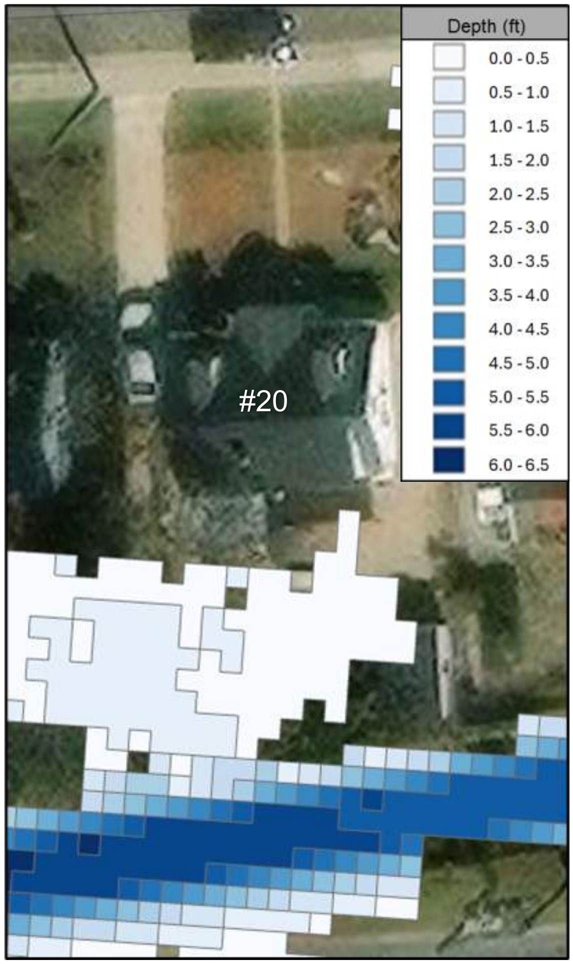


Figure 2.20.2.1 Property #20: 100-year flood depth above grade

Table 2.20.1 Property #20: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.8 feet	
100-year Water Surface Elevation	**66.9 feet**	
Lowest Point of Entry	-0.9 feet	Upper Stairwell Landing to Basement Door (estimated - limited access)
Adjacent Grade	-1.0 feet	
Basement Door	-3.4 feet	

2.20.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Install a hinged flood gate at the upper landing of the basement door stairwell to raise the lowest point of entry. The hinged flood gate will require a new concrete stairwell with approximately 1 foot taller walls. The top of the flood gate and stairwell walls should at least match the 100-year water surface elevation.
- Prior to installing the previous retrofit, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Provide a waterproof seal for any basement wall penetration below the 100-year water surface elevation.
- Raise the HVAC unit so the bottom of the unit is above the 100-year water surface elevation, if necessary.

2.20.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby and downstream as well. If constructed, it would be most effective to construct a channel floodwall for all impacted properties on Spring Road. Given the amount of water overtopping this channel, extending the channel floodwall could increase flood risk farther downstream.

2.20.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.21 Property #21: 4106 55th Avenue

2.21.1 Description

The property at 4106 55th Avenue consists of a one-and-a-half story building. The grade slopes down from the front to the back of the building. A lower level area below the first-floor addition at the north side has been closed in with boards. There are three doors at the back (west) side of the building which are at grade. The HVAC unit nearby is approximately 11 inches above grade. The south side of the building has two basement windows more than a couple feet above grade. There are penetrations through the basement wall for an electrical conduit, a plumbing pipe, and a hose bib. Figure 2.21.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.21.1.2, Figure 2.21.1.3 and Figure 2.21.1.4.

Figure 2.21.1.1 Property #21: Aerial view with elevation contours and photo numbering

Figure 2.21.1.2 Property #21: Front side (east side)

Figure 2.21.1.3 Property #21: Side (south side)

Figure 2.21.1.4 Property #21: Back side (west side)

2.21.2 Flood Risk

The property at 4106 55th Avenue abuts the Edmonston Channel on the north side of the property. Flood modeling indicates that floodwater from a 100-year event will extend to the back (west) wall of the building. See Figure 2.21.2.1. The main floor is 6.1 feet above the 100-year flood level. However, floodwater will potentially enter the basement at the back (west) side through a lower level door at the addition.
Table 2.21.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is the lower level door at 0.2 feet below the 100-year water surface elevation. None of the basement wall penetrations observed or HVAC unit are below the 100-year water surface elevation. Note that the boarded-up area under the addition at the north side and the area within the metal enclosure at the back (west) side may have prevented the identification of other flood risks.

Figure 2.21.2.1 Property #21: 100-year flood depth above grade

Table 2.21.1 Property #21: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+6.1 feet	
100-year Water Surface Elevation	**68.9 feet**	
Lowest Point of Entry	-0.2 feet	Lower-Level Door under the 1st Floor Addition
Adjacent Grade	-0.5 feet	

2.21.3 Strategies Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).

Note: It appears the wall system beneath the first-floor addition is not watertight and the assumption is the enclosed area is not a finished living space. Therefore, the doors associated with this space with thresholds below the 100-year water surface elevation likely do not need to be protected from floodwater.

2.21.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building could create difficulties in draining rain runoff from within the site.

Permanent Floodwall: Given the proximity of the channel to the building, there is insufficient area to construct a floodwall and the associated footing. If constructed, it would be as part of the channel improvements as a structural strategy for the watershed-level construction renovations. Local site drainage may require a pump station to address rainfall runoff.

2.21.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.22 Property #22: 4105 55th Avenue

2.22.1 Description

The property at 4105 55th Avenue consists of a one-and-a-half story building with a south side deck and basement door at the bottom of an exterior stairwell. The back (east) side of the building has a basement window a couple feet above grade and the HVAC unit at grade. Additional penetrations could not be identified due to limited access to the property. Figure 2.22.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.22.1.2, Figure 2.22.1.3 and Figure 2.22.1.4.

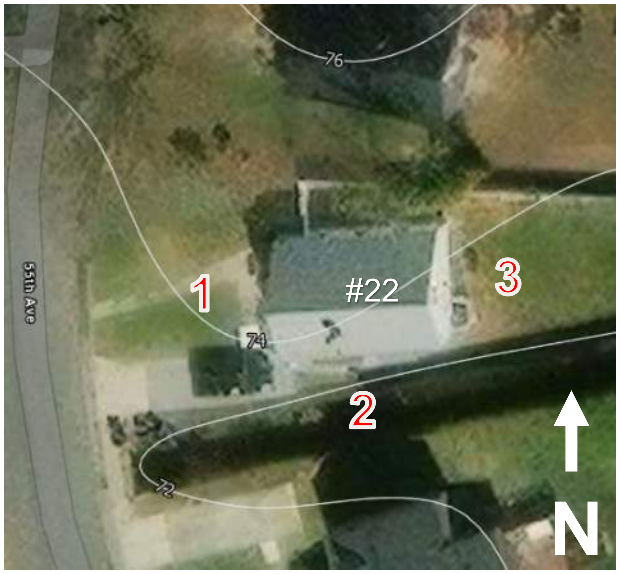


Figure 2.22.1.1 Property #22: Aerial view with elevation contours and photo numbering

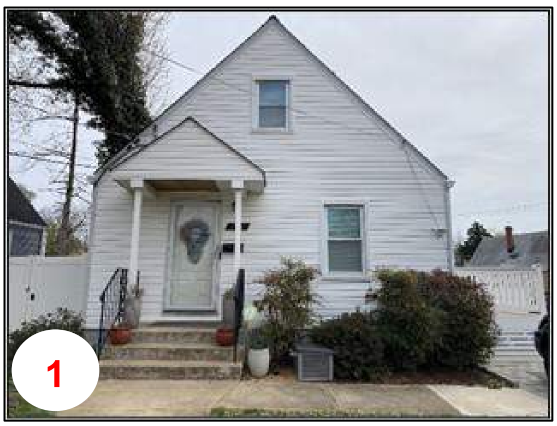


Figure 2.22.1.2 Property #22: Front side (west side) *Figure 2.22.1.3 Property #22: Side (south side)*

Figure 2.22.1.4 Property #22: Back side (east side)

2.22.2 Flood Risk

The property at 4105 55th Avenue borders the Edmonston Channel on the south side of the property. Flood modeling indicates that floodwater from a 100-year event will overtop the channel and extend to the south wall of the building. See Figure 2.22.2.1. The main floor is 4.4 feet above the 100-year flood level. However, floodwater will likely enter the basement at the south side through a basement door. Table 2.22.1 below lists the critical building elevations relative to the 100-year flood level. Based upon the survey, the lowest point of entry is at the upper stairwell landing to the basement door at 0.2 feet below the 100-year water surface elevation, whereas the basement door is 2.6 feet below. Also, the HVAC unit at the back (east) side of the building may be at the 100-year water surface elevation, but could not be confirmed because of limited access to the site during the site visit. Note that the boarded-up area under the deck on the south side may have prevented the identification of other flood risks.

Figure 2.22.2.1 Property #22 100-year flood depth above grade

Table 2.22.1 Property #22: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+4.4 feet	
100-year Water Surface Elevation	**73.5 feet**	
Lowest Point of Entry	-0.2 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-0.2 feet	
Basement Door	-2.6 feet	

2.22.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a sump pump with a battery backup at the basement to assist with water removal, if it does not already exist.
- Add a landing at the eastern end of the basement stairwell that is at least one step height greater than the existing top step at this end of the stairwell. Re-work the top of the southern side of the basement stairwell and possibly the western landing to match the new height of the eastern landing. Adjust the handrails as needed to provide fall protection. These efforts will raise the lowest point of entry.
- Prior to installing the previous retrofit, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 6 inches so the bottom of the unit is above the 100-year water surface elevation.

2.22.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: This strategy is not recommended because of the limited available property on which to construct a berm.

Permanent Floodwall: Given the proximity of the channel to the building, there is insufficient area to construct a floodwall and the associated footing. If constructed, it would be as part of the channel improvements as a structural strategy for the watershed-level construction renovations. Local site drainage may require a pump station to address rainfall runoff.

2.22.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed culvert enlargement at 56th Avenue (CE-4), and storm drain improvement (SD-1) along 55th Avenue and 56th Ave would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.23 Property #23: 4103 55th Avenue

2.23.1 Description

The property at 5429 Spring Road consists of a one-and-a-half story building with dormers at the roof. At the back (east) side of the building, exterior steps lead down from the adjacent grade to a basement door next to the backyard deck. The building has a sump pump system. There is a window on the north and south sides of the building. The window on the south side is slightly below grade and has a window well which is constructed of corrugated metal. Nearby the HVAC unit sits at grade. The basement window on the north side is a few inches above grade. There are penetrations through the basement wall for a hose bib, a plumbing pipe, electrical conduit, and HVAC conduit. Figure 2.23.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.23.1.2, Figure 2.23.1.3, Figure 2.23.1.4, Figure 2.23.1.5 and Figure 2.23.1.6.

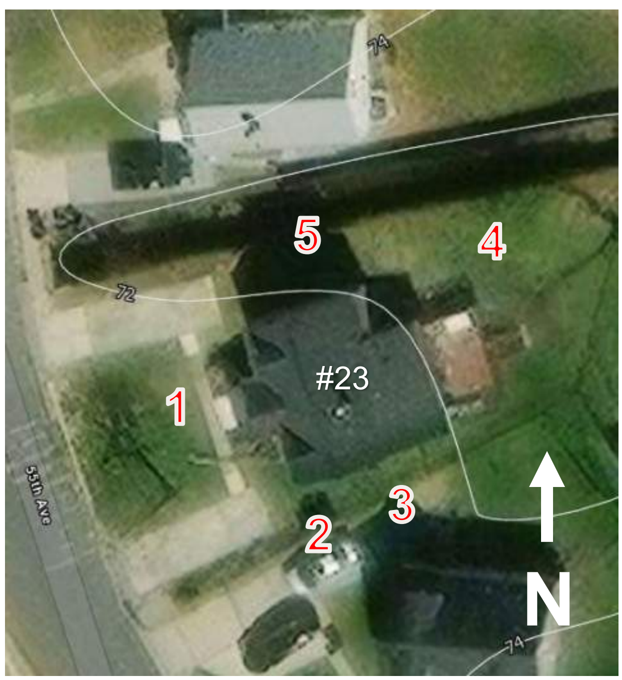


Figure 2.23.1.1 Property #23: Aerial view with elevation contours and photo numbering

Figure 2.23.1.2 Property #23: Front side (west side)

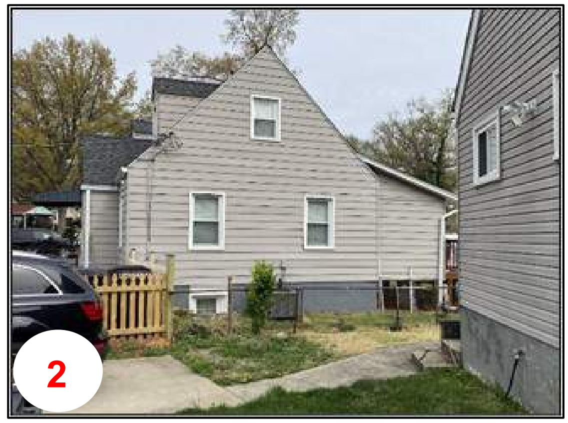


Figure 2.23.1.3 Property #23: Side (south side)

Figure 2.23.1.4 Property #23: Side (south side)

Figure 2.23.1.5 Property #23: Back side (east side)

Figure 2.23.1.6 Property #23: Side (north side)

2.23.2 Flood Risk

The property at 4103 55th Avenue borders the Edmonston Channel on the north side of the property. Flood modeling indicates that floodwater from a 100-year event will overtop the channel and extend to the north, east, and south walls of the building. See Figure 2.23.2.1. The main floor is 3.5 feet above the 100-year flood level. However, floodwater will likely enter the basement at the back (east) side through a basement door and may enter through the south side basement window. Table 2.23.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 0.5 feet below the 100-year water surface elevation, whereas the basement door is 4.0 feet below. Also, the HVAC unit at the south side of the building is approximately 0.5 feet below the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation. Note that the objects under the back (east) side deck may have prevented the identification of other flood risks.

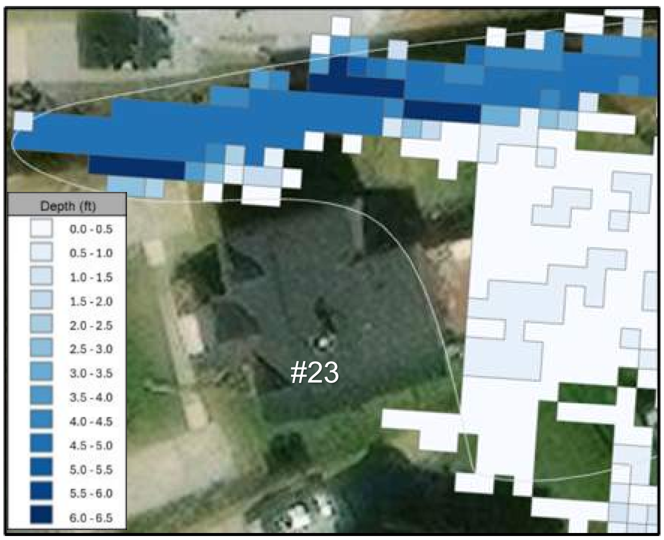


Figure 2.23.2.1 Property #23: 100-year flood depth above grade

Table 2.23.1 Property #23: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.5 feet	
100-year Water Surface Elevation	**72.5 feet**	
Lowest Point of Entry	-0.5 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-0.9 feet	
Basement Door	-4.0 feet	

2.23.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup for the sump pump at the basement, if one does not already exist.
- Extend the length of the upper landing to the basement door stairwell and add a step to raise the lowest point of entry. Extend the side wall of the stairwell and the guardrail as necessary.
- Install a larger landing at the upper landing of the basement stairwell that is at least one step height greater than the existing top step of the stairwell. Extend the south and north side walls of the stairwell to reach the upper landing. The top of the upper landing and new stairwell walls should at least match the 100-year water surface elevation. Then adjust the handrails as needed to provide fall protection. Adjust the grade around the landing to create a flat approach to the landing. These efforts will raise the lowest point of entry.
- Prior to installing the previous retrofit, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either adding a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Confirm or provide waterproof seals at the existing window well and construct a cover at the basement window on the south side of the building.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 1 foot so the bottom of the unit is above the 100-year water surface elevation.

2.23.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby and potentially to those downstream.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby. Additionally, a pump station might be required to address local site drainage from rainfall runoff.

2.23.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed culvert enlargement at 56th Avenue (CE-4), and storm drain improvement (SD-1) along 55th Avenue and 56th Ave would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.24 Property #24: 4101 55th Avenue

2.24.1 Description

The property at 4101 55th Avenue consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. At the back (north) side of the building, exterior steps lead down from the adjacent grade to a basement door. Along the same side, the HVAC unit is at grade. Basement windows are located between a couple inches to a couple feet above grade on the east, north, and west sides of the building. There are penetrations through the basement wall for plumbing pipes, vents, hose bibs, electrical conduit, gas piping, and cable conduit. Figure 2.24.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.24.1.2, Figure 2.24.1.3, Figure 2.24.1.4 and Figure 2.24.1.5.

Figure 2.24.1.1 Property #24: Aerial view with elevation contours and photo numbering

Figure 2.24.1.2 Property #24: Front side (south side)

Figure 2.24.1.3 Property #24: Side (east side)

Figure 2.24.1.4 Property #24: Back side (north side)

Figure 2.24.1.5 Property #24: Side (west side)

2.24.2 Flood Risk

The property at 4101 55th Avenue is located south of the Edmonston Channel. Flood modeling indicates that floodwater from a 100-year event will overtop the channel and extend to the back (north) wall of the building. See Figure 2.24.2.1. The main floor is 3.8 feet above the 100-year flood level. However, floodwater could potentially enter the basement at the back (north) side through a basement door.
Table 2.24.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 0.5 feet above the 100-year water surface elevation, whereas the basement door is 6.1 feet below. Also, the HVAC unit at the back (north) side of the building is approximately 0.3 feet below the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation.

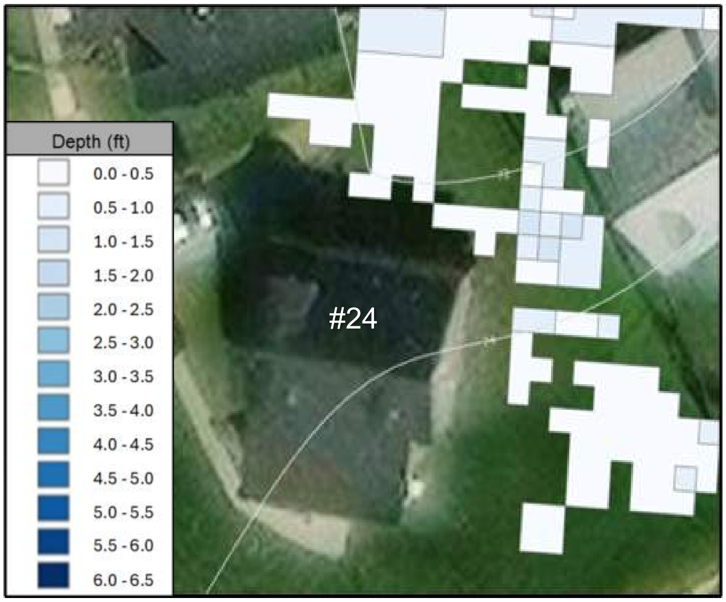


Figure 2.24.2.1 Property #24: 100-year flood depth above grade

Table 2.24.1 Property #24: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.8 feet	
Lowest Point of Entry	+0.5 feet	Upper Stairwell Landing to Basement Door
100-year Water Surface Elevation	**73.1 feet**	
Adjacent Grade	-0.5 feet	
Basement Door	-6.1 feet	

2.24.3 Strategy Recommended

Homeowner Flood Retrofits

The following retrofits are recommended to help reduce flood risk for this property:

- Install a battery backup sump pump at the basement to assist with water removal, if one does not already exist. Make sure the discharge is in an area above the 100-year water surface elevation.
- Prevent rainwater from collecting at the base of the exterior stairwell by adding a drain at the bottom of the stairs connected to the sump pump if one does not already exist.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 1 foot so the bottom of the unit is above the 100-year water surface elevation.

2.24.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Raise Lowest Point of Entry: This is not necessary because the lowest point of entry is above the 100-year water surface elevation.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would potentially increase the amount of flooding to properties nearby.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby. Additionally, a pump station might be required to address local site drainage for rainfall runoff.

2.24.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed culvert enlargement at 56th Avenue (CE-4), and storm drain improvement (SD-1) along 55th Avenue and 56th Ave would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.25 Property #25: 4100 56th Avenue

2.25.1 Description

The property at 4100 56th Avenue consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. There is an open sump pump at the back of the house that drains to the channel and an additional sump pump inside the building at the basement level. The basement door and HVAC unit are located at the back (north) side of the building at grade. Basement wall openings are covered with boards on the east, north, and west sides of the building. There are penetrations through the basement wall for a dryer vent, and electrical conduit. Figure 2.25.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.25.1.2, Figure 2.25.1.3, Figure 2.25.1.4 ,and Figure 2.25.1.5.

Figure 2.25.1.1 Property #25: Aerial view with elevation contours and photo numbering

Figure 2.25.1.2 Property #25: Front side (south side)

Figure 2.25.1.3 Property #25: Side (east side)

Figure 2.25.1.4 Property #25: Back side (north side)

Figure 2.25.1.5 Property #25: Side (west side)

2.25.2 Flood Risk

The property at 4100 56th Avenue is located south of the Edmonston Channel. Flood modeling indicates that floodwater from a 100-year event will extend to all four sides of the building. See Figure 2.25.2.1. The main floor is 4.4 feet above the 100-year flood level. However, floodwater will likely enter the basement through a basement door and may enter through a few other boarded openings at the back (north) side. Table 2.25.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the basement door at 2.0 feet below the 100-year water surface elevation. Also, the HVAC unit nearby is more than 1.0 feet below the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation. The homeowner reported that floodwater has previously penetrated the home. Note that the objects adjacent to the exterior wall at the carport may have prevented the identification of other flood risks.

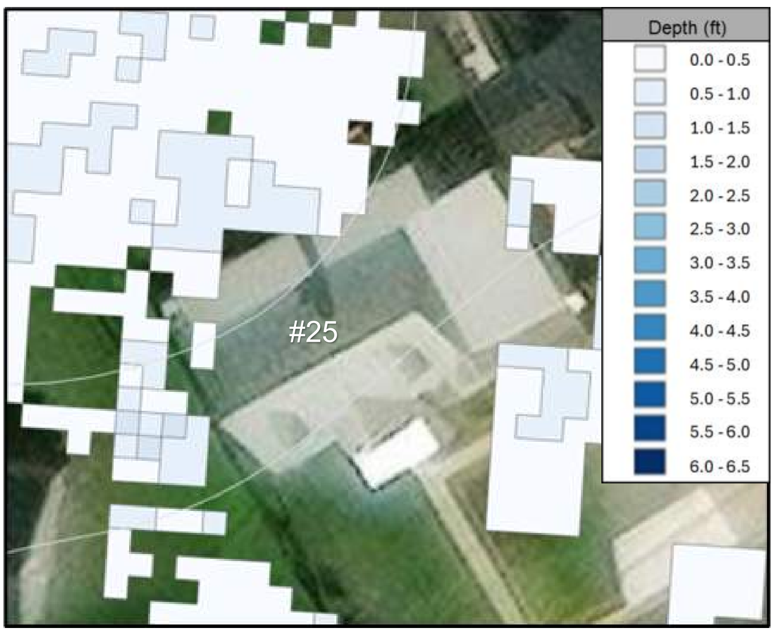


Figure 2.25.2.1 Property #25 100-year flood depth above grade

Table 2.25.1 Property #25: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+4.4 feet	
100-year Water Surface Elevation	**73.1 feet**	
Bottom of Boarded Openings at Back (North) Side	-1.0 feet	
Lowest Point of Entry	-2.0 feet	Basement Door
Adjacent Grade	-2.0 feet	

2.25.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a battery backup for the sump pump, if it does not already exist.
- Provide a waterproof seal at the boarded basement windows at the back (north) side of the building.
- Replace the basement door at the back (north) side with a flood resistant door to raise the lowest point of entry.
- Prior to installing the two previous retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 2 feet so the bottom of the unit is above the 100-year water surface elevation.

2.25.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would likely increase the amount of flooding to properties nearby.

Permanent Floodwall: Floodwall placement is not advised for this property. It would potentially increase the amount of flooding to properties nearby. Additionally, a pump station might be required to address local site drainage for rainfall runoff.

2.25.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed culvert enlargement at 56th Avenue (CE-4), and storm drain improvement (SD-1) along 55th Avenue and 56th Ave would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.26 Property #26: 4102 56th Avenue

2.26.1 Description

The property at 4102 56th Ave consists of a one-and-a-half story building with a dormer at the roof. The grade slopes down from the front to the back of the building. At the back (north) side of the building, exterior steps lead down from the adjacent grade to a basement door. There are walls at each side that support a small roof at the exterior stairs. The HVAC unit is at grade near the basement door. Basement windows are at or below grade on the east, north, and west sides of the building. The window at the west side has a window well which is constructed of metal. There are penetrations through the basement wall for a plumbing pipe, dryer vent, hose bib, and electrical conduit. Figure 2.26.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.26.1.2, Figure 2.26.1.3, Figure 2.26.1.4 and Figure 2.26.1.5.

Figure 2.26.1.1 Property #26: Aerial view with elevation contours and photo numbering

Figure 2.26.1.2 Property #26: Front side (south side)

Figure 2.26.1.3 Property #26: Side (east side)

Figure 2.26.1.4 Property #26: Back side (north side)

Figure 2.26.1.5 Property #26: Side (west side)

2.26.2 Flood Risk

The property at 4102 56th Avenue abuts the Edmonston Channel at the east side of the property. Flood modeling indicates that floodwater from a 100-year event will overtop the channel and extend to the back (north) wall of the building. See Figure 2.26.2.1. The main floor is 3.8 feet above the 100-year flood level. However, floodwater could potentially enter the basement at the back (north) side through a basement door as well as through basement windows at the east, north, and west sides of the building. Table 2.26.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 0.9 feet below the 100-year water surface elevation, whereas the basement door is 3.2 feet below. Also, the HVAC unit at the back (north) side of the building is approximately 1.5 feet below the 100-year water surface elevation. A few of the basement wall penetrations are at or may be below the 100-year water surface elevation including a hose bib, electrical conduit, and plumbing pipe. Note that the objects adjacent to the exterior walls may have prevented the identification of other flood risks.

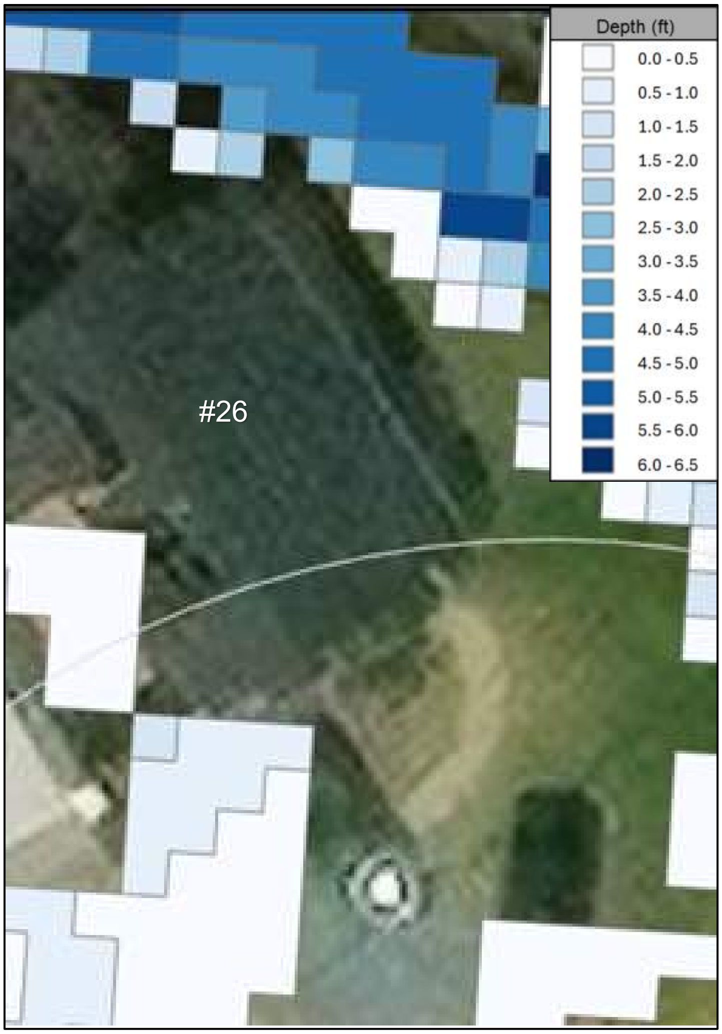


Figure 2.26.2.1 Property #26: 100-year flood depth above grade

Table 2.26.1 Property #26: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.8 feet	
100-year Water Surface Elevation	**74.0 feet**	
Basement Windowsill at East Side	-0.1 feet	
Basement Windowsill at Back (North) Side	-0.4 feet	
Lowest Point of Entry	-0.9 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-1.4 feet	
Basement Door	-3.2 feet	

2.26.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a sump pump with a battery backup, if one does not already exist.
- This group of retrofits will raise the lowest point of entry:
  - Install a hinged flood gate at the upper landing of the basement door stairwell. The hinged flood gate will require a new concrete stairwell. The top of the flood gate and stairwell walls should at least match the 100-year water surface elevation.
  - Install a flood glass window or a waterproof window well with cover around the basement window at the east and north sides that extends a minimum of 6 inches above the 100-year water surface elevation.
- Prior to installing the previous group of retrofits, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either reconstruction a roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Confirm or provide waterproof seals and reconstruct a cover at the existing window well at the west side.
- Provide a waterproof seal for any basement wall penetration below the 100-year water surface elevation.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 2 feet so the bottom of the unit is above the 100-year water surface elevation.

2.26.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would potentially increase the amount of flooding to properties nearby.

Permanent Floodwall: Given the proximity of the channel to the building, there is insufficient area to construct a floodwall and the associated footing. If constructed, it would be as part of the channel improvements as a structural strategy for the watershed-level construction renovations. Local site drainage may require a pump station to address rainfall runoff.

2.26.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed culvert enlargement at 56th Avenue (CE-4), and storm drain improvement (SD-1) along 55th Avenue and 56th Ave would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.27 Property #27: 4104 56th Avenue

2.27.1 Description

The property at 4104 56th Avenue consists of a one-and-a-half story building with dormers at the roof. The grade slopes down from the front to the back of the building. At the back (west) side of the building, exterior steps lead down from the adjacent grade to a basement door. There is a small roof over the exterior steps. The HVAC unit is at grade at the south side of the building. Basement windows are located below or above grade on the north, west and south sides of the building. The window on the north side has a window well which is constructed of metal with a cover. There are penetrations through the basement wall for a hose bib, dryer vent, plumbing pipe, electrical conduit, and HVAC conduit. Figure 2.27.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.27.1.2, Figure 2.27.1.3, Figure 2.27.1.4, and Figure 2.27.1.5 and Figure 2.27.1.6.

Figure 2.27.1.1 Property #27: Aerial view with elevation contours and photo numbering

Figure 2.27.1.2 Property #27: Front side (east side)

Figure 2.27.1.3 Property #27: Side (north side)

Figure 2.27.1.4 Property #27: Basement window (north side)

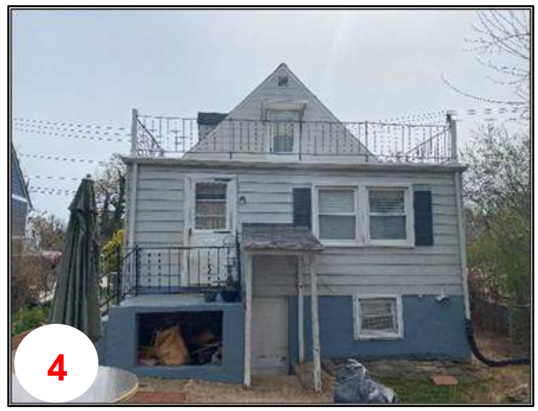


Figure 2.27.1.5 Property #27: Back side (west side)

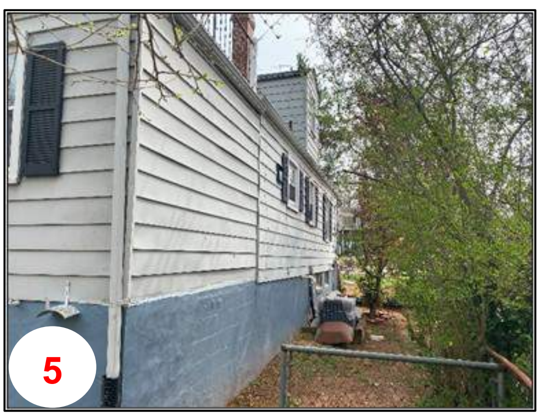


Figure 2.27.1.6 Property #27: Side (south side)

2.27.2 Flood Risk

The property at 4104 56th Avenue abuts the Edmonston Channel at the south side of the property. Flood modeling indicates that floodwater from a 100-year event will overtop the channel and extend to the back (west) wall and south wall of the building. See Figure 2.27.2.1. The main floor is 4.7 feet above the 100-year flood level. However, floodwater could potentially enter the basement at the back (west) side through a basement door. Table 2.27.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the upper stairwell landing to the basement door at 0.1 feet below the 100-year water surface elevation, whereas the basement door is 2.1 feet below. Also, the HVAC unit at the south side of the building is approximately a few inches below the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation. The homeowner reported they have seen water on the floor of the basement at the west side of the building. Note that the objects under the back (west) side landing may have prevented the identification of other flood risks.

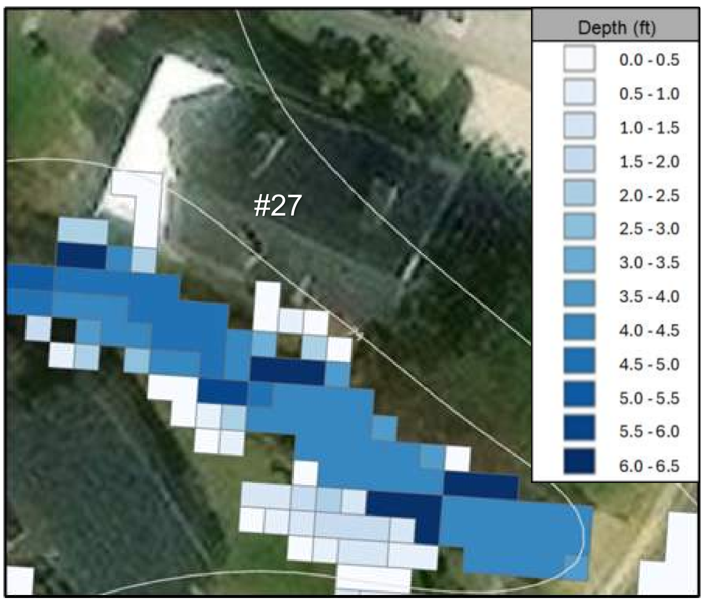


Figure 2.27.2.1 Property #27: 100-year flood depth above grade

Table 2.27.1 Property #27: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+4.7 feet	
100-year Water Surface Elevation	**74.5 feet**	
Lowest Point of Entry	-0.1 feet	Upper Stairwell Landing to Basement Door
Adjacent Grade	-0.1 feet	
Basement Door	-2.1 feet	

2.27.3 Strategy Recommended

Homeowner Flood Retrofits and Raise the Lowest Point of Entry

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a sump pump with a battery backup, if one does not already exist.
- Construct a new landing at the top of the stairs leading to the basement door that adds one step to the stairs and wraps around the south side of the stairwell. The top of the new landing should meet or exceed the 100-year water surface elevation. Install railings along the south side of the stairwell to prevent someone from falling into the stairwell. These efforts will raise the lowest point of entry.
- Prior to installing the previous retrofit, an engineering assessment should be performed to determine if the existing structure can support the flood loads. Structural modifications may be needed before installation.
- Prevent rainwater from collecting at the base of the exterior stairwell by either reconstructing the roof extension over the stairwell or adding a drain at the bottom of the stairs connected to the sump pump.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Raise the HVAC unit at least 1 foot so the bottom of the unit is above the 100-year water surface elevation.

2.27.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would potentially increase the amount of flooding to properties nearby.

Permanent Floodwall: Given the proximity of the channel to the building, there is insufficient area to construct a floodwall and the associated footing. If constructed, it would be as part of the channel improvements as a structural strategy for the watershed-level construction renovations. Local site drainage may require a pump station to address rainfall runoff. It would potentially increase the amount of flooding to properties nearby.

2.27.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed culvert enlargement at 56th Avenue (CE-4), and storm drain improvement (SD-1) along 55th Avenue and 56th Ave would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.28 Property #28: 4111 56th Avenue

2.28.1 Description

The property at 4111 56th Avenue consists of a two-story home with a basement. There is an at-grade addition at the back (east) side of the building. Two basement windows are located a few inches above grade on the north and south sides of the building. The HVAC unit is at grade along the north side. There are penetrations through the basement wall for a dryer vent, hose bib, electrical conduit, and HVAC conduit. Figure 2.28.1.1 below provides an aerial view of the home with topographic elevation contours, and the property is further depicted in Figure 2.28.1.2, Figure 2.28.1.3, Figure 2.28.1.4, and Figure 2.28.1.5.

Figure 2.28.1.1 Property #28: Aerial view with elevation contours and photo numbering

Figure 2.28.1.2 Property #28: Front side (west side)

Figure 2.28.1.3 Property #28: Side (south side)

Figure 2.28.1.4 Property #28: Back side (east side)

Figure 2.28.1.5 Property #28: Side (north side)

2.28.2 Flood Risk

The property at 4111 56th Avenue is located north of the Edmonston Channel. Flood modeling indicates that floodwater from a 100-year event will overtop the channel and extend to the south wall and back (east) wall of the building. See Figure 2.28.2.1. The main floor is 3.5 feet above the 100-year flood level. However, floodwater could potentially enter the addition at the back (east) side through a side door. Table 2.28.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry is at the side door at 0.4 feet above the 100-year water surface elevation. None of the basement wall penetrations are below the 100-year water surface elevation. Note that the objects adjacent to the exterior walls may have prevented the identification of other flood risks.

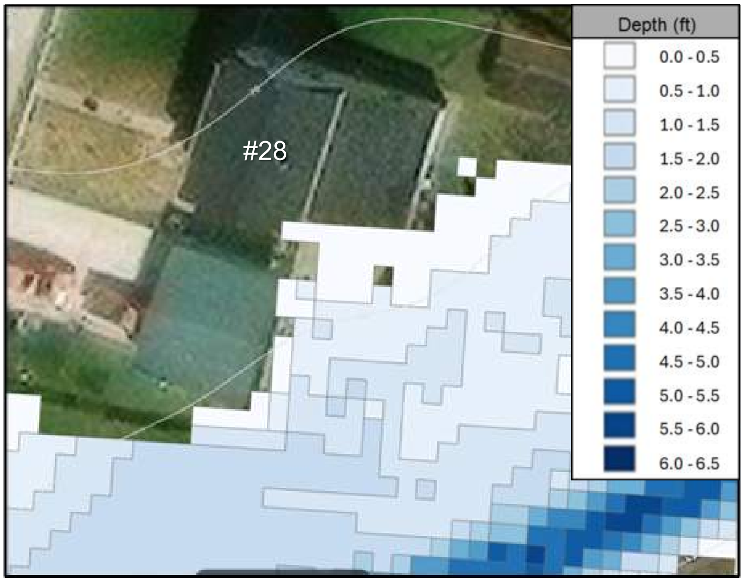


Figure 2.28.2.1 Property #28: 100-year flood depth above grade

Table 2.28.1 Property #28: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Main Floor	+3.5 feet	
Lowest Point of Entry	+0.4 feet	Side Door
100-year Water Surface Elevation	**77.1 feet**	
Adjacent Grade	-0.5 feet	

2.28.3 Strategy Recommended

Homeowner Flood Retrofits

The following retrofits are recommended to help mitigate flood risk for this property:

- Install a sump pump with a battery backup, if one does not already exist.
- Replace interior basement floor finishes with flood damage resistant materials to limit damage from water intrusion (e.g., replace carpet with tiles and paper-faced gypsum board with wood paneling, or wainscoting at the walls).
- Waterproof the exterior of the lowest 12-inches of the foundation structure of the addition to prevent floodwater associated with a 100-year event from seeping under the addition and minimize chances that it will flow into the basement.

2.28.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this home. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Raise Lowest Point of Entry: This strategy is not necessary because the lowest point of entry is above the 100-year water surface elevation.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this home. This strategy would involve adherence to rigorous standards that produce extensive renovations and large costs that are not appropriate for residential basements. Prior to implementing this strategy, an engineering assessment would be required to determine if the existing structure can support the flood loads. Significant structural modifications would likely be needed for the basement wall, footings, and basement slab to resist flood loads and other modifications (e.g., flood doors, waterproofing, etc.) would be needed to address dry floodproofing requirements.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would create an aesthetically unpleasing and odd feature compared to nearby properties. Also, it would potentially increase the amount of flooding to properties nearby.

Permanent Floodwall: It would potentially increase the amount of flooding to properties nearby. Local site drainage may require a pump station to address rainfall runoff.

2.28.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed culvert enlargement at 56th Avenue (CE-4), and storm drain improvement (SD-1) along 55th Avenue and 56th Ave would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

2.29 Property #29: 5416 Annapolis Road

2.29.1 Description

The property at 5416 Annapolis Road consists of a large one-story shopping center complex located adjacent to the Edmonston Channel. The basement level is constructed with concrete masonry units (CMU). The grade slopes down from the front to the back of the building. At the back (north) side there are several doors at grade and several loading docks approximately 3.5 feet above grade that service the basement. Wall penetrations for electrical are located approximately 1.5 feet above grade at the back (north) side. Figure 2.29.1.1 below provides an aerial view of the complex with topographic elevation contours, and the property is further depicted in Figure 2.29.1.2, Figure 2.29.1.3, Figure 2.29.1.4, and Figure 2.29.1.5.

Figure 2.29.1.1 Property #29: Aerial view with elevation contours and photo numbering

Figure 2.29.1.2 Property #29: Front side (south side)

Figure 2.29.1.3 Property #29: Back side (north side)

Figure 2.29.1.4 Property #29: Back side (north side)

Figure 2.29.1.5 Property #29: Side (west side)

2.29.2 Flood Risk

The property at 5416 Annapolis Road is located south of the Edmonston Channel. Flood modeling indicates that floodwater from a 100-year event will overtop the channel and extend to the back (north) wall of the building. See Figure 2.29.2.1. The lower floor level is 2.6 feet above the 100-year flood level. However, floodwater could enter the exterior access doors that likely lead to a stairwell for entry to the lower floor level at the back (north) side. This is not expected to impact the lowest floor level, but may affect contents behind these access doors which may include mechanical, electrical, and plumbing systems that were not accessible for observation during the site visit. Table 2.29.1 below lists the critical building elevations relative to the 100-year flood level. The lowest point of entry to the lowest floor level is at the back (north) loading dock doors at 2.6 feet above the 100-year water surface elevation. A transformer at the same side is below the 100-year water surface elevation as well. Note that the restricted access through the exterior access doors may have prevented the identification of other flood risks.

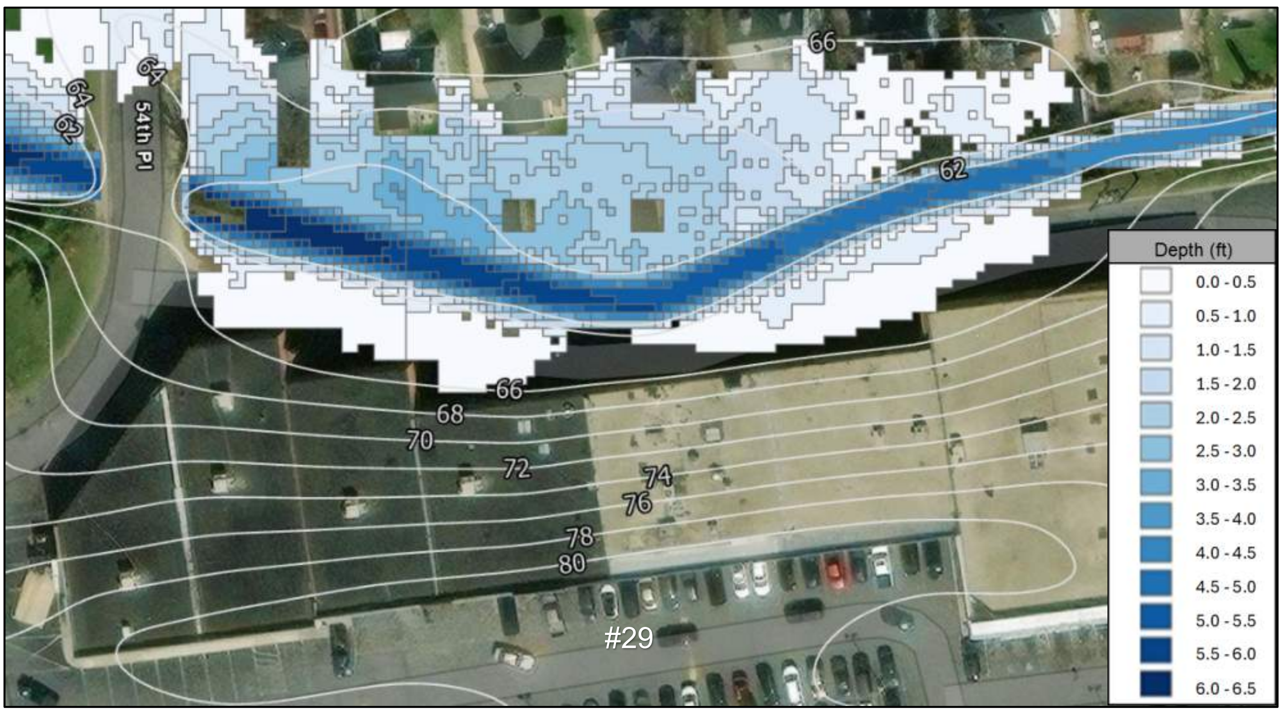


Figure 2.29.2.1 Property #29: 100-year flood depth above grade

Table 2.29.1 Property #29: Critical building elevations relative to the 100-year flood level

Item	Elevation	Notes
Lower Floor Level	+2.6 feet	
Lowest Point of Entry	+2.6 feet	Loading Dock Doors
100-year Water Surface Elevation	**66.5 feet**	
Exterior Building Doors	-0.8 feet	Doors Provide Access to Stairs Up to Lowest Level Entry
Adjacent Grade	-1.0 feet	

2.29.3 Strategy Recommended

Building Owner Flood Retrofits

This strategy would help reduce flood risk for this property. The following retrofits are recommended:

- Install a floor drain connected to a sump pump with a battery backup at each enclosed floor area at or below the 100-year flood water surface elevation, if one does not already exist. Discharge the pump through the exterior wall at least above the 100-year water surface elevation.
- Install flood doors at back (north) entrances where the flood door threshold is at or below the 100-year flood water surface elevation.

2.29.4 Strategies Considered

The following site-specific flood mitigation strategies were assessed as potential options to reduce the risk of flood damage to this building. Due to structural and property constraints, technical feasibility, cost, and other factors, these strategies were eliminated as feasible options for this property.

Raise Lowest Point of Entry: This strategy is not necessary because the lowest point of entry to the lowest floor level is above the 100-year water surface elevation.

Dry Floodproofing: Based on the modeled extent of the 100-year event, full and comprehensive dry floodproofing is not recommended for this building. This strategy would involve adherence to rigorous standards that are not necessary for enclosed areas used for access purposes only.

Grading and Placement of Fill: Additional fill to protect the building would result in a berm that would likely increase the amount of flooding to properties nearby.

Permanent Floodwall: This strategy is not recommended because it would likely increase the amount of flooding to properties nearby.

2.29.5 Structural Strategies

Based on an evaluation of modeled alternatives, the proposed bridge enlargements at Taylor Street (BE-2), Spring Road (BE-3), and 54th Place (BE-4) and channel improvements from 54th Place and 55th Avenue (CI-1) would potentially remove the building from the 100-year floodplain. For more information, refer to Section 8 (Proposed Improvements) of the Bladensburg Flood Reduction Preliminary Design Report.

With every community, we redefine what's possible.

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

Stantec Consulting Services Inc.
6110 Frost Place Suite 200
Laurel MD 20707-2927
stantec.com

Appendix B Floodwall Internal Drainage Memo

Technical Memo

To: Corvias Infrastructure Solutions
Project/File: Bladensburg Flood Reduction Project
From: Stantec Consulting Service, Inc; Laurel, MD

Date: September 2025

Reference: Quincy Run – Floodwall Interior Drainage

1 Introduction

Quincy Run is subject to frequent flood events that impact roads, parking lots and residential buildings, including the apartment building at 5204-5206 Newton Street. To mitigate flood risk at this location, a permanent floodwall is proposed around the existing apartment building. An important consideration when designing floodwalls is the evaluation of internal drainage. The objective of this memo is to provide a description of the methodology and assumptions used to size the proposed pumps for the floodwall.

The proposed location and alignment of the floodwall are shown in Figure 1 and Figure 2. Stormwater runoff from the building's parking lot will no longer be able to discharge to the stream and will instead pond behind the proposed floodwall. Therefore, pumps were designed to drain the interior floodwater. For this analysis, only the 100-year return event was evaluated for the pump design. However, the pump station will be used to evacuate water during other frequent events, as needed.

The proposed design will follow the FEMA Guidance Document 95, Section 4.1.8 for interior drainage in conjunction with the Prince Georges Stormwater Management Design Manual (Design Manual). The FEMA levee guidance states that, "An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than one foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters."

Reference: **Quincy Run Interior Drainage**

Figure 1: Project Location

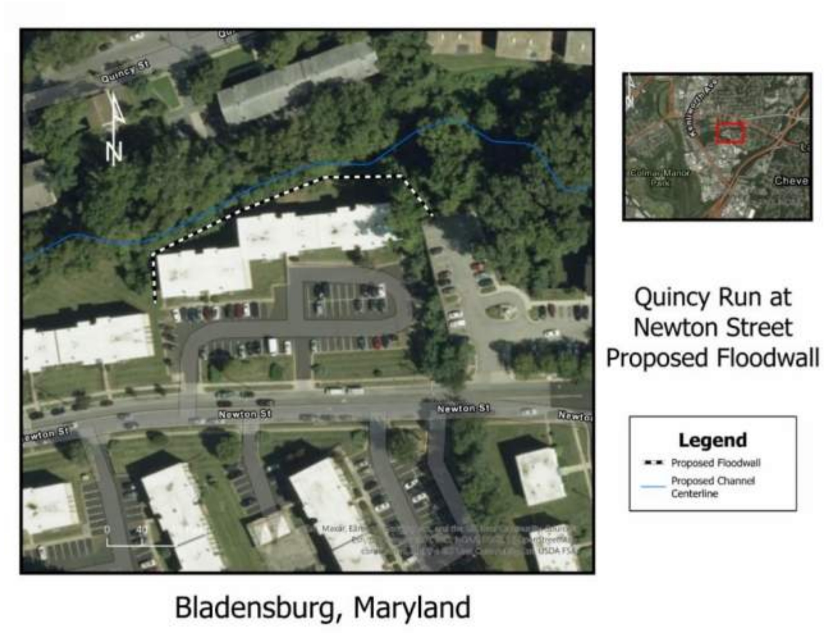
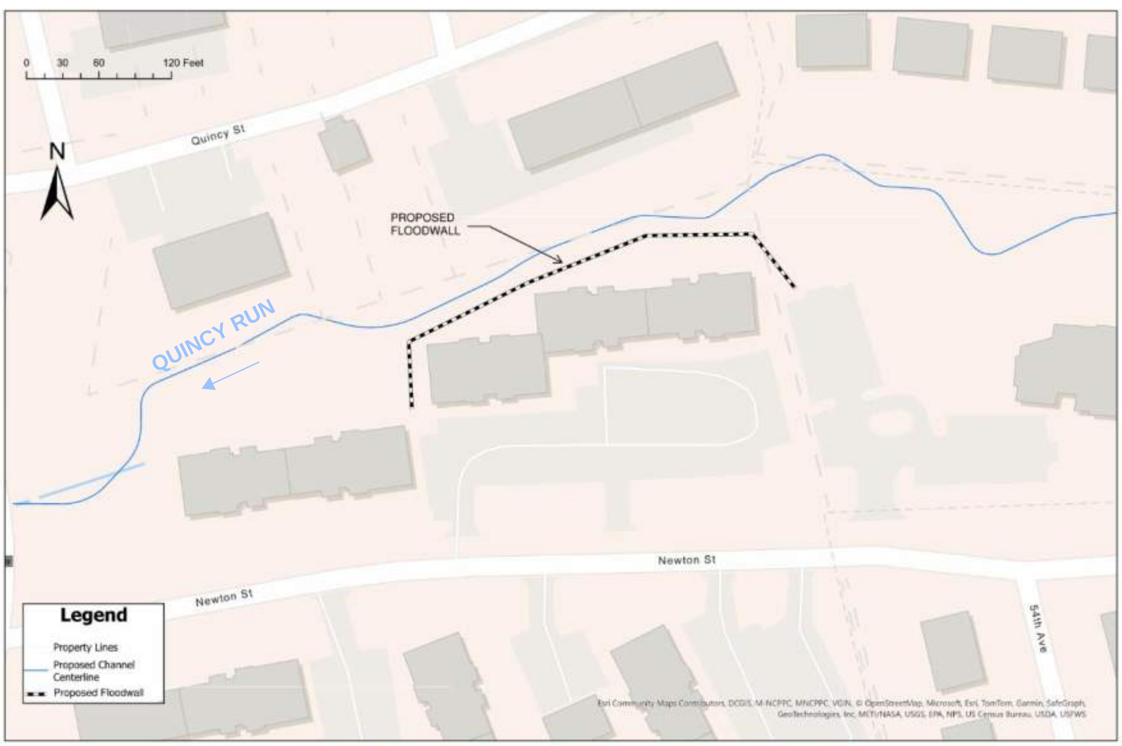


Figure 2: Proposed Floodwall Location



2 Methodology

The Prince Georges Stormwater Management Design Manual was utilized for the interior drainage hydrologic calculations. Per this guidance, the rational method is appropriate for this site since the drainage area is less than 20 acres. The following summarizes the parameters used for these calculations.

Rational Method:

Q = cIA, where:

Q = flow (cfs)
c = runoff coefficient
I = rainfall intensity (in/hr)
A = area (acres)

Runoff Coefficient:

The only two land covers for the site are impervious (buildings and paved areas) and grass/lawn. The impervious areas are depicted in Figure 3. The impervious surfaces dataset is from Prince George's County Planning Department. A conservative assumption that the slopes were greater than 7% was used for the grass/lawn.

Figure 3: Impervious Area

Section 8.2.1A of the Design Manual provides guidance on the selection of the runoff coefficient (c):

c = 0.90 for impervious areas (before correction)
c = 0.35 for lawns and grass areas (before correction)

From Section 8.2.1.2, a c-factor Correction Factor is applied to the runoff coefficient for design storms beyond the 25-yr. For the 100-yr event the Correction Factor is 1.25. The Correction Factor was applied to the runoff coefficient for the pervious areas. Therefore, the following adjustments were made to the runoff coefficient. It should be noted that the impervious area cannot be multiplied by 1.25 as this would lead to a value of 1.125 which. As such, a value of 0.95 for this analysis:

c = 0.95 for impervious
c = 0.35 x 1.25 = 0.44 for pervious

Table references for runoff coefficient and Correction Factor from the Design Manual:

Table 8-1 Rational Method Runoff Coefficient

Zone/Development	7% or Less	Steeper Than 7%
C Commercial (85% Imp.)	0.80	0.90
I Industrial	0.60-0.85	0.70-01.85
R-P-H Garden Type Apartments	0.60-0.85	0.70-0.85
R-H School, Churches	0.60-0.85	0.70-0.85
R-T Residential (65% Imp)	0.65	0.75
R-10 Apartments	0.60-0.85	0.70-0.85
R-20 Residential	0.60	0.70
R-30 Residential	0.60	0.70
R-35 Residential	0.60	0.70
R-55 Residential	0.55	0.65
R-80 Residential	0.50	0.60
1/3 Acre	0.45	0.55
R-R Rural Residential (25% Imp)	0.40	0.50
R-A Rural Agricultural	0.30	0.40
R-E Residential Estate	0.30	0.40
O-S Open Space	0.25	0.35

Impervious areas	0.90
Lawns and grass areas	
Slopes 7% or flatter	0.25
Slopes greater than 7%	0.35
Wooded areas	0.20

Table 8-2 Runoff Correction Factor

Design Storm	Correction Factor
≤ 25-Year	1.00
25-Year	1.10
50-Year	1.20
100-Year	1.25

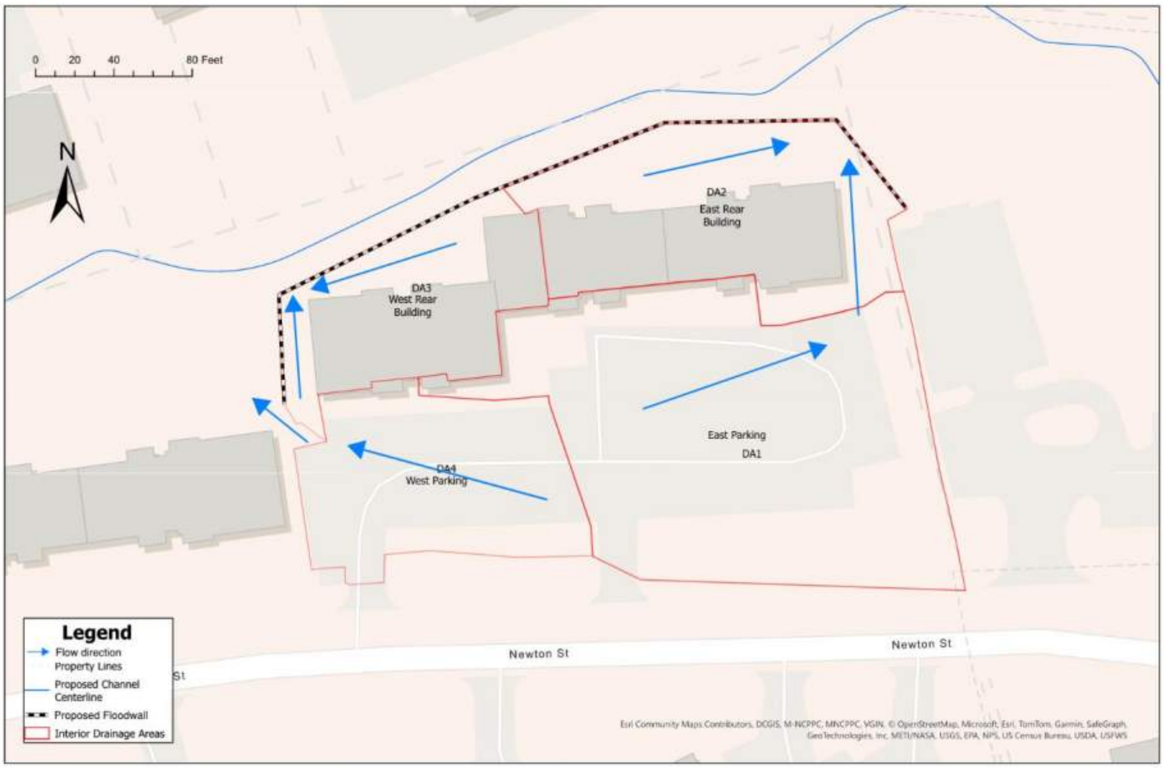
Intensity:

Rainfall intensity for the Rational Method was based on rainfall intensity curves from NOAA Atlas 14 (Figure 5). The intensity curves were developed for Times of Concentration (Tc) of 5-minutes to 1-hour storm frequencies for the 1-, 2-, 5-, 10-, 50-, and 100-yr return events. Since our site is less than 2 acres, Section 8.2.2.1 of the Design Manual states that commercial, industrial, apartments, or similar should use a Tc of 5 minutes. The NOAA Atlas 14 gives the 100-yr, 5-minute rainfall as 0.739 which translates to an intensity of 8.88 in/hr.

Area:

Four drainage areas were delineated using site specific survey data supplemented with publicly available Digital Elevation Model data for Prince Georges County, MD (Figure 4). The total, impervious and pervious areas from the GIS were used to calculate the weighted runoff coefficients and the flows.

Figure 4: Interior Drainage Areas



The east parking lot (DA1) conveys runoff to a curb cut and swale before discharging to Quincy Run. The east rear building (DA2) includes runoff from behind the building and part of the roof. The west rear building (DA3) includes the runoff from behind the building and part of the roof. DA2 and DA3 are separated by a short wall that divides the flow. A storm inlet conveys runoff from the west parking lot (DA4) through the existing storm sewer system and discharges directly to Quincy Run. If overflow at this inlet occurs, the runoff will be conveyed overland and outside of the floodwall.

Hydrologic Parameters Summary:

A summary of drainage area properties is provided in Table 1.

Table 1: Drainage Area Properties

DA#	Interior DA	Area (sq ft)	Area (ac)	Impervious Area (sq ft)	Pervious Area (sq ft)
DA1	East Parking	29,072	0.67	17,578	11,495
DA2	East Rear Building	15,047	0.35	6,684	8,363
DA3	West Rear Building	9,707	0.22	6,007	3,700
DA4	West Parking	11,597	0.27	9,476	2,121
	Total	**65,425**	**1.50**	**39,745**	**25,678**

Flows were determined for each of the drainage areas separately, in addition to the Total East DA (DA1 and DA2) and the Total West DA (DA3 and DA4) flows. Total East DA assumes that the entire flow from the east parking lot and the east rear building will contribute to the interior flooding. Total West DA assumes that the entire flow from the west parking lot and the west rear building will contribute to the interior flooding behind the floodwall. As noted herein, the flows from the east and west sides of the building remain separate due to a wall behind the building, and therefore it is assumed that two pumps will be needed, one for each side.

The scenarios considered are:

1. Scenario 1 - Runoff from the parking areas will be conveyed directly to Quincy Run. This is the least amount of area that contributes to interior flooding. This is represented by DA 2 (east) and DA 3 (west):

    a. Q_{DA2} = 2.0 cfs
    b. Q_{DA3} = 1.5 cfs

2. Scenario 2 - Runoff from the east parking area and both building areas contribute to the interior flooding, represented by Total East DA and DA 3 (west):

    a. $Q_{Total\ East\ DA}$ = 6.5 cfs
    b. Q_{DA3} = 1.5 cfs

3. Scenario 3 – Runoff from the entire site contributes to the interior flooding represented by the Total East DA and Total West DA:

    a. $Q_{Total\ East\ DA}$ = 6.5 cfs
    b. $Q_{Total\ West\ DA}$ = 3.5 cfs

3 Results

Results are provided in Table 2, where the total area is provided in acres (ac), the weighted runoff coefficient (c), rainfall intensity, I = 8.88 in/hr and flow is in cfs.

Table 2: Drainage Area Flows

DA#	Interior DA	Total Area (ac)	Weighted Runoff Coefficient	Rainfall Intensity (in/hr)	Flow, Q (cfs)	Storage Volume (cf)
DA1	East Parking	0.67	0.75	8.88	4.44	11148
DA2	East Rear Building	0.35	0.67	8.88	2.04	4110
DA3	West Rear Building	0.22	0.76	8.88	1.50	11616
DA4	West Parking	0.27	0.75	8.88	2.03	6251
Total East DA (DA1 & DA2)	East Parking and Rear Building	1.01	0.72	8.88	6.48	15228
Total West DA (DA3 & DA4)	West Rear Building and Parking	0.49	0.81	8.88	3.52	17867

These flows were used to size the pumps. The following additional assumptions will need to be incorporated into the final design.

1. Grading will be necessary to convey the stormwater to pumps/outfalls through grading;
2. A reservoir/underground storage will collect water to be pumped;
3. Surcharge at inlet will be included;
4. Pumps are sized based upon local guidance/methods;
5. Existing outfalls located at the upstream and downstream limit of the floodwall to be evaluated for the 100-yr event.

Reference: **Quincy Run Interior Drainage**

Figure 5: NOAA Atlas 14 for Bladensburg, MD. Accessed June 23, 2025.

6/23/25, 8:59 AM Precipitation Frequency Data Server

NOAA Atlas 14, Volume 2, Version 3
Location name: Bladensburg, Maryland, USA*
Latitude: 38.9366°, Longitude: -76.9286°
Elevation: 46 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.350 (0.318-0.385)	0.418 (0.380-0.461)	0.498 (0.452-0.549)	0.557 (0.504-0.614)	0.631 (0.566-0.696)	0.685 (0.612-0.757)	0.739 (0.656-0.818)	0.791 (0.697-0.879)	0.856 (0.747-0.959)	0.907 (0.785-1.02)
10-min	0.559 (0.507-0.614)	0.669 (0.608-0.737)	0.798 (0.723-0.879)	0.891 (0.805-0.982)	1.00 (0.902-1.11)	1.09 (0.974-1.20)	1.17 (1.04-1.30)	1.25 (1.10-1.39)	1.35 (1.18-1.52)	1.43 (1.24-1.61)
15-min	0.698 (0.634-0.768)	0.841 (0.764-0.926)	1.01 (0.915-1.11)	1.13 (1.02-1.24)	1.27 (1.14-1.40)	1.38 (1.23-1.53)	1.48 (1.32-1.64)	1.58 (1.40-1.76)	1.70 (1.49-1.91)	1.79 (1.55-2.02)
30-min	0.958 (0.869-1.05)	1.16 (1.06-1.28)	1.43 (1.30-1.58)	1.63 (1.48-1.80)	1.89 (1.69-2.08)	2.08 (1.86-2.30)	2.27 (2.02-2.52)	2.46 (2.17-2.74)	2.71 (2.37-3.04)	2.90 (2.51-3.27)
60-min	1.19 (1.08-1.31)	1.46 (1.32-1.60)	1.84 (1.67-2.03)	2.13 (1.92-2.34)	2.51 (2.25-2.77)	2.82 (2.52-3.11)	3.13 (2.78-3.47)	3.45 (3.04-3.84)	3.89 (3.39-4.36)	4.24 (3.67-4.77)
2-hr	1.41 (1.28-1.55)	1.71 (1.56-1.89)	2.17 (1.97-2.38)	2.52 (2.28-2.77)	3.02 (2.72-3.32)	3.42 (3.06-3.76)	3.84 (3.42-4.24)	4.28 (3.78-4.75)	4.91 (4.28-5.48)	5.41 (4.67-6.08)
3-hr	1.51 (1.38-1.67)	1.84 (1.67-2.03)	2.33 (2.11-2.57)	2.72 (2.46-3.00)	3.28 (2.94-3.61)	3.74 (3.33-4.12)	4.23 (3.73-4.67)	4.74 (4.15-5.25)	5.48 (4.73-6.11)	6.08 (5.18-6.83)
6-hr	1.86 (1.70-2.06)	2.26 (2.06-2.50)	2.85 (2.59-3.15)	3.34 (3.01-3.69)	4.07 (3.63-4.49)	4.68 (4.14-5.18)	5.35 (4.69-5.93)	6.07 (5.26-6.76)	7.14 (6.08-8.01)	8.03 (6.74-9.08)
12-hr	2.26 (2.04-2.55)	2.73 (2.46-3.07)	3.48 (3.12-3.90)	4.11 (3.66-4.61)	5.08 (4.48-5.70)	5.94 (5.18-6.67)	6.89 (5.93-7.76)	7.95 (6.74-8.99)	9.57 (7.94-10.9)	11.0 (8.94-12.6)
24-hr	2.62 (2.40-2.91)	3.17 (2.90-3.52)	4.08 (3.72-4.52)	4.88 (4.42-5.38)	6.10 (5.49-6.70)	7.19 (6.41-7.86)	8.42 (7.44-9.17)	9.82 (8.58-10.7)	12.0 (10.3-13.0)	13.9 (11.7-15.0)
2-day	3.05 (2.78-3.36)	3.69 (3.37-4.07)	4.73 (4.31-5.21)	5.62 (5.10-6.18)	6.96 (6.28-7.64)	8.13 (7.29-8.90)	9.44 (8.39-10.3)	10.9 (9.59-11.9)	13.1 (11.3-14.3)	15.0 (12.8-16.4)
3-day	3.22 (2.94-3.55)	3.89 (3.56-4.29)	4.98 (4.54-5.49)	5.91 (5.38-6.50)	7.32 (6.61-8.03)	8.54 (7.67-9.35)	9.90 (8.82-10.8)	11.4 (10.1-12.5)	13.7 (11.9-15.0)	15.7 (13.5-17.2)
4-day	3.38 (3.10-3.73)	4.09 (3.74-4.52)	5.23 (4.78-5.76)	6.20 (5.65-6.83)	7.67 (6.94-8.42)	8.95 (8.05-9.80)	10.4 (9.25-11.3)	12.0 (10.6-13.1)	14.3 (12.5-15.7)	16.4 (14.1-18.0)
7-day	3.92 (3.61-4.30)	4.72 (4.35-5.19)	5.97 (5.49-6.55)	7.04 (6.46-7.71)	8.64 (7.86-9.43)	10.0 (9.06-10.9)	11.5 (10.4-12.6)	13.2 (11.8-14.4)	15.7 (13.8-17.2)	17.9 (15.5-19.6)
10-day	4.47 (4.12-4.89)	5.37 (4.95-5.87)	6.71 (6.18-7.33)	7.83 (7.19-8.55)	9.46 (8.64-10.3)	10.8 (9.84-11.8)	12.3 (11.1-13.4)	13.9 (12.5-15.1)	16.2 (14.4-17.7)	18.2 (16.0-19.8)
20-day	6.04 (5.63-6.51)	7.19 (6.70-7.74)	8.69 (8.08-9.35)	9.91 (9.20-10.7)	11.6 (10.7-12.5)	13.0 (12.0-13.9)	14.4 (13.2-15.5)	15.9 (14.5-17.1)	17.9 (16.2-19.3)	19.6 (17.6-21.1)
30-day	7.46 (6.95-7.99)	8.82 (8.23-9.46)	10.5 (9.78-11.2)	11.8 (11.0-12.7)	13.7 (12.7-14.7)	15.2 (14.0-16.2)	16.7 (15.4-17.9)	18.2 (16.7-19.5)	20.3 (18.5-21.8)	22.0 (19.9-23.6)
45-day	9.37 (8.80-9.96)	11.0 (10.4-11.7)	12.9 (12.1-13.7)	14.3 (13.5-15.2)	16.2 (15.2-17.2)	17.7 (16.5-18.8)	19.1 (17.8-20.3)	20.5 (19.1-21.8)	22.3 (20.7-23.8)	23.6 (21.8-25.2)
60-day	11.1 (10.5-11.8)	13.1 (12.4-13.9)	15.2 (14.3-16.0)	16.7 (15.7-17.7)	18.7 (17.6-19.8)	20.2 (18.9-21.4)	21.6 (20.2-22.9)	22.9 (21.5-24.4)	24.7 (23.0-26.2)	25.9 (24.1-27.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

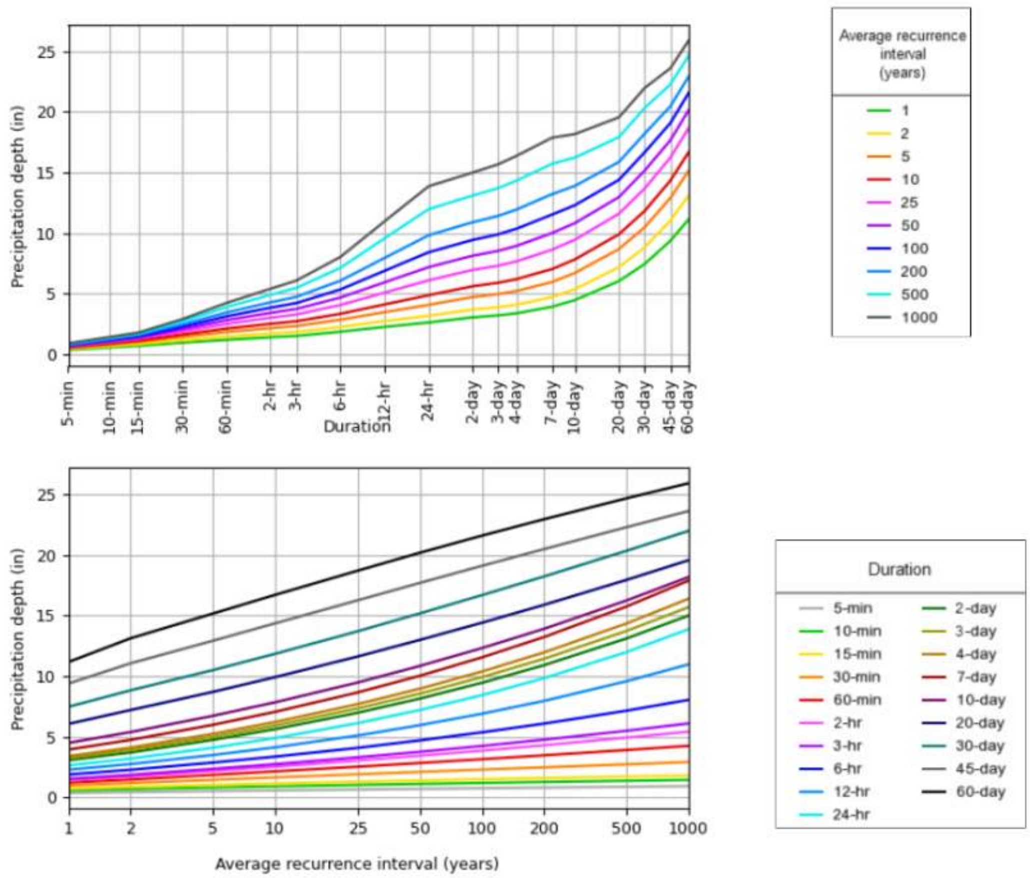
Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

Reference: **Quincy Run Interior Drainage**

PDS-based depth-duration-frequency (DDF) curves
Latitude: 38.9366°, Longitude: -76.9286°



NOAA Atlas 14, Volume 2, Version 3 Created (GMT): Mon Jun 23 15:59:25 2025

Back to Top

Maps & aerials

Small scale terrain

Reference: **Quincy Run Interior Drainage**

Large scale terrain

Large scale map

Large scale aerial

Reference: Quincy Run Interior Drainage

Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

4 References:

FEMA. (2020). *Guidance Document 95: Guidance for Flood Risk Analysis and Mapping, Levees*. Levee Guidance

Department of Permitting, Inspections and Enforcement. (2014). *Prince Georges Stormwater Management Design Manual*. dcv4782_stormwater-management-design-manual-pdf.pdf

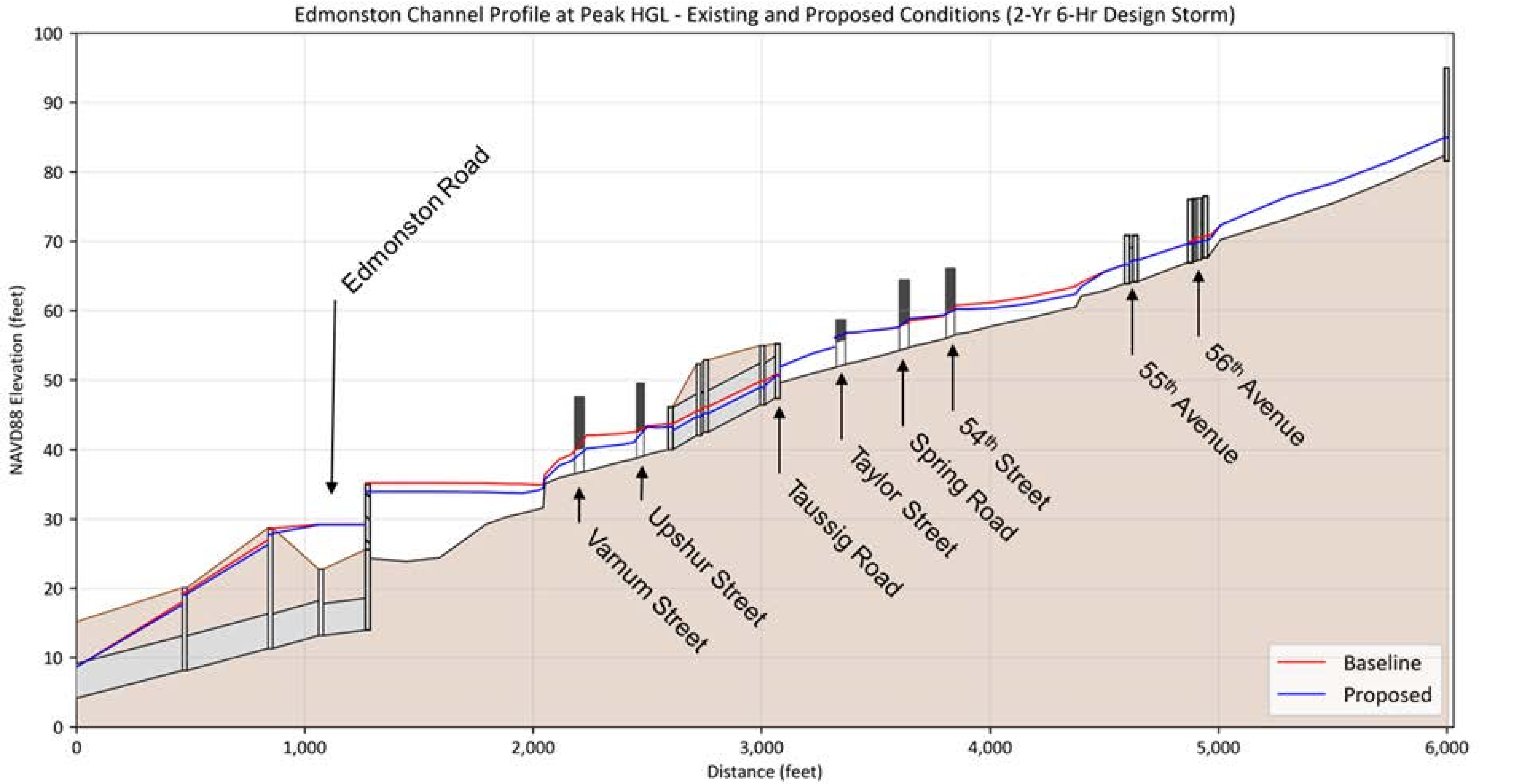
Prince Georges County Planning Department. GIS database provided by Prince George's County GIS Open Data Portal (Impervious Surface). Creative Commons Attribution CC BY https://creativecommons.org/licenses/by/4.0/.

NOAA. Digital Elevation Model (DEM) was obtained from the NOAA data access viewer, based on the 2018 Maryland-National Capitol Park and Planning Commission (MNPPC) LiDAR for Montgomery and Prince George's Counties.

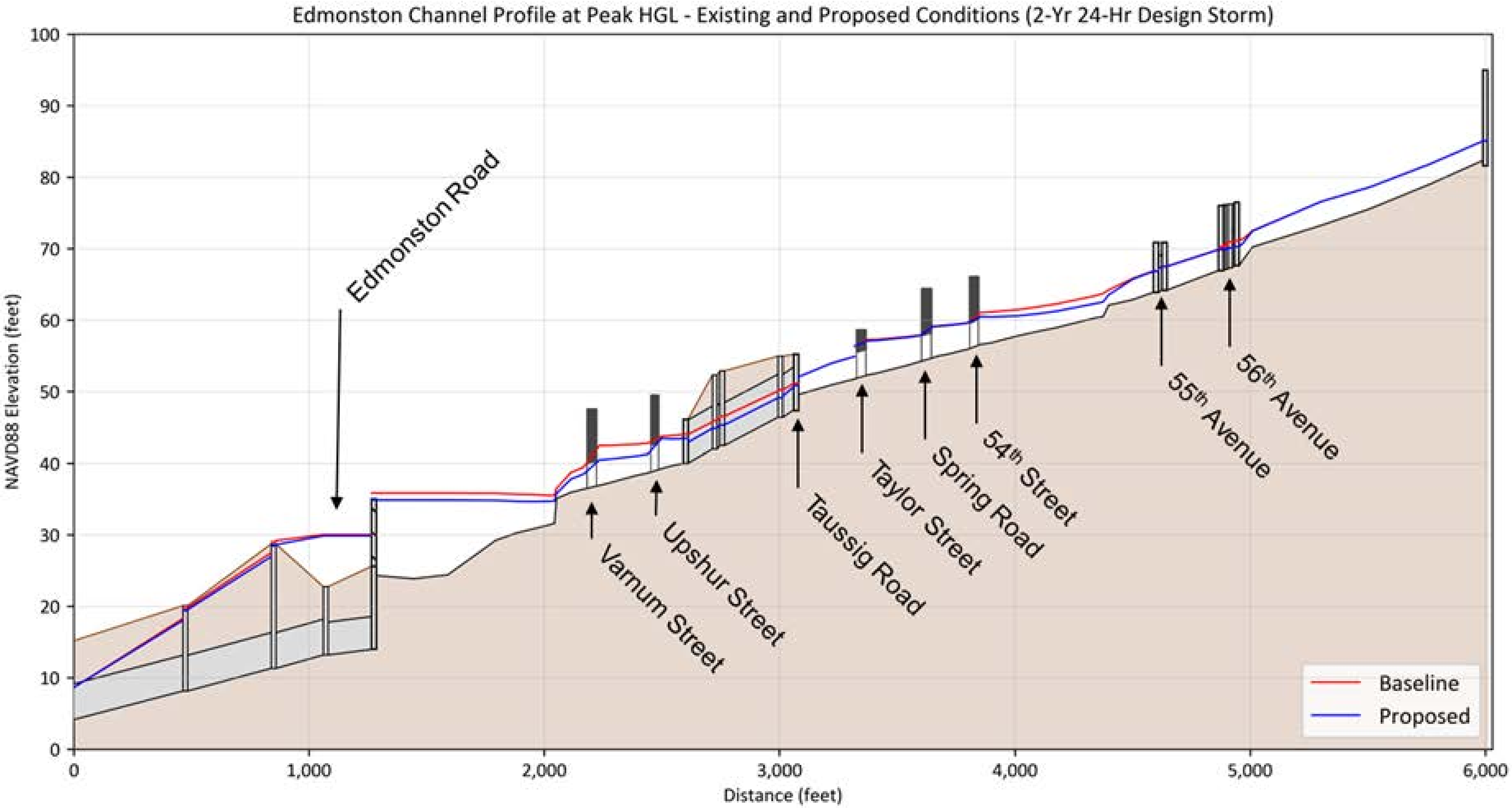
Appendix C Edmonston Channel - Hydraulic Model Outputs

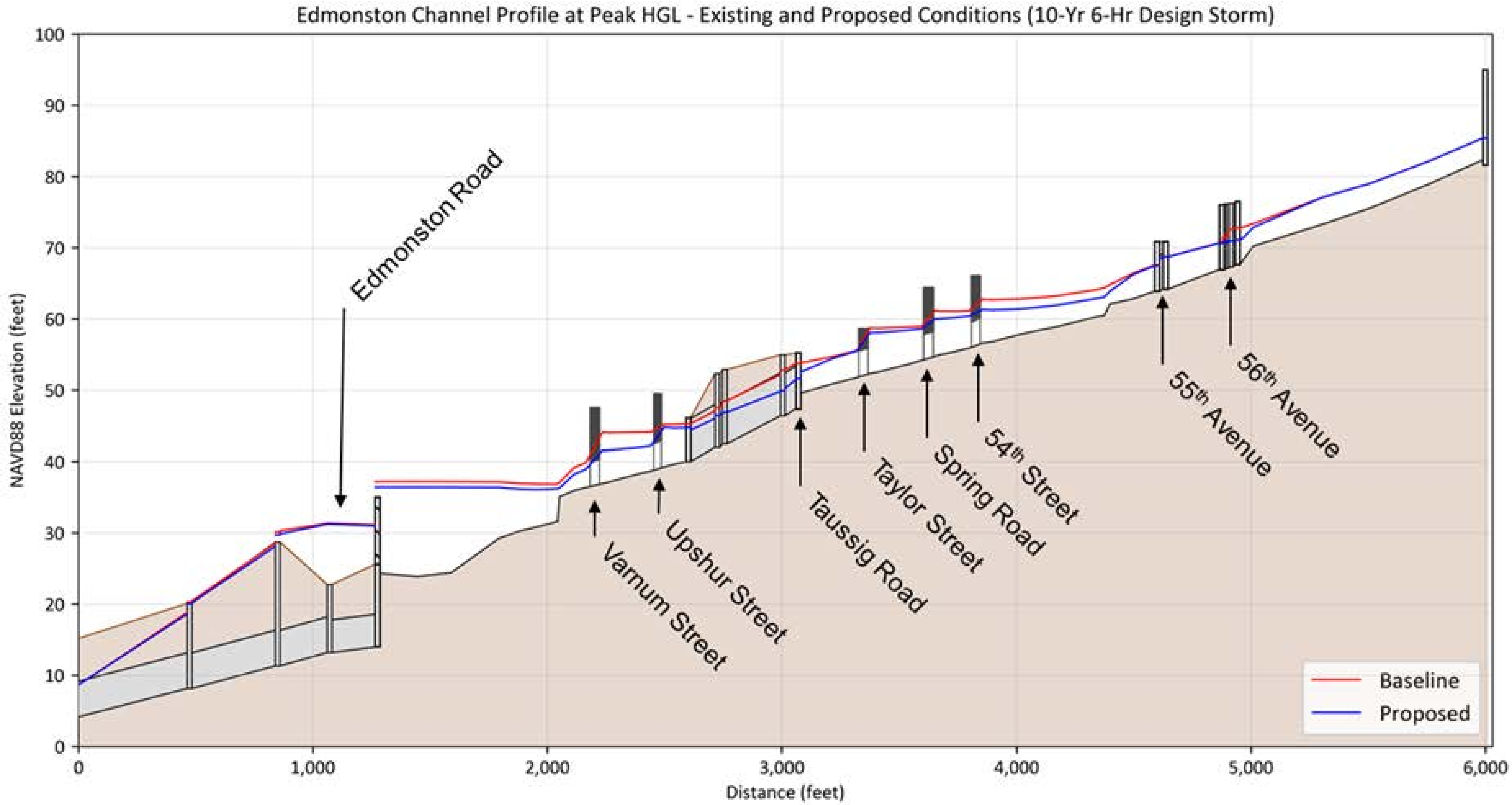
EDMONSTON CHANNEL - EXISTING AND PROPOSED 24HR, 100-YR WATER SURFACE ELEVATIONS

Bridge ID	**CI-2**		**BE-1**		**BE-5**		**BE-2**		**BE-3**		**BE-4**		**SD-1**		**CE-1**		**S-1**	**CI-1**	**SD-1**
Road Crossing	**Varnum St**		**Upshur St**		**54th Pl & Taussig Rd**		**Taylor St**		**Spring Rd**		**54th Pl**		**55th Ave**		**56th Ave**		**Dry Storage Area**	**Channel Improvements**	**Storm Drain Improvement**
	WSE (ft)		**WSE (ft)**		**WSE (ft)**		**WSE (ft)**		**WSE (ft)**		**WSE (ft)**		**WSE (ft)**		**WSE (ft)**		**WSE (ft)**	**Depth (ft)**	**Depth (ft)**
Scenario	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US			
Existing Conditions	40.5	46.2	46	47.8	48.2	58.7	58.8	60.6	60.3	64.2	64.4	66.4	68.8	69.6	71.8	77.1	38.22	7.45	0.88
Proposed Conditions	39.8	43.2	43.6	47.1	46.9	56.1	56.9	59.6	60	61.6	61.9	62.8	68.7	69.5	72	73	38.22	5.71	0.67

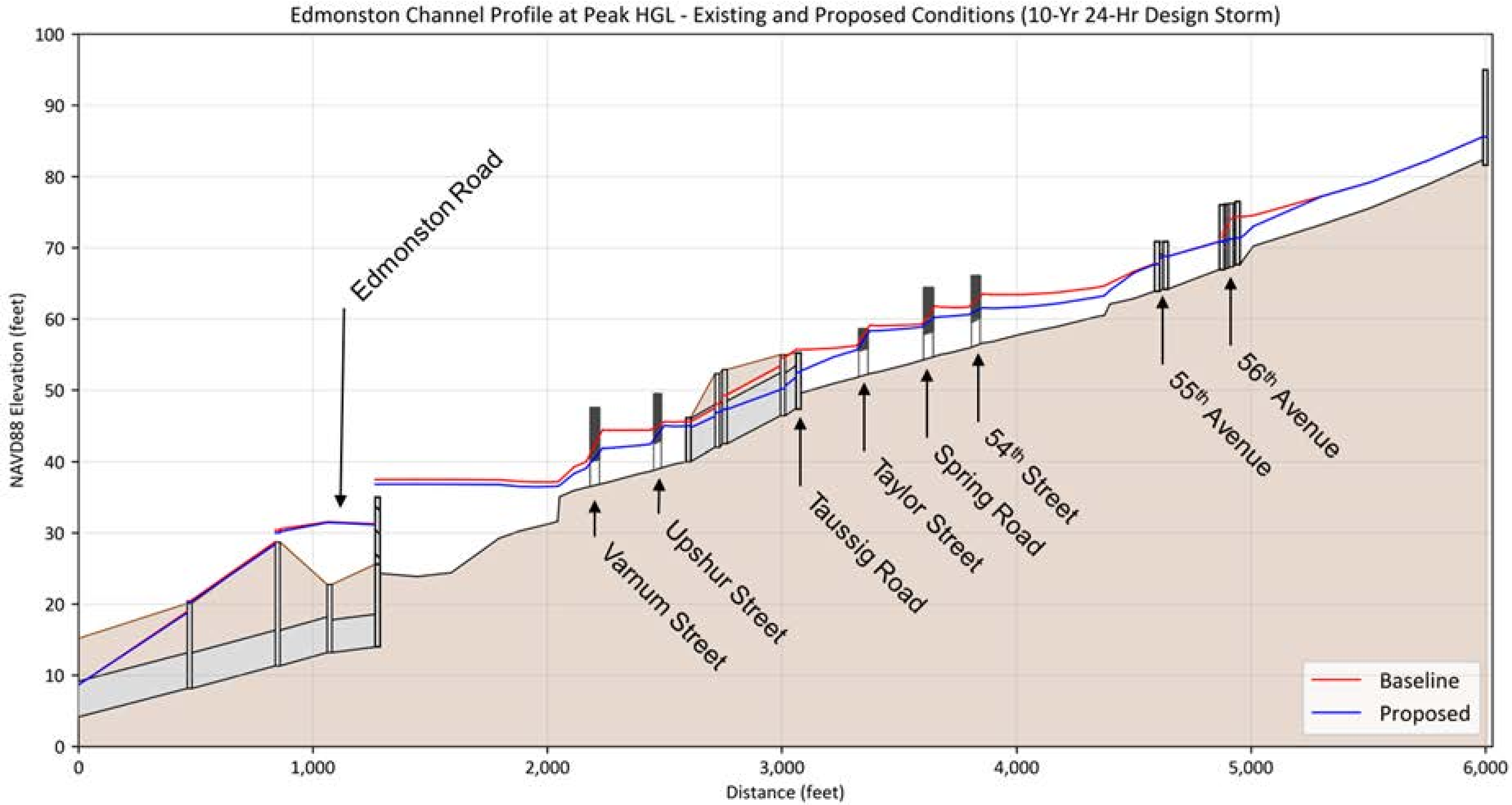


Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (2-Yr 6-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
0
10
20
30
40
50
60
70
80
90
100
0
1,000
2,000
3,000
4,000
5,000
6,000
Edmonston Road
Varnum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed

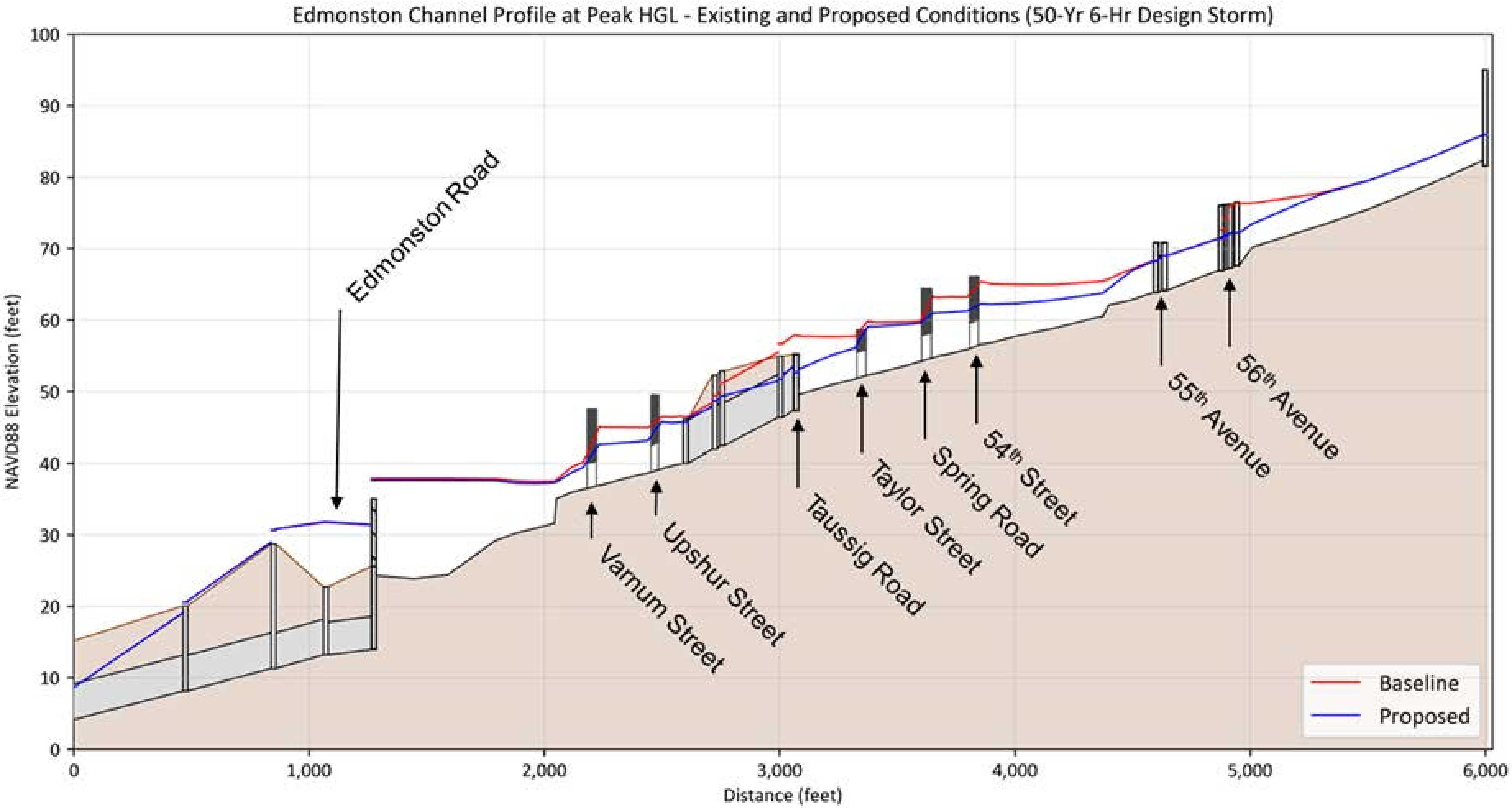

Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (2-Yr 24-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
0
10
20
30
40
50
60
70
80
90
100
0
1,000
2,000
3,000
4,000
5,000
6,000
Edmonston Road
Vamum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed

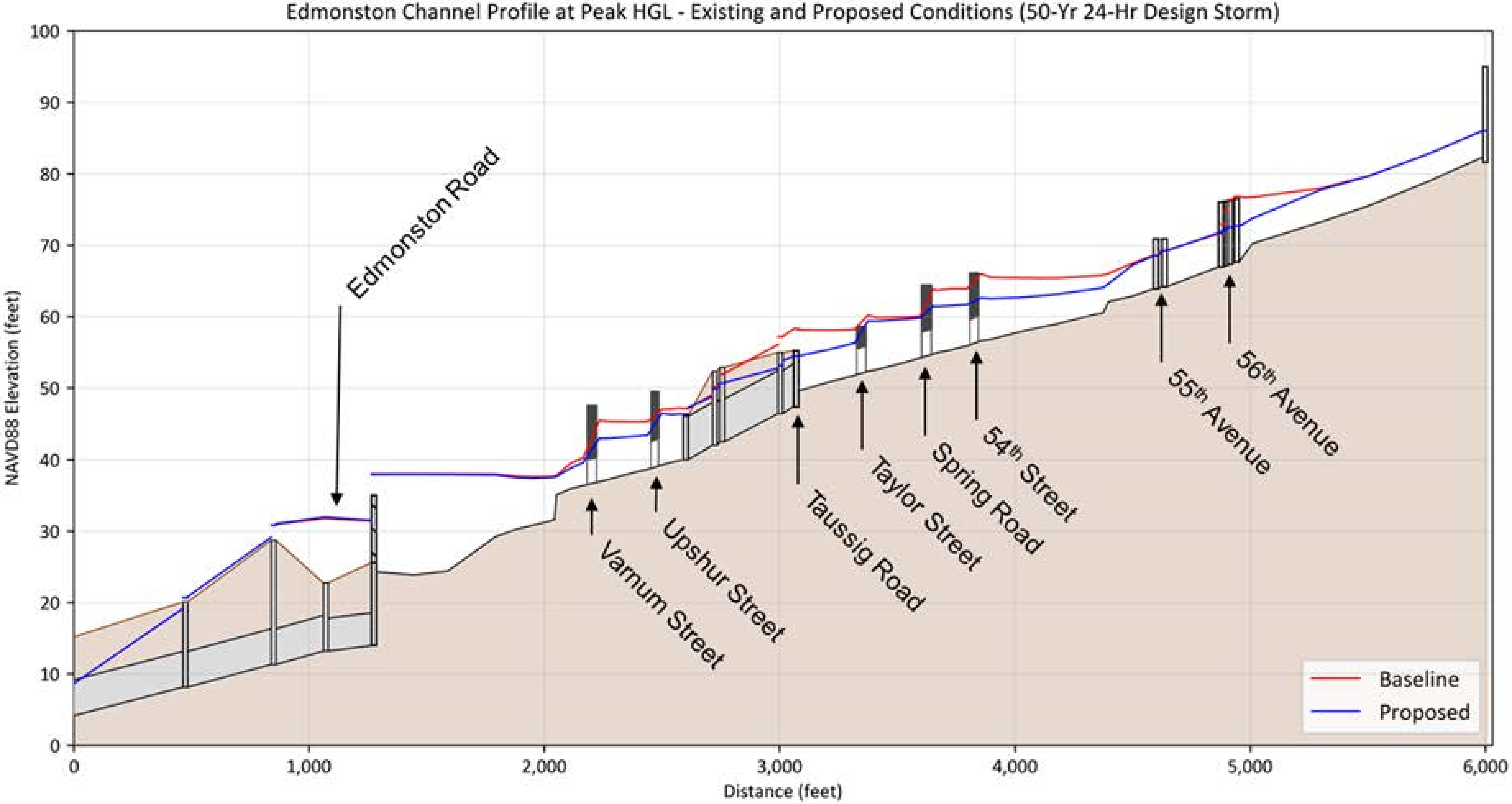


Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (10-Yr 6-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
0
10
20
30
40
50
60
70
80
90
100
0
1,000
2,000
3,000
4,000
5,000
6,000
Edmonston Road
Vamum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed

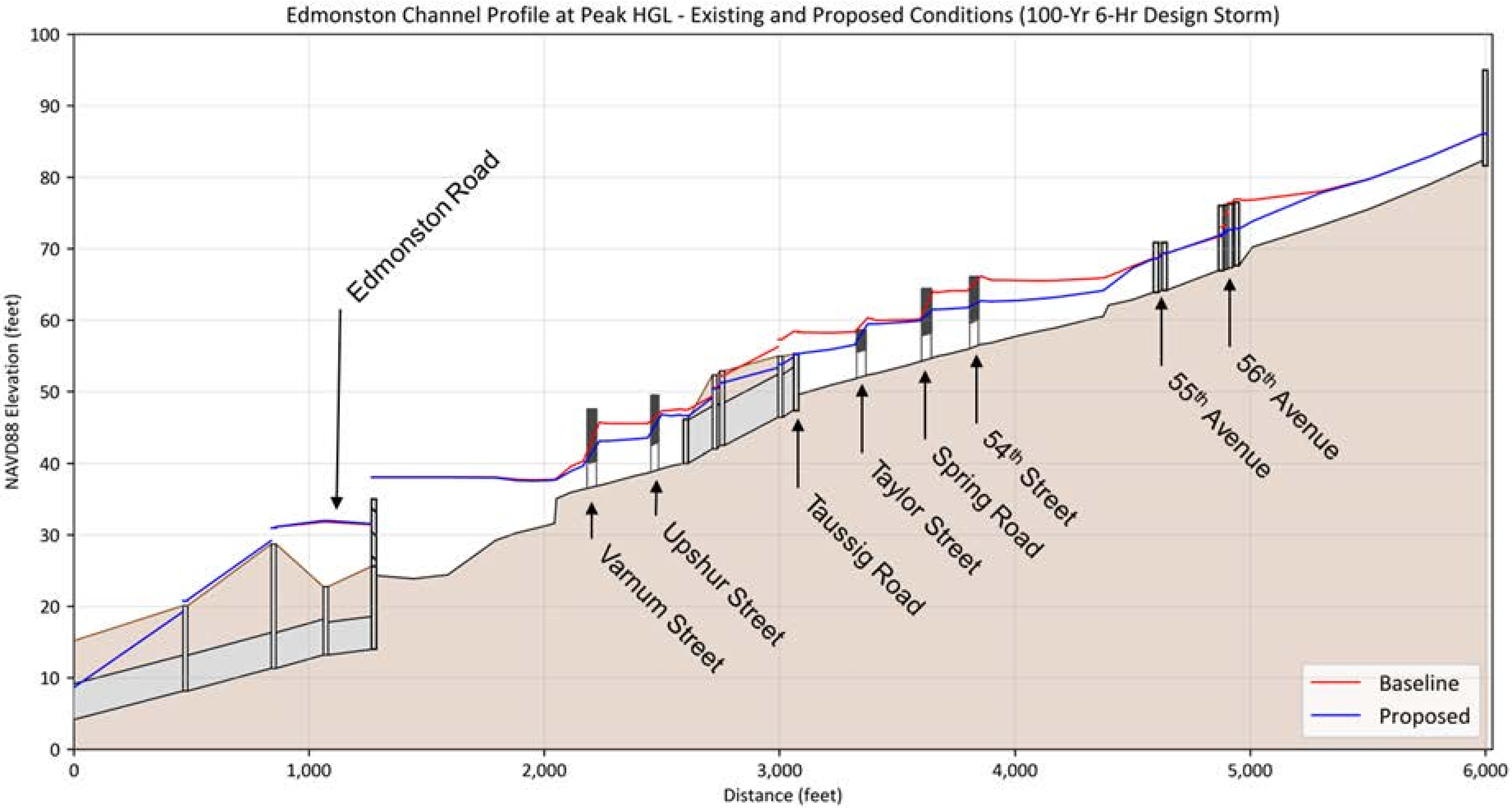


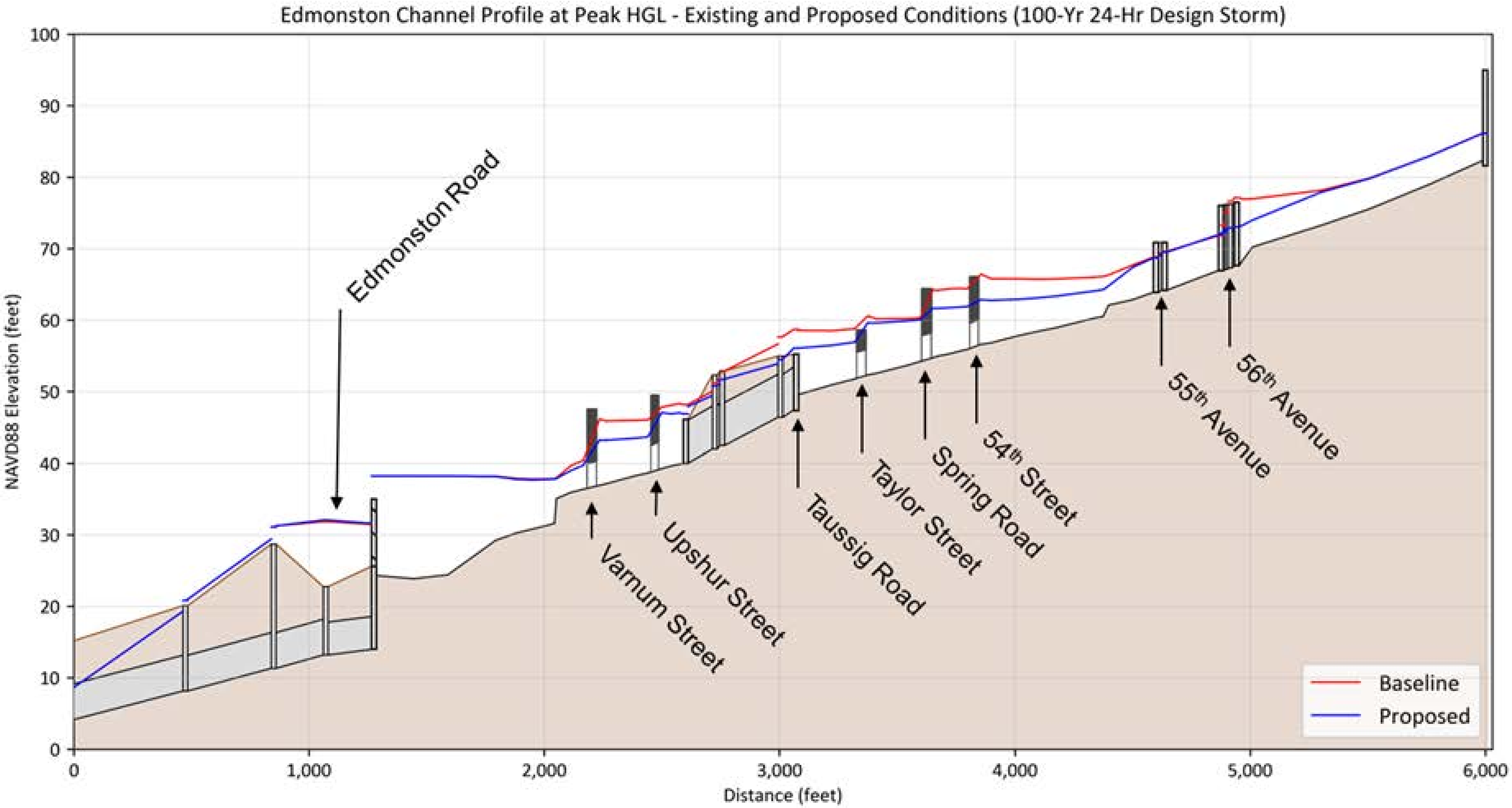
Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (10-Yr 24-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
0
10
20
30
40
50
60
70
80
90
100
0
1,000
2,000
3,000
4,000
5,000
6,000
Edmonston Road
Varnum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed


Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (50-Yr 6-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
Edmonston Road
Vamum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed
0
10
20
30
40
50
60
70
80
90
100
0
1,000
2,000
3,000
4,000
5,000
6,000



Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (50-Yr 24-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
0
10
20
30
40
50
60
70
80
90
100
0
1,000
2,000
3,000
4,000
5,000
6,000
Edmonston Road
Vamum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed

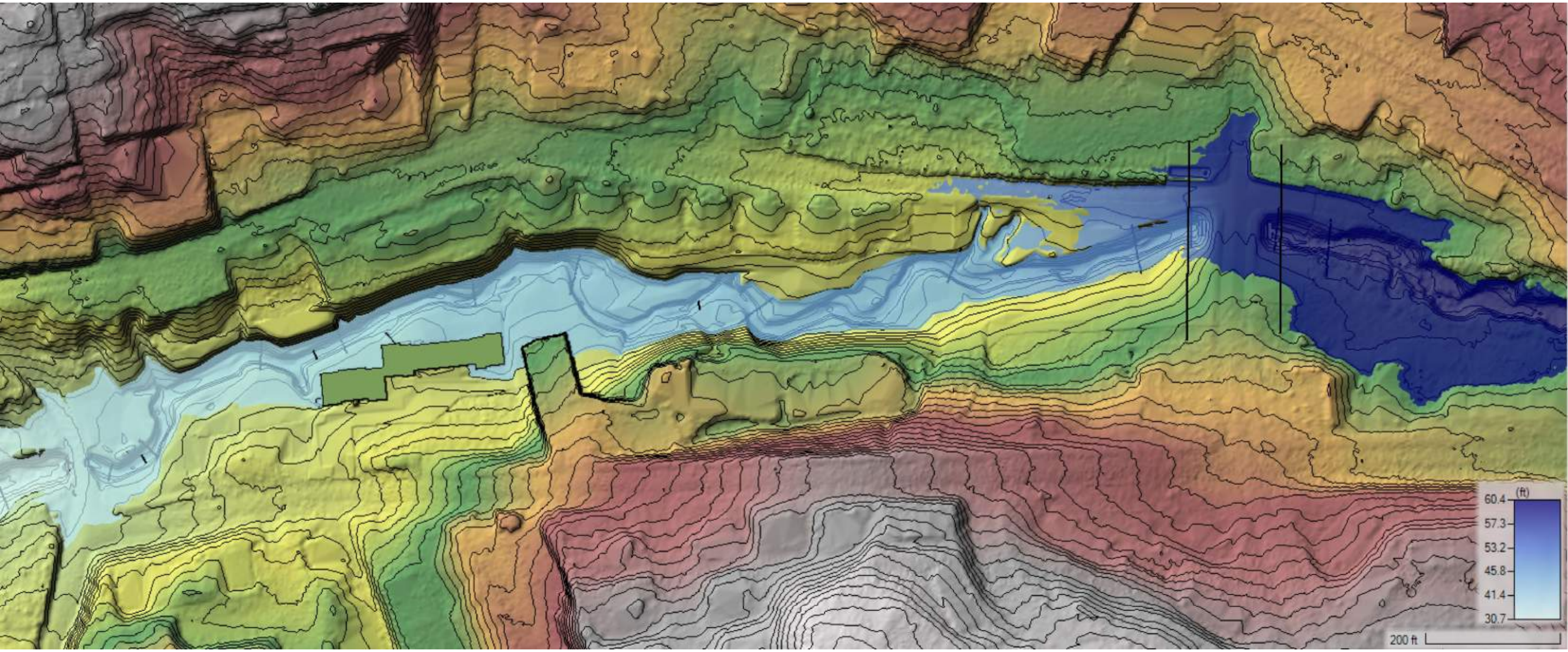

Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (100-Yr 6-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
0
10
20
30
40
50
60
70
80
90
100
1,000
2,000
3,000
4,000
5,000
6,000
Edmonston Road
Vamum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed



Edmonston Channel Profile at Peak HGL - Existing and Proposed Conditions (100-Yr 24-Hr Design Storm)
NAVD88 Elevation (feet)
Distance (feet)
Edmonston Road
Varnum Street
Upshur Street
Taussig Road
Taylor Street
Spring Road
54th Street
55th Avenue
56th Avenue
Baseline
Proposed

Appendix D Quincy Run - Hydraulic Model Outputs

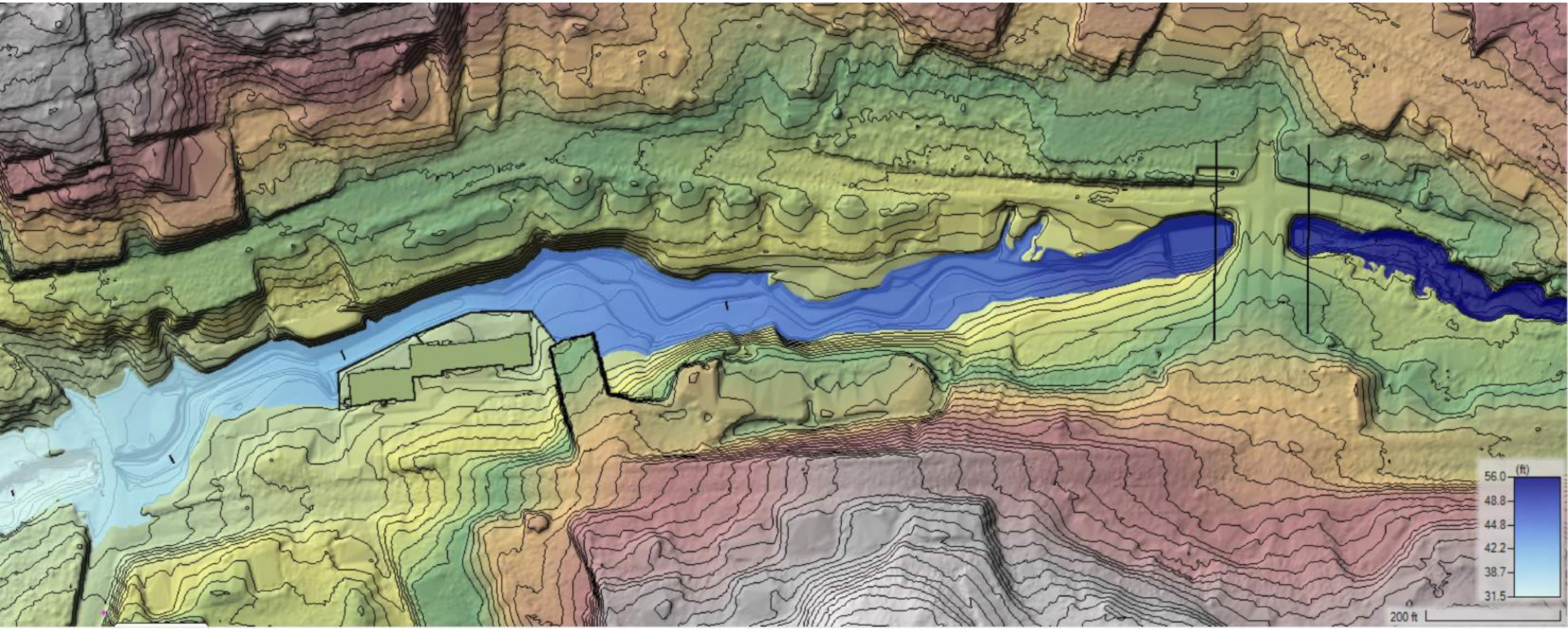
Quincy Run



Existing Conditions

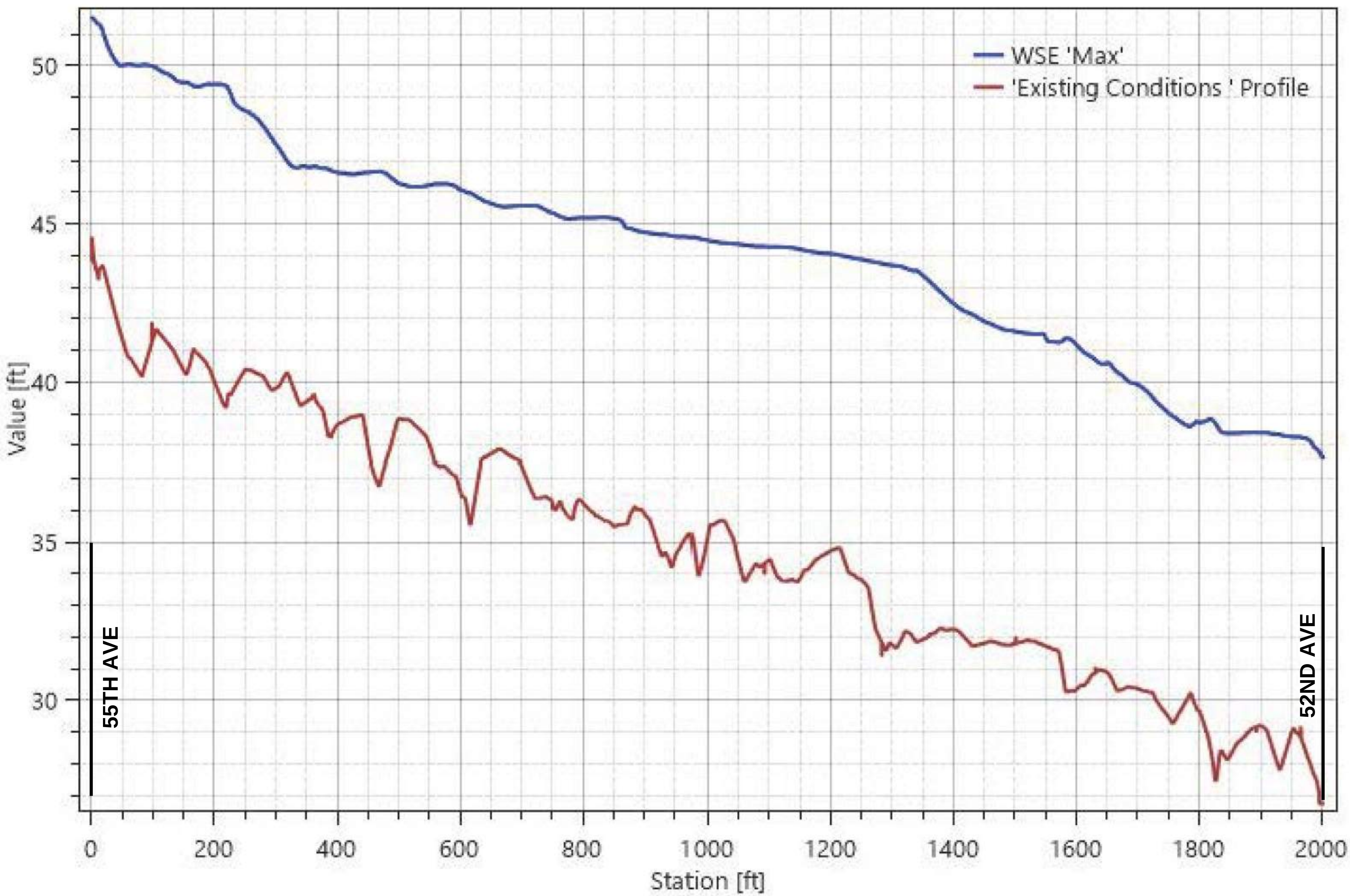
100-YR Water Surface Elevation

Quincy Run

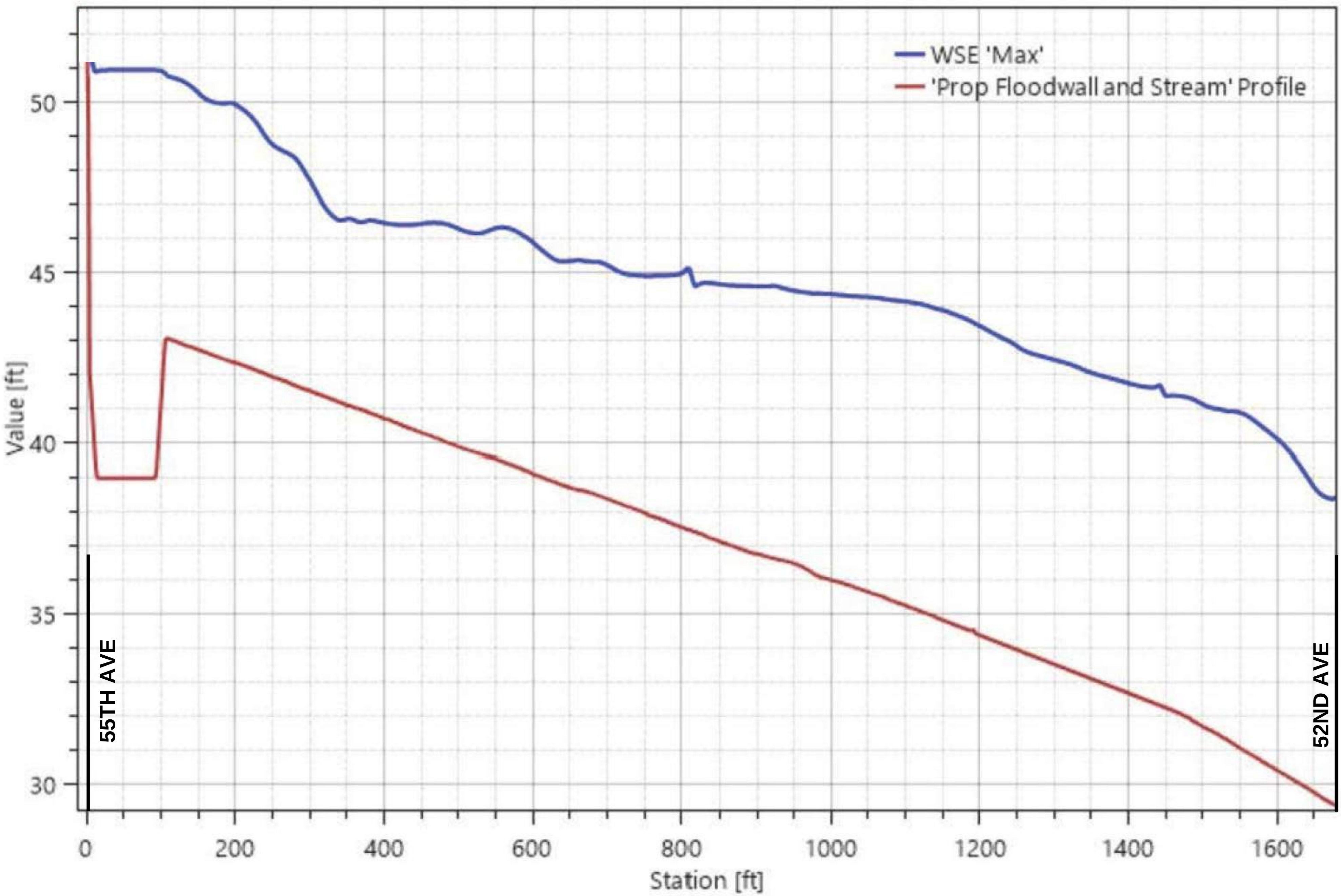


Proposed Conditions

100-YR Water Surface Elevation



WSE 'Max'
'Existing Conditions ' Profile
Value [ft]
Station [ft]
55TH AVE
52ND AVE
50
45
40
35
30
0
200
400
600
800
1000
1200
1400
1600
1800
2000


WSE 'Max'
'Prop Floodwall and Stream' Profile
Value [ft]
Station [ft]
55TH AVE
52ND AVE
50
45
40
35
30
0
200
400
600
800
1000
1200
1400
1600

Appendix E Preliminary Construction Cost Estimate

Stantec

P-BL05001 BRIDGE ENLARGEMENT
VARNUM STREET OVER EDMONSTON CHANNEL

BE-1, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

		9/17/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 365,785
CATEGORY 2 - GRADING		$ 9,350
CATEGORY 3 - DRAINAGE		$ 191,450
CATEGORY 4 - STRUCTURES		$ 1,570,005
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,400
CATEGORY 7 LANDSCAPING		$ 6,244
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 110,070
SUB-TOTAL	TOTAL DIRECT COST	$ 2,288,854
	CONTINGENCY (30%)	$ 686,656
	TOTAL INCLUDING CONTINGENCY	$ 2,975,510
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 297,551
	TOTAL CONSTRUCTION COST	$ 3,273,061
BE-1, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE	**SAY**	**$ 3,274,000**
	Road Cost	$572,000
	Structure Cost	$2,702,000

P-BL05001 BRIDGE ENLARGEMENT
VARNUM STREET OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-1, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$185,000.00	1	$185,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	161	$4,025
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$365,785**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	101	$5,050
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$9,350**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	150	$2,250
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	150	$1,200
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	RELOCATION OF 36" RCP DRAINAGE	LS	$12,000.00	1	$12,000
	SUBTOTAL				**$191,450**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	2,283	$251,130
4002	REMOVAL OF EXISTING STRUCTURE	LS	$48,000.00	1	$48,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	88	$105,600
4004	FOOTING CONCRETE FOR BRIDGE	CY	$1,000.00	104	$104,000
4005	PRESTRESSED CONCRETE SLAB (36X24)	LF	$1,100.00	481	$529,100
4006	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	53	$79,500
4007	WINGWALL CONCRETE	CY	$1,200.00	121	$145,200
4008	DYNAMIC PILE MONITORING	EA	$5,000.00	2	$10,000
4009	CAPWAP	EA	$1,000.00	2	$2,000
4010	STEEL HP 12 X 53 BEARING PILE	LF	$130.00	1,530	$198,900
4011	STEEL HP 12 X 53 BEARING TEST PILE	LF	$150.00	90	$13,500
4012	SETUP FOR DRIVING STEEL HP PILES	EA	$600.00	36	$21,600
4013	METAL RAILING THREE STRAND	LF	$650.00	80	$52,000
4014	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	190	$3,800
4015	CHAIN LINK SAFETY FENCE	LF	$50.00	114	$5,675
	SUBTOTAL				**$1,570,005**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$21,400**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	334	$3,340
7002	TEMPORARY STRAW MULCHING	SY	$2.00	334	$668
7003	TEMPORARY SEEDING	SY	$2.00	334	$668
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	334	$668
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	6	$900
	SUBTOTAL				**$6,244**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$107,070.00	1	$107,070
	SUBTOTAL				
					$110,070
	TOTAL				**$2,288,854**
	CONTINGENCY (30%)				$686,656
	TOTAL INCLUDING CONTINGENCY				**$2,975,510**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$297,551
	TOTAL CONSTRUCTION COST				**$3,273,061**
BE-1, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE		**USE**			**$3,274,000**
			Road Cost	17.4%	$572,000
			Structure Cost	82.6%	$2,702,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-1, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 340,785
CATEGORY 2 - GRADING		$ 9,350
CATEGORY 3 - DRAINAGE		$ 191,450
CATEGORY 4 - STRUCTURES		$ 1,270,705
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,400
CATEGORY 7 LANDSCAPING		$ 6,244
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 110,065
SUB-TOTAL	TOTAL DIRECT COST	$ 1,964,549
	CONTINGENCY (30%)	$ 589,365
	TOTAL INCLUDING CONTINGENCY	$ 2,553,914
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 255,391
	TOTAL CONSTRUCTION COST	$ 2,809,305
BE-1, ALTERNATIVE 2 - DOUBLE BOX CULVERT	**SAY**	**$ 2,810,000**
	Road Cost	$582,000
	Structure Cost	$2,228,000

Stantec

P-BL05001 BRIDGE ENLARGEMENT
VARNUM STREET OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-1, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$160,000.00	1	$160,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	161	$4,025
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$340,785**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	101	$5,050
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$9,350**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	150	$2,250
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	150	$1,200
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	RELOCATION OF 36" RCP DRAINAGE	LS	$12,000.00	1	$12,000
	SUBTOTAL				**$191,450**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	2,283	$251,130
4002	REMOVAL OF EXISTING STRUCTURE	LS	$48,000.00	1	$48,000
4003	SUBSTRUCTURE CONCRETE FOR CULVERT	CY	$1,200.00	11	$13,200
4004	PRECASET BOX CULVERT (15'X8')	LF	$6,500.00	84	$546,000
4005	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	139	$208,500
4006	WINGWALL CONCRETE	CY	$1,200.00	121	$145,200
4007	METAL RAILING THREE STRAND	LF	$650.00	76	$49,400
4008	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	180	$3,600
4009	CHAIN LINK SAFETY FENCE	LF	$50.00	114	$5,675
	SUBTOTAL				**$1,270,705**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$21,400**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4”) DEPTH	SY	$10.00	334	$3,340
7002	TEMPORARY STRAW MULCHING	SY	$2.00	334	$668
7003	TEMPORARY SEEDING	SY	$2.00	334	$668
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	334	$668
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	6	$900
	SUBTOTAL				**$6,244**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$107,065.00	1	$107,065
	SUBTOTAL				
					$110,065
	TOTAL				**$1,964,549**
	CONTINGENCY (30%)				$589,365
	TOTAL INCLUDING CONTINGENCY				**$2,553,914**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$255,391
	TOTAL CONSTRUCTION COST				**$2,809,305**
BE-1, ALTERNATIVE 2 - DOUBLE BOX CULVERT		**USE**			**$2,810,000**
			Road Cost	20.7%	$582,000
			Structure Cost	79.3%	$2,228,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-2, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 351,085
CATEGORY 2 - GRADING		$ 9,950
CATEGORY 3 - DRAINAGE		$ 180,600
CATEGORY 4 - STRUCTURES		$ 1,319,403
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,400
CATEGORY 7 LANDSCAPING		$ 8,620
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 220,950
SUB-TOTAL	TOTAL DIRECT COST	$ 2,126,558
	CONTINGENCY (30%)	$ 637,968
	TOTAL INCLUDING CONTINGENCY	$ 2,764,526
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 276,453
	TOTAL CONSTRUCTION COST	$ 3,040,979
BE-2, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE	**SAY**	**$ 3,041,000**
	Road Cost	$754,000
	Structure Cost	$2,287,000

P-BL03001 BRIDGE ENLARGEMENT
TAYLOR STREET OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-2, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$170,000.00	1	$170,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	173	$4,325
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$351,085**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	113	$5,650
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$9,950**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	200	$3,000
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	200	$1,600
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
	SUBTOTAL				**$180,600**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	1,772	$194,920
4002	REMOVAL OF EXISTING STRUCTURE	LS	$43,000.00	1	$43,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	54	$64,800
4004	FOOTING CONCRETE FOR BRIDGE	CY	$1,000.00	106	$106,000
4005	PRESTRESSED CONCRETE SLAB (36X21)	LF	$1,000.00	418	$418,167
4006	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	46	$69,000
4007	WINGWALL CONCRETE	CY	$1,200.00	101	$121,200
4008	DYNAMIC PILE MONITORING	EA	$5,000.00	2	$10,000
4009	CAPWAP	EA	$1,000.00	2	$2,000
4010	STEEL HP 12 X 53 BEARING PILE	LF	$130.00	1,530	$198,900
4011	STEEL HP 12 X 53 BEARING TEST PILE	LF	$150.00	90	$13,500
4012	SETUP FOR DRIVING STEEL HP PILES	EA	$600.00	36	$21,600
4013	METAL RAILING THREE STRAND	LF	$650.00	70	$45,717
4014	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	170	$3,400
4015	CHAIN LINK SAFETY FENCE	LF	$50.00	144	$7,200
	SUBTOTAL				**$1,319,403**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
6004	GALVANIZED TRAFFIC BARRIER W BEAM USING SIX FOOT (6') POSTS (STD. MD 605.22)	LF	$60.00		$0
6005	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$21,400**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	445	$4,450
7002	TEMPORARY STRAW MULCHING	SY	$2.00	445	$890
7003	TEMPORARY SEEDING	SY	$2.00	445	$890
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	445	$890
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	10	$1,500
	SUBTOTAL				**$8,620**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$217,950.00	1	$217,950
	SUBTOTAL				**$220,950**
	TOTAL				**$2,126,558**
	CONTINGENCY (30%)				$637,968
	TOTAL INCLUDING CONTINGENCY				**$2,764,526**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$276,453
	TOTAL CONSTRUCTION COST				**$3,040,979**
BE-2, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE		**USE**			**$3,041,000**
			Road Cost	24.8%	$754,000
			Structure Cost	75.2%	$2,287,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-2, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 331,085
CATEGORY 2 - GRADING		$ 9,950
CATEGORY 3 - DRAINAGE		$ 180,600
CATEGORY 4 - STRUCTURES		$ 1,052,570
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,400
CATEGORY 7 LANDSCAPING		$ 8,620
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 220,950
SUB-TOTAL	TOTAL DIRECT COST	$ 1,839,725
	CONTINGENCY (30%)	$ 551,918
	TOTAL INCLUDING CONTINGENCY	$ 2,391,643
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 239,164
	TOTAL CONSTRUCTION COST	$ 2,630,807
BE-2, ALTERNATIVE 2 - DOUBLE BOX CULVERT	**SAY**	**$ 2,631,000**
	Road Cost	$769,000
	Structure Cost	$1,862,000

P-BL03001 BRIDGE ENLARGEMENT
TAYLOR STREET OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-2, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$150,000.00	1	$150,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	173	$4,325
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$331,085**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	113	$5,650
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$9,950**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	200	$3,000
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	200	$1,600
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
	SUBTOTAL				**$180,600**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	1,799	$197,890
4002	REMOVAL OF EXISTING STRUCTURE	LS	$43,000.00	1	$43,000
4003	SUBSTRUCTURE CONCRETE FOR CULVERT	CY	$1,200.00	9	$10,800
4004	PRECASET BOX CULVERT (13'X5')	LF	$5,200.00	84	$436,800
4005	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	123	$184,500
4006	WINGWALL CONCRETE	CY	$1,200.00	104	$124,800
4007	METAL RAILING THREE STRAND	LF	$650.00	68	$44,200
4008	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	160	$3,200
4009	CHAIN LINK SAFETY FENCE	LF	$50.00	148	$7,380
	SUBTOTAL				**$1,052,570**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
6004	GALVANIZED TRAFFIC BARRIER W BEAM USING SIX FOOT (6') POSTS (STD. MD 605.22)	LF	$60.00		$0
6005	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$21,400**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	445	$4,450
7002	TEMPORARY STRAW MULCHING	SY	$2.00	445	$890
7003	TEMPORARY SEEDING	SY	$2.00	445	$890
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	445	$890
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	10	$1,500
	SUBTOTAL				**$8,620**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$217,950.00	1	$217,950
	SUBTOTAL				**$220,950**
	TOTAL				**$1,839,725**
	CONTINGENCY (30%)				$551,918
	TOTAL INCLUDING CONTINGENCY				**$2,391,643**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$239,164
	TOTAL CONSTRUCTION COST				**$2,630,807**
BE-2, ALTERNATIVE 2 - DOUBLE BOX CULVERT		**USE**			**$2,631,000**
			Road Cost	29.2%	$769,000
			Structure Cost	70.8%	$1,862,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-3, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 380,435
CATEGORY 2 - GRADING		$ 8,750
CATEGORY 3 - DRAINAGE		$ 206,050
CATEGORY 4 - STRUCTURES		$ 1,500,515
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,600
CATEGORY 7 LANDSCAPING		$ 4,018
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 291,190
SUB-TOTAL	TOTAL DIRECT COST	$ 2,427,108
	CONTINGENCY (30%)	$ 728,132
	TOTAL INCLUDING CONTINGENCY	$ 3,155,240
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 315,524
	TOTAL CONSTRUCTION COST	$ 3,470,764
BE-3, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE	**SAY**	**$ 3,471,000**
	Road Cost	$468,000
	Structure Cost	$3,003,000

P-BL01001 BRIDGE ENLARGEMENT
SPRING ROAD OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-3, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$200,000.00	1	$200,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	147	$3,675
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$380,435**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	89	$4,450
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$8,750**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	100	$1,500
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	100	$800
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	RELOCATION OF DRAINAGE INLETS	EA	$7,000.00	2	$14,000
3007	RELOCATION OF 15" RCP PIPE	LF	$200.00	25	$5,000
3008	RELOCATION OF 18" RCP PIPE	LF	$250.00	35	$8,750
	SUBTOTAL				**$206,050**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	1,875	$206,250
4002	REMOVAL OF EXISTING STRUCTURE	LS	$44,000.00	1	$44,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	79	$94,800
4004	FOOTING CONCRETE FOR BRIDGE	CY	$1,000.00	106	$106,000
4005	PRESTRESSED CONCRETE SLAB (36X24)	LF	$1,100.00	491	$539,825
4006	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	53	$79,500
4007	WINGWALL CONCRETE	CY	$1,200.00	102	$122,400
4008	DYNAMIC PILE MONITORING	EA	$5,000.00	2	$10,000
4009	CAPWAP	EA	$1,000.00	2	$2,000
4010	STEEL HP 12 X 53 BEARING PILE	LF	$130.00	1,530	$198,900
4011	STEEL HP 12 X 53 BEARING TEST PILE	LF	$150.00	90	$13,500
4012	SETUP FOR DRIVING STEEL HP PILES	EA	$600.00	36	$21,600
4013	METAL RAILING THREE STRAND	LF	$650.00	82	$52,975
4014	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	190	$3,800
4015	CHAIN LINK SAFETY FENCE	LF	$50.00	99	$4,965
	SUBTOTAL				**$1,500,515**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	60	$2,400
6004	FARM TYPE FENCE	LF	$50.00	20	$1,000
6005	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$21,600**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	223	$2,230
7002	TEMPORARY STRAW MULCHING	SY	$2.00	223	$446
7003	TEMPORARY SEEDING	SY	$2.00	223	$446
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	223	$446
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	3	$450
	SUBTOTAL				**$4,018**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$288,190.00	1	$288,190
	SUBTOTAL				**$291,190**
	TOTAL				**$2,427,108**
	CONTINGENCY (30%)				$728,132
	TOTAL INCLUDING CONTINGENCY				**$3,155,240**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$315,524
	TOTAL CONSTRUCTION COST				**$3,470,764**
BE-3, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE		**USE**			**$3,471,000**
			Road Cost	13.5%	$468,000
			Structure Cost	86.5%	$3,003,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-3, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 350,435
CATEGORY 2 - GRADING		$ 8,750
CATEGORY 3 - DRAINAGE		$ 206,050
CATEGORY 4 - STRUCTURES		$ 1,203,895
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,600
CATEGORY 7 LANDSCAPING		$ 4,018
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 291,190
SUB-TOTAL	TOTAL DIRECT COST	$ 2,100,488
	CONTINGENCY (30%)	$ 630,146
	TOTAL INCLUDING CONTINGENCY	$ 2,730,634
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 273,063
	TOTAL CONSTRUCTION COST	$ 3,003,697
BE-3, ALTERNATIVE 2 - DOUBLE BOX CULVERT	**SAY**	**$ 3,004,000**
	Road Cost	$912,000
	Structure Cost	$2,092,000

Stantec

P-BL01001 BRIDGE ENLARGEMENT
SPRING ROAD OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-3, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$170,000.00	1	$170,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	147	$3,675
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$350,435**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	89	$4,450
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$8,750**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	100	$1,500
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	100	$800
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	RELOCATION OF DRAINAGE INLETS	EA	$7,000.00	2	$14,000
3007	RELOCATION OF 15" RCP PIPE	LF	$200.00	25	$5,000
3008	RELOCATION OF 18" RCP PIPE	LF	$250.00	35	$8,750
	SUBTOTAL				**$206,050**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	1,864	$205,040
4002	REMOVAL OF EXISTING STRUCTURE	LS	$44,000.00	1	$44,000
4003	SUBSTRUCTURE CONCRETE FOR CULVERT	CY	$1,200.00	11	$13,200
4004	PRECASET BOX CULVERT (15'X7')	LF	$6,200.00	88	$545,600
4005	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	145	$217,500
4006	WINGWALL CONCRETE	CY	$1,200.00	100	$120,000
4007	METAL RAILING THREE STRAND	LF	$650.00	77	$50,050
4008	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	180	$3,600
4009	CHAIN LINK SAFETY FENCE	LF	$50.00	98	$4,905
	SUBTOTAL				**$1,203,895**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	60	$2,400
6004	FARM TYPE FENCE	LF	$50.00	20	$1,000
6005	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$21,600**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	223	$2,230
7002	TEMPORARY STRAW MULCHING	SY	$2.00	223	$446
7003	TEMPORARY SEEDING	SY	$2.00	223	$446
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	223	$446
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	3	$450
	SUBTOTAL				**$4,018**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$288,190.00	1	$288,190
	SUBTOTAL				**$291,190**
	TOTAL				**$2,100,488**
	CONTINGENCY (30%)				$630,146
	TOTAL INCLUDING CONTINGENCY				**$2,730,634**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$273,063
	TOTAL CONSTRUCTION COST				**$3,003,697**
BE-3, ALTERNATIVE 2 - DOUBLE BOX CULVERT		**USE**			**$3,004,000**
			Road Cost	30.3%	$912,000
			Structure Cost	69.7%	$2,092,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 355,485
CATEGORY 2 - GRADING		$ 8,950
CATEGORY 3 - DRAINAGE		$ 189,760
CATEGORY 4 - STRUCTURES		$ 1,461,870
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,400
CATEGORY 7 LANDSCAPING		$ 5,172
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 108,350
SUB-TOTAL	TOTAL DIRECT COST	$ 2,165,537
	CONTINGENCY (30%)	$ 649,661
	TOTAL INCLUDING CONTINGENCY	$ 2,815,198
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 281,520
	TOTAL CONSTRUCTION COST	$ 3,096,718
BE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE	**SAY**	**$ 3,097,000**
	Road Cost	$566,000
	Structure Cost	$2,531,000

Stantec

P-BL02001 BRIDGE ENLARGEMENT
54TH PLACE OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$175,000.00	1	$175,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	149	$3,725
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$355,485**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	93	$4,650
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$8,950**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	120	$1,800
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	120	$960
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	RELOCATION OF 18" RCP DRAINAGE	LS	$11,000.00	1	$11,000
	SUBTOTAL				**$189,760**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	2,159	$237,490
4002	REMOVAL OF EXISTING STRUCTURE	LS	$37,000.00	1	$37,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	77	$92,400
4004	FOOTING CONCRETE FOR BRIDGE	CY	$1,000.00	99	$99,000
4005	PRESTRESSED CONCRETE SLAB (36X21)	LF	$1,000.00	462	$461,500
4006	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	51	$76,500
4007	WINGWALL CONCRETE	CY	$1,200.00	127	$152,400
4008	DYNAMIC PILE MONITORING	EA	$5,000.00	2	$10,000
4009	CAPWAP	EA	$1,000.00	2	$2,000
4010	STEEL HP 12 X 53 BEARING PILE	LF	$130.00	1,530	$198,900
4011	STEEL HP 12 X 53 BEARING TEST PILE	LF	$150.00	90	$13,500
4012	SETUP FOR DRIVING STEEL HP PILES	EA	$600.00	36	$21,600
4013	METAL RAILING THREE STRAND	LF	$650.00	77	$50,050
4014	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	180	$3,600
4015	CHAIN LINK SAFETY FENCE	LF	$50.00	119	$5,930
	SUBTOTAL				**$1,461,870**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
					$21,400
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	267	$2,670
7002	TEMPORARY STRAW MULCHING	SY	$2.00	267	$534
7003	TEMPORARY SEEDING	SY	$2.00	267	$534
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	267	$534
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	6	$900
	SUBTOTAL				**$5,172**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$105,350.00	1	$105,350
	SUBTOTAL				**$108,350**
	TOTAL				**$2,165,537**
	CONTINGENCY (30%)				$649,661
	TOTAL INCLUDING CONTINGENCY				**$2,815,198**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$281,520
	TOTAL CONSTRUCTION COST				**$3,096,718**
BE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE		**USE**			**$3,097,000**
			Road Cost	18.3%	$566,000
			Structure Cost	81.7%	$2,531,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-4, ALTERNATIVE 2 - DOUBLE BOX CULVERT

		9/17/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 330,485
CATEGORY 2 - GRADING		$ 8,950
CATEGORY 3 - DRAINAGE		$ 189,760
CATEGORY 4 - STRUCTURES		$ 1,182,930
CATEGORY 5 - PAVING		$ 14,550
CATEGORY 6 - SHOULDERS		$ 21,400
CATEGORY 7 LANDSCAPING		$ 5,172
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 108,350
SUB-TOTAL	TOTAL DIRECT COST	$ 1,861,597
	CONTINGENCY (30%)	$ 558,479
	TOTAL INCLUDING CONTINGENCY	$ 2,420,076
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 242,008
	TOTAL CONSTRUCTION COST	$ 2,662,084
BE-4, ALTERNATIVE 2 - DOUBLE BOX CULVERT	**SAY**	**$ 2,663,000**
	Road Cost	$577,000
	Structure Cost	$2,086,000

Stantec

P-BL02001 BRIDGE ENLARGEMENT
54TH PLACE OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-4, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$150,000.00	1	$150,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	149	$3,725
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$330,485**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	93	$4,650
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$8,950**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	120	$1,800
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	120	$960
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	RELOCATION OF 18" RCP DRAINAGE	LS	$11,000.00	1	$11,000
	SUBTOTAL				**$189,760**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	2,190	$240,900
4002	REMOVAL OF EXISTING STRUCTURE	LS	$37,000.00	1	$37,000
4003	SUBSTRUCTURE CONCRETE FOR CULVERT	CY	$1,200.00	10	$12,000
4004	PRECASET BOX CULVERT (15'X7')	LF	$6,200.00	78	$483,600
4005	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	131	$196,500
4006	WINGWALL CONCRETE	CY	$1,200.00	130	$156,000
4007	METAL RAILING THREE STRAND	LF	$650.00	73	$47,450
4008	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	170	$3,400
4009	CHAIN LINK SAFETY FENCE	LF	$50.00	122	$6,080
	SUBTOTAL				**$1,182,930**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	134	$2,010
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	80	$2,400
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	9	$1,440
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	18	$2,700
	SUBTOTAL				**$14,550**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	150	$6,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	60	$4,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$21,400**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	267	$2,670
7002	TEMPORARY STRAW MULCHING	SY	$2.00	267	$534
7003	TEMPORARY SEEDING	SY	$2.00	267	$534
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	267	$534
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	6	$900
	SUBTOTAL				**$5,172**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$105,350.00	1	$105,350
	SUBTOTAL				**$108,350**
	TOTAL				**$1,861,597**
	CONTINGENCY (30%)				$558,479
	TOTAL INCLUDING CONTINGENCY				**$2,420,076**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$242,008
	TOTAL CONSTRUCTION COST				**$2,662,084**
BE-4, ALTERNATIVE 2 - DOUBLE BOX CULVERT		**USE**			**$2,663,000**
			Road Cost	21.6%	$577,000
			Structure Cost	78.4%	$2,086,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-5, ALTERNATIVE 1 - REPLACE ONE 72" RCP W/ 11'x6' BOX CULVERT

		9/17/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 663,055
CATEGORY 2 - GRADING		$ 43,500
CATEGORY 3 - DRAINAGE		$ 192,800
CATEGORY 4 - STRUCTURES		$ 3,435,039
CATEGORY 5 - PAVING		$ 114,370
CATEGORY 6 - SHOULDERS		$ 83,400
CATEGORY 7 LANDSCAPING		$ 29,000
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 386,310
SUB-TOTAL	TOTAL DIRECT COST	$ 4,947,474
	CONTINGENCY (30%)	$ 1,484,242
	TOTAL INCLUDING CONTINGENCY	$ 6,431,716
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 643,172
	TOTAL CONSTRUCTION COST	$ 7,074,888
BE-5, ALTERNATIVE 1 - REPLACE ONE 72" RCP W/ 11'x6' BOX CULVERT	**SAY**	**$ 7,075,000**
	Road Cost	$1,290,000
	Structure Cost	$5,785,000

CULVERT ENLARGEMENT
TAUSSIG ROAD OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-5, ALTERNATIVE 1 - REPLACE ONE 72" RCP W/ 11'x6' BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$20,000.00	1	$20,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$400,000.00	1	$400,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$120,000.00	1	$120,000
1007	RELOCATE SIGN	SF	$20.00	143	$2,860
1008	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	347	$8,675
1009	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	28	$9,520
	SUBTOTAL				**$663,055**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	590	$29,500
2002	COMMON BORROW EXCAVATION	CY	$60.00	100	$6,000
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	40	$8,000
	SUBTOTAL				**$43,500**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	600	$9,000
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	600	$4,800
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	INLET PROTECTION	EA	$500.00	6	$3,000
	SUBTOTAL				**$192,800**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	7,431	$817,410
4002	REMOVAL OF EXISTING BRIDGE	LS	$142,000.00	1	$142,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	3	$3,600
4004	PRECAST BOX CULVERT (11'X6')	LF	$4,950.00	471	$2,331,450
4005	WINGWALL CONCRETE	CY	$1,200.00	111	$133,200
4006	CHAIN LINK SAFETY FENCE	LF	$50.00	148	$7,379
	SUBTOTAL				**$3,435,039**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	858	$12,870
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	556	$16,680
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	158	$39,500
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	62	$9,920
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	124	$18,600
5006	6 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY	SY	$200.00	84	$16,800
	SUBTOTAL				**$114,370**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	1,000	$40,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	300	$24,000
6003	CHAIN LINK FENCE	LF	$40.00	300	$12,000
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$83,400**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	1,700	$17,000
7002	TEMPORARY STRAW MULCHING	SY	$2.00	1,700	$3,400
7003	TEMPORARY SEEDING	SY	$2.00	1,700	$3,400
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	1,700	$3,400
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	12	$1,800
	SUBTOTAL				**$29,000**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$5,000.00	1	$5,000
8002	RELOCATION OF UTILITIES	LS	$381,310.00	1	$381,310
	SUBTOTAL				**$386,310**
	TOTAL				**$4,947,474**
	CONTINGENCY (30%)				$1,484,242
	TOTAL INCLUDING CONTINGENCY				**$6,431,716**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$643,172
	TOTAL CONSTRUCTION COST				**$7,074,888**
BE-5, ALTERNATIVE 1 - REPLACE ONE 72" RCP W/ 11'x6' BOX CULVERT		**USE**			**$7,075,000**
			Road Cost	18.2%	$1,290,000
			Structure Cost	81.8%	$5,785,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-5, ALTERNATIVE 2 - REPLACE ONE 72" RCP W/ 7'x5' BOX CULVERT

CATEGORY		9/17/2025 COST
CATEGORY 1 - PRELIMINARY		$ 683,055
CATEGORY 2 - GRADING		$ 45,850
CATEGORY 3 - DRAINAGE		$ 192,800
CATEGORY 4 - STRUCTURES		$ 3,827,161
CATEGORY 5 - PAVING		$ 117,105
CATEGORY 6 - SHOULDERS		$ 97,400
CATEGORY 7 LANDSCAPING		$ 29,000
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 449,650
SUB-TOTAL	TOTAL DIRECT COST	$ 5,442,021
	CONTINGENCY (30%)	$ 1,632,606
	TOTAL INCLUDING CONTINGENCY	$ 7,074,627
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 707,463
	TOTAL CONSTRUCTION COST	$ 7,782,090
BE-5, ALTERNATIVE 2 - REPLACE ONE 72" RCP W/ 7'x5' BOX CULVERT	**SAY**	**$ 7,783,000**
	Road Cost	$1,394,000
	Structure Cost	$6,389,000

Stantec

CULVERT ENLARGEMENT
TAUSSIG ROAD OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-5, ALTERNATIVE 2 - REPLACE ONE 72" RCP W/ 7'x5' BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$20,000.00	1	$20,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$420,000.00	1	$420,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$120,000.00	1	$120,000
1007	RELOCATE SIGN	SF	$20.00	143	$2,860
1008	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	347	$8,675
1009	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	28	$9,520
	SUBTOTAL				**$683,055**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	637	$31,850
2002	COMMON BORROW EXCAVATION	CY	$60.00	100	$6,000
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	40	$8,000
	SUBTOTAL				**$45,850**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	600	$9,000
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	600	$4,800
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	INLET PROTECTION	EA	$500.00	6	$3,000
	SUBTOTAL				**$192,800**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	9,208	$1,012,880
4002	REMOVAL OF EXISTING BRIDGE	LS	$142,000.00	1	$142,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	5	$6,000
4004	PRECAST TWIN BOX CULVERT (7'X5')	LF	$2,700.00	942	$2,543,400
4005	WINGWALL CONCRETE	CY	$1,200.00	97	$116,400
4006	CHAIN LINK SAFETY FENCE	LF	$50.00	130	$6,481
	SUBTOTAL				**$3,827,161**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	819	$12,285
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	595	$17,850
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	158	$39,500
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	67	$10,720
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	133	$19,950
5006	6 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY	SY	$200.00	84	$16,800
	SUBTOTAL				**$117,105**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	1,250	$50,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	350	$28,000
6003	CHAIN LINK FENCE	LF	$40.00	300	$12,000
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$97,400**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	1,700	$17,000
7002	TEMPORARY STRAW MULCHING	SY	$2.00	1,700	$3,400
7003	TEMPORARY SEEDING	SY	$2.00	1,700	$3,400
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	1,700	$3,400
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	12	$1,800
	SUBTOTAL				**$29,000**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$5,000.00	1	$5,000
8002	RELOCATION OF UTILITIES	LS	$444,650.00	1	$444,650
	SUBTOTAL				**$449,650**
	TOTAL				**$5,442,021**
	CONTINGENCY (30%)				$1,632,606
	TOTAL INCLUDING CONTINGENCY				**$7,074,627**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$707,463
	TOTAL CONSTRUCTION COST				**$7,782,090**
BE-5, ALTERNATIVE 2 - REPLACE ONE 72" RCP W/ 7'x5' BOX CULVERT		**USE**			**$7,783,000**
			Road Cost	17.9%	$1,394,000
			Structure Cost	82.1%	$6,389,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-5, ALTERNATIVE 3 - ADD DIVERSION 8'x6' BOX CULVERT

		9/17/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 683,055
CATEGORY 2 - GRADING		$ 52,850
CATEGORY 3 - DRAINAGE		$ 183,750
CATEGORY 4 - STRUCTURES		$ 3,259,873
CATEGORY 5 - PAVING		$ 166,160
CATEGORY 6 - SHOULDERS		$ 104,600
CATEGORY 7 LANDSCAPING		$ 12,744
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 606,810
SUB-TOTAL	TOTAL DIRECT COST	$ 5,069,842
	CONTINGENCY (30%)	$ 1,520,953
	TOTAL INCLUDING CONTINGENCY	$ 6,590,795
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 659,080
	TOTAL CONSTRUCTION COST	$ 7,249,875
BE-5, ALTERNATIVE 3 - ADD DIVERSION 8'x6' BOX CULVERT	**SAY**	**$ 7,250,000**
	Road Cost	$1,731,000
	Structure Cost	$5,519,000

Stantec

CULVERT ENLARGEMENT
TAUSSIG ROAD OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

BE-5, ALTERNATIVE 3 - ADD DIVERSION 8'x6' BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$20,000.00	1	$20,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$420,000.00	1	$420,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$120,000.00	1	$120,000
1007	RELOCATE SIGN	SF	$20.00	143	$2,860
1008	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	347	$8,675
1009	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	28	$9,520
	SUBTOTAL				**$683,055**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	777	$38,850
2002	COMMON BORROW EXCAVATION	CY	$60.00	100	$6,000
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	40	$8,000
	SUBTOTAL				**$52,850**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	250	$3,750
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	250	$2,000
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	INLET PROTECTION	EA	$500.00	4	$2,000
	SUBTOTAL				**$183,750**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	9,704	$1,067,431
4002	REMOVAL OF EXISTING BRIDGE	LS	$78,000.00	1	$78,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	82	$98,400
4004	PRECAST DIVERSION BOX CULVERT (8'X6')	LF	$3,100.00	397	$1,230,700
4005	PRECAST TWIN BOX CULVERT AT BOTH ENDS (8.5'X6')	LF	$3,200.00	209	$668,800
4006	WINGWALL CONCRETE	CY	$1,200.00	92	$110,400
4007	CHAIN LINK SAFETY FENCE	LF	$50.00	123	$6,143
	SUBTOTAL				**$3,259,873**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	452	$6,780
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	962	$28,860
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	158	$39,500
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	107	$17,120
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	214	$32,100
5006	6 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY	SY	$200.00	209	$41,800
	SUBTOTAL				**$166,160**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	1,100	$44,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	565	$45,200
6003	CHAIN LINK FENCE	LF	$40.00	200	$8,000
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$104,600**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	684	$6,840
7002	TEMPORARY STRAW MULCHING	SY	$2.00	684	$1,368
7003	TEMPORARY SEEDING	SY	$2.00	684	$1,368
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	684	$1,368
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	12	$1,800
	SUBTOTAL				**$12,744**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$5,000.00	1	$5,000
8002	RELOCATION OF UTILITIES	LS	$601,810.00	1	$601,810
	SUBTOTAL				**$606,810**
	TOTAL				**$5,069,842**
	CONTINGENCY (30%)				$1,520,953
	TOTAL INCLUDING CONTINGENCY				**$6,590,795**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$659,080
	TOTAL CONSTRUCTION COST				**$7,249,875**
BE-5, ALTERNATIVE 3 - ADD DIVERSION 8'x6' BOX CULVERT		**USE**			**$7,250,000**
			Road Cost	23.9%	$1,731,000
			Structure Cost	76.1%	$5,519,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

CE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

		9/17/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 357,595
CATEGORY 2 - GRADING		$ 16,350
CATEGORY 3 - DRAINAGE		$ 237,520
CATEGORY 4 - STRUCTURES		$ 1,282,020
CATEGORY 5 - PAVING		$ 47,245
CATEGORY 6 - SHOULDERS		$ 27,000
CATEGORY 7 LANDSCAPING		$ 8,694
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 198,660
SUB-TOTAL	TOTAL DIRECT COST	$ 2,175,084
	CONTINGENCY (30%)	$ 652,525
	TOTAL INCLUDING CONTINGENCY	$ 2,827,609
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 282,761
	TOTAL CONSTRUCTION COST	$ 3,110,370
CE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE	**SAY**	**$ 3,111,000**
	Road Cost	$884,000
	Structure Cost	$2,227,000

CULVERT ENLARGEMENT
56TH AVENUE OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

CE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$175,000.00	1	$175,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	179	$4,475
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	18	$6,120
	SUBTOTAL				**$357,595**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	241	$12,050
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$16,350**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	240	$3,600
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	240	$1,920
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	RELOCATION OF 21" RCP DRAINAGE	LS	$13,000.00	1	$13,000
3007	RELOCATION OF 15" RCP DRAINAGE	LS	$23,000.00	1	$23,000
3008	RELOCATION OF DRAINAGE INLET	EA	$20,000.00	1	$20,000
	SUBTOTAL				**$237,520**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	2,516	$276,760
4002	REMOVAL OF EXISTING STRUCTURE	LS	$29,000.00	1	$29,000
4003	SUBSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,200.00	87	$104,400
4004	FOOTING CONCRETE FOR BRIDGE	CY	$1,000.00	123	$123,000
4005	PRESTRESSED CONCRETE SLAB (36X18)	LF	$850.00	273	$232,050
4006	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	43	$64,500
4007	WINGWALL CONCRETE	CY	$1,200.00	136	$163,200
4008	DYNAMIC PILE MONITORING	EA	$5,000.00	2	$10,000
4009	CAPWAP	EA	$1,000.00	2	$2,000
4010	STEEL HP 12 X 53 BEARING PILE	LF	$130.00	1,530	$198,900
4011	STEEL HP 12 X 53 BEARING TEST PILE	LF	$150.00	90	$13,500
4012	SETUP FOR DRIVING STEEL HP PILES	EA	$600.00	36	$21,600
4013	METAL RAILING THREE STRAND	LF	$650.00	48	$31,200
4014	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	140	$2,800
4015	CHAIN LINK SAFETY FENCE	LF	$50.00	182	$9,110
	SUBTOTAL				**$1,282,020**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	323	$4,845
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	212	$6,360
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	60	$15,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	24	$3,840
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	48	$7,200
5006	6 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY	SY	$200.00	50	$10,000
	SUBTOTAL				**$47,245**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	225	$9,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	185	$14,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
	SUBTOTAL				**$27,000**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	534	$5,340
7002	TEMPORARY STRAW MULCHING	SY	$2.00	534	$1,068
7003	TEMPORARY SEEDING	SY	$2.00	534	$1,068
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	534	$1,068
7005	TREE, SHRUB, AND PERRENNIAL INSTALLATION ESTABLISHMENT	EA	$150.00	1	$150
	SUBTOTAL				**$8,694**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$195,660.00	1	$195,660
	SUBTOTAL				**$198,660**
	TOTAL				**$2,175,084**
	CONTINGENCY (30%)				$652,525
	TOTAL INCLUDING CONTINGENCY				**$2,827,609**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$282,761
	TOTAL CONSTRUCTION COST				**$3,110,370**
CE-4, ALTERNATIVE 1 - PRESTRESSED CONCRETE SLAB BRIDGE		**USE**			**$3,111,000**
			Road Cost	28.4%	$884,000
			Structure Cost	71.6%	$2,227,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

CE-4, ALTERNATIVE 2 - SINGLE BOX CULVERT

		9/17/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 332,595
CATEGORY 2 - GRADING		$ 15,950
CATEGORY 3 - DRAINAGE		$ 237,520
CATEGORY 4 - STRUCTURES		$ 958,960
CATEGORY 5 - PAVING		$ 47,245
CATEGORY 6 - SHOULDERS		$ 27,000
CATEGORY 7 LANDSCAPING		$ 8,694
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 198,660
SUB-TOTAL	TOTAL DIRECT COST	$ 1,826,624
	CONTINGENCY (30%)	$ 547,987
	TOTAL INCLUDING CONTINGENCY	$ 2,374,611
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 237,461
	TOTAL CONSTRUCTION COST	$ 2,612,072
CE-4, ALTERNATIVE 2 - SINGLE BOX CULVERT	**SAY**	**$ 2,613,000**
	Road Cost	$638,000
	Structure Cost	$1,975,000

CULVERT ENLARGEMENT
56TH AVENUE OVER EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

CE-4, ALTERNATIVE 2 - SINGLE BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$150,000.00	1	$150,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	179	$4,475
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	18	$6,120
	SUBTOTAL				**$332,595**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	233	$11,650
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$15,950**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	240	$3,600
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	240	$1,920
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3008	RELOCATION OF 21" RCP DRAINAGE	LS	$13,000.00	1	$13,000
3009	RELOCATION OF 15" RCP DRAINAGE	LS	$23,000.00	1	$23,000
3010	RELOCATION OF DRAINAGE INLET	EA	$20,000.00	1	$20,000
	SUBTOTAL				**$237,520**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	2,517	$276,870
4002	REMOVAL OF EXISTING STRUCTURE	LS	$29,000.00	1	$29,000
4003	SUBSTRUCTURE CONCRETE FOR CULVERT	CY	$1,200.00	5	$6,000
4004	PRECASET BOX CULVERT (16'X6')	LF	$6,200.00	51	$316,200
4005	SUPERSTRUCTURE CONCRETE FOR BRIDGE	CY	$1,500.00	88	$132,000
4006	WINGWALL CONCRETE	CY	$1,200.00	136	$163,200
4007	METAL RAILING THREE STRAND	LF	$650.00	38	$24,375
4008	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	110	$2,200
4009	CHAIN LINK SAFETY FENCE	LF	$50.00	182	$9,115
	SUBTOTAL				**$958,960**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	323	$4,845
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	212	$6,360
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	60	$15,000
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	24	$3,840
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	48	$7,200
5006	6 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY	SY	$200.00	50	$10,000
	SUBTOTAL				**$47,245**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	225	$9,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	185	$14,800
6003	CHAIN LINK FENCE	LF	$40.00	80	$3,200
	SUBTOTAL				**$27,000**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	534	$5,340
7002	TEMPORARY STRAW MULCHING	SY	$2.00	534	$1,068
7003	TEMPORARY SEEDING	SY	$2.00	534	$1,068
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	534	$1,068
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	1	$150
	SUBTOTAL				**$8,694**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$195,660.00	1	$195,660
	SUBTOTAL				**$198,660**
	TOTAL				**$1,826,624**
	CONTINGENCY (30%)				$547,987
	TOTAL INCLUDING CONTINGENCY				**$2,374,611**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$237,461
	TOTAL CONSTRUCTION COST				**$2,612,072**
CE-4, ALTERNATIVE 2 - SINGLE BOX CULVERT		**USE**			**$2,613,000**
			Road Cost	24.4%	$638,000
			Structure Cost	75.6%	$1,975,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

CHANNEL IMPROVEMENTS
EDMONSTON CHANNEL

EDMONSTON RD TO VARNUM ST, VARNUM ST TO UPSHUR ST, UPSHUR ST TO 54TH ST & 54TH PL TO 55TH AVE

9/18/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 411,709
CATEGORY 2 - GRADING		$ 148,315
CATEGORY 3 - DRAINAGE		$ 223,250
CATEGORY 4 - STRUCTURES		$ 1,067,250
CATEGORY 7 LANDSCAPING		$ 37,526
SUB-TOTAL	TOTAL DIRECT COST	$ 1,888,050
	CONTINGENCY (30%)	$ 566,415
	TOTAL INCLUDING CONTINGENCY	$ 2,454,465
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 245,447
	TOTAL CONSTRUCTION COST	$ 2,699,912
EDMONSTON RD TO VARNUM ST, VARNUM ST TO UPSHUR ST, UPSHUR ST TO 54TH ST & 54TH PL TO 55TH AVE	**SAY**	**$ 2,700,000**
	Road Cost	$0
	Structure Cost	$0

Stantec

CHANNEL IMPROVEMENTS
EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

EDMONSTON RD TO VARNUM ST, VARNUM ST TO UPSHUR ST, UPSHUR ST TO 54TH ST & 54TH PL TO 55TH AVE

9/18/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$5,000.00	1	$5,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$39,000.00	1	$39,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$250,000.00	1	$250,000
1007	FLAGGER	HR	$43.50	224	$9,744
1008	RELOCATE SIGN	SF	$20.00	134	$2,680
1009	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	67	$1,675
1010	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	2	$680
1011	DRUMS FOR MAINTENANCE OF TRAFFIC	EA	$62.00	15	$930
	SUBTOTAL				**$411,709**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION HAULED OFF-SITE FOR DISPOSAL	CY	$55.00	1,459	$80,245
2002	CLASS 1 EXCAVATION FOR REUSE ON SITE AS FILL	CY	$30.00	6	$180
2003	REMOVAL AND DISPOSAL OF CONCRETE CHANNEL	SY	$30.00	2,263	$67,890
	SUBTOTAL				**$148,315**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	940	$14,100
3003	SILT FENCE (SF)	LF	$6.00	1,150	$6,900
3004	REMOVE AND RESET SILT FENCE (SF)	LF	$3.00	1,150	$3,450
3005	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	850	$6,800
3006	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	4	$20,000
3007	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	4	$12,000
	SUBTOTAL				**$223,250**
CATEGORY 4 STRUCTURES					
4001	RECTANGULAR CONCRETE CHANNEL	CY	$1,600.00	594	$950,400
4002	SILANE CONCRETE PROTECTIVE COATING	SY	$20.00	2,680	$53,600
4003	CHAIN LINK SAFETY FENCE	LF	$50.00	1,265	$63,250
	SUBTOTAL				**$1,067,250**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	2,111	$21,110
7002	TEMPORARY STRAW MULCHING	SY	$2.00	2,111	$4,222
7003	TEMPORARY SEEDING	SY	$2.00	2,111	$4,222
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	2,111	$4,222
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	25	$3,750
	SUBTOTAL				**$37,526**
	TOTAL				**$1,888,050**
	CONTINGENCY (30%)				$566,415
	TOTAL INCLUDING CONTINGENCY				**$2,454,465**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$245,447
	TOTAL CONSTRUCTION COST				**$2,699,912**
EDMONSTON RD TO VARNUM ST, VARNUM ST TO UPSHUR ST, UPSHUR ST TO 54TH ST & 54TH PL TO 55TH AVE		**USE**			**$2,700,000**

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

EDMONSTON RD TO VARNUM ST

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 276,900
CATEGORY 2 - GRADING		$ 247,740
CATEGORY 3 - DRAINAGE		$ 173,250
CATEGORY 4 - STRUCTURES		$ 333,090
CATEGORY 7 LANDSCAPING		$ 111,352
SUB-TOTAL	TOTAL DIRECT COST	$ 1,142,332
	CONTINGENCY (30%)	$ 342,700
	TOTAL INCLUDING CONTINGENCY	$ 1,485,032
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 148,503
	TOTAL CONSTRUCTION COST	$ 1,633,535
EDMONSTON RD TO VARNUM ST	**SAY**	**$ 1,634,000**

STORAGE
EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

EDMONSTON RD TO VARNUM ST

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$20,000.00	1	$20,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$104,000.00	1	$104,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$50,000.00	1	$50,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	36	$900
	SUBTOTAL				**$276,900**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION FOR REUSE ON SITE AS FILL	CY	$30.00	367	$11,010
2002	CLASS 1 EXCAVATION HAULED OFF-SITE FOR DISPOSAL	CY	$55.00	4,027	$221,485
2003	RIPRAP EXCAVATION FOR REUSE	CY	$65.00	107	$6,955
2004	REMOVAL AND DISPOSAL OF CONCRETE CHANNEL	SY	$30.00	123	$3,690
2005	REMOVAL AND DISPOSAL OF CONCRETE STRUCTURES	CY	$200.00	23	$4,600
	SUBTOTAL				**$247,740**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	350	$5,250
3003	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	1	$5,000
3004	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	1	$3,000
	SUBTOTAL				**$173,250**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	109	$11,990
4002	OUTLET STRUCTURE CONCRETE	CY	$1,200.00	38	$45,600
4003	STEEL CAGE	EA	$126,000.00	1	$126,000
4004	METAL RAILING THREE STRAND	LF	$650.00	230	$149,500
	SUBTOTAL				**$333,090**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	6,922	$69,220
7002	TEMPORARY STRAW MULCHING	SY	$2.00	6,922	$13,844
7003	TEMPORARY SEEDING	SY	$2.00	6,922	$13,844
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	6,922	$13,844
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	4	$600
	SUBTOTAL				**$111,352**
	TOTAL				**$1,142,332**
	CONTINGENCY (30%)				$342,700
	TOTAL INCLUDING CONTINGENCY				**$1,485,032**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$148,503
	TOTAL CONSTRUCTION COST				**$1,633,535**
EDMONSTON RD TO VARNUM ST		**USE**			**$1,634,000**
			Non-Structure Cost	61.5%	$1,006,000
			Structure Cost	38.5%	$628,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

STORM DRAIN IMPROVEMENT
EDMONSTON CHANNEL

55TH AVE AND 56TH AVE

CATEGORY		9/18/2025 COST
CATEGORY 1 - PRELIMINARY		$ 295,116
CATEGORY 2 - GRADING		$ 22,000
CATEGORY 3 - DRAINAGE		$ 9,000
CATEGORY 4 - STRUCTURES		$ 126,570
CATEGORY 5 - PAVING		$ 33,520
CATEGORY 6 - SHOULDERS		$ 63,040
CATEGORY 7 LANDSCAPING		$ 3,056
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 62,000
SUB-TOTAL	TOTAL DIRECT COST	$ 614,302
	CONTINGENCY (30%)	$ 184,291
	TOTAL INCLUDING CONTINGENCY	$ 798,593
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 79,859
	TOTAL CONSTRUCTION COST	$ 878,452
55TH AVE AND 56TH AVE	**SAY**	**$ 879,000**

Stantec

STORM DRAIN IMPROVEMENT
EDMONSTON CHANNEL

CONSTRUCTION COST ESTIMATE

55TH AVE AND 56TH AVE

9/18/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$20,000.00	1	$20,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$50,000.00	1	$50,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$100,000.00	1	$100,000
1007	STEEL PLATE 8 FOOT X 12 FOOT X 1 INCH FOR MAINTENANCE OF TRAFFIC RENTAL PER DAY	EA	$115.00	31	$3,565
1008	FLAGGER	HR	$43.50	336	$14,616
1009	RELOCATE SIGN	SF	$20.00	67	$1,340
1010	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	67	$1,675
1011	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	2	$680
1012	DRUMS FOR MAINTENANCE OF TRAFFIC	EA	$62.00	20	$1,240
	SUBTOTAL				**$295,116**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	250	$12,500
2002	COMMON BORROW EXCAVATION	CY	$60.00	25	$1,500
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	40	$8,000
	SUBTOTAL				**$22,000**
CATEGORY 3 DRAINAGE					
301	SUPER SILT FENCE (SSF)	LF	$15.00	500	$7,500
302	INLET PROTECTION	EA	$500.00	3	$1,500
	SUBTOTAL				**$9,000**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION	CY	$110.00	162	$17,820
4002	REMOVAL OF INLET	EA	$1,349.00	2	$2,698
4003	REMOVAL OF STORM DRAIN PIPE	LF	$18.00	83	$1,494
4004	21" STORM DRAIN	LF	$80.00	354	$28,320
4005	24" STORM DRAIN	LF	$92.00	11	$1,012
4006	END SECTION	EA	$858.00	2	$1,716
4007	A-15 INLET	EA	$7,256.00	5	$36,280
4008	48" TYPE "A" PRECAST MANHOLE	VF	$730.00	51	$37,230
	SUBTOTAL				**$126,570**
CATEGORY 5 PAVING					
501	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	216	$6,480
502	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	24	$6,000
503	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	24	$3,840
504	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	48	$7,200
505	6 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY	SY	$200.00	50	$10,000
	SUBTOTAL				**$33,520**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	890	$35,600
6002	CONCRETE CURB & GUTTER	LF	$80.00	343	$27,440
	SUBTOTAL				**$63,040**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	191	$1,910
7002	TEMPORARY STRAW MULCHING	SY	$2.00	191	$382
7003	TEMPORARY SEEDING	SY	$2.00	191	$382
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	191	$382
	SUBTOTAL				**$3,056**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$59,000.00	1	$59,000
	SUBTOTAL				**$62,000**
	TOTAL				**$614,302**
	CONTINGENCY (30%)				$184,291
	TOTAL INCLUDING CONTINGENCY				**$798,593**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$79,859
	TOTAL CONSTRUCTION COST				**$878,452**
55TH AVE AND 56TH AVE		**USE**			**$879,000**

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

QUINCY RUN
FROM 52ND AVE TO 55TH AVE

STREAM RESTORATION

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 201,000
CATEGORY 2 - GRADING		$ 149,200
CATEGORY 3 - DRAINAGE		$ 550,110
CATEGORY 4 LANDSCAPING		$ 415,250
SUB-TOTAL	TOTAL DIRECT COST	$ 1,315,560
	CONTINGENCY (30%)	$ 394,668
	TOTAL INCLUDING CONTINGENCY	$ 1,710,228
STREAM RESTORATION	**SAY**	**$ 1,711,000**

QUINCY RUN
FROM 52ND AVE TO 55TH AVE

CONSTRUCTION COST ESTIMATE

STREAM RESTORATION

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$33,000.00	1	$33,000
1003	CONSTRUCTION STAKEOUT	LS	$56,000	1	$56,000
1004	MOBILIZATION AND DEMOBILIZATION	LS	$112,000	1	$112,000
	SUBTOTAL				**$201,000**
CATEGORY 2 GRADING					
2001	CLASS 5 EXCAVATION	CY	$40.00	3,730	$149,200
	SUBTOTAL				**$149,200**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$117,000.00	1	$117,000
3002	SILT FENCE (SF)	LF	$6.00	200	$1,200
3003	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	3	$15,000
3004	TEMPORARY BRIDGE CROSSING	EA	$5,000.00	2	$10,000
3005	CLASS I RIPRAP FOR SLOPE AND CHANNEL PROTECTION	CY	$150.00	1,200	$180,000
3006	CLASS II RIPRAP FOR SLOPE AND CHANNEL PROTECTION	CY	$175.00	1,250	$218,750
3007	TEMPORARY MULCH ACCESS ROAD	SY	$12.00	680	$8,160
	SUBTOTAL				**$550,110**
CATEGORY 4 LANDSCAPING					
4001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4”) DEPTH	SY	$10.00	1,000	$10,000
4002	TEMPORARY STRAW MULCHING	SY	$2.00	12,100	$24,200
4003	TEMPORARY SEEDING	SY	$2.00	12,100	$24,200
4004	TURFGRASS ESTABLISHMENT	SY	$2.00	1,000	$2,000
4005	TREE, SHRUB, AND PERRENNIAL INSTALLATION ESTABLISHMENT	LS	$286,700.00	1	$286,700
4006	SOIL STABILIZATION MATTING	CY	$2.00	5,100	$10,200
4007	PLUG INSTALLATION	EA	$5.00	1,600	$8,000
4008	NATIVE RIPARIAN MEADOW ESTABLISHMENT	SY	$4.50	11,100	$49,950
	SUBTOTAL				**$415,250**
	TOTAL				**$1,315,560**
	CONTINGENCY (30%)				$394,668
	TOTAL INCLUDING CONTINGENCY				**$1,710,228**
	USE				**$1,711,000**

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

ALTERNATIVE 1 - FLOODWALL AND PUMP STATION (2)

		9/18/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 312,000
CATEGORY 2 - GRADING		$ 27,400
CATEGORY 3 - DRAINAGE		$ 23,504
CATEGORY 4 - STRUCTURES		$ 2,006,736
CATEGORY 7 LANDSCAPING		$ 12,164
SUB-TOTAL	TOTAL DIRECT COST	$ 2,381,804
	CONTINGENCY (30%)	$ 714,541
	TOTAL INCLUDING CONTINGENCY	$ 3,096,345
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 309,634
	TOTAL CONSTRUCTION COST	$ 3,405,979
ALTERNATIVE 1 - FLOODWALL AND PUMP STATION (2)	**SAY**	**$ 3,406,000**

Stantec

QUINCY RUN PERMANENT FLOOD WALL (PF-1)
BEHIND 5204, 5206, AND 5208 NEWTON ST.

CONSTRUCTION COST ESTIMATE

ALTERNATIVE 1 - FLOODWALL AND PUMP STATION (2)

9/18/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$200,000.00	1	$200,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
	SUBTOTAL				**$312,000**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	548	$27,400
	SUBTOTAL				**$27,400**
CATEGORY 3 DRAINAGE					
3001	SUPER SILT FENCE (SSF)	LF	$15.00	422	$6,330
3002	SILT FENCE (SF)	LF	$6.00	422	$2,532
3003	REMOVE AND RESET SILT FENCE (SF)	LF	$3.00	422	$1,266
3004	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	422	$3,376
3005	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
	SUBTOTAL				**$23,504**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION	CY	$110.00	501	$55,081
4002	PUMPSTATION REINFORCED CONCRETE	CY	$1,200.00	316	$379,200
4003	PUMPSTATION PROCESS EQUIPMENT	LS	$355,234.16	1	$355,234
4004	PUMPSTATION ELECTRICAL	LS	$400,000.00	1	$400,000
4004	CATCH BASIN REINFORCED CONCRETE	CY	$1,200.00	10	$12,000
4005	PZC13 SHEET PILE WALL	VLF	$100.00	2,512	$251,200
4006	PZC13 REINFORCED CONCRETE OVERLAY	CY	$1,200.00	406	$486,720
4007	OVERLAY ANCHOR STUDS	EA	$30.00	2,110	$63,300
4008	STEEL DIAMOND PLATE COVERS	EA	$500.00	8	$4,000
	SUBTOTAL				**$2,006,736**
CATEGORY 5 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	704	$7,040
7002	TEMPORARY STRAW MULCHING	SY	$2.00	704	$1,408
7003	TEMPORARY SEEDING	SY	$2.00	704	$1,408
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	704	$1,408
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	6	$900
	SUBTOTAL				**$12,164**
	TOTAL				**$2,381,804**
	CONTINGENCY (30%)				$714,541
	TOTAL INCLUDING CONTINGENCY				**$3,096,345**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$309,634
	TOTAL CONSTRUCTION COST				**$3,405,979**
ALTERNATIVE 1 - FLOODWALL AND PUMP STATION (2)		**USE**			**$3,406,000**

QUINCY RUN PERMANENT FLOOD WALL (PF-1)
BEHIND 5204, 5206, AND 5208 NEWTON ST.

ALTERNATIVE 2 - FLOODWALL AND PUMP STATION (1)

9/18/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 312,000
CATEGORY 2 - GRADING		$ 27,400
CATEGORY 3 - DRAINAGE		$ 23,504
CATEGORY 4 - STRUCTURES		$ 1,978,703
CATEGORY 7 LANDSCAPING		$ 12,164
SUB-TOTAL	TOTAL DIRECT COST	$ 2,353,771
	CONTINGENCY (30%)	$ 706,131
	TOTAL INCLUDING CONTINGENCY	$ 3,059,902
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 305,990
	TOTAL CONSTRUCTION COST	$ 3,365,892
ALTERNATIVE 2 - FLOODWALL AND PUMP STATION (1)	**SAY**	**$ 3,366,000**

QUINCY RUN PERMANENT FLOOD WALL (PF-1)
BEHIND 5204, 5206, AND 5208 NEWTON ST.

CONSTRUCTION COST ESTIMATE

ALTERNATIVE 2 - FLOODWALL AND PUMP STATION (1)

9/18/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$200,000.00	1	$200,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
	SUBTOTAL				**$312,000**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	548	$27,400
	SUBTOTAL				**$27,400**
CATEGORY 3 DRAINAGE					
3001	SUPER SILT FENCE (SSF)	LF	$15.00	422	$6,330
3002	SILT FENCE (SF)	LF	$6.00	422	$2,532
3003	REMOVE AND RESET SILT FENCE (SF)	LF	$3.00	422	$1,266
3004	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	422	$3,376
3005	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
	SUBTOTAL				**$23,504**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION	CY	$200.00	337	$67,407
4002	PUMPSTATION REINFORCED CONCRETE	CY	$1,200.00	197	$236,400
4003	PUMPSTATION PROCESS EQUIPMENT	LS	$431,195.36	1	$431,195
4004	PUMPSTATION ELECTRICAL	LS	$400,000.00	1	$400,000
4004	CATCH BASIN REINFORCED CONCRETE	CY	$1,200.00	10	$12,000
4005	PZC13 SHEET PILE WALL	VLF	$100.00	2,624	$262,400
4006	PZC13 REINFORCED CONCRETE OVERLAY	CY	$1,200.00	420	$504,000
4007	OVERLAY ANCHOR STUDS	EA	$30.00	2,110	$63,300
4008	STEEL DIAMOND PLATE COVERS	EA	$500.00	4	$2,000
	SUBTOTAL				**$1,978,703**
CATEGORY 5 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4”) DEPTH	SY	$10.00	704	$7,040
7002	TEMPORARY STRAW MULCHING	SY	$2.00	704	$1,408
7003	TEMPORARY SEEDING	SY	$2.00	704	$1,408
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	704	$1,408
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	6	$900
	SUBTOTAL				**$12,164**
	TOTAL				**$2,353,771**
	CONTINGENCY (30%)				$706,131
	TOTAL INCLUDING CONTINGENCY				**$3,059,902**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$305,990
	TOTAL CONSTRUCTION COST				**$3,365,892**
ALTERNATIVE 2 - FLOODWALL AND PUMP STATION (1)		**USE**			**$3,366,000**

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

BE-6, ALTERNATIVE 1 - CON/SPAN ARCH BRIDGE

		9/18/2025
CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 491,585
CATEGORY 2 - GRADING		$ 21,450
CATEGORY 3 - DRAINAGE		$ 286,920
CATEGORY 4 - STRUCTURES		$ 2,895,240
CATEGORY 5 - PAVING		$ 37,185
CATEGORY 6 - SHOULDERS		$ 64,200
CATEGORY 7 LANDSCAPING		$ 20,296
CATEGORY 8 - TRAFFIC & UTILITIES		$ 96,490
(2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		
SUB-TOTAL	TOTAL DIRECT COST	$ 3,913,366
	CONTINGENCY (30%)	$ 1,174,010
	TOTAL INCLUDING CONTINGENCY	$ 5,087,376
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 508,738
	TOTAL CONSTRUCTION COST	$ 5,596,114
BE-6, ALTERNATIVE 1 - CON/SPAN ARCH BRIDGE	**SAY**	**$ 5,597,000**
	Road Cost	$628,000
	Structure Cost	$4,969,000

Stantec

P-1266 BRIDGE ENLARGEMENT
55TH AVENUE OVER QUINCY RUN

CONSTRUCTION COST ESTIMATE

BE-6, ALTERNATIVE 1 - CON/SPAN ARCH BRIDGE

9/18/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$310,000.00	1	$310,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	193	$4,825
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$491,585**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	343	$17,150
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$21,450**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	260	$3,900
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	260	$2,080
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3006	CLASS II RIPRAP	SY	$180.00	583	$104,940
	SUBTOTAL				**$286,920**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	6,389	$702,790
4002	REMOVAL OF EXISTING STRUCTURE	LS	$32,000.00	1	$32,000
4003	FOOTING CONCRETE FOR BRIDGE	CY	$1,000.00	300	$300,000
4004	CONSPAN ARCH (28X6)	LF	$7,700.00	92.5	$712,250
4005	WINGWALL CONCRETE	CY	$1,200.00	253	$303,600
4006	DYNAMIC PILE MONITORING	EA	$5,000.00	2	$10,000
4007	CAPWAP	EA	$1,000.00	2	$2,000
4008	STEEL HP 12 X 53 BEARING PILE	LF	$130.00	5,670	$737,100
4009	STEEL HP 12 X 53 BEARING TEST PILE	LF	$150.00	90	$13,500
4010	SETUP FOR DRIVING STEEL HP PILES	EA	$600.00	128	$76,800
4011	CHAIN LINK SAFETY FENCE	LF	$50.00	104	$5,200
	SUBTOTAL				**$2,895,240**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	189	$2,835
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	265	$7,950
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	51	$12,750
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	30	$4,800
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	59	$8,850
	SUBTOTAL				**$37,185**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	850	$34,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	180	$14,400
6003	GALVANIZED TRAFFIC BARRIER W BEAM USING SIX FOOT (6') POSTS (STD. MD 605.22)	LF	$60.00	140	$8,400
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$64,200**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4") DEPTH	SY	$10.00	1,156	$11,560
7002	TEMPORARY STRAW MULCHING	SY	$2.00	1,156	$2,312
7003	TEMPORARY SEEDING	SY	$2.00	1,156	$2,312
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	1,156	$2,312
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	12	$1,800
	SUBTOTAL				**$20,296**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$93,490.00	1	$93,490
	SUBTOTAL				**$96,490**
	TOTAL				**$3,913,366**
	CONTINGENCY (30%)				$1,174,010
	TOTAL INCLUDING CONTINGENCY				**$5,087,376**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$508,738
	TOTAL CONSTRUCTION COST				**$5,596,114**
BE-6, ALTERNATIVE 1 - CON/SPAN ARCH BRIDGE		**USE**			**$5,597,000**
			Road Cost	11.2%	$628,000
			Structure Cost	88.8%	$4,969,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.

Stantec

P-1266 BRIDGE ENLARGEMENT
55TH AVENUE OVER QUINCY RUN

BE-6, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

CATEGORY		COST
CATEGORY 1 - PRELIMINARY		$ 421,585
CATEGORY 2 - GRADING		$ 21,450
CATEGORY 3 - DRAINAGE		$ 283,320
CATEGORY 4 - STRUCTURES		$ 2,067,360
CATEGORY 5 - PAVING		$ 37,185
CATEGORY 6 - SHOULDERS		$ 64,200
CATEGORY 7 LANDSCAPING		$ 20,296
CATEGORY 8 - TRAFFIC & UTILITIES (2-LANE TEMPORARY DETOUR ROAD DURING CONSTRUCTION)		$ 96,490
SUB-TOTAL	TOTAL DIRECT COST	$ 3,011,886
	CONTINGENCY (30%)	$ 903,566
	TOTAL INCLUDING CONTINGENCY	$ 3,915,452
	COST OF CONSTRUCTION MANAGEMENT (10%)	$ 391,545
	TOTAL CONSTRUCTION COST	$ 4,306,997
BE-6, ALTERNATIVE 2 - DOUBLE BOX CULVERT	**SAY**	**$ 4,307,000**
	Road Cost	$643,000
	Structure Cost	$3,664,000

Stantec

P-1266 BRIDGE ENLARGEMENT
55TH AVENUE OVER QUINCY RUN

CONSTRUCTION COST ESTIMATE

BE-6, ALTERNATIVE 2 - DOUBLE BOX CULVERT

9/17/2025

Item	Description	Unit	Unit Cost	Quantity	Total Cost
CATEGORY 1 PRELIMINARY					
1001	CLEARING AND GRUBBING	LS	$10,000.00	1	$10,000
1002	ENGINEER'S OFFICE TYPE B	LS	$60,000.00	1	$60,000
1003	CONSTRUCTION STAKEOUT	LS	$30,000.00	1	$30,000
1004	MOBILIZATION	LS	$240,000.00	1	$240,000
1005	CPM PROJECT SCHEDULE	LS	$12,000.00	1	$12,000
1006	MAINTENANCE OF TRAFFIC	LS	$60,000.00	1	$60,000
1007	TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	SF	$25.00	193	$4,825
1008	TYPE III BARRICADE FOR MAINTENANCE OF TRAFFIC	EA	$340.00	14	$4,760
	SUBTOTAL				**$421,585**
CATEGORY 2 GRADING					
2001	CLASS 1 EXCAVATION	CY	$50.00	343	$17,150
2002	COMMON BORROW EXCAVATION	CY	$60.00	5	$300
2003	TEST PIT EXCAVATION (CONTINGENT)	CY	$200.00	20	$4,000
	SUBTOTAL				**$21,450**
CATEGORY 3 DRAINAGE					
3001	MAINTENANCE OF STREAM FLOW	LS	$160,000.00	1	$160,000
3002	SUPER SILT FENCE (SSF)	LF	$15.00	260	$3,900
3003	REMOVE AND RESET SUPER SILT FENCE (SSF)	LF	$8.00	260	$2,080
3004	STABILIZED CONSTRUCTION ENTRANCE (SCE)	EA	$5,000.00	2	$10,000
3005	CONCRETE WASHOUT STRUCTURE (CWS)	EA	$3,000.00	2	$6,000
3008	CLASS II RIPRAP	SY	$180.00	563	$101,340
	SUBTOTAL				**$283,320**
CATEGORY 4 STRUCTURES					
4001	STRUCTURE EXCAVATION (CLASS 3)	CY	$110.00	6,741	$741,510
4002	REMOVAL OF EXISTING STRUCTURE	LS	$32,000.00	1	$32,000
4003	SUBSTRUCTURE CONCRETE FOR CULVERT	CY	$1,200.00	14	$16,800
4004	PRECASET BOX CULVERT (12'X6')	LF	$5,200.00	180	$936,000
4005	WINGWALL CONCRETE	CY	$1,200.00	280	$336,000
4006	CHAIN LINK SAFETY FENCE	LF	$50.00	101	$5,050
	SUBTOTAL				**$2,067,360**
CATEGORY 5 PAVING					
5001	MILLING ASPHALT PAVEMENT ZERO TO TWO INCH (0" - 2")	SY	$15.00	189	$2,835
5002	SIX INCH (6") BASE COURSE USING GRADED AGGREGATE	SY	$30.00	265	$7,950
5003	HOT MIX ASPHALT SUPERPAVE FOR SURFACE 9.5MM PG 70-22, LEVEL 2	TON	$250.00	51	$12,750
5004	HOT MIX ASPHALT SUPERPAVE FOR INTERMEDIATE SURFACE 12.5MM, PG 70-22, LEVEL 2	TON	$160.00	30	$4,800
5005	HOT MIX ASPHALT SUPERPAVE FOR BASE 25.0MM, PG 64-22, LEVEL 2	TON	$150.00	59	$8,850
	SUBTOTAL				**$37,185**
CATEGORY 6 SHOULDERS					
6001	5 INCH CONCRETE SIDEWALK	SF	$40.00	850	$34,000
6002	CONCRETE CURB & GUTTER	LF	$80.00	180	$14,400
6003	GALVANIZED TRAFFIC BARRIER W BEAM USING SIX FOOT (6') POSTS (STD. MD 605.22)	LF	$60.00	140	$8,400
6004	TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L) (STD. MD 605.13)	EA	$1,850.00	4	$7,400
	SUBTOTAL				**$64,200**
CATEGORY 7 LANDSCAPING					
7001	FURNISHING AND PLACING TOPSOIL FOUR INCH (4”) DEPTH	SY	$10.00	1,156	$11,560
7002	TEMPORARY STRAW MULCHING	SY	$2.00	1,156	$2,312
7003	TEMPORARY SEEDING	SY	$2.00	1,156	$2,312
7004	TURFGRASS ESTABLISHMENT	SY	$2.00	1,156	$2,312
7005	TREE INSTALLATION AND ESTABLISHMENT	EA	$150.00	12	$1,800
	SUBTOTAL				**$20,296**
CATEGORY 8 TRAFFIC & UTILITIES					
8001	ROAD SIGNAGE	LS	$3,000.00	1	$3,000
8002	RELOCATION OF UTILITIES	LS	$93,490.00	1	$93,490
	SUBTOTAL				**$96,490**
	TOTAL				**$3,011,886**
	CONTINGENCY (30%)				$903,566
	TOTAL INCLUDING CONTINGENCY				**$3,915,452**
	COST OF CONSTRUCTION MANAGEMENT (10%)				$391,545
	TOTAL CONSTRUCTION COST				**$4,306,997**
BE-6, ALTERNATIVE 2 - DOUBLE BOX CULVERT		**USE**			**$4,307,000**
			Road Cost	14.9%	$643,000
			Structure Cost	85.1%	$3,664,000

Notes: 1. The cost of ROW and easement if any is not included.
2. Cost of engineering is not included.