

1 Purpose

The District of Columbia Water and Sewer Authority (DC Water) is proposing to construct the Northeast Boundary Tunnel (NEBT) as a major component of the DC Clean Rivers (DCCR) Project to meet court-ordered combined sewer overflow (CSO) control objectives and provide flood relief in the Northeast Boundary area of the District. The tunnel is designed to comply with the requirements of a Federal Consent Decree entered into by DC Water, the District of Columbia (the District), and the United States, as represented by the U.S. Environmental Protection Agency (EPA) and the Department of Justice. In addition, the NEBT is also a major project associated with the Mayor's Task Force in response to extreme flood events in Bloomingdale and LeDroit Park.

DC Water has prepared this Construction Staging Area Package (Package) in accordance with the *Memorandum of Understanding for the Northeast Boundary Neighborhood Protection Project* (Northeast Boundary MOU) established between DC Water and the District on September 11, 2014 and provided as Appendix I. The Northeast Boundary MOU accomplishes the following related to meeting the Mayor's Task Force goals:

- Provides for construction of the Irving Street Green Infrastructure, McMillan Stormwater Storage Facility, First Street Tunnel and Northeast Boundary Tunnel
- Provides for granting of easements and construction staging areas to build projects
- Outlines procedures for granting permits and working with the District to facilitate the project's aggressive schedule, specifically:
 - DC Water to submit draft construction staging packages identifying facilities to be constructed, staging areas, estimated construction durations, work hours and traffic management plan for review by the District
 - DC Water and the District to work collaboratively to resolve issues and reach agreement on construction staging areas
 - District Department of Transportation (DDOT) to execute approval letters to DC Water for each site on District property where construction staging will occur. For each site, identify the conditions the Design-Build Contractor must follow in order to obtain permits for construction
 - DC Water will incorporate restrictions on construction as agreed with DDOT in the RFP Documents
 - DDOT to issue permits to Design-Builder for construction within 15 business days of submittal of application package prepared in accordance with approval letter

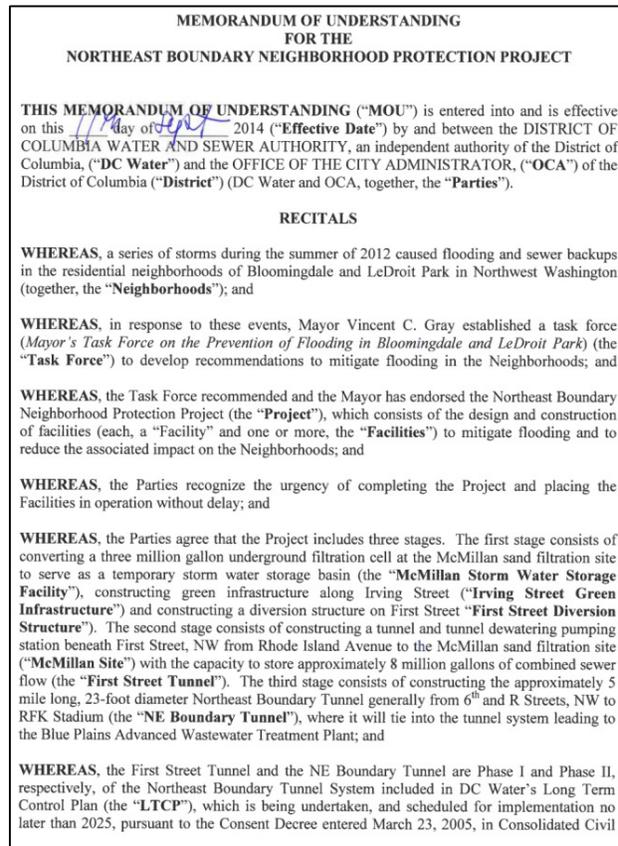


Figure 1-1. Executed Northeast Boundary MOU

This Package, prepared in accordance with the Northeast Boundary MOU, presents the anticipated impacts to vehicular, pedestrian, bicycle and transit operations as a result of the construction of the NEBT

and proposes mitigation measures to minimize impacts. The Package also outlines the construction staging area limits and their associated durations required to construct NEBT components. This submittal is part of a collaborative effort between DC Water and the District to resolve concerns and reach a consensus on the construction staging areas, their impacts and proposed mitigation measures. The consensus from this collaboration effort will allow DC Water to establish contractual requirements for the proposed construction work and ensure timely delivery of permits from the District.

2 Overview

The proposed NEBT is a large, deep, sewer tunnel that will increase the capacity of the existing sewer system in the District to current design standards; significantly mitigating the frequency, magnitude and duration of sewer flooding and basement backups. Additionally, the NEBT will provide storage volume to effectively reduce CSO discharges to the Anacostia River by 98 percent. As illustrated in Figure 2-1, the NEBT will commence just south of Robert F. Kennedy (RFK) Stadium and terminate just west of the intersection of Rhode Island Avenue NW and 6th Street NW.

The proposed tunnel will be 23 feet in diameter, approximately 27,000 feet long, and constructed approximately 50 to 160 feet below the ground surface in geologic stratigraphy consisting of clays, sands and highly weathered bedrock. The entire length of the NEBT will be excavated by a tunnel boring machine (TBM) and the ground supported by a permanent concrete tunnel lining.



Figure 2-1. NEBT Alignment and Construction Sites

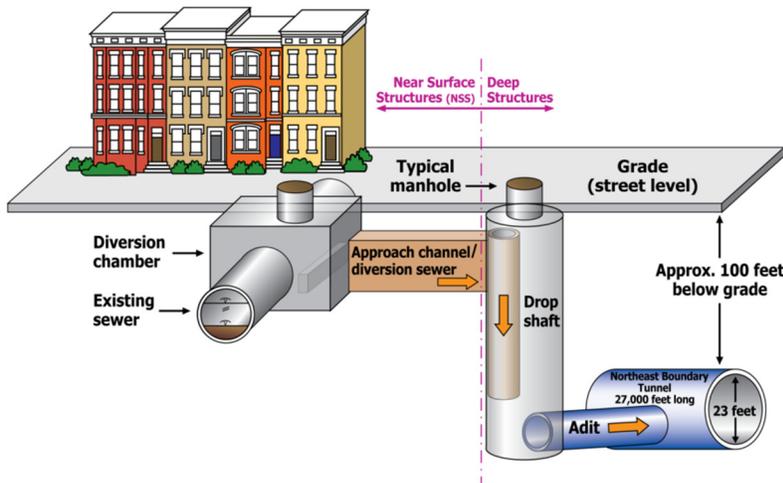


Figure 2-2: Graphic illustration of a typical diversion facility

A majority of the tunnel support infrastructure is designed to relieve the existing sewers during storm events via diversion facilities. A typical diversion facility is depicted in Figure 2-2 and includes a diversion chamber, approach channel, drop shaft, and adit. The diversion chamber direct flow from the existing combined sewer to the approach channel and drop shaft, which drop the flow approximately 100 feet to be delivered to the NEBT via a short connecting tunnel or “adit.” These facilities will be sited along the existing trunk sewers and near chronic flood areas.

Ultimately, all flow captured by the system will be conveyed to the Blue Plains Advanced Wastewater Treatment Plant (Blue Plains) where it will be treated to comply with DC Water’s NPDES Permit and the Federal Consent Decree.

2.1 Project Phases

Construction of the NEBT and associated facilities will be accomplished in two phases in order to mitigate temporary impacts and accelerate schedule to meet the Mayor’s Task Force goals as outlined in Table 2-1 below.

Table 2-1: NEBT Construction Phases

Phase	Description	Schedule	
		Start	Finish
A	<ul style="list-style-type: none"> ▪ Relocation of utilities (gas, electric, communication, water, sewer, etc.) that conflict with permanent diversion facility structures ▪ Typical linear trench-type utility work ▪ Moving work areas ▪ Short durations 	April 2016	September 2017
B	<ul style="list-style-type: none"> ▪ Construction of NEBT and diversion facilities along tunnel alignment ▪ Stationary work areas ▪ Long durations ▪ Similar to First Street Tunnel construction slope 	April 2017	December 2022

Phase A will be procured through a traditional design-bid-build contract by DC Water to a single Contractor that will perform all utility relocation work to avoid permanent NEBT structures. Phase B, the majority of contract work associated with the NEBT, will be procured as a design-build contract – in the same manner as DC Water’s previous tunnel jobs. Design-Build procurement allows for Contractor innovation in preparing designs for tunnel and adit construction, selecting appropriate ground improvement technologies and utilizing support of excavation methods to minimize impacts to existing infrastructure.

Construction of Phase A is anticipated to begin in April 2016 and last through September 2017, while Phase B is anticipated to receive notice to proceed in April 2017 and last through December 2022 in accordance with milestones set forth by the Mayor’s Task Force.

2.1.1 Application of Traffic Analysis to Phase A

The analysis included herein has defined mandatory requirements for the maintenance of traffic in both phases of work. Work proposed under Phase A is anticipated to have similar traffic impacts as Phase B. However, work under Phase A is anticipated to be much shorter in duration and have less surface impacts than Phase B. The analysis included in this Package is based on the worst-case construction scenario of the midpoint of NEBT Phase B construction (2020). The analysis resulted in a set of mandatory requirements for maintenance of vehicular, pedestrian, and bicycle traffic, which are discussed in detail in the subsequent sections and included in Appendix B, Tables B-1 through B-8. Although conservative, these same traffic restrictions will be applied to Phase A of NEBT work for peak travel times (7:00AM to 9:30AM and 3:30PM to 7:30PM, respectively). It should be noted that due to the nature of Phase A work, a majority of the relocations can be accomplished during off-peak travel times including night work.

2.2 Project Permitting

Since the NEBT is a major component of the Mayor’s Task Force, the permitting process for work associated with Phases A and B will follow the guidelines established within the Northeast Boundary MOU. Figure 2-3 illustrates the permitting process for both phases of work. Since Phase A will be fully designed and bid via traditional contracting methods, detailed maintenance of traffic plans will be prepared and included in the Final Package. It is anticipated that DDOT will grant a Construction Permit for Phase A and approval letters noting concurrence with the Package for Phase B.

Prior to construction of Phase B, the Design-Build Contractor will prepare detailed maintenance of traffic plans in accordance with this Package and submit for Construction and Occupancy Permits through DDOT.

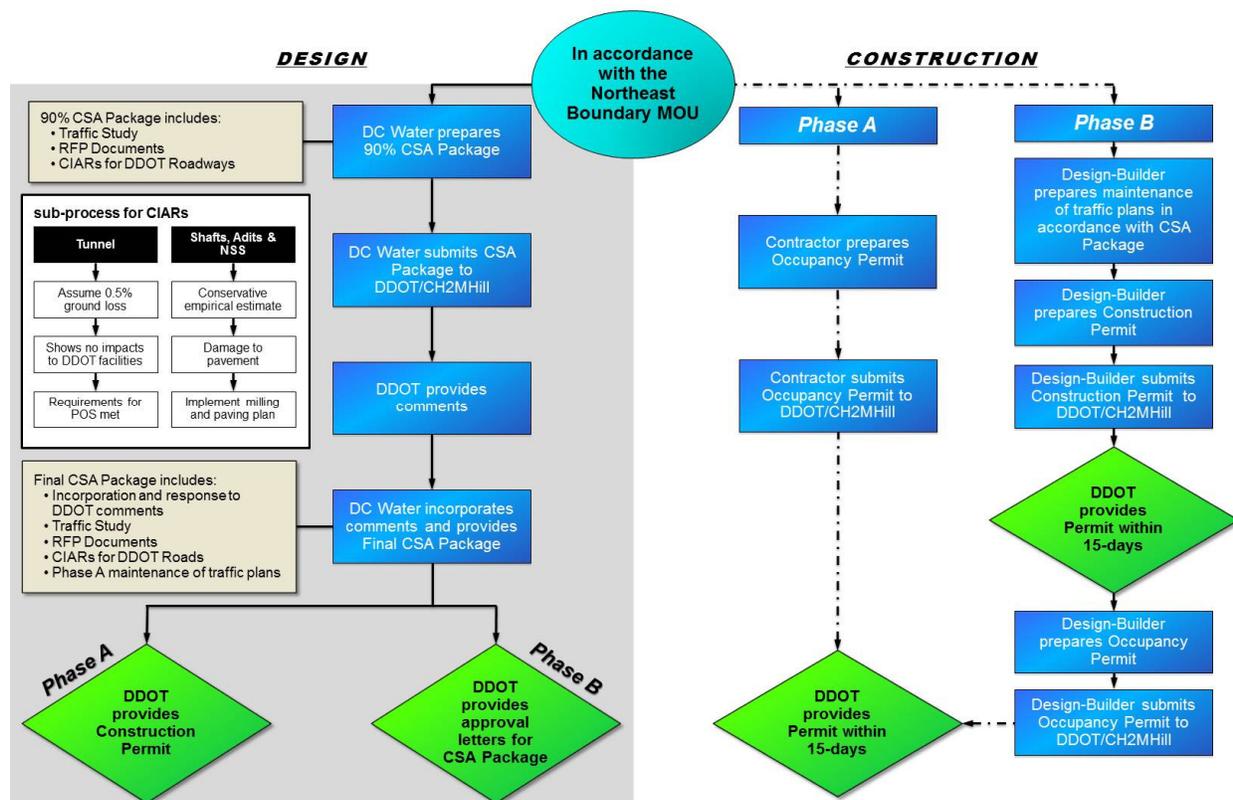


Figure 2-3: NEBT Permitting Process for Phases A and B

2.2.1 Construction Impact Assessment Reports

Unlike previous Design-Build projects procured by DC Water, the Construction Impact Assessment Report (CIAR) review and approval process will be coordinated with DDOT as part of this Package and prior to construction. The CIAR analysis is provided within Appendix G and includes analysis for the construction of the NEBT and the proposed diversion facilities. DDOT structures analyzed as part of this work include DDOT roadways, the Rhode Island Avenue pedestrian bridge and the Rhode Island Avenue overpass at North Capitol Street. The conclusion of the CIAR is that local pavement damage around diversion facilities is possible and cracking is predicted to be minor. This localized pavement damage will be repaired via a robust milling and paving plan outlined in the “C-Series” Drawings included in Appendix C. No anticipated damage to pavement along the tunnel alignment and the Rhode Island Avenue overpass at North Capitol Street are predicted based on the movement criteria specified in the RFP Documents. The pedestrian bridge and overpass will be instrumented and monitored during construction.

3 Northeast Boundary Tunnel Project Sites

Along the tunnel alignment, there are eleven (11) proposed Phase B project sites as illustrated in Figure 2-1. These project sites are the physical locations where construction work will occur at the ground surface. The project sites were further divided into multiple construction staging areas (CSA) to be occupied at different times and durations to minimize construction impacts. Figures 3-1 through 3-11 illustrate each project site. The figures include symbology which is described in Table 3-2.

Mobilizations to six (6) of the project sites are anticipated under Phase A and detailed in Table 3-1.

Table 3-1: NEBT Project Site Locations and Descriptions

Site	Abbreviation	Location	Key Components	Phase A Work?	Figure
CSO 019	CSO 019	On NPS land, just south of RFK Stadium along the west bank of the Anacostia River	<ul style="list-style-type: none"> ▪ Mining site for NEBT – will be used to launch the TBM, supply materials for construction, and remove excavated materials associated with tunnel construction 	No	3-1
Mt Olivet Road	MOR-D	Mt Olivet Road NE between Capitol Avenue NE and West Virginia Avenue NE.	<ul style="list-style-type: none"> ▪ Diversion chamber retrofitted to existing Ivy City trunk sewer along Mt Olivet Road NE ▪ Stormwater inlets along Capitol Avenue NE ▪ Tunneled diversion sewer along Mt Olivet Road NE 	Yes	3-2
	MOR-S	District property adjacent to the Mt Olivet Cemetery	<ul style="list-style-type: none"> ▪ Drop shaft and adit within and adjacent to the Department of Public Works facility ▪ Below-grade ventilation control facility 	Yes	3-2
W Street	WS	District property in an area of mixed open space between W Street NE and the Amtrak railyard	<ul style="list-style-type: none"> ▪ Junction shaft ▪ Above-ground ventilation control facility 	No	3-3
Rhode Island Avenue	RIA	Intersection of Rhode Island Avenue and 8th Place NE	<ul style="list-style-type: none"> ▪ Diversion chamber retrofitted to existing trunk sewer along Rhode Island Avenue NE ▪ Stormwater inlets along Rhode Island Avenue NE ▪ Drop shaft and adit located along Rhode Island Avenue NE 	Yes	3-4
4th Street	4S	Intersection of 4th Street NE and Rhode Island Avenue NE	<ul style="list-style-type: none"> ▪ Diversion chamber retrofitted to existing trunk sewer along 4th Street NE ▪ Stormwater inlets along Rhode Island Avenue NE ▪ Drop shaft and adit near the intersection of 4th Street NE and Rhode Island Avenue NE 	Yes	3-5

Site	Abbreviation	Location	Key Components	Phase A Work?	Figure
Pumping Station	PS	Intersection of Thomas Street NW and First Street NW	<ul style="list-style-type: none"> ▪ Pumping station associated with the First Street Tunnel will be decommissioned ▪ Ground improvement for First Street Tunnel to NEBT connection 	No	3-6
Channing Street Mining Shaft	CS	First Street NW between Channing Street NW and McMillan Drive NW.	<ul style="list-style-type: none"> ▪ Diversion sewer between the existing mining shaft and the diversion chamber ▪ Ventilation control Vault, motor control center, and electric transformer vault ▪ Support connection of First Street Tunnel to NEBT 	No	3-7
Michigan Avenue	MA	North Capitol Street NW just south of Michigan Avenue NW	<ul style="list-style-type: none"> ▪ Abandonment of sand filter storage and diversion chamber 	No	3-8
T Street	TS	Intersection of T Street NW and Rhode Island Avenue NW	<ul style="list-style-type: none"> ▪ Stormwater inlets along Rhode Island Avenue NW at T Street NW ▪ Drop shaft and adit at the intersection of T Street NW and Rhode Island Avenue NW 	Yes	3-9
Florida Avenue	FLA	Intersection of 3rd Street NW and Florida Avenue NW	<ul style="list-style-type: none"> ▪ Diversion chamber retrofitted to existing Northeast Boundary Trunk Sewer along Florida Avenue NW ▪ Drop shaft and adit located at the intersection of Rhode Island Avenue NW and 3rd Street NW 	Yes	3-10
R Street	RS	Intersection of 6th Street NW, R Street NW and Rhode Island Avenue NW	<ul style="list-style-type: none"> ▪ Terminus of the NEBT ▪ Diversion chamber retrofitted to existing trunk sewer along R Street NW ▪ Drop shaft at the intersection of Rhode Island Avenue NW and 6th Street NW ▪ Below-grade ventilation control facility ▪ Park restoration 	Yes	3-11

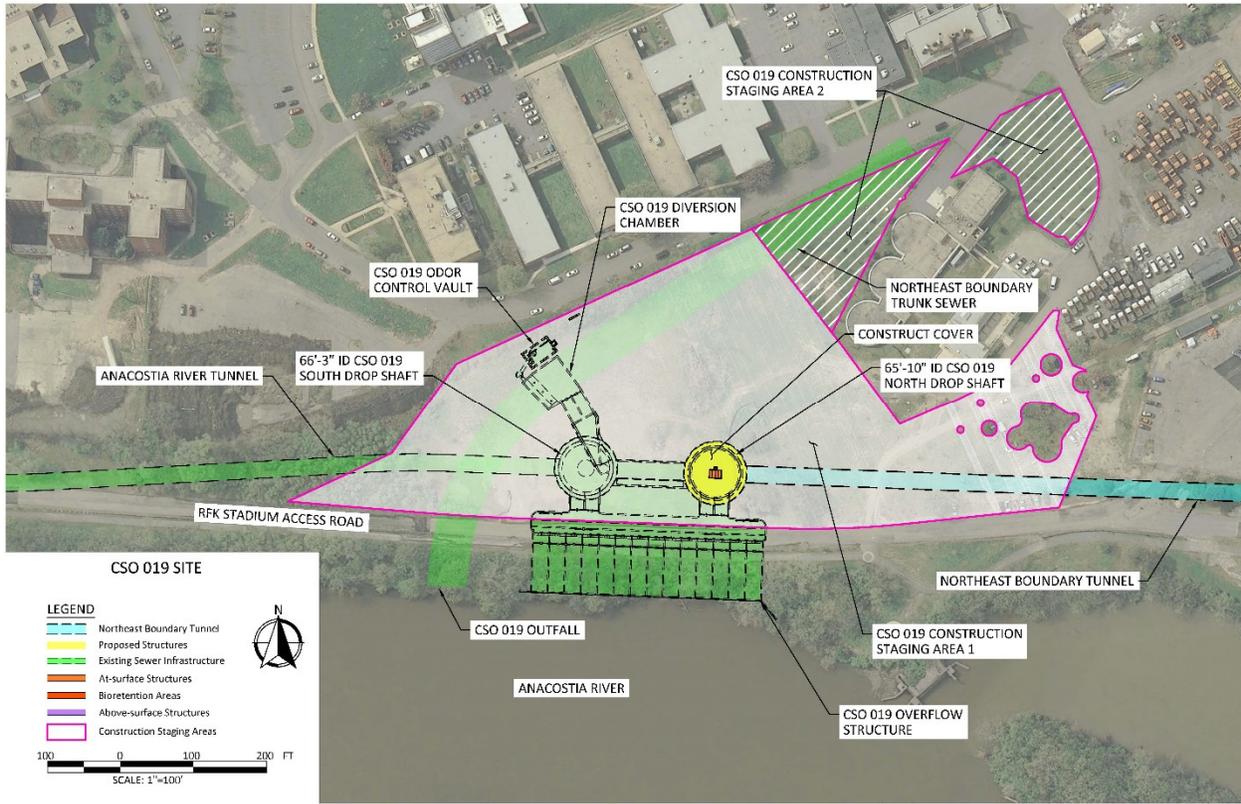


Figure 3-1: CSO 019 Site

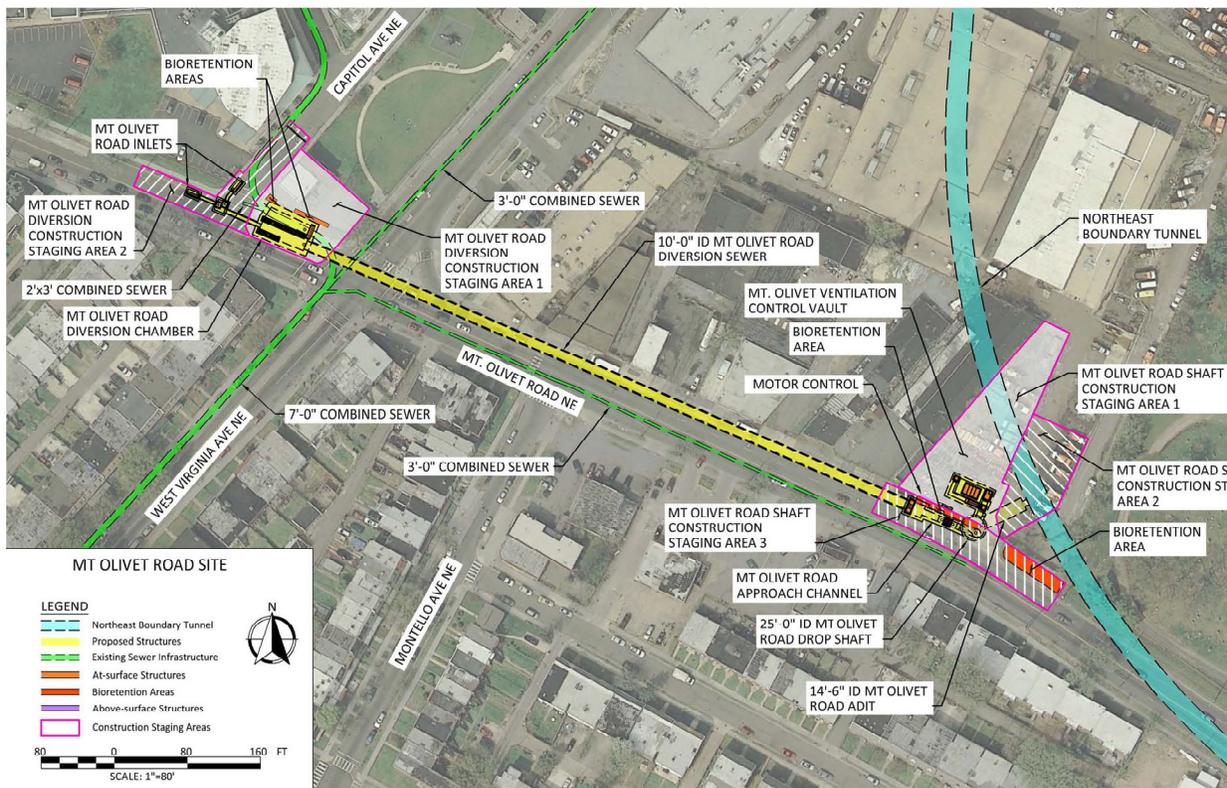


Figure 3-2: Mt. Olivet Road Sites

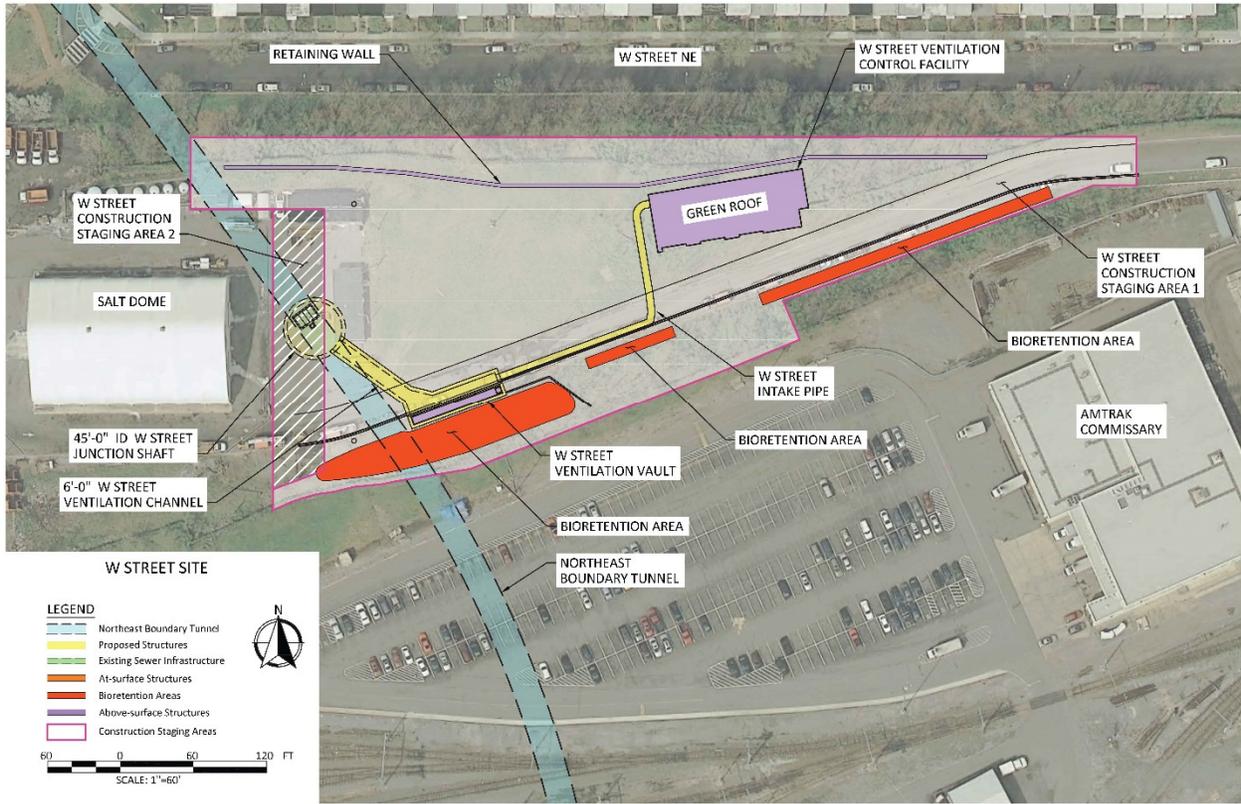


Figure 3-3: W Street Site

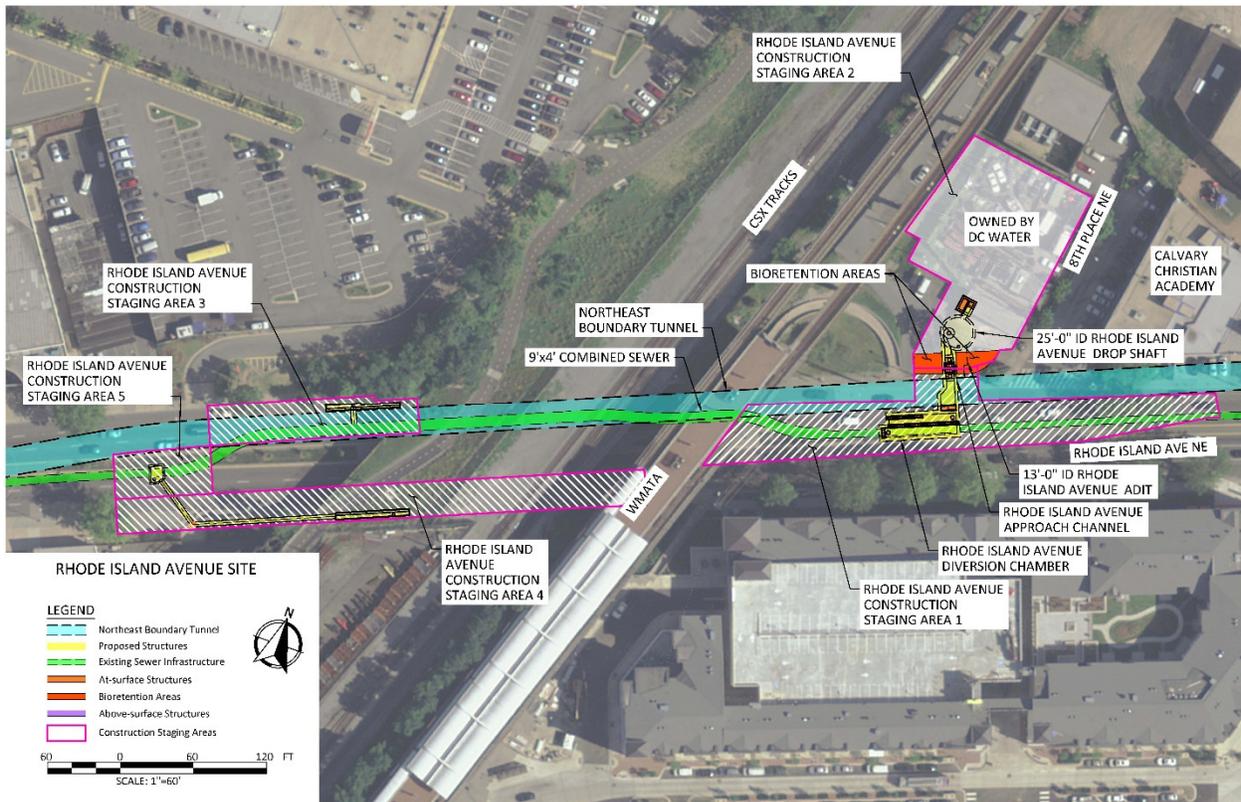


Figure 3-4: Rhode Island Avenue Site

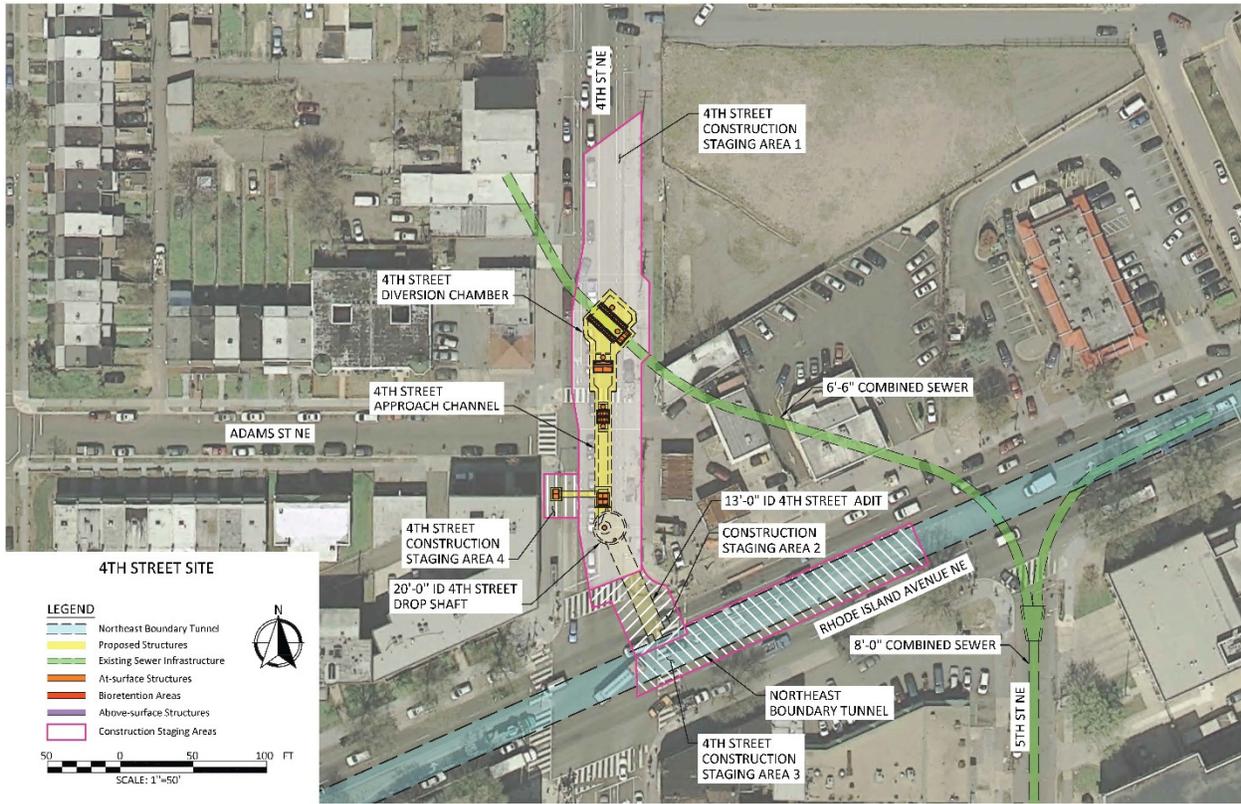


Figure 3-5: 4th Street Site

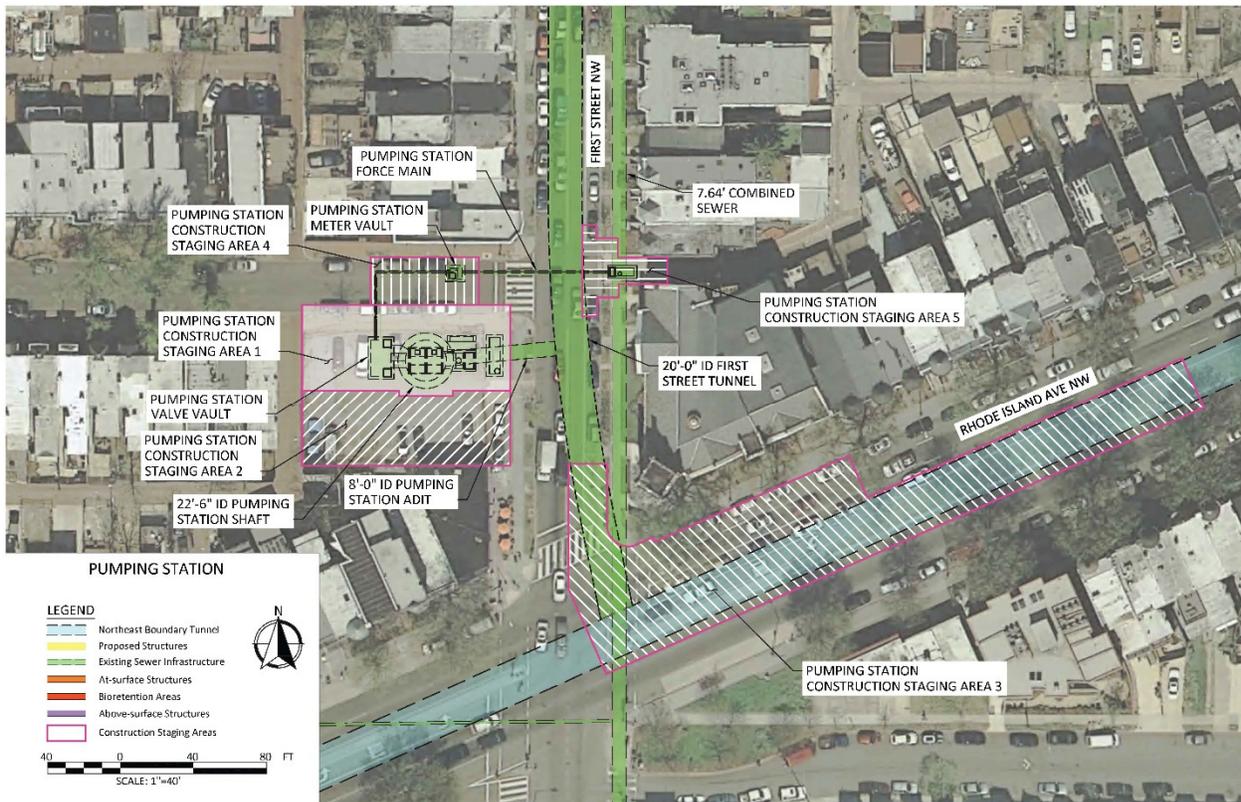


Figure 3-6: Pumping Station Site

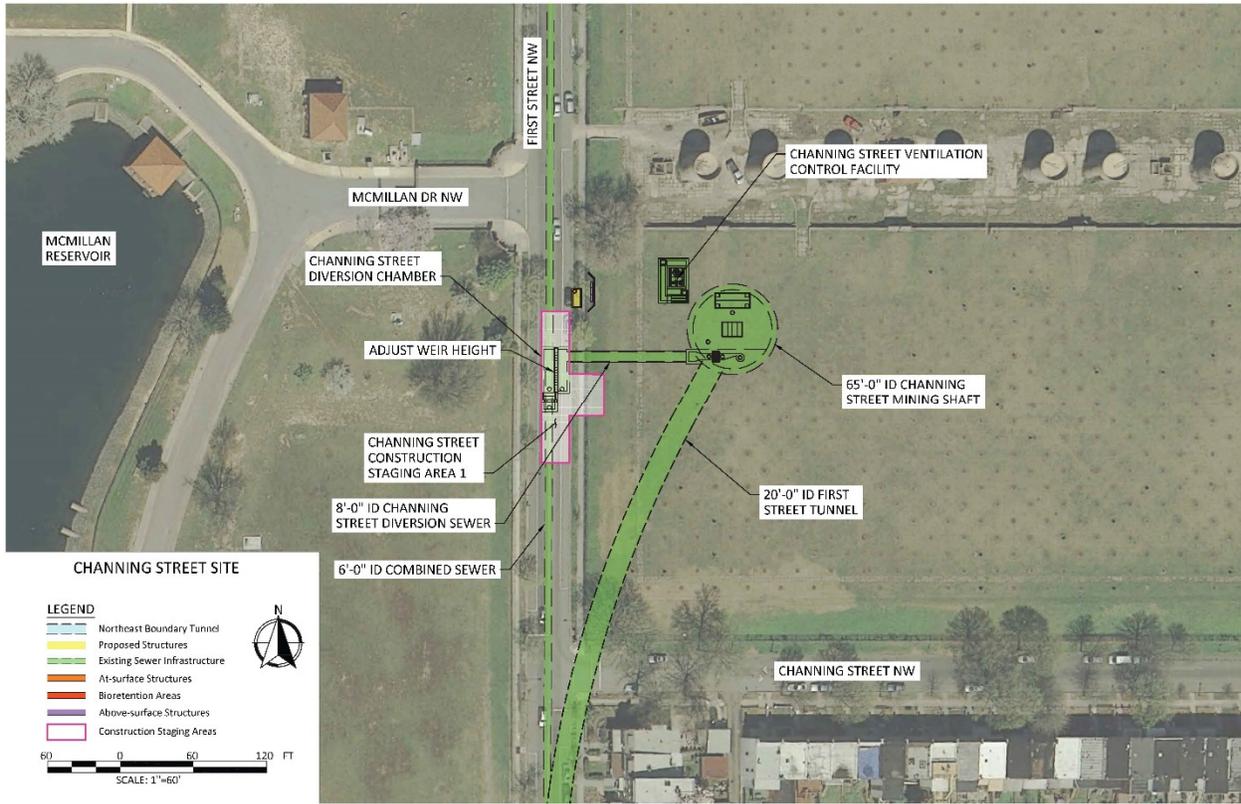


Figure 3-7: Channing Street Mining Shaft Site

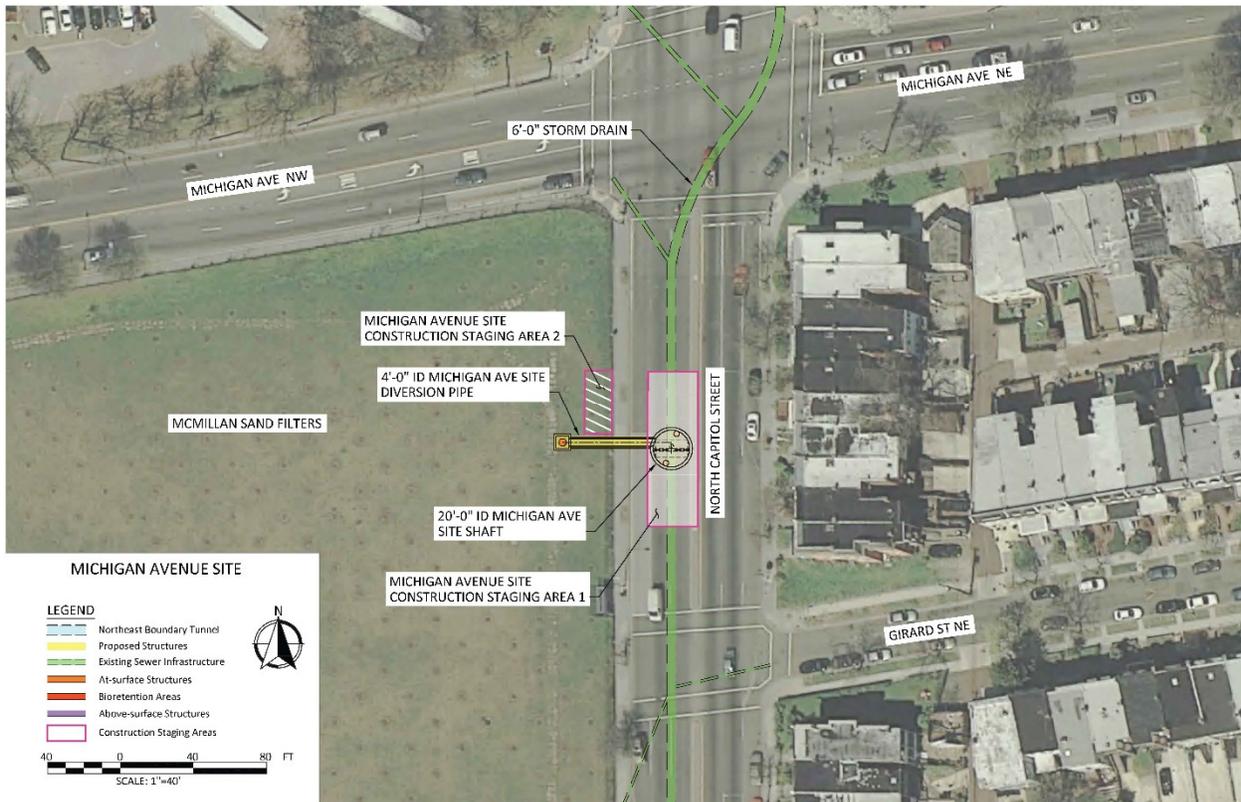


Figure 3-8: Michigan Avenue Site

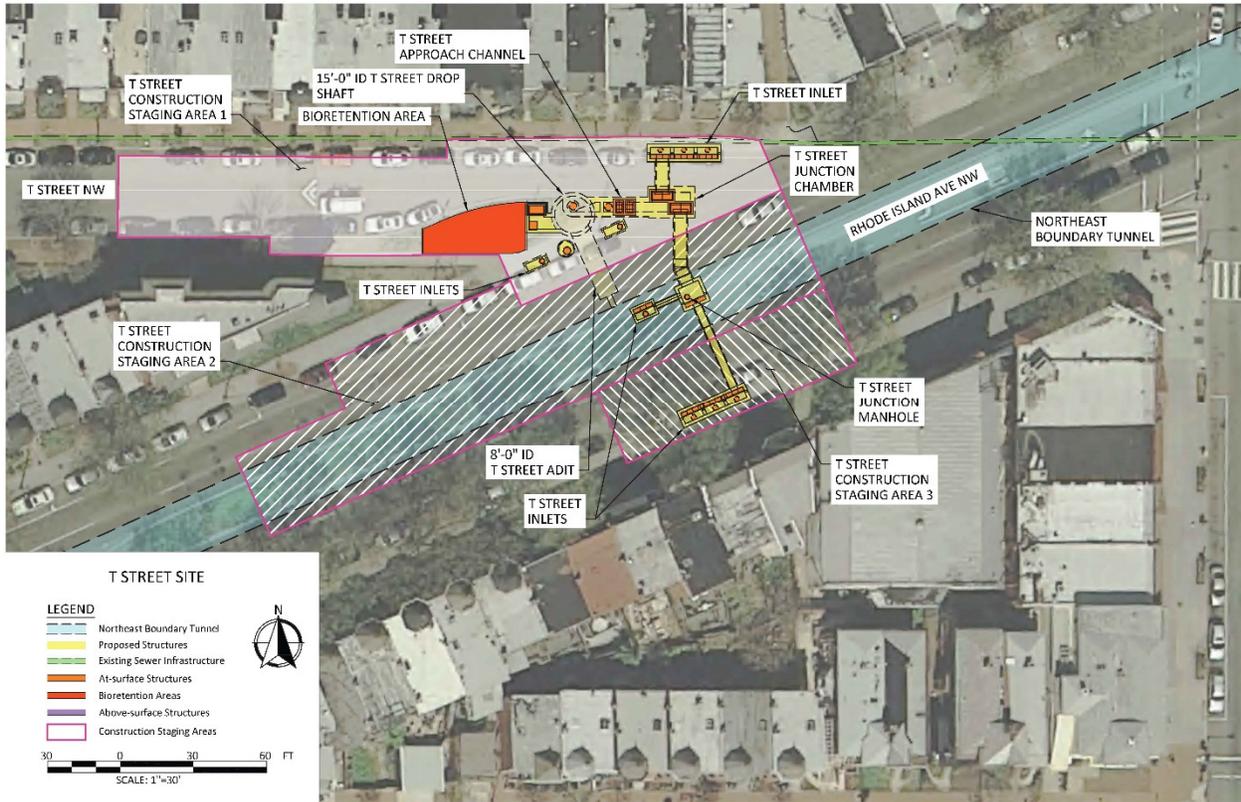


Figure 3-9: T Street Site

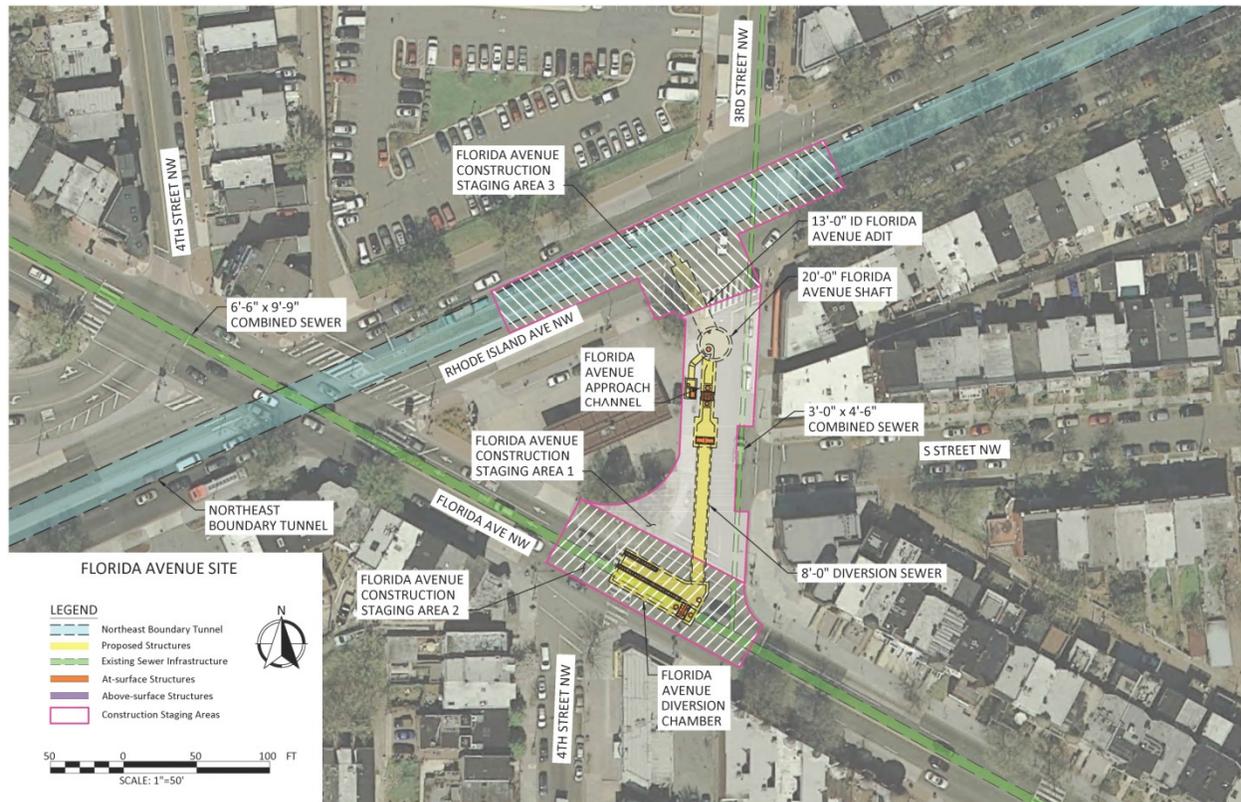


Figure 3-10: Florida Avenue Site

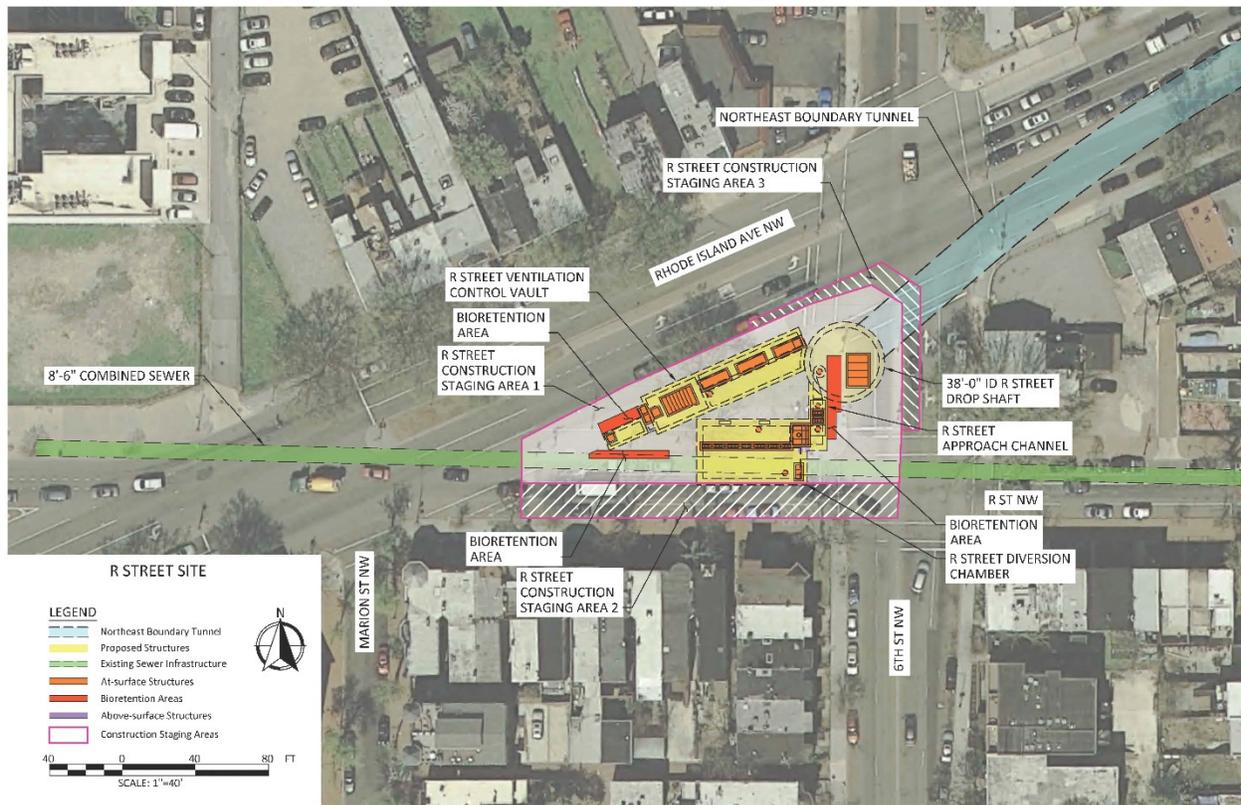


Figure 3-11: R Street Site

3.1 Work Hours and Construction Traffic

Typical work hours, haul hours, estimated workers per site and estimated construction truck volumes for Phase B of NEBT work are summarized in Table 3-3.

Table 3-3: Phase B – Anticipated Work Hours, Haul Hours and Construction Traffic

Site	Work Hours	Estimated No. of Workers	Haul Hours	Estimated Trucks per Hour
CSO 019	24 hours/ day, 7 days/ week	3 shifts : 60 (1st); 30 (2nd); 30 (3rd)	7:00 AM - 7:00 PM	15
W Street R Street	7:00 AM - 7:00 PM, Mon - Fri	30	9:30 AM – 3:30 PM	12
Channing Street Michigan Avenue	9:30AM – 3:30PM, Mon - Fri	15	9:30 AM – 3:30 PM	7
All other Sites	7:00 AM - 7:00 PM, Mon - Fri	15	9:30 AM – 3:30 PM	7

The Channing Street and Michigan Avenue sites were analyzed under the previous Northeast Boundary Neighborhood Protection Project Traffic Study dated April 2013. Since work at these sites is minimal, additional Synchro runs were not completed and work will be restricted from 7:00AM – 9:30AM and 3:30PM – 7:30PM.

Normal work for Phase A will be from 7:00 AM to 7:00 PM and haul hours 9:30 AM to 3:30 PM, Monday through Friday. Some work under both phases may need to occur from 7:00 PM to 7:00 AM, including, but not limited to; service connections, utility relocations and bypass pumping.

It is anticipated that the construction workers at each site will utilize the same roadway system and therefore were included in the traffic analysis discussed in Section 4. In addition to the workers, construction vehicles will also utilize the same roadway system for hauling to and from the sites and were also accounted for in the analysis. Since the Institute of Transportation Engineers (ITE) Trip generation rates are not available for a construction site, the methodology developed by the National Geospatial Intelligence Agency and Nohl Canyon Water Storage studies was utilized at the project sites to generate trips. The two approved studies identified that the majority of workers would enter the site before the peak hour of the roadway. In those studies, it was identified that 80% of the worker trips would occur outside the peak hours and 20% within the typical peak hours and that an 80/20 split for inbound versus outbound trips in the AM peak would occur. A reverse split was assumed for the traffic analysis in the PM peak.

Since operations will take place for twenty four (24) consecutive hours at the CSO 019 site during mining operations, it was assumed three shifts of workers would be employed at the site. The first shift for daytime operations would have sixty (60) workers, while the second and third shifts were assumed to have thirty (30) workers each. Trip generation calculations for the construction traffic are provided in Appendix E.

3.2 Geotechnical Instrumentation Installation

In order to monitor ground movements during construction, protect existing structures and ensure compliance with the requirements included in the RFP Documents; geotechnical instrumentation will be installed along the tunnel alignment and in proximity to the proposed diversion facilities. The geotechnical instrumentation will include deep borehole extensometers, piezometers, observation wells, inclinometers, structure monitoring points, tilt meters, seismographs, utility monitoring points and ground monitoring points. Instrumentation is proposed throughout the tunnel alignment including along Mt Olivet Road NE, Fenwick Street NE, 13th Street NE, Bryant Street NE, and Rhode Island Avenue between 6th Street NW and 10th Street NE. The locations and typical installation details are outlined within the “B-Series” drawings, located in Appendix C. The installation and maintenance of the ground monitoring instrumentation will have minimal traffic impacts. Installation of the instruments will be staggered based on the progress of the tunnel boring machine and take approximately one (1) week per site. Readings will occur when the tunnel is in close proximity of the instruments over several months. Installation of the instrumentation will be restricted from occurring between the hours of 7:00AM to 9:30AM and 3:30PM to 7:30PM. After completion of the project, the instrumentation will be decommissioned and the pavement will be locally restored. Traffic management associated with the installation and demolition of the proposed instrumentation will follow DDOT’s Traffic Control Plan (TCP) Typical and be submitted for approval to DDOT by the Design-Builder.

3.3 Roadway Restoration

At the completion of Phase A, utility trenches will be restored in the following manner:

- Trench filled with appropriate backfill material and compacted

- Base course (matching existing base course) placed and compacted (if necessary)
- Hot-mix asphalt (matching existing thickness) placed over base course

No milling and paving under Phase A is anticipated due to the follow-on of work associated with Phase B. Following the completion of Phase B, roadways, sidewalks, crosswalks and other public right-of-way features will be restored as outlined in the RFP Documents provided as Appendix C. Final site plans, pavement restoration sheets and associated details are provided in the C-Series drawings.

3.4 Community and Commuter Outreach Plans

DC Water has implemented an inclusive, phased-approach to community outreach for the NEBT Project. This approach includes three (3) major phases of outreach, each having an increased level of community involvement and participation in the outreach process.

- Phase 1: One-on-one Briefings with Community Leaders – meetings with elected officials and chairs of the ANC’s to provide an overview of the NEBT Project and identify any specific community requirements associated with construction.
- Phase 2: General Outreach to Community Groups – meetings with ANC’s, civic associations and special interest groups to discuss the NEBT Project.
- Phase 3: Site-Specific Meetings – organized meetings at NEBT Project Sites to review the proposed locations of permanent tunnel facilities, work hours and durations. These meetings help DC Water address specific community concerns and develop mitigation actions to lessen construction impacts.

Prior to construction, it is proposed to develop site-specific Task Force Group(s) that would work collaboratively with DC Water’s NEBT project team (including the NEBT Design Builder and Construction Manager) Groups to continuously monitor and mitigate community impacts as the project moves into construction. The Task Force would include a representative sample of geographically impacted stakeholders and other community groups that would hold regularly scheduled meetings to:

- Disseminate information about the project
- Address community-wide and individual concerns regarding construction related impacts
- Resolve conflicts to the extent possible in a timely manner
- Provide feedback for the roll-out and implementation of mitigation items

In addition to the community aspect of the outreach, DC Water also intends to implement a concurrent Commuter Outreach Plan to notify users of the District’s roadway network (vehicular, pedestrians and bicycles) of construction staging areas, lane closures, traffic detours and suggested alternate routes. The Commuter Outreach Plan will utilize various media outlets to provide weekly updates on the NEBT Project’s impacts to the roadway network and may include, but not be limited to the following:

- Websites (blogs, social media)
- Radio/ Television
- Mobile Phone Updates (e.g., Waze Traffic App)
- Public Meetings
- Newspapers

It is proposed that press releases will be submitted to local area newspapers (e.g. Dr. Gridlock at the Washington Post) and websites as Construction Staging Areas get established or modified to notify

readers of the impending lane reductions during the various surface construction phases. In addition, a television/radio traffic alert campaign will be developed for the project. It is proposed that the campaign would initiate one month prior to the lane closures along Rhode Island Avenue and then provide regular updates through construction at each Site. The traffic alert campaign would use any or all of the following venues:

- FM 88.5, 93.9, 96.3, 97.1, 99.5, 101.1, 103.5, 107.3 (preference would be 103.5 FM to coordinate with their traffic reports)
- AM 570, 980, 1450
- Various TV and cable news traffic update reporters

In order to complement the media outreach, Portable Variable Message Signs (PVMS) will be placed three months in advance of construction at strategic locations as illustrated in Figure 3-12. A 24-hour hotline is also proposed for providing a direct line of communication between the community, DC Water and its Design-Build Contractor.

Details associated with the Community and Commuter Outreach Plans will continue to be refined through design as DC Water receives input from the various project stakeholders. Details associated with the plans will be subject to change as the project progresses. The overarching goals of the outreach plan are to provide information to the impacted community and commuters, gather feedback on the potential impacts of the project at the earliest stage in order to determine mitigation measures, educate the public on the benefits of the project, collaborate and validate our assumptions with our shortlisted Design Build teams, and create platforms for a continuous flow of information on the project. The NEBT Project Team has been fully engaged on Phases 1 and 2 of community outreach since April 2014 and will continue to implement the plan through design, procurement and construction.

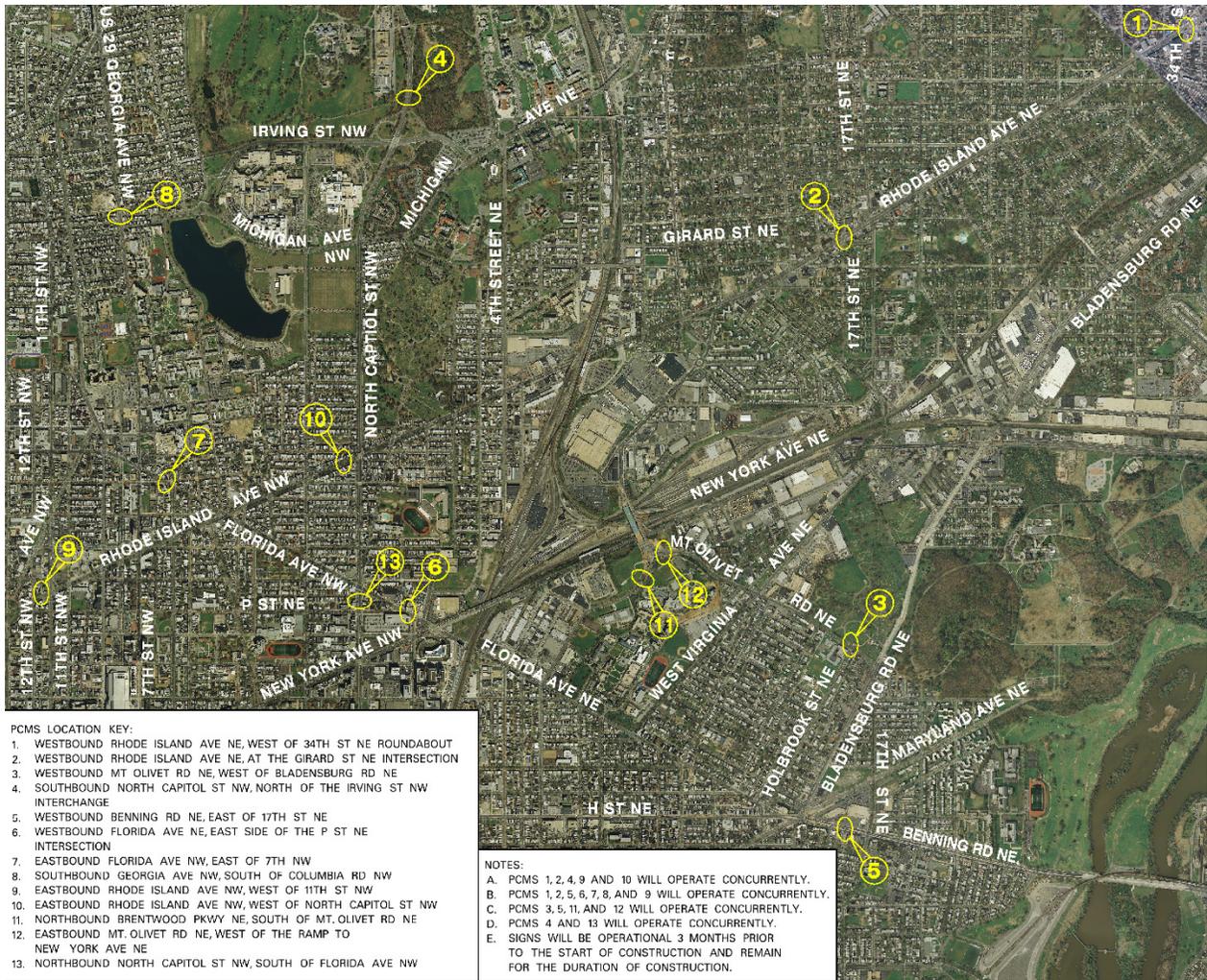


Figure 3-12: Proposed PVMS Locations

3.5 Services

Services including, but not limited to, trash collection, mail service and emergency services will be maintained throughout construction. Residential trash and recycling collection is provided through the Department of Public Works (DPW). Coordination will take place as the project progresses with the DPW to meet the needs on any changes in trash collection. Mail delivery will be maintained throughout the project duration and the United States Postal Service (USPS) will be informed of any changes they will need to make in their routing and when this will occur.

DC Water has coordinated closely on other projects with DC Fire and Emergency Medical Services (DC Fire and EMS) to minimize impacts to their services. This coordination is already underway for the NEBT Project. DC Water has a standing monthly meeting with DC Fire and EMS and will keep the agency apprised of the projected impacts including road closures and detours. DC Water will continue to meet with DC Fire and EMS and provide project information as necessary to educate and prepare their staff for the impacts. Required signage will be maintained at all times to route traffic as needed. Access to all fire hydrants will be maintained or hydrants will be relocated as necessary to ensure uninterrupted service for all buildings in the project study area.