ExxonMobil Former Buffalo Terminal
Operable Unit 3 (BCP Site No. C915201D)
Babcock Street Combined Sewer Overflow Repair and Interim Passive Product Recovery

Remedial Action Work Plan Addendum

Location:

503 & 625 Elk Street and 1 & 3 Babcock Street
Buffalo, New York

Prepared for:

Elk Street Commerce Park, LLC
4 Centre Drive
Orchard Park, New York

LaBella Project No. 2200012

December 9, 2021

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1.0 INTRODUCTION

On behalf of Elk Street Commerce Park, LLC (ESCP), LaBella Associates, DPC has prepared this addendum to the Final Remedial Action Work Plan (RAWP) for Operable Unit No. 3 (OU-3) of the ExxonMobil Oil Former Buffalo Terminal Brownfield Cleanup Program (BCP) site (Site No. C915201D), dated December 2017 (Revised May 2018). Operable Unit No. 3 is located at 503 and 625 Elk Street and 1 and 3 Babcock Street, Buffalo, New York, as depicted on Figure 1. This RAWP addendum addresses: (1) the planned repair of the Babcock Street Combined Sewer Overflow (CSO) structure, which is owned, operated and maintained pursuant to an easement by the Buffalo Sewer Authority (BSA) and which crosses the western portion of OU-3 (see Figure 2); and (2) the passive recovery of historic, residual petroleum product present in the subsurface adjacent to the CSO structure until this repair is completed. Construction of a sealed sheet pile containment system effectively eliminated any petroleum releases that may have occurred from impacted soils in the vicinity of the CSO outfall structure and served to identify the primary source of discharge to the Buffalo River as emanating from the CSO directly. Based on investigations of the CSO structure and the hydrogeology of the surrounding subsurface, it was determined that the BSA's CSO infrastructure crossing OU-3 was allowing exfiltration of Buffalo River water into the soils of OU-3 and infiltration of impacted groundwater back into the CSO and out to the Buffalo River. As such, the additional work presented herein is necessary to resolve the petroleum release to the Buffalo River (Spill No. 2003976) that has been the subject of the ongoing investigation, containment, monitoring and recovery measures. Interim source removal via passive product recovery and repair of the deteriorated CSO structure will be incorporated as supplementary components of the previously constructed OU-3 remedy.

2.0 BACKGROUND

ESCP entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in October 2017 to investigate and remediate OU-3. The remedy implemented at OU-3 was constructed in accordance with the Final RAWP and is fully described in the Final Engineering Report (FER) for OU-3, dated December 2019, which details the final remedy that was approved by the New York State Department of Environmental Conservation (NYSDEC) and constructed in 2019. The NYSDEC issued a Certificate of Completion (COC) for OU-3 under the BCP in December 2019.

A BSA CSO structure is located on the western portion of OU-3 and discharges to the Buffalo River at the southern terminus of Babcock Street. On August 7, 2020, a petroleum release was reported in the Buffalo River in the vicinity of the CSO outfall, which lead to a multi-agency response that included the NYSDEC, United States Coast Guard (USCG) and City of Buffalo Fire Department. The source of the release could not be pinpointed at that time, but historic petroleum contamination remaining in the subsurface in the vicinity of the CSO structure was identified as a potential source.

ESCP voluntarily initiated response and containment measures following the discovery of the release and has continued such operations to date. Said operations are being conducted in accordance with a Discharge Removal and Inspection Plan that was submitted to the USCG pursuant to an Administrative Order issued by the USCG on August 20, 2020. A Short Term Corrective Measures Work Plan (CMWP) developed on behalf of ESCP was approved by the NYSDEC on September 18, 2020 and described the containment and recovery measures initially utilized to effectively mitigate impacts to the river associated with the petroleum release.

An Interim CMWP detailing additional measures implemented to provide adequate control of continued releases prior to implementation of the long-term remedy was approved by the NYSDEC in October 2020. The Interim CMWP included the preliminary design of an extension of the existing OU-3 containment system in the area of the CSO outfall, as well as several pre-remedial studies intended to investigate current conditions in the subsurface proximal to the CSO structure and in the CSO structure itself. Provisions for the recovery of any product encountered during these investigations as well as the

implementation of interim measures to prevent further discharges to the river were included in the Interim CMWP.

Subsequently, a Long Term CMWP, in the form of a RAWP Addendum, was prepared and was approved by the NYSDEC on October 29, 2020. Pursuant to this work plan, the sealed sheet pile containment system that was installed along the southern boundary of OU-3 as part of the original BCP remedy was extended in the vicinity of the CSO outfall structure to isolate residual petroleum contaminants within and adjacent to the riverbank from leaching directly into the river in this area. The containment system extension was completed in January 2021 as a supplemental component of the final remedy. The installation of this sealed sheet pile containment extension served to isolate and identify the primary source of discharge to the Buffalo River from the CSO.

Additional investigations of the condition of the CSO structure and the surrounding subsurface conducted pursuant to the October 2020 RAWP Addendum and NYSDEC-approved Source Area Investigation Work Plan (March 2021) determined that the substantially deteriorated condition of the CSO structure has been enabling communication between the structure and the subsurface of OU-3. Specifically, it was concluded that fluctuating stages of the Buffalo River are flushing free-phase petroleum hydrocarbons from the subsurface into the structure where they can be conveyed to the river. The mechanism identified as the driving force behind this occurrence is the exfiltration of water from the river into the subsurface from the CSO during high river stage, and the infiltration of groundwater and petroleum products back into the CSO structure from the subsurface during low river stage.

An assessment of CSO repair options capable of eliminating communication between the CSO structure and surrounding subsurface was performed in consultation with the NYSDEC, BSA and USCG. As a result of this assessment, slip lining of the CSO from immediately downstream of the BSA weir at Prenatt Street southward to the CSO outfall to the river was identified as the preferred supplemental remedy and was deemed acceptable by BSA, NYSDEC and USCG. Passive product recovery methods employed in the area adjacent to the CSO structure since May 2021 have proven effective in preventing migration of petroleum contaminants into the CSO and to the Buffalo River, and will be continued until the slip line repair is completed.

The corrective measures detailed in this RAWP Addendum encompass the following two primary components, which upon completion will be incorporated as supplementary elements of the previously constructed OU-3 remedy:

1. Slip line repair of the CSO structure from the Prenatt Street weir to the outfall at the Buffalo River;
2. Continued passive product recovery from select monitoring wells in the vicinity of the CSO structure until the CSO repair is complete.

3.0 SITE CONTROL AND MANAGEMENT MEASURES

Site control and management measures to be employed during the implementation of this RAWP addendum shall be in accordance with the Final RAWP and the Site Management Plan (SMP), dated December 2019, for OU-3. This includes, but is not limited to, measures relating to site access and control; erosion and sedimentation control; health and safety; community air monitoring; soils management; recordkeeping and reporting.

4.0 REPAIR OF BABCOCK STREET CSO

4.1 Overview

Slip lining techniques will be employed to preserve the functionality of the CSO structure while eliminating communication between the interior of the CSO structure and the surrounding subsurface. Slip lining is the

process of installing a smaller diameter "liner pipe" inside of a deteriorated host pipe. The diameter, type and wall thickness of the slip-line pipe is determined based upon a design process that considers the existing condition and configuration of the host pipe, required flow capacity, structural requirements, allowable infiltration rate, and chemical compatibility with the fluids to be conveyed and the subsurface environment in which it will be placed. Segments of the slip-line pipe are joined together to create a flush-jointed, watertight pipe that is pushed and/or pulled into the host pipe through an access pit that is excavated and shored above the host pipe. The pipe segments are typically joined by butt fusion or gasketed bell and spigot joining methods, or by extrusion welding. The annular space between the liner pipe and the host pipe is filled with non-permeable, lightweight cellular concrete, and the terminal ends of the liner and host pipe are sealed using an appropriate method identified during the design stage. The current concrete CSO structure will serve as the host pipe for the new liner pipe that will be introduced into it. The area of the proposed slip lining is depicted on the attached aerial site map (Figure 3).

It should be noted that implementation of the slip line repair will effectively prevent exfiltration of river water resulting from varying river levels out of the CSO and onto ESCP's property and effectively prevent infiltration of water or petroleum into the CSO from the surrounding subsurface on OU-3. However, since the CSO serves as a combined sewer system conveying both sanitary and storm water discharges originating from a large area north of Elk Street, rain events or the occurrence of high river levels may result in discharges to the river that are unrelated to conditions on ESCP's property.

4.2 Permits and Approvals

Based upon a simulation conducted by BSA's consultant using the United State Environmental Protection Agency (USEPA) Storm Water Management Model (SWMM), the BSA determined that the use of a liner pipe possessing an inside diameter (ID) of 60-inches and a Manning's coefficient of 0.012 will provide sufficient flow capacity and will not result in unacceptable impacts to the upstream system. Consequently, design plans and specifications for a 60-inch ID slip line repair were developed and submitted to BSA and NYSDEC on October 30, 2021 for review. The NYSDEC issued comments on the plans and specifications, while the BSA indicated that they concurred with those issued by the NYSDEC and had no additional comments on the design. NYSDEC's comments have been addressed in the revised slip line design contained in Appendix A of this RAWP Addendum.

To facilitate dewatering required to undertake the slip line repair, ESCP secured a Temporary Discharge Permit from BSA (BPDES Permit #21-10-TP282) in October 2021. A copy of the permit is provided in Appendix B. This Temporary Discharge Permit allows the discharge of dewatering fluids to the BSA system at a maximum rate of 800 gallons per minute (GPM), 24-hours per day in accordance with the terms of the permit. Dewatering activities planned in connection with the slip line repair are discussed in Section 4.4.

4.3 Design of the Slip Line Repair

The revised design plans and specifications developed by LaBella in consultation with the slip lining contractor, Union Concrete and Construction Corp., and the pipe supplier, Infra Pipe Solutions Ltd., are included in Appendix A. As reflected by the plans, 60-inch ID, Weholite structural profile wall High Density Polyethylene (HDPE) liner pipe with an outside diameter of 65.4-inches will be utilized for the repair. Product information pertaining to the Weholite HDPE pipe is provided in Appendix C.

The dual walled HDPE liner pipe will be inserted into the 72-inch ID concrete host structure and will extend from immediately downstream of the BSA's Prenatt Street weir approximately 550-feet to the CSO outfall to the Buffalo River. The liner pipe will consist of 25-foot long segments that are extrusion welded together to create a continuous length of leak-proof CSO conveyance pipe along the entire length of the repair. Laterals entering the liner pipe will be reinstated using leak-proof connections/fittings, the terminal ends of the liner pipe will be sealed and the annular space between the liner pipe and host pipe will be injected with non-permeable, lightweight cellular concrete.

Refer to the plans and specifications provided in Appendix A for more detail concerning the design of the slip line repair. The following section provides a sequential description of the primary work tasks associated with the construction of the repair.

4.4 Slip Line Construction

4.4.1 Mark-out of Utilities and Engineering Controls

Public utilities within the work area will be located and marked via *Dig Safely New York* prior to the commencement of intrusive activities. Additionally, a private utility locating contractor will be deployed to locate and mark private utilities within the work limits. Lastly, historic site plans and record drawings will be utilized to locate and mark components of the engineering controls previously installed on the site (i.e., slurry wall, hanging wall, sealed sheet pile extension and associated tieback rods, etc.).

4.4.2 Stormwater Diversion and Dewatering of CSO

In preparation for the dewatering and repair of the CSO, discharges from select components of the stormwater management system on OU-2 East and OU-3 will be diverted from the CSO as detailed in the design drawings. This includes plugging the outlets to the OU-2 East detention basin outlet structure and all stormwater catch basins on ESCP's property that discharge to the CSO structure; and the management and diversion of stormwater that accumulates in these structures as detailed in the design drawings.

Dewatering of the CSO will be performed to remove standing water from the structure in preparation for the construction of the slip line repair. Pumping will be conducted from the temporary coffer dam located at the CSO outfall, and the water will be directly conveyed to an existing BSA manhole located northeast of the weir at Prenatt Street and discharged to the sanitary sewer system under Temporary BPDES Permit #21-10-TP282. The location of the manhole to be utilized for this discharge is shown on Figure 3, and a copy of the temporary discharge permit is included in Appendix B. Continuous pumping and discharge to the BSA manhole will be performed in accordance with the terms and conditions of the temporary permit until the CSO has been dewatered, after which time pumping will be conducted as needed to maintain the CSO free of standing water.

4.4.3 Excavation of Insertion Pit

While the CSO is being dewatered, a pipe insertion pit, which will be utilized to provide access to the CSO for introduction of the liner pipe into the host pipe, will be excavated between Manhole No. 1 (MH-1) and the northern end of the CSO segment slated for repair. The insertion pit will be rectangular with the long axis oriented along the centerline of the CSO structure, and the dimensions are expected to be approximately 12 feet wide by 35 feet long with a depth equal to the invert of the CSO. Excavation of the insertion pit will be performed in accordance with the procedures prescribed in the Excavation Work Plan (EWP) for the site, and material removed from the excavation will be stockpiled on-site prior to characterization and off-site disposal as described in Section 4.6.

Shoring and/or shielding will be utilized as necessary to maintain the integrity of the excavation and protect the contractor's employees during construction of the slip line repair. Refer to the drawings and specifications for more detailed information regarding provisions for excavation protection.

A welding pit will be excavated and shored/shielded transverse to the host pipe, and will extend below the invert of the host pipe to provide access to the underside of the pipe for the exterior weld that will extend around the entire circumference of the pipe joints.

Dewatering of the insertion/welding pits will be conducted as needed to maintain groundwater levels below the bottom of the pits. Sumps will be excavated within the pits, from which pumping of accumulated water will be performed. Dewatering fluids removed from the insertion and welding pits will be discharged directly to the BSA system under the temporary discharge permit. If turbid dewatering fluids are generated, the fluids will be pumped into holding tanks to enable sediment to settle out before discharging to the BSA system under said permit. Sediment accumulated in the holding tanks will be managed as described in Section 4.6.

4.4.4 Host Pipe Preparation & Blocking

Upon completion and dewatering of the pipe insertion pit, the roof of the CSO structure will be removed from the segment of the structure that is exposed within the pit, thereby creating access to the CSO. Utilizing this access point, the host pipe will be prepared to receive the liner pipe. This will include the removal of any debris present within the host pipe and the elimination of any irregularities within the host pipe that could hinder or obstruct the insertion of the liner pipe.

After the host pipe is cleared of debris and obstructions, timber blocking will be fabricated and placed in the host pipe for the purpose of preventing movement of the liner pipe after installation. Additionally, tremie pipes and air relief tubes to be utilized during the injection of cellular concrete within the annular space between the liner and host pipes. These pipes and tubes will be installed as shown in the plans.

4.4.5 Lateral Inspection and Abandonment

Existing laterals that are presumed to be inactive or are of unknown origin will be video inspected in an attempt to verify their status. Laterals that are confirmed to be inactive, will be plugged at their entry point to the existing CSO structure using appropriate means (i.e., concrete grout; sewer plug; brick, mortar and concrete, etc.). Those that are determined to be active, will be re-instated as described in Section 4.4.9.

4.4.6 Liner Pipe Insertion

Individual 25-foot lengths of liner pipe will be lowered into the host pipe via the insertion pit using a crane or excavator and pushed/pulled into the host pipe to create space for the next length of pipe, which will be lowered into the host pipe and welded to the previous pipe length as described in Section 4.4.7. This process will be repeated until the continuous liner pipe extends from the northern limit of the repair zone to the CSO outfall at the Buffalo River.

It is anticipated that both pushing and pulling of the liner pipe using an excavator(s) or other suitable means will be necessary to advance it through the host pipe. The downstream end of the first pipe length inserted will be equipped with a sacrificial segment for use in pulling the liner pipe through the host pipe, while blocking will be utilized on the upstream end of the pipe to protect the liner pipe segments from damage.

4.4.7 Welding of Joints

Liner pipe segments will be extrusion welded together to create watertight joints along the entire length of the repair. Both the interior and exterior seams of the liner pipe will be welded together within the insertion pit using a handheld extruder welder (i.e., extrusion gun). Welding of both the internal and external seams will provide an extra measure of protection to complement the dual walled HDPE liner pipe.

For each joint, surfaces of the ends of the two liner pipe segments being welded will be prepared and subsequently butted together with the joint positioned over the welding pit. The interior weld will be completed from inside the liner pipe and extend the entire 360 degree inner circumference of the pipe. The exterior weld will be completed from the outside of the pipe and will extend the entire 360 degree outer circumference of the pipe. Appendix D contains a more detailed description of the welding procedure to be utilized for this project.

Welding will be performed by welders that are certified by the extrusion gun manufacturer or the manufacturer of the liner pipe. Upon completion, each weld will be visually inspected and certified by the pipe manufacturer's representative to ensure the integrity of the welds. The welder will address any issues identified as a result of the weld inspections before the joint is advanced downstream into the host pipe from the insertion pit.

4.4.8 Sealing of Terminal Ends

Upstream End

A grout collar formed of shotcrete will be used to seal the annular space between the host pipe and the liner pipe at the upstream terminus of the slip line repair. The grout collar will be coated with a sealant and will function as a durable watertight surface covering the non-permeable cellular concrete placed within the annular space between the host pipe and liner pipe along the length of the slip line repair. Additionally, shotcrete will be applied to the host pipe upstream of the collar to the BSA weir to sculpt a smooth transition to the smaller diameter liner pipe to minimize protrusions that could trap debris.

A temporary bulkhead will be constructed at the upstream terminus of the liner pipe to facilitate the injection of cellular concrete into the annular space between the host pipe and liner pipe as described in Section 4.4.10. The terminal grout seal will be installed at the upstream end of the liner pipe after the annular space between the two pipes has been injected with cellular concrete and said material has cured.

Downstream End

The downstream end of the liner pipe will terminate at the opening of the existing CSO outfall structure to the Buffalo River where a new, 12-inch thick structural concrete bulkhead will be poured to seal the annulus between the outside of the liner pipe and inside of the outfall structure. The new bulkhead will be formed around the exterior end of the liner pipe, which will be fitted with a welded collar or flange that will be imbedded in the concrete poured to form the new bulkhead. Additionally, a waterstop will be installed between the new concrete and existing outfall chamber. Although contaminant migration along the annular space between the host pipe and liner pipe will be prevented through the placement of non-permeable cellular concrete within this space, the imbedded collar and waterstop will serve as secondary levels of protection against any potential discharges to the river originating from the annular space.

In order to facilitate the forming of the new bulkhead, an entry point will be created to the roof of the outlet structure by excavating an 8' x 8' access pit and saw cutting an opening in the top of the structure. Care will be taken to avoid disturbing the tieback rods associated with the sealed sheet pile bulkhead that cross the outfall structure in this area. Excavated material will be stockpiled on-site for characterization and off-site disposal pursuant to Section 4.6.

4.4.9 Lateral Reinstatement

Excavations will be conducted to expose the existing laterals that are to be reinstated along the repair. At each lateral, an HDPE stub pipe, with a diameter sized to match the existing lateral will be inserted through

the liner pipe and extrusion welded to the liner pipe from the exterior (see plan details). A leak-proof flexible PVC coupling (i.e., Fernco coupling) will be utilized to connect the stub pipe to the lateral.

Excavation of the lateral joints will be performed in accordance with the procedures prescribed in the Excavation Work Plan (EWP) for the site, and material removed from the excavations will be stockpiled on-site prior to characterization and off-site disposal as described in Section 4.6.

4.4.10 Cellular Concrete Injection into Annular Space

The annular space between the host pipe and the liner pipe will be injected with non-permeable cellular concrete. The cellular concrete will fill the annular space around the entire circumference of the liner pipe for the full length of the slip line repair to stabilize the liner pipe and prevent the migration of contaminants within the annular space. This product is non-permeable with a closed cell matrix and is relatively lightweight and easily pumped, making it suitable for this application.

The cellular concrete will have an oven-dry density of 40 pounds per cubic foot (PCF) and a minimum compressive strength of 125 pounds per square inch (PSI). Lift thickness of the cellular concrete grout will be determined based upon buoyancy calculations. Adherence to temperature restrictions during installation and curing requirements identified by the supplier will be maintained throughout the construction period.

Tremie pipes terminating at various intervals throughout the length of the repair will extend inside the annular space between the host pipe and the liner pipe, and will be utilized to introduce the cellular concrete along the entire length of the repair. These pipes are sacrificial and will remain in place after the cellular concrete has been injected.

4.4.11 Backfilling & Cover System Restoration

Excavations will be backfilled with clean, DER-10 compliant stone from a virgin quarry that is approved for importation to the site by NYSDEC, or with suitable fill from on-site excavations in compliance with the requirements for reuse specified in the EWP. The backfill will be placed in lifts and compacted to within 6-inches of the surrounding pavement grade. The asphalt pavement cover system will be restored to match the existing pavement section, which consists of 4.5 inches of 19 FP Binder Course HMA Series 80 Compaction and 1.5 inches of 9.5 FP F2 Top Course HMA 80 Series Compaction. Restoration of the pavement cover system will include the area that was disturbed during the previous construction of the sealed sheet pile extension and associated tieback rods.

4.5 Provisions for CSO Activation During Construction

The CSO will remain functional throughout the construction period. Furthermore, slip lining activities, particularly in the insertion pit will not be performed immediately prior to, or during, precipitation events forecasted to generate 0.77 inches or more of rainfall, which is the threshold above which the CSO activates according to the BSA. If a rainfall event of this magnitude is forecasted or activation of the CSO is anticipated, the following contingency measures will be implemented:

- The segment of the liner pipe that has been placed in the host pipe will be positioned to bridge the opening in the host pipe that was created within the insertion pit. This will contain the majority of the flow within the liner pipe through the insertion pit and direct it downstream into the CSO;
- Once repositioned, an excavator(s) will be utilized to pin the liner pipe against the bottom of the host pipe to prevent the pipe from moving during CSO activation. The excavator bucket(s) will be

positioned on the top of the liner pipe and care will be taken to apply the appropriate downforce to minimize deformation of the pipe;
- The liner pipe will remain pinned within the host pipe until the CSO has de-activated and the risk of further activation has abated.

The elevation of the cofferdam constructed at the CSO outfall was set below the elevation of the top of the CSO weir located at Prenatt Street to accommodate flows should the CSO activate during construction. Should an activation occur during construction, work that could disrupt the functionality of the CSO will be suspended, and dewatering will be performed as necessary following the procedures described in Section 4.4 after the CSO has de-activated and prior to the resumption of work in this area.

4.6 Management and Disposal of Contaminated Materials

Construction of the slip line repair is anticipated to generate contaminated materials that will require proper management. All such materials will be managed in accordance with the procedures specified in the EWP for OU-3. Soil/fill materials excavated to facilitate the construction of the insertion and welding pits, reinstatement of sewer laterals, manhole replacement and access to the CSO outfall chamber will be stockpiled or staged on the western, paved portion of the site prior to characterization and proper off-site disposal. Excavation spoils will be placed on, and covered with properly anchored plastic sheeting to prevent interaction with the environmental. Alternately, the material will be placed in lined and covered roll-off containers.

Disposal characterization of contaminated materials, including dewatering sediment, will be performed in accordance with the designated disposal facility requirements pertaining to the number/type of samples and analytical methods/parameters. The resulting waste profile will be submitted along with the appropriate disposal application for disposal facility and NYSDEC approval, prior to removal from the site. All waste materials will be transported by licensed waste haulers to the permitted off-site facility for disposal.

4.7 Sediment and Erosion Control

Construction stormwater management and erosion control measures will be installed as prescribed in the Final RAWP for OU-3 and will include the installation of silt sock along the western and southern perimeter of the work area, as well as around the perimeter of stockpiles containing excavated material and backfill. Additionally, active stormwater drains proximal to the construction area will be protected.

4.8 Product/Sheen Containment and Recovery

The temporary cofferdam constructed of PZC-18 sheet piles driven to approximately 537 feet AMSL was installed at the mouth of the CSO outfall and connected to the outboard side of the new steel bulkhead. The top of the cofferdam was set at an approximate elevation of 575 feet AMSL, several feet above the mean high water level of the river. The temporary cofferdam will be utilized to contain any product/sheen that migrates within the CSO to the outfall during the repair. Current containment and recovery measures required by USCG and NYSDEC will continue to the extent practical during construction for pollution control purposes. These procedures are described in the NYSDEC-approved Short Term Corrective Measures Work Plan dated September 18, 2020. Fluids generated as a result of product/sheen recovery activities will be transferred to and batched through the on-site Groundwater Treatment Facility (GWTF).

4.9 Schedule

Pending the receipt of all required approvals, ESCP has targeted January-February 2022 for the construction of the slip lining and anticipates that it will require 4-6 weeks to perform this activity.

5.0 INTERIM PASSIVE PRODUCT RECOVERY IN CSO AREA

A hydrogeologic investigation of the western portion of OU-3 in the vicinity of the CSO was conducted in April 2021, the results of which are presented in the Hydrogeologic Investigation Report dated July 2021. This investigation included the installation of three new wells (ESCP-CSO-MW-4, ESCP-CSO-PZ-1 and ESCP-CSO-PZ-2) along the eastern side of the CSO for use in conducting a pump test to assist in evaluating the effect of the CSO on local groundwater patterns. The location of these wells is shown in Figure 4. Following the performance of the pump test, free-phase petroleum product was observed in these three wells. Laboratory analysis of the product that was encountered in these wells determined that the product is lighter than water with a specific gravity of 0.84 grams per cubic centimeter (g/cm^3). No product has been observed in any of the other existing groundwater wells installed within CSO area.

In May 2021, following completion of the hydrogeologic investigation, product recovery measures were initiated within the three pump test wells and have continued on a weekly basis through November 2021 to reduce the likelihood of further migration of oil into the CSO and to the river. The product recovery method applied has involved the use of a peristaltic pump equipped with tubing that is connected to an oil/water interface probe. The oil/water interface probe is lowered into each well to define the thickness of product present and the depth of the product/groundwater interface, and then the product is removed from the wells via the tubing and pump, placed into containers and ultimately stored within the product storage tank at the GWTF. This method has proven effective in controlling migration to the CSO and recovering product while minimizing the capture of groundwater. The quantities of product recovered from each of the wells to date is summarized in the following table:

WELL DESIGNATION	CUMMULATIVE VOLUME OF PRODUCT RECOVERED (MAY 2021 – NOVEMBER 2021)
ESCP-CSO- MW-4	26.05 Gallons
ESCP-CSO-PZ-1	30.05 Gallons
ESCP-CSO-PZ-2	29.70 Gallons

The current product recovery program will be continued at the three above listed well locations until the CSO repair has been completed and the cover system has been fully restored. At that point, the migration pathway to the river created by the deteriorated condition of the CSO structure will be eliminated, engineering controls will be in place to isolate the remaining contamination, and monitoring of groundwater wells within the interior and perimeter of this area of OU-3 will enable the detection of any changes in product occurrence. The frequency of passive product removal will be adjusted to bi-weekly to reflect the diminishing volume of product being recovered under the current weekly schedule. The current method of product recovery, management and storage will continue to be utilized. Additionally, the quantity of product recovered from each of the wells will be recorded during each bi-weekly event.

Once the CSO repair has been completed and the cover system has been fully restored, the three pump test wells will be decommissioned in accordance with the procedures contained in NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy. This work will be supervised by an experienced geologist or engineer and decommissioning logs documenting the work will be recorded.

6.0 CONSTRUCTION COMPLETION REPORT

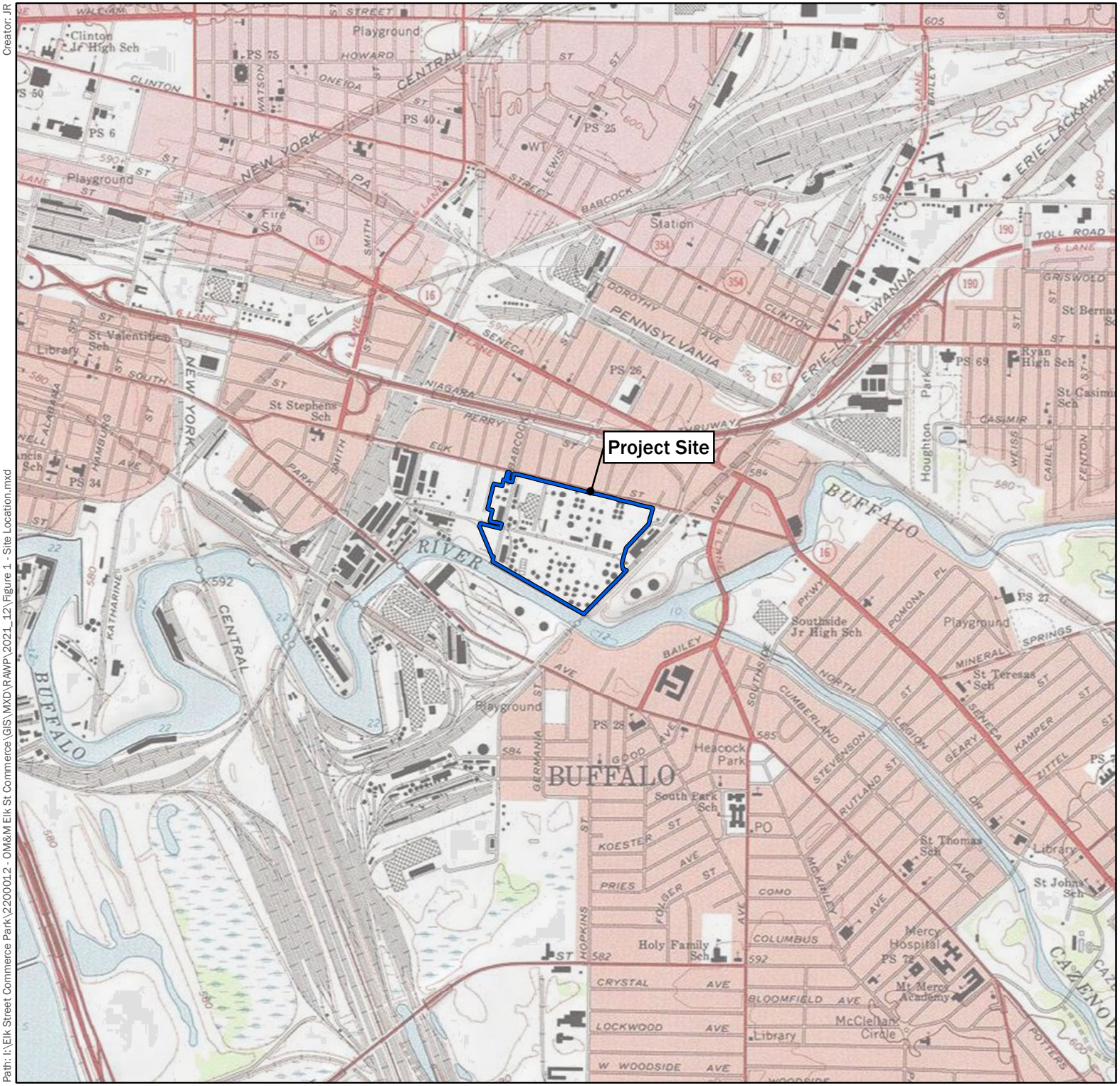
A Construction Completion Report (CCR) summarizing and documenting the construction of the CSO repair, execution of the interim passive product recovery program, and decommissioning of the associated wells will be prepared for submittal to the NYSDEC to supplement the FER and previous CCR for the extension of the sealed sheet pile containment system. This report will describe the remedial construction, passive product recovery and well decommissioning activities performed; document compliance with the EWP and CAMP; and identify remaining contamination within the CSO area of OU-3. As-built drawings, passive

product recovery logs, well decommissioning logs, and photo-documentation of the work will also be included in the CCR, which will be finalized to address any comments received from the NYSDEC.

7.0 SITE MANAGEMENT PLAN REVISIONS

The SMP shall be revised to reflect changes to the OU-3 remedy, as well as modifications to the operations, monitoring and maintenance program for OU-3. Said revisions will be submitted to the NYSDEC and New York State Department of Health (NYSDOH) for review and shall be finalized once agency comments have been addressed.

FIGURES



Creator: JR

Path: I:\Elk Street Commerce Park\2200012 - OM&M Elk St Commerce\GIS\MXD\RAWP\2021_12\Figure 1 - Site Location.mxd

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Remedial Action Work Plan Addendum

Babcock Street Combined Sewer Overflow Repair ExxonMobil Former Buffalo Terminal Operable Unit No. 3

N

0 0.25 0.5 Miles

Legend

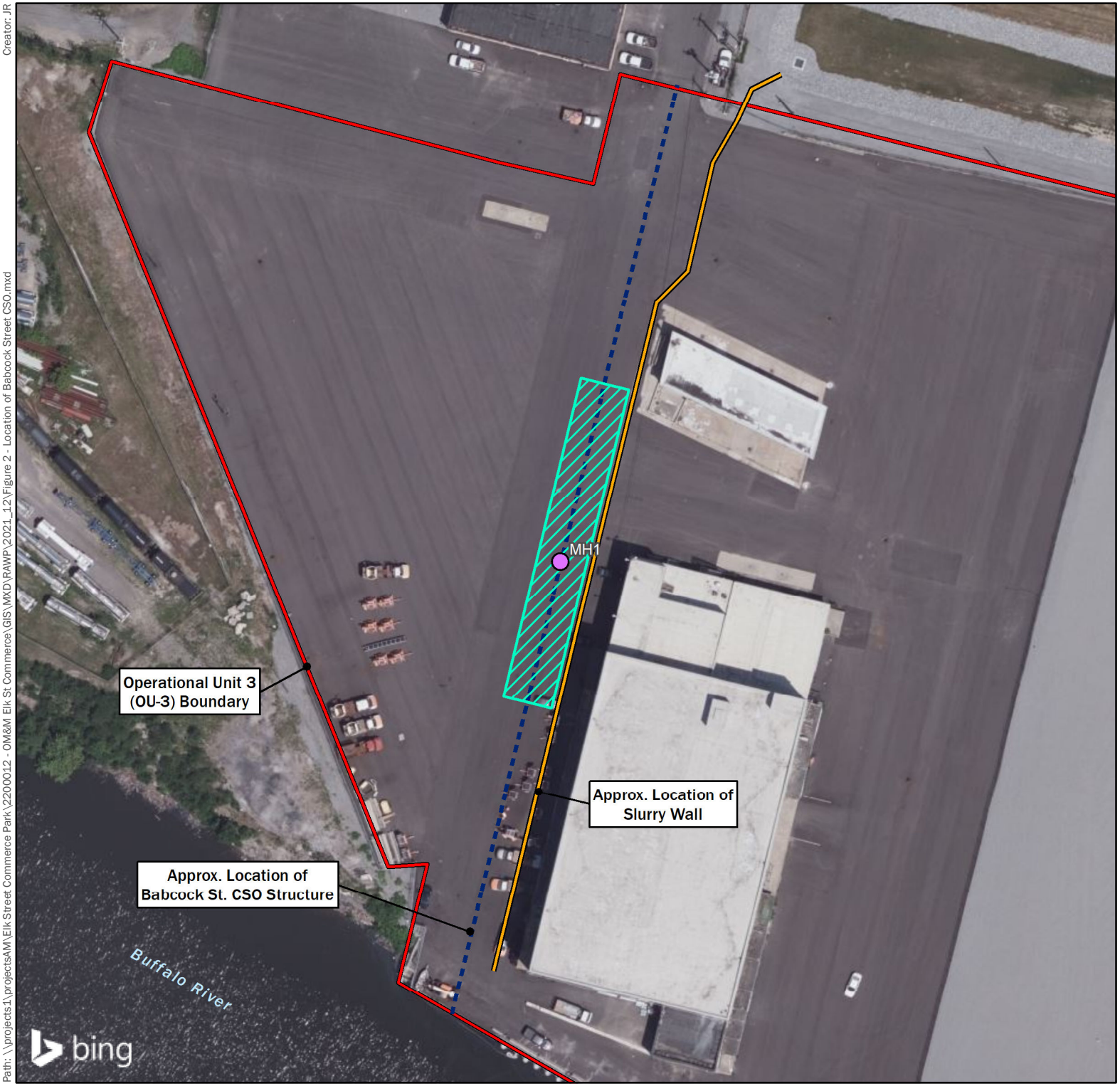
Project Site

Sources: LaBella 2021; USGS 2019.

Site Location

Figure 1

LaBella Project No: 2200012
Date: December 2021



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Remedial Action Work Plan Addendum

Babcock Street Combined Sewer Overflow Repair ExxonMobil Former Buffalo Terminal Operable Unit No. 3

N

0 50 100 Feet

Legend

- CSO Manhole
- Babcock St. CSO Structure
- Slurry Wall
- Location of Exfiltration and Infiltration of River Water from and into the CSO
- Operational Unit 3 (OU-3) Boundary

Sources: Bing 2020; Erie County 2020; LaBella 2021.

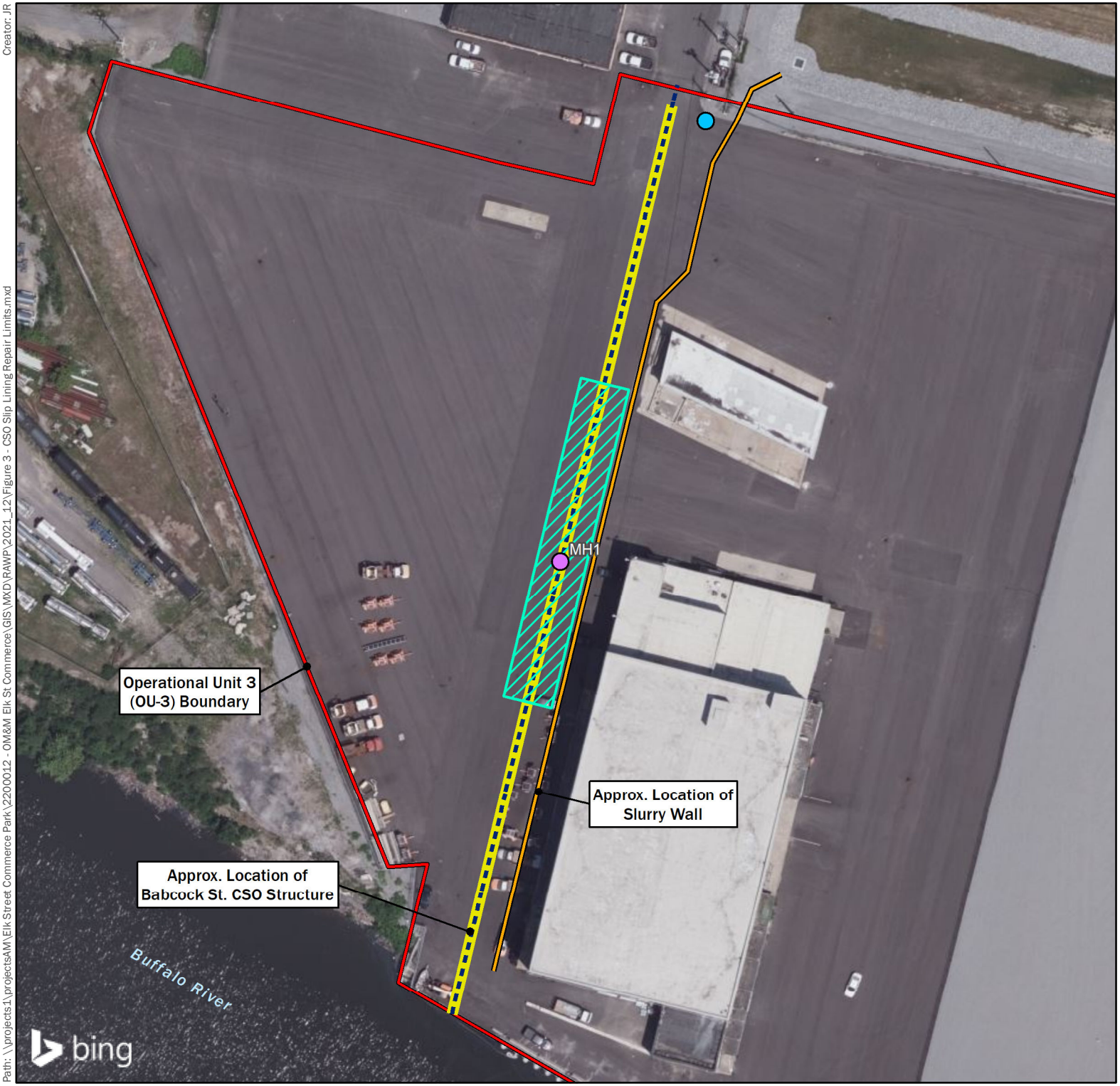
Location of Babcock Street CSO

Figure 2

LaBella Project No: 2200012
Date: December 2021

Creator: JR

Path: \\projects1\projectsAM\Elk Street Commerce Park\2200012 - OM&M Elk St Commerce\GIS\MXD\RAWP\2021_12\Figure 2 - Location of Babcock Street CSO.mxd



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Remedial Action Work Plan Addendum

Babcock Street Combined Sewer Overflow Repair ExxonMobil Former Buffalo Terminal Operable Unit No. 3

N

0 50 100 Feet

Legend

- CSO Manhole
- BSA Temporary Discharge Manhole
- Babcock St. CSO Structure
- Slurry Wall
- Extent of Slip Line Repair
- Location of Exfiltration and Infiltration of River Water from and into the CSO
- Operational Unit 3 (OU-3) Boundary

Sources: Bing 2020; Erie County 2020; LaBella 2021.

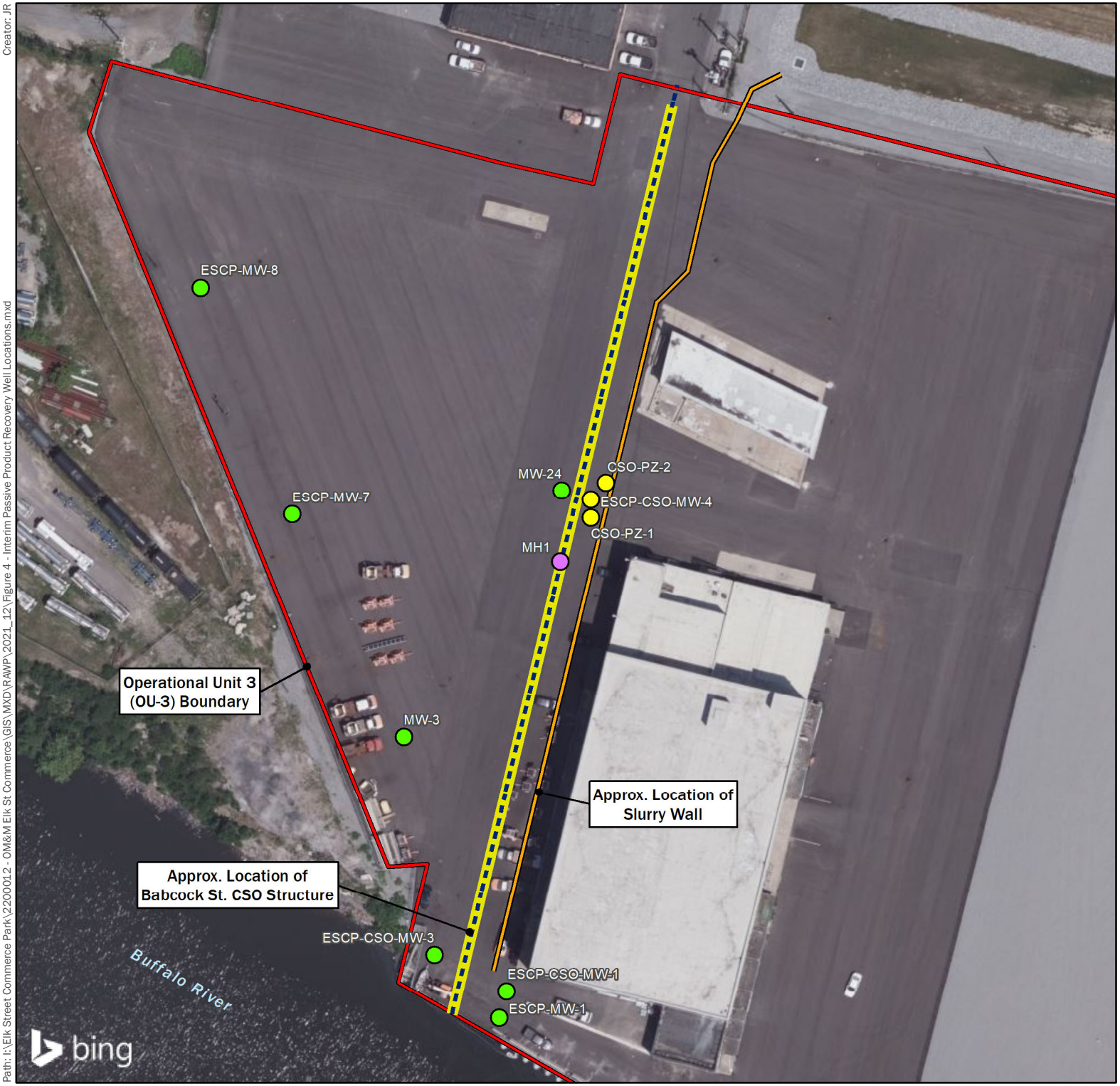
CSO Slip Lining Repair Limits

Figure 3

LaBella Project No: 2200012
Date: December 2021

Creator: JR

Path: \\projects1\projectsAM\Elk Street Commerce Park\2200012 - OM&M Elk St Commerce\GIS\MXD\RAWP\2021_12\Figure 3 - CSO Slip Lining Repair Limits.mxd



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Remedial Action Work Plan Addendum

Babcock Street Combined Sewer Overflow Repair ExxonMobil Former Buffalo Terminal Operable Unit No. 3

N

0 50 100 Feet

Legend

- CSO Manhole
- Existing Monitoring Well
- Interim Passive Product Recovery Well
- Babcock St. CSO Structure
- Slurry Wall
- Extent of Slip Line Repair
- Operational Unit 3 (OU-3) Boundary

Note: Well ESCP-CSO-MW-4 installed at the borehole location for CSO-SB-1.

Sources: Bing 2020; Erie County 2020; LaBella 2021.

Interim Passive Product Recovery Well Locations

Figure 4

LaBella Project No: 2200012
Date: December 2021

Creator: JR

Path: I:\Elk Street Commerce Park\2200012 - OM&M Elk St Commerce\GIS\MXD\RAWP\2021_12\Figure 4 - Interim Passive Product Recovery Well Locations.mxd

APPENDIX A

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

1 BABCOCK STREET
BUFFALO, NY 14210

LOCATION MAP
N.T.S.

ELK STREET COMMERCE PARK
BUFFALO, NY 14210
PROJECT NO: 2200012
DECEMBER 2021

LaBella
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300 State Street, Suite 201
Rochester, NY 14614
585-454-6110
labellapc.com

ISSUED FOR SUBMISSION
DECEMBER 2021

ELK ST COMMERCE PARK
PROJECT NO: 2200012

BABCOCK ST COMBINED SEWER OVERFLOW REPAIR
1 BABCOCK ST, BUFFALO, NY 14210

GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ALL MATERIALS, TOOLS AND EQUIPMENT, INCLUDING SPECIAL CUTTING DEVICES, NECESSARY TO PERFORM THE WORK CONTAINED IN THIS CONTRACT.
2. THE SIZES AND MATERIAL OF CONSTRUCTION OF WATER MAINS, SANITARY SEWERS AND STORM SEWERS TO REMAIN ARE REPUTED. THE CONTRACTOR SHALL VERIFY SIZES OF ALL UTILITIES WHERE CONNECTIONS TO SAID EXISTING UTILITIES ARE REQUIRED. EXCAVATION TO VERIFY THESE UTILITIES SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL PROTECT ALL EXISTING SITE AMENITIES NOT DESIGNATED FOR REMOVAL.
4. THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL EXISTING UTILITIES DESIGNATED TO REMAIN FOR THE DURATION OF THE CONTRACT.
5. ANY SITE AMENITY, UTILITY, OR OTHER ITEM WHICH BECOMES DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED IN-KIND BY THE CONTRACTOR AS DETERMINED BY THE PROJECT MANAGER OR ARCHITECT/ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER.

ENVIRONMENTAL NOTES

1. THIS WORK IS BEING CONDUCTED AS A SUPPLEMENTAL REMEDIAL ACTION UNDER THE NEW YORK STATE BROWNFIELD CLEANUP PROGRAM (BCP) ON OPERABLE UNIT 3 (OU-3) OF THE EXXONMOBIL FORMER BUFFALO TERMINAL SITE (SITE NO. C915201D), ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH APPLICABE PROVISIONS OF:
   1.1. OU-3 SITE MANAGEMENT PLAN (SMP), DATED DECEMBER 2019
   1.2. OU-3 EXCAVATION WORK PLAN (EWP), DATED DECEMBER 2019
   1.3. OU-3 COMMUNITY AIR MONITORING PROGRAM (CAMP), DATED DECEMBER 2019
   1.4. NYSDEC DER-10 "TECHNICAL GUIDANCE FOR SITE INVESTIGATION AND REMEDIATION, ISSUED MAY 3, 2010
   1.5. LOCAL, STATE AND FEDERAL REGULATIONS
2. CONTRACTOR SHALL PREPARE A SITE SPECIFIC HEALTH AND SAFETY PLAN (HASP) AND SHALL COMPLY WITH APPLICABLE PROVISIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS, INCLUDING, BUT NOT LIMITED TO 29 CFR 1910 AND 1926 THROUGHOUT THE DURATION OF THE CONTRACT.
3. THE AIR MONITORING SPECIFIED IN THE COMMUNITY AIR MONITORING PLAN (CAMP) CONTAINED IN THE SMP SHALL BE PERFORMED BY THE OWNER'S ENGINEER.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AREA AIR MONITORING REQUIRED TO ENSURE THE HEALTH AND SAFETY OF PERSONS DURING ALL CONTRACT ACTIVITIES.
5. CONTRACTOR SHALL PROTECT EXISTING MONITORING WELLS AND PIEZOMETERS FROM DAMAGE FOR THE DURATION OF THE CONTRACT.
6. CONTRACTOR ACKNOWLEDGES THAT SUBSURFACE CONTAMINATION EXISTS WITHIN THE LIMITS OF WORK AND SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT THE SAFETY AND HEALTH OF ITS WORKERS, OPERATORS, SUBCONTRACTORS, SUPPLIERS AND SITE VISITORS FROM EXPOSURE TO SAID CONTAMINATION.
7. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

SITE NOTES

1. WELL COMPACTED SUBGRADE SHALL BE UTILIZED UNDERNEATH CONSTRUCTION OF PAVEMENT AND CONCRETE BASES.
2. IF ANY DISCREPANCIES ARE NOTED BETWEEN THESE CONSTRUCTION DOCUMENTS AND INFORMATION PROVIDED OR AN ERROR IS SUSPECT, IT SHALL BE IMMEDIATELY REPORTED TO THE CONSTRUCTION MANAGER AND LABELLA ASSOCIATES PROJECT MANAGER IN WRITING.
3. PROOF-ROLLING OF EXPOSED SUBGRADE AND SHALL BE COMPLETED UNDER THE GUIDANCE OF, AND OBSERVED BY, OWNER'S REPRESENTATIVE. PROOF ROLLING SHALL BE COMPLETED USING A 10-TON STATIC ROLLER OR A DUMP TRUCK OF EQUAL OR GREATER WEIGHT. SUBBASE MATERIAL SHALL ACHIEVE AT LEAST 95% COMPACTION.
4. THIS IS AN ACTIVE BROWNFIELD CONTAMINATED SITE. COMPLY WITH ALL REQUIREMENTS OUTLINED BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) AND ENVIRONMENTAL PROTECTION AGENCY (EPA).

SURVEY NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO BID. NO ALLOWANCE WILL BE MADE FOR ADDITIONAL COSTS DUE TO CONTRACTOR'S FAILURE TO VERIFY EXISTING CONDITIONS.
2. ANY IRON PINS, MONUMENTS OR OTHER ITEMS DEFINING PROPERTY LINES WHICH ARE DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE PROPERLY TIED AND ACCURATELY RESET BY A NYS LICENSED SURVEYOR UPON COMPLETION OF THE WORK.
3. HORIZONTAL DATUM BASED OFF N.A.D. '83 WESTERN ZONE (US SURVEY FEET).
4. VERTICAL BASED OFF OF N.A.V.D. '88 (US SURVEY FEET).

EROSION AND SEDIMENT CONTROL NOTES

1. ALL EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, AND LOCAL GOVERNING SOIL AND WATER CONSERVATION AGENCY RECOMMENDATIONS AND STANDARDS. CONTRACTOR SHALL SUBMIT PROPOSED EROSION CONTROL PLAN INCLUDING SEQUENCING OF WORK TO THE ENGINEER FOR REVIEW PRIOR TO START OF WORK.
2. ALL SEDIMENTATION BARRIERS AND OTHER TEMPORARY OR PERMANENT MEASURES SHALL BE IN PLACE PRIOR TO THE START OF CONSTRUCTION. PLANS SHOW THE SUGGESTED MINIMUM MEASURES REQUIRED.
3. REMOVAL OF ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE COMPLETED AT THE APPROVAL OF THE OWNER AND ENGINEER. THE COST OF REMOVING THESE MEASURES SHALL ALSO BE INCLUDED IN THE BID PRICE.
4. FOR THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL PROTECT ALL ON-SITE, ADJACENT AND/OR DOWNSTREAM STORM/SANITARY SEWERS, AND/OR OTHER WATER COURSES FROM CONTAMINATION BY WATER BORNE SILTS, SEDIMENTS, FUELS, SOLVENTS, LUBRICANTS OR OTHER POLLUTANTS ORIGINATING FROM ANY WORK DONE ON, OR IN SUPPORT OF THIS PROJECT.
5. DURING CONSTRUCTION NO WET OR FRESH CONCRETE OR LEACHATE SHALL BE ALLOWED TO ESCAPE INTO STORM/SANITARY SEWERS, DITCHES OR OTHER WATERS OF NEW YORK STATE, NOR SHALL WASHINGS FROM CONCRETE TRUCKS, MIXERS OR OTHER DEVICES BE ALLOWED TO ENTER ANY STORM/SANITARY SEWERS, DITCHES, RIVERS, OR WATER COURSES.
6. ALL METHODS AND EQUIPMENT PROPOSED BY THE CONTRACTOR TO ACCOMPLISH THE WORK FOR EROSION AND POLLUTION CONTROL SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
7. THE CONTRACTOR SHALL BE REQUIRED TO TREAT TRAVELED AREAS TO CONTROL DUST. WATER SHALL BE APPLIED TO SUCH TRAVELED AREAS AS THE ARCHITECT/ENGINEER OR OWNER'S DESIGNATED REPRESENTATIVE MAY DESIGNATE. THE NUMBER OF APPLICATIONS AND THE AMOUNT OF WATER SHALL BE BASED UPON FIELD AND WEATHER CONDITIONS.
8. CONTRACTOR STAGING AREAS LOCATIONS SHALL BE COORDINATED WITH THE OWNER PRIOR TO START OF CONSTRUCTION.

EXCAVATION NOTES

1. CONTRACTOR SHALL PROVIDE SUFFICIENT NOTICE OF THE START OF ANY GROUND INTRUSIVE ACTIVITIES TO ENABLE OWNER'S ENGINEER TO NOTIFY NYSDEC 15-DAYS PRIOR TO THE START OF SAID ACTIVITIES PURSUANT TO THE EWP. CONTRACTOR'S NOTICE SHALL CONTAIN THE ITEMS SPECIFIED IN SECTION D-1 OF THE EWP.
2. CONTRACTOR SHALL PERFORM ALL EXCAVATION WORK IN COMPLIANCE WITH THE EWP.
3. TEMPORARY EXCAVATIONS MUST BE CONDUCTED IN ACCORDANCE WITH OSHA 29 CFR 1926 SUBPART P TITLED "EXCAVATIONS" AND NYCRR PART 23 TITLED "PROTECTION IN CONSTRUCTION, DEMOLITION AND EXCAVATION OPERATIONS".
4. THE AFOREMENTIONED CODES PERTAIN TO SAFETY ASPECTS OF EXCAVATIONS THAT INCLUDE BUT ARE NOT LIMITED TO: SOIL CLASSIFICATION, SLOPING AND BENCHING, SHORING, AND ASSISTANCE WITH SELECTING THE APPROPRIATE PROTECTIVE SYSTEM.
5. PRIOR TO WORKERS ENTERING ANY EXCAVATION, THE CONTRACTOR'S COMPETENT PERSON, AS DEFINED BY OSHA, MUST INSPECT THE EXCAVATION AND DEEM IT SAFE FOR ENTRY.
6. FOR EXCAVATIONS 5-FEET DEEP AND GREATER, THE CONTRACTOR WILL BE REQUIRED TO PROVIDE EXCAVATION PROTECTION (E.G., SLOPING, BENCHING, SHIELDING, TRENCH BOX, ETC.) AND IF NECESSARY AN EXCAVATION PROTECTION SYSTEM (EPS) (E.G., SHORING, MECHANICAL SUPPORT OF EXCAVATION, ETC.).
7. IF THE CONTRACTOR CHOOSES TO SLOPE THE EXCAVATION SIDEWALLS, THE CONTRACTOR'S COMPETENT PERSON, AS DEFINED BY OSHA, SHALL BE RESPONSIBLE TO IDENTIFY THE MAXIMUM/STEEPEST SLOPE BASED ON THE SOIL CONDITIONS ENCOUNTERED IN THE FIELD.
8. IF AN EPS IS REQUIRED, THE CONTRACTOR SHALL CONDUCT THE NECESSARY SUBSURFACE INVESTIGATION TO CONFIRM DESIGN VALUES.
9. IF AN EPS IS REQUIRED, THE CONTRACTOR SHALL SUBMIT THEIR DESIGN TO THE OWNER A MINIMUM OF TWO WEEKS PRIOR TO INSTALLING SAME.
10. THE CONTRACTOR SHALL NOT PLACE EXCAVATED SPOILS CLOSER TO THE EXCAVATION THAN THE MINIMUM SETBACK DISTANCE AS PRESCRIBED BY OSHA AND/OR NYCRR TO MAINTAIN THE STABILITY OF THE EXCAVATION AND/OR THE EPS.
11. THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE MEASURES TO CONTROL SURFACE WATER RUNOFF FROM ENTERING EXCAVATIONS.
12. THE CONTRACTOR SHALL SECURE ALL EXCAVATIONS AT THE END OF EACH WORK DAY AND SHALL CAUSE THEM TO REMAIN SECURED UNTIL WORK RESUMES AT THAT EXCAVATION.
13. THE CONTRACTOR SHALL COVER AND/OR FENCE OFF ANY OPEN HOLES. COVERS SHALL BE LABELED IN HIGH VISIBILITY PAINT "HOLE", AND FENCING SHALL BE HIGH VISIBILITY ORANGE AND STAKED SECURELY.

DEMOLITION NOTES

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY DIG SAFE NEW YORK AT 811 TO REQUEST UTILITY STAKEOUT OF ALL PUBLIC UTILITIES.
2. THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING ABOVE GROUND AND BELOW GROUND UTILITIES, STRUCTURES, AND APPURTENANCES SHOWN ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES, STRUCTURES, AND APPURTENANCES IN THE PATH OF AND ADJACENT TO THE PROPOSED WORK.
3. CONTRACTOR SHALL PROTECT AND SUPPORT ALL EXISTING UTILITIES DESIGNATED TO REMAIN FOR THE DURATION OF THE CONTRACT.
4. OWNER OR OWNER'S REPRESENTATIVE SHALL NOTIFY THE LOCAL GOVERNMENT, LOCAL FIRE DEPARTMENT AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) AS NECESSARY AND SHALL OBTAIN ANY REQUIRED PERMITS PRIOR TO BEGINNING WORK, UNLESS OTHERWISE SPECIFIED HEREIN.
5. CONTRACTOR SHALL REMOVE FROM SITE, MATERIALS NOT INDICATED TO BE SALVAGED INCLUDING ALL DEBRIS. ALL REMOVED MATERIALS SHALL BECOME THE PROPERTY OF CONTRACTOR WHO SHALL LEGALLY DISPOSE OF SAME.
6. THE CONTRACTOR SHALL MAINTAIN SAFE VEHICULAR AND PEDESTRIAN ACCESS TO THE EXISTING BUILDINGS FOR THE DURATION OF THE CONTRACT.
7. WHEN EXISTING CONSTRUCTION WHICH IS TO REMAIN IS DAMAGED DURING THE COURSE OF CONSTRUCTION AS A RESULT OF CONTRACTORS WORK, IT SHALL BE REPAIRED AND/OR REPLACED WITH SIMILAR OR LIKE MATERIALS AS MUCH AS POSSIBLE, AT NO COST TO THE OWNER. ALL REPAIRS AND/OR REPLACEMENTS WILL BE SUBJECT TO OWNERS APPROVAL.
8. COORDINATE LOCATION OF TEMPORARY STONE STAGING AREA WITH OWNER.

SPOILS MANAGEMENT NOTES

1. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS FOR SOIL STAGING, LOAD-OUT, TRANSPORT, DISPOSAL AND RE-USE SPECIFIED FOR EXCAVATED MATERIALS IN THE EWP.
2. THE OWNER'S ENGINEER WILL SCREEN THE MATERIAL EXCAVATED BY CONTRACTOR PURSUANT TO THE EWP. CONTRACTOR SHALL NOTIFY OWNER'S ENGINEER AT LEAST TWO BUSINESS DAYS IN ADVANCE OF PERFORMING ANY EXCAVATIONS TO ENSURE ENGINEER'S AVAILABILITY TO PERFORM THE SCREENING AND SHALL FACILITATE THE SCREENING PROCESS.
3. NO INVASIVE ACTIVITIES OR EXCAVATION WORK SHALL BE CONDUCTED WITHOUT THE OWNER'S ENGINEER PRESENT TO PERFORM THE SCREENING.
4. CONTRACTOR SHALL SEGREGATE EXCAVATED MATERIAL INTO MATERIAL THAT REQUIRES OFF-SITE DISPOSAL AND MATERIAL THAT CAN BE RE-USED ON-SITE AS BACKFILL BELOW THE COVER SYSTEM.
5. CONTRACTOR SHALL STOCKPILE/STAGE THE MATERIAL IN ACCORDANCE WITH THE METHODS DETAILED IN THE EWP AND SHALL REPAIR OR REPLACE TARP COVERS, ANCHORS, ETC. AS NECESSARY TO MINIMIZE INTERACTION WITH THE ENVIRONMENT.
6. CONTRACTOR SHALL CONDUCT EXCAVATED MATERIAL LOAD-OUT ACTIVITIES IN ACCORDANCE WITH THE EWP AND SHALL BE RESPONSIBLE FOR PREVENTING THE OFF-SITE TRACKING OF MATERIAL AND FOR KEEPING THE ADJACENT ROADWAY NETWORK FREE OF DIRT AND OTHER MATERIALS DERIVED FROM THE CONTRACT WORK.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL PROVISIONS OF THE EWP PERTAINING TO THE TRANSPORT OF MATERIALS OFF-SITE.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR CHARACTERIZING EXCAVATED MATERIAL TO BE REMOVED FROM THE SITE FOR OFF-SITE DISPOSAL, COMPLETING WASTE PROFILE DOCUMENTATION AND OBTAINING WASTE STREAM APPROVAL FROM AN APPROPRIATELY PERMITTED OFF-SITE DISPOSAL FACILITY. DOCUMENTATION OF WASTE STREAM APPROVAL (E.G., WASTE PROFILES, FACILITY ACCEPTANCE LETTERS, ETC.) SHALL BE PROVIDED TO THE OWNER'S ENGINEER WITH THE PRE-EXCAVATION NOTIFICATION.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL WASTE STREAMS AND FOR PROVIDING THE OWNER'S ENGINEER WITH RECORDS DOCUMENTING THE QUANTITIES AND FINAL DISPOSITION OF SAID MATERIALS (E.G., GATE RECEIPTS, SCALE TICKETS, MANIFESTS, ETC.).

BACKFILL NOTES

1. IMPORTED BACKFILL MUST COMPLY WITH THE REQUIREMENTS FOR IMPORTED BACKFILL SPECIFIED IN THE SITE MANAGEMENT PLAN (SMP) AND EXCAVATION WORK PLAN (EWP) FOR THIS BCP SITE, PER NYSDEC DER-10, GRAVEL, ROCK OR STONE, CONSISTING OF VIRGIN MATERIAL FROM A PERMITTED MINE OR QUARRY, MAY BE IMPORTED WITHOUT CHEMICAL TESTING PROVIDED THAT IT CONTAINS LESS THAN 10% BY WEIGHT MATERIAL WHICH WOULD PASS THROUGH A SIZE 80 SIEVE, THE CONTRACTOR SHALL PROVIDE GEOTECHNICAL LABORATORY TEST RESULTS DOCUMENTING COMPLIANCE WITH THIS DER-10 REQUIREMENT FOR ALL IMPORTED BACKFILL MATERIAL OF THIS TYPE. CONTRACTOR IS RESPONSIBLE FOR CHEMICAL TESTING PER NYSDEC REQUIREMENTS FOR BACKFILL MATERIAL OTHER THAN GRAVEL, ROCK OR STONE CONSISTING OF VIRGIN MATERIAL FROM A PERMITTED MINE OR QUARRY THAT IS TO BE IMPORTED TO THE SITE.
2. BACKFILL TO BE IMPORTED TO THE SITE FROM OFF-SITE SOURCES SHALL BE SUBJECT TO APPROVAL BY THE OWNER'S ENGINEER AND NYSDEC PRIOR TO IMPORTATION TO THE SITE. CONTRACTOR SHALL SUBMIT A REQUEST TO IMPORT/REUSE FILL OR SOIL FORM IN THE FORMAT PRESCRIBED BY NYSDEC A MINIMUM OF 10 BUSINESS DAYS IN ADVANCE AND NO MATERIALS SHALL BE IMPORTED TO THE SITE WITHOUT PRIOR APPROVAL.
3. THE CONTRACTOR SHALL SUBMIT GEOTECHNICAL LABORATORY TEST RESULTS A MINIMUM OF 10 BUSINESS DAYS PRIOR TO ANY EARTH WORK COMMENCING FOR ANY AND ALL BACKFILL MATERIAL (INCLUDING ON-SITE SOILS TO BE RE-USED) TO BE USED FOR THE CONTRACT WORK. TESTING SHALL NOT BE MORE THAN 6-MONTHS OLD AND SHALL CONSIST OF THE FOLLOWING:
   3.1. MOISTURE CONTENT
   3.2. SOIL GRADATION WITHOUT HYDROMETER FOR NON-COHESIVE BACKFILL MATERIALS (ASTM C136)
   3.3. SOIL GRADATION ANALYSIS WITH HYDROMETER ANALYSIS FOR COHESIVE BACKFILL MATERIALS (ASTM C136 & D422)
   3.4. MODIFIED PROCTOR FOR ANY AND ALL BACKFILL MATERIALS (ASTM D1557)
4. NO MATERIAL SHALL BE BROUGHT ON-SITE UNTIL THE OWNER'S ENGINEER HAS BEEN ABLE TO REVIEW AND COMMENT ON THE GEOTECHNICAL LABORATORY RESULTS.
5. BACKFILL SHALL BE PLACED ON A SATISFACTORY SUBGRADE TO MINIMIZE SEGREGATION AND SHALL BE PLACED IN NEARLY HORIZONTAL LIFTS.
6. THE MOISTURE CONTENT OF THE BACKFILL MATERIAL SHALL BE ADJUSTED PRIOR TO APPLICATION OF COMPACTION SUCH THAT IT CONFORMS WITH THE OPTIMUM MOISTURE CONTENT DEFINED BY THE LABORATORY ANALYSIS.
7. THE MAXIMUM LOOSE LIFT THICKNESS SHALL BE 12-INCHES AND THE MINIMUM IN-PLACE FIELD DENSITY SHALL BE 95%, AS DETERMINED BY ASTM D1557.
8. A MINIMUM OF ONE COMPACTION TEST PER 400 SQUARE FEET (FT2/) SHALL BE PERFORMED ON EACH LIFT OF MATERIAL PLACED.
9. WHEN THE RESULTS INDICATE THAT INSUFFICIENT COMPACTION HAS BEEN OBTAINED, THE CONTRACTOR SHALL TAKE ACTION TO MODIFY OR ALTER THE MOISTURE CONTENT OF THE MATERIAL, PROVIDE ADDITIONAL COMPACTION, AND/OR MAKE ADJUSTMENT TO INCREASE THE IN-PLACE DENSITY. IF THE CONTRACTOR CANNOT OBTAIN SATISFACTORY COMPACTION DUE TO MATERIAL PROPERTIES, THE CONTRACTOR SHALL REMOVE THE UNSATISFACTORY MATERIAL AND REPLACE WITH NEW MATERIAL.
10. MATERIAL THAT IS FROZEN, OR INCLUDES MUD, DEBRIS, ORGANICS OR OTHER DELETERIOUS MATERIALS SHALL BE REMOVED AND REPLACED WITH CLEAN SPECIFIED MATERIAL.
11. MATERIAL SHALL NOT BE PLACED OVER AN AREA OR LIFT THAT HAS NOT BEEN TESTED AND ACHIEVED THE MINIMUM IN-PLACE DENSITY REQUIREMENTS.
12. IF INCLEMENT WEATHER OCCURS AFTER ACHIEVING ACCEPTABLE TEST RESULTS, AREAS SUBJECT TO THE INCLEMENT WEATHER SHALL BE RE-TESTED TO IDENTIFY IF THOSE AREAS REQUIRE REPAIR OR REPLACEMENT PRIOR TO PLACING ADDITIONAL MATERIAL.

GRADING NOTES

1. THE CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF OSHA, AND ANY OTHER AGENCY HAVING JURISDICTION WITH REGARD TO SAFETY PRECAUTIONS WITH TRENCHING OPERATIONS. THE REQUIREMENTS SET FORTH HEREIN ARE INTENDED TO SUPPLEMENT REQUIREMENTS ESTABLISHED BY THESE AGENCIES. IN THE CASE OF A CONFLICT BETWEEN REQUIREMENTS OF OTHER JURISDICTIONAL AGENCIES AND THESE DOCUMENTS, THE MORE STRINGENT REQUIREMENT ON THE CONTRACTOR SHALL APPLY.
2. SHEETING, IF REQUIRED DURING CONSTRUCTION, IS CONSIDERED TO BE PART OF THIS CONTRACT AND SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
3. ALL TRENCHES THROUGH PAVEMENT SHALL BE SAW CUT PRIOR TO EXCAVATION AND AGAIN PRIOR TO PAVEMENT RESTORATION.
4. CONTRACTOR SHALL ADJUST THE RIMS OF ALL MANHOLES, CATCH BASINS, VALVE BOXES AND OTHER UTILITY SITE STRUCTURES TO MEET FINISHED GRADE IN AREAS REQUIRING REPAVING OR REGRADING AS PART OF THE WORK, INCLUDING THOSE THAT MAY NOT BE SHOWN ON THE PLANS.
5. VOIDS LEFT BY STRUCTURE REMOVAL SHALL BE BACKFILLED AND PROPERLY COMPACTED WITH STRUCTURAL FILL (NYSDOT ITEM 304.12) IN AREAS UNDER AND WITHIN 5 FEET HORIZONTALLY OF ALL STRUCTURES, BUILDINGS AND PAVEMENTS. ALL DISTURBED AREAS SHALL BE RESTORED.
6. THE CONTRACTOR SHALL DEWATER ALL EXCAVATIONS TO PREVENT THE INTRODUCTION OF GROUNDWATER INTO THE TRENCHES/EXCAVATIONS. PROVIDE ALL EQUIPMENT NECESSARY TO MAINTAIN THE GROUNDWATER LEVEL AS NECESSARY. SEE DEWATERING NOTES.

COVER SYSTEM RESTORATION NOTES

1. CONTRACTOR SHALL RESTORE THE COVER SYSTEM IN ALL AREAS WHERE THE COVER SYSTEM WAS DAMAGED OR REMOVED DURING THE CONTRACT WORK AND AS OTHERWISE SPECIFIED IN THE PLANS.
2. COVER SYSTEM RESTORATION SHALL INCLUDE THE PLACEMENT OF A DEMARCATION LAYER (ORANGE SNOW FENCING MATERIAL, WHITE GEOTEXTILE, OR APPROVED EQUIVALENT MATERIAL) AND OTHER COVER MATERIALS APPROPRIATE FOR THE TYPE OF COVER SYSTEM PRESENT IN THE WORK AREA PRIOR TO THE CONTRACT WORK AND AS SPECIFIED IN THE EWP.

COMBINED SEWER OVERFLOW PREPARATION, SUPPLEMENTARY MATERIAL, AND INSTALLATION NOTES

1. CONTRACTOR SHALL REMOVE ANY SOLIDS FROM THE EXISTING COMBINED SEWER OVERFLOW AND PRESSURE WASH PRIOR TO APPLYING ANY GROUT, STRUCTURAL CONCRETE, CELLULAR CONCRETE, OR SEALANT MATERIALS.
2. GROUT SHALL BE 4,000 PSI SHOTCRETE. SEALANT SHALL BE DURAGUARD 310 OR APPROVED EQUAL.
3. GROUT, STRUCTURAL CONCRETE, CELLULAR CONCRETE, AND SEALANT MATERIALS SHALL BE INSTALLED PER MANUFACTURER RECOMMENDATIONS UNLESS OTHERWISE NOTED.

LEGEND

EXISTING	PROPOSED	DESCRIPTION
×		PROJECT BENCHMARK / CONTROL POINTS
		FENCE, CHAIN LINK
BLDG	BLDG	BUILDING/STRUCTURE
R	R	PROPERTY LINE
PE	PE	EASEMENTS
		UTILITY POLE
		CATCH BASIN
		MANHOLE (SOLID COVER)
		HYDRANT
OE OE	OE OE	OVERHEAD ELECTRIC
G	G	GAS LINE
SA	SA	SANITARY LINE
ST	ST	STORM LINE
W	W	WATER LINE
ST-SA	ST-SA	COMBINED SANITARY AND STORM

CONTRACT DRAWING INDEX

REFERENCE DRAWING INDEX

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labellapc.com

ELK STREET COMMERCE PARK

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

1 BABCOCK STREET
BUFFALO, NY 14210

NO:	DATE:	DESCRIPTION:
6		
5		
4		
3		
2		
1	12/21	ADDRESSED NYSDEC COMMENTS

Revisions

PROJECT NUMBER: 2200012

DRAWN BY: DMB

REVIEWED BY: BBU

ISSUED FOR: SUBMISSION SET

DATE: DECEMBER 2021

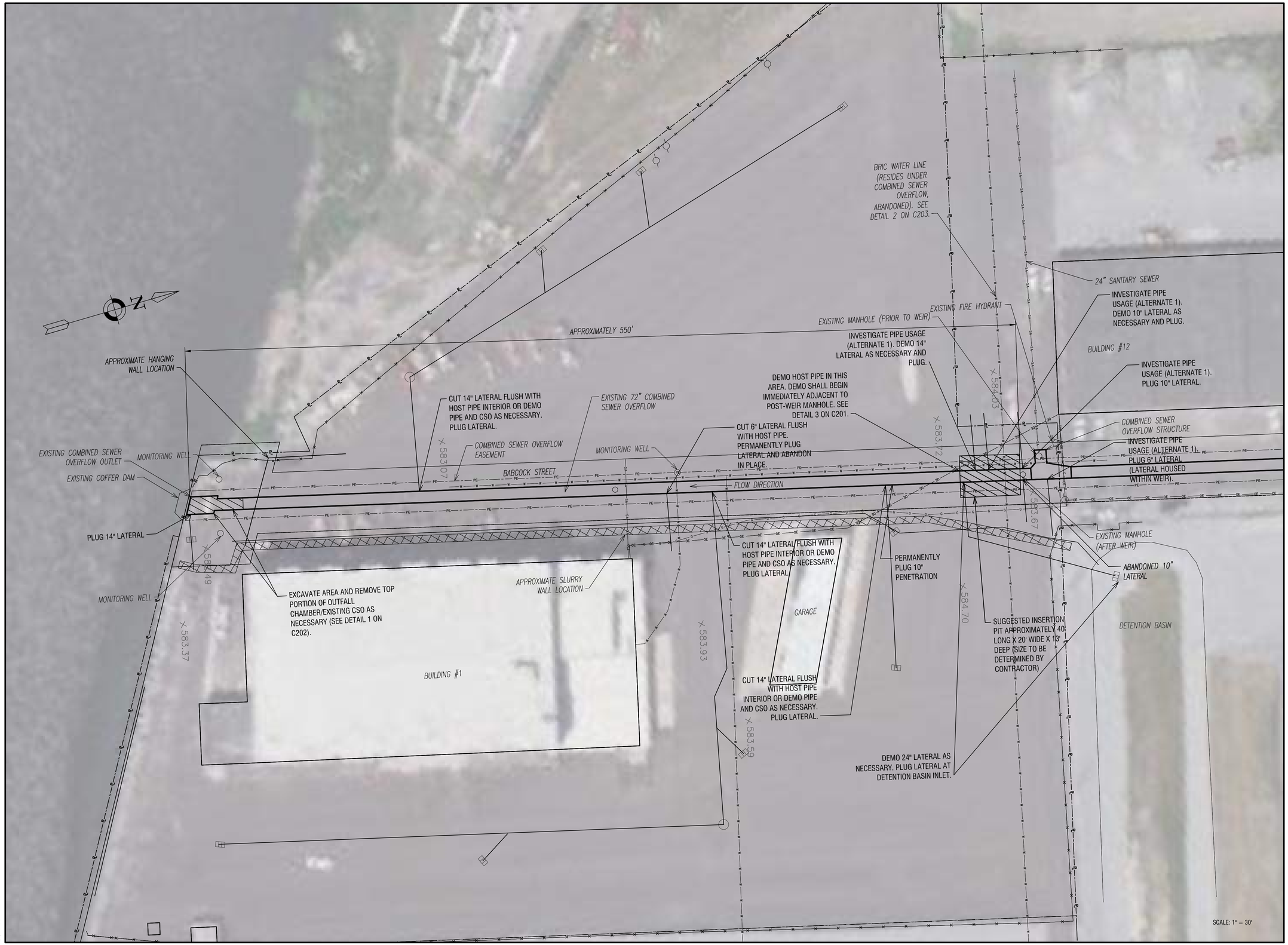
DRAWING NAME:

GENERAL NOTES, LEGEND, AND DRAWING INDEX

DRAWING NUMBER:

C001

VERSION 19.0
6/3/2019 8:47:36 AM



VERSION 19.0
6/3/2010 8:47:56 AM

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STATE OF NEW YORK
JASON RONALD [illegible]
095099
LICENSED PROFESSIONAL ENGINEER

ELK STREET COMMERCE PARK

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

1 BABCOCK STREET
BUFFALO, NY 14210

NO:	DATE:	DESCRIPTION:
6		
5		
4		
3		
2		
1	12/21	ADDRESSED NYSDEC COMMENTS

Revisions

PROJECT NUMBER: 2200012

DRAWN BY: DMB

REVIEWED BY: BBU

ISSUED FOR: SUBMISSION SET

DATE: DECEMBER 2021

DRAWING NAME:

SITE DEMO PLAN

DRAWING NUMBER:

C101

STORMWATER MANAGEMENT SYSTEM DIVERSION NOTES

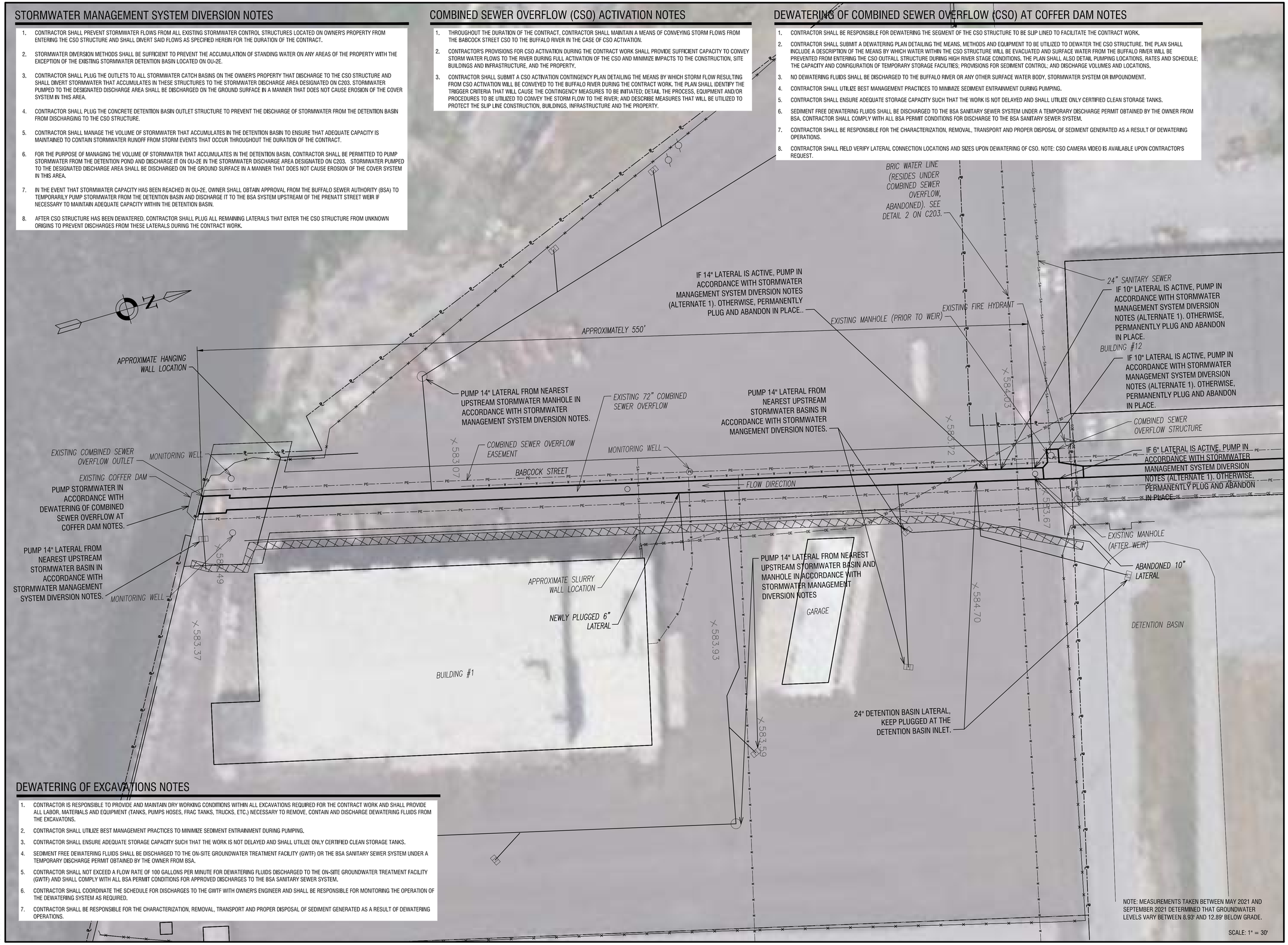
1. CONTRACTOR SHALL PREVENT STORMWATER FLOWS FROM ALL EXISTING STORMWATER CONTROL STRUCTURES LOCATED ON OWNER'S PROPERTY FROM ENTERING THE CSO STRUCTURE AND SHALL DIVERT SAID FLOWS AS SPECIFIED HEREIN FOR THE DURATION OF THE CONTRACT.
2. STORMWATER DIVERSION METHODS SHALL BE SUFFICIENT TO PREVENT THE ACCUMULATION OF STANDING WATER ON ANY AREAS OF THE PROPERTY WITH THE EXCEPTION OF THE EXISTING STORMWATER DETENTION BASIN LOCATED ON OU-2E.
3. CONTRACTOR SHALL PLUG THE OUTLETS TO ALL STORMWATER CATCH BASINS ON THE OWNER'S PROPERTY THAT DISCHARGE TO THE CSO STRUCTURE AND SHALL DIVERT STORMWATER THAT ACCUMULATES IN THESE STRUCTURES TO THE STORMWATER DISCHARGE AREA DESIGNATED ON C203. STORMWATER PUMPED TO THE DESIGNATED DISCHARGE AREA SHALL BE DISCHARGED ON THE GROUND SURFACE IN A MANNER THAT DOES NOT CAUSE EROSION OF THE COVER SYSTEM IN THIS AREA.
4. CONTRACTOR SHALL PLUG THE CONCRETE DETENTION BASIN OUTLET STRUCTURE TO PREVENT THE DISCHARGE OF STORMWATER FROM THE DETENTION BASIN FROM DISCHARGING TO THE CSO STRUCTURE.
5. CONTRACTOR SHALL MANAGE THE VOLUME OF STORMWATER THAT ACCUMULATES IN THE DETENTION BASIN TO ENSURE THAT ADEQUATE CAPACITY IS MAINTAINED TO CONTAIN STORMWATER RUNOFF FROM STORM EVENTS THAT OCCUR THROUGHOUT THE DURATION OF THE CONTRACT.
6. FOR THE PURPOSE OF MANAGING THE VOLUME OF STORMWATER THAT ACCUMULATES IN THE DETENTION BASIN, CONTRACTOR SHALL BE PERMITTED TO PUMP STORMWATER FROM THE DETENTION POND AND DISCHARGE IT ON OU-2E IN THE STORMWATER DISCHARGE AREA DESIGNATED ON C203. STORMWATER PUMPED TO THE DESIGNATED DISCHARGE AREA SHALL BE DISCHARGED ON THE GROUND SURFACE IN A MANNER THAT DOES NOT CAUSE EROSION OF THE COVER SYSTEM IN THIS AREA.
7. IN THE EVENT THAT STORMWATER CAPACITY HAS BEEN REACHED IN OU-2E, OWNER SHALL OBTAIN APPROVAL FROM THE BUFFALO SEWER AUTHORITY (BSA) TO TEMPORARILY PUMP STORMWATER FROM THE DETENTION BASIN AND DISCHARGE IT TO THE BSA SYSTEM UPSTREAM OF THE PRENATT STREET WEIR IF NECESSARY TO MAINTAIN ADEQUATE CAPACITY WITHIN THE DETENTION BASIN.
8. AFTER CSO STRUCTURE HAS BEEN DEWATERED, CONTRACTOR SHALL PLUG ALL REMAINING LATERALS THAT ENTER THE CSO STRUCTURE FROM UNKNOWN ORIGINS TO PREVENT DISCHARGES FROM THESE LATERALS DURING THE CONTRACT WORK.

COMBINED SEWER OVERFLOW (CSO) ACTIVATION NOTES

1. THROUGHOUT THE DURATION OF THE CONTRACT, CONTRACTOR SHALL MAINTAIN A MEANS OF CONVEYING STORM FLOWS FROM THE BABCOCK STREET CSO TO THE BUFFALO RIVER IN THE CASE OF CSO ACTIVATION.
2. CONTRACTOR'S PROVISIONS FOR CSO ACTIVATION DURING THE CONTRACT WORK SHALL PROVIDE SUFFICIENT CAPACITY TO CONVEY STORM WATER FLOWS TO THE RIVER DURING FULL ACTIVATION OF THE CSO AND MINIMIZE IMPACTS TO THE CONSTRUCTION, SITE BUILDINGS AND INFRASTRUCTURE, AND THE PROPERTY.
3. CONTRACTOR SHALL SUBMIT A CSO ACTIVATION CONTINGENCY PLAN DETAILING THE MEANS BY WHICH STORM FLOW RESULTING FROM CSO ACTIVATION WILL BE CONVEYED TO THE BUFFALO RIVER DURING THE CONTRACT WORK. THE PLAN SHALL IDENTIFY THE TRIGGER CRITERIA THAT WILL CAUSE THE CONTINGENCY MEASURES TO BE INITIATED; DETAIL THE PROCESS, EQUIPMENT AND/OR PROCEDURES TO BE UTILIZED TO CONVEY THE STORM FLOW TO THE RIVER; AND DESCRIBE MEASURES THAT WILL BE UTILIZED TO PROTECT THE SLIP LINE CONSTRUCTION, BUILDINGS, INFRASTRUCTURE AND THE PROPERTY.

DEWATERING OF COMBINED SEWER OVERFLOW (CSO) AT COFFER DAM NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING THE SEGMENT OF THE CSO STRUCTURE TO BE SLIP LINED TO FACILITATE THE CONTRACT WORK.
2. CONTRACTOR SHALL SUBMIT A DEWATERING PLAN DETAILING THE MEANS, METHODS AND EQUIPMENT TO BE UTILIZED TO DEWATER THE CSO STRUCTURE. THE PLAN SHALL INCLUDE A DESCRIPTION OF THE MEANS BY WHICH WATER WITHIN THE CSO STRUCTURE WILL BE EVACUATED AND SURFACE WATER FROM THE BUFFALO RIVER WILL BE PREVENTED FROM ENTERING THE CSO OUTFALL STRUCTURE DURING HIGH RIVER STAGE CONDITIONS. THE PLAN SHALL ALSO DETAIL PUMPING LOCATIONS, RATES AND SCHEDULE; THE CAPACITY AND CONFIGURATION OF TEMPORARY STORAGE FACILITIES; PROVISIONS FOR SEDIMENT CONTROL; AND DISCHARGE VOLUMES AND LOCATIONS.
3. NO DEWATERING FLUIDS SHALL BE DISCHARGED TO THE BUFFALO RIVER OR ANY OTHER SURFACE WATER BODY, STORMWATER SYSTEM OR IMPOUNDMENT.
4. CONTRACTOR SHALL UTILIZE BEST MANAGEMENT PRACTICES TO MINIMIZE SEDIMENT ENTRAINMENT DURING PUMPING.
5. CONTRACTOR SHALL ENSURE ADEQUATE STORAGE CAPACITY SUCH THAT THE WORK IS NOT DELAYED AND SHALL UTILIZE ONLY CERTIFIED CLEAN STORAGE TANKS.
6. SEDIMENT FREE DEWATERING FLUIDS SHALL BE DISCHARGED TO THE BSA SANITARY SEWER SYSTEM UNDER A TEMPORARY DISCHARGE PERMIT OBTAINED BY THE OWNER FROM BSA. CONTRACTOR SHALL COMPLY WITH ALL BSA PERMIT CONDITIONS FOR DISCHARGE TO THE BSA SANITARY SEWER SYSTEM.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR THE CHARACTERIZATION, REMOVAL, TRANSPORT AND PROPER DISPOSAL OF SEDIMENT GENERATED AS A RESULT OF DEWATERING OPERATIONS.
8. CONTRACTOR SHALL FIELD VERIFY LATERAL CONNECTION LOCATIONS AND SIZES UPON DEWATERING OF CSO. NOTE: CSO CAMERA VIDEO IS AVAILABLE UPON CONTRACTOR'S REQUEST.



DEWATERING OF EXCAVATIONS NOTES

1. CONTRACTOR IS RESPONSIBLE TO PROVIDE AND MAINTAIN DRY WORKING CONDITIONS WITHIN ALL EXCAVATIONS REQUIRED FOR THE CONTRACT WORK AND SHALL PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT (TANKS, PUMPS HOSES, FRAC TANKS, TRUCKS, ETC.) NECESSARY TO REMOVE, CONTAIN AND DISCHARGE DEWATERING FLUIDS FROM THE EXCAVATONS.
2. CONTRACTOR SHALL UTILIZE BEST MANAGEMENT PRACTICES TO MINIMIZE SEDIMENT ENTRAINMENT DURING PUMPING.
3. CONTRACTOR SHALL ENSURE ADEQUATE STORAGE CAPACITY SUCH THAT THE WORK IS NOT DELAYED AND SHALL UTILIZE ONLY CERTIFIED CLEAN STORAGE TANKS.
4. SEDIMENT FREE DEWATERING FLUIDS SHALL BE DISCHARGED TO THE ON-SITE GROUNDWATER TREATMENT FACILITY (GWTF) OR THE BSA SANITARY SEWER SYSTEM UNDER A TEMPORARY DISCHARGE PERMIT OBTAINED BY THE OWNER FROM BSA.
5. CONTRACTOR SHALL NOT EXCEED A FLOW RATE OF 100 GALLONS PER MINUTE FOR DEWATERING FLUIDS DISCHARGED TO THE ON-SITE GROUNDWATER TREATMENT FACILITY (GWTF) AND SHALL COMPLY WITH ALL BSA PERMIT CONDITIONS FOR APPROVED DISCHARGES TO THE BSA SANITARY SEWER SYSTEM.
6. CONTRACTOR SHALL COORDINATE THE SCHEDULE FOR DISCHARGES TO THE GWTF WITH OWNER'S ENGINEER AND SHALL BE RESPONSIBLE FOR MONITORING THE OPERATION OF THE DEWATERING SYSTEM AS REQUIRED.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR THE CHARACTERIZATION, REMOVAL, TRANSPORT AND PROPER DISPOSAL OF SEDIMENT GENERATED AS A RESULT OF DEWATERING OPERATIONS.

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STATE OF NEW YORK
JASON RONALD [illegible]
095099
LICENSED PROFESSIONAL ENGINEER

ELK STREET COMMERCE PARK

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

1 BABCOCK STREET
BUFFALO, NY 14210

NO:	DATE:	DESCRIPTION:
6		
5		
4		
3		
2		
1	12/21	ADDRESSED NYSDEC COMMENTS

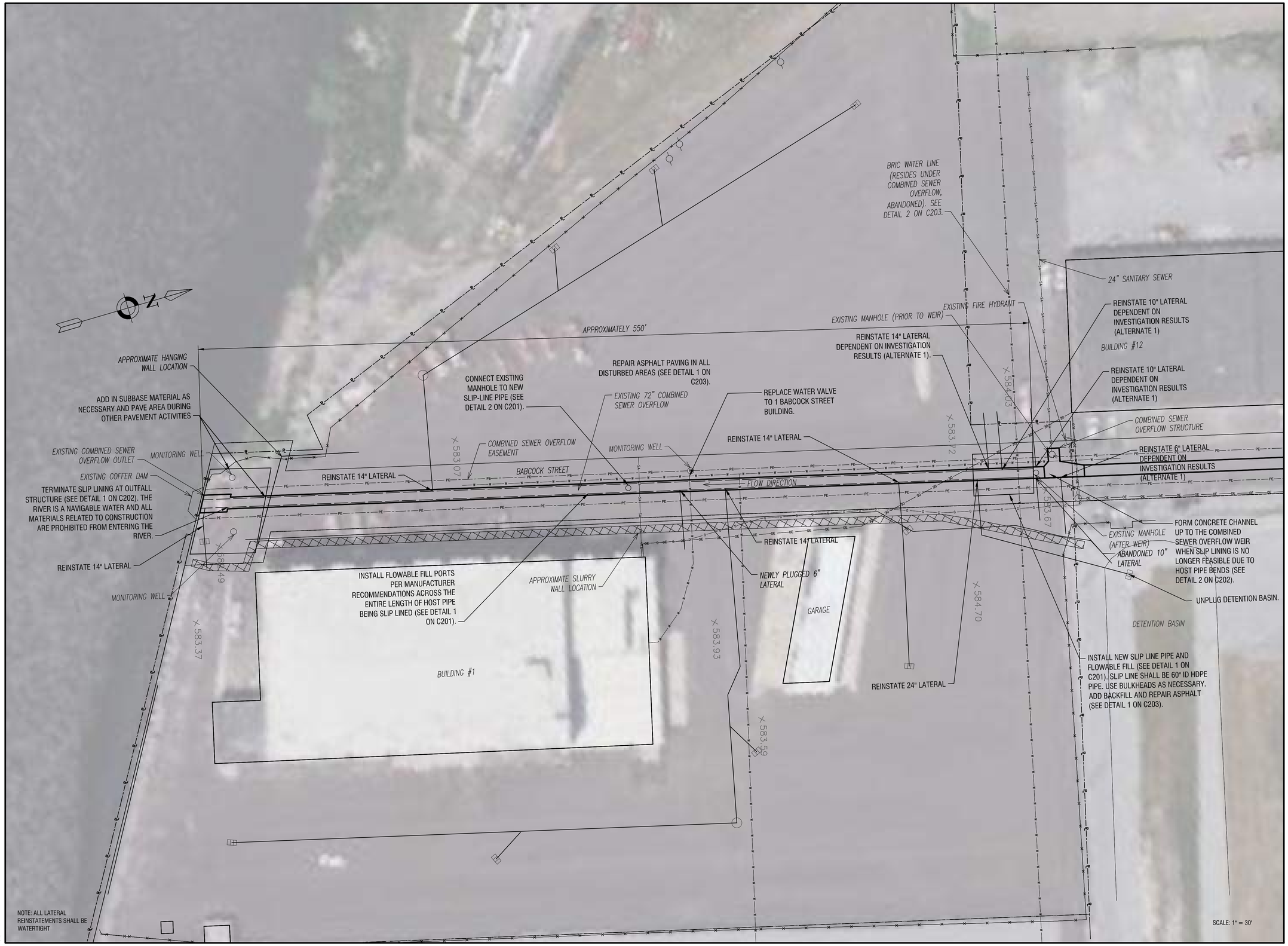
Revisions

PROJECT NUMBER: 2200012
DRAWN BY: DMB
REVIEWED BY: BBU
ISSUED FOR: SUBMISSION SET
DATE: DECEMBER 2021
DRAWING NAME:

SITE TEMPORARY PUMPING PLAN

DRAWING NUMBER:

C102



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ELK STREET COMMERCE PARK

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

1 BABCOCK STREET
BUFFALO, NY 14210

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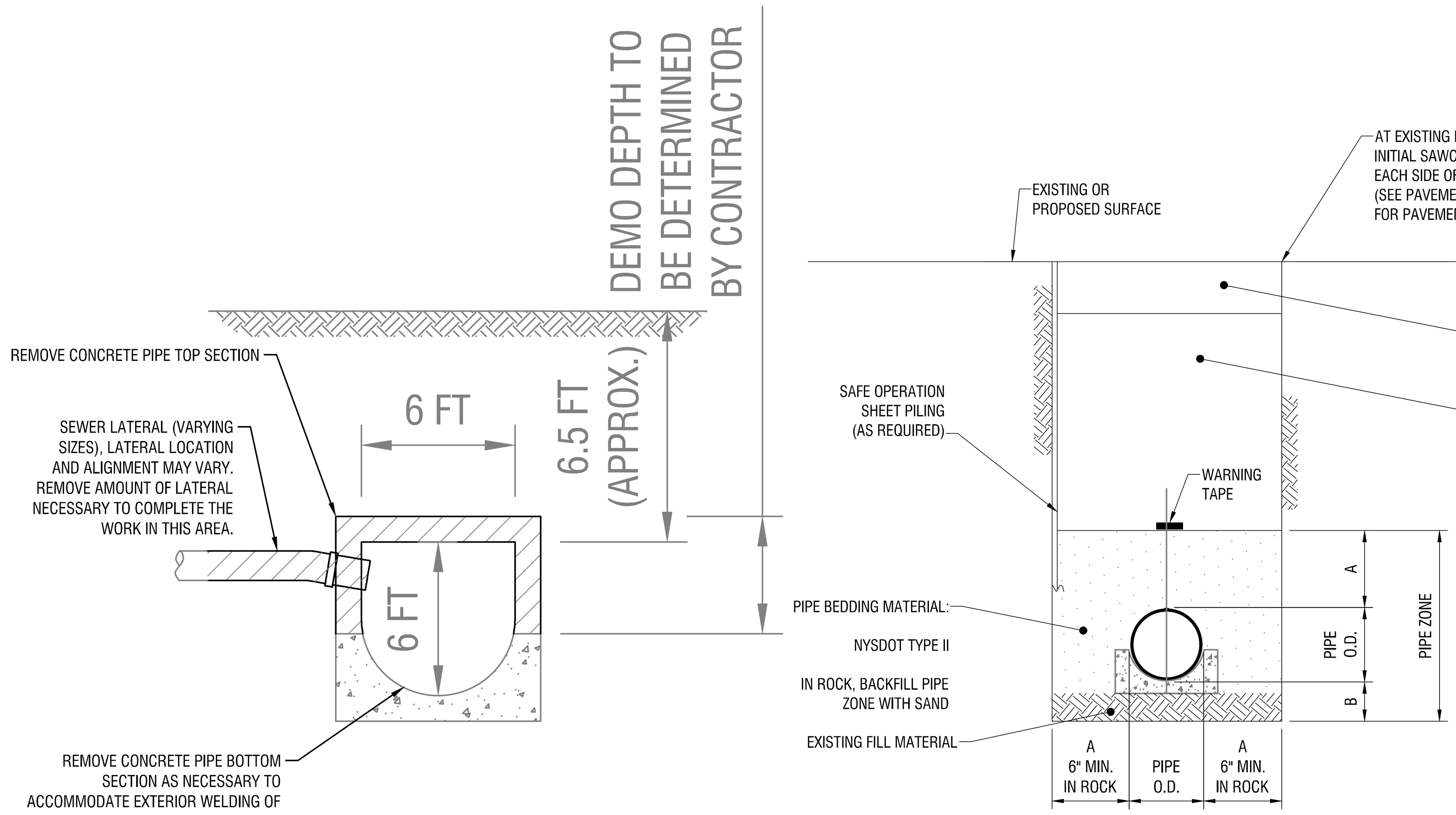
DATE: DECEMBER 2021
DRAWING NAME:

SITE PLAN

DRAWING NUMBER:

C103



PIPE DEMO SECTION

PIPE PROPOSED SECTION

NOTE:

BEDDING AND BACKFILL MATERIAL INSTALLED & COMPACTED IN MAXIMUM 6" LIFTS.

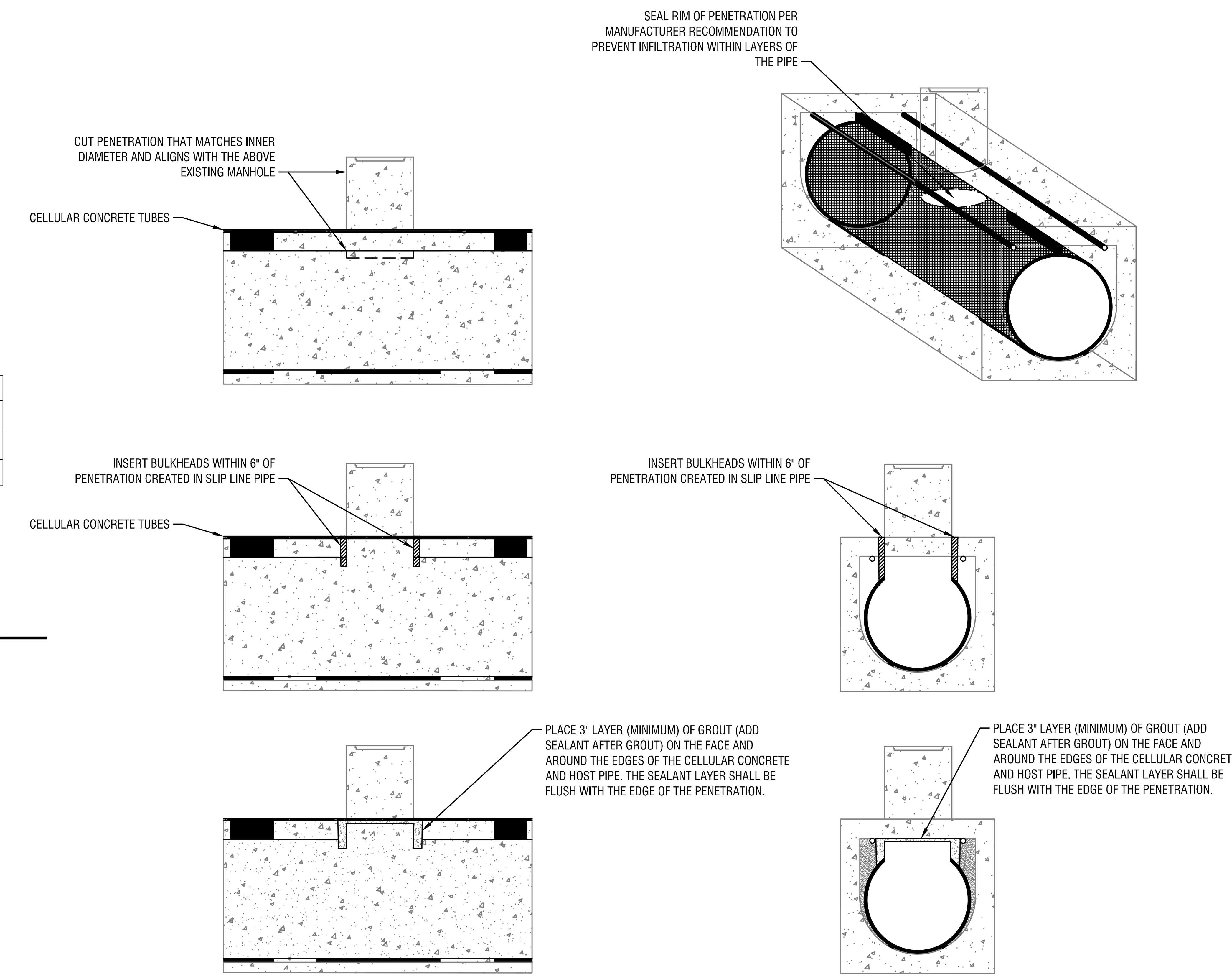
PIPE DIA.	DIM. A	DIM. B
UP TO 18"	1'-0" (MIN.)	6"
19" TO 36"	1'-6" (MIN.)	9"
OVER 36"	2'-0" (MIN.)	12"

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR DEWATERING TO PREVENT GROUND WATER FROM ENTERING NAVIGABLE WATERS. CONTRACTOR TO COORDINATE WITH OWNER BEFORE DEWATERING PROCESS.

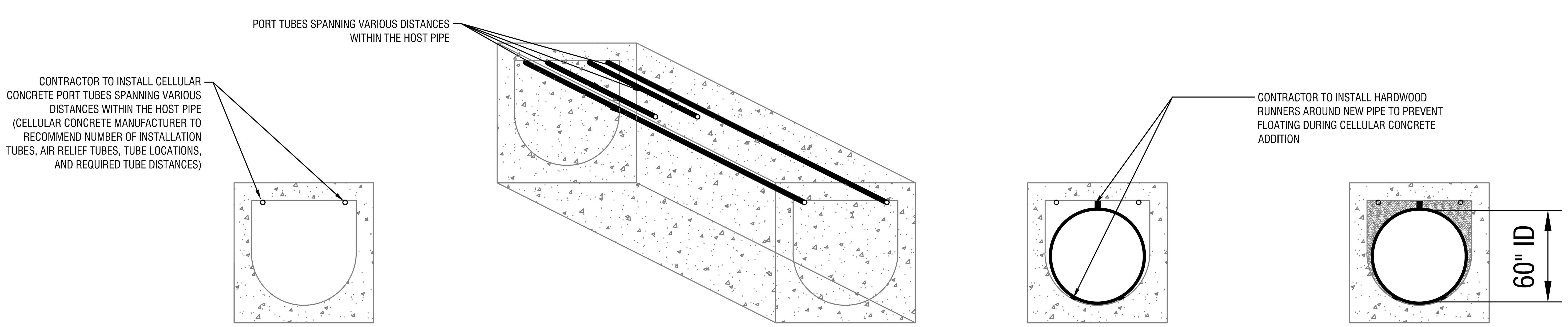
3 / C201 OPEN CUT SECTION

N.T.S.



2 / C201 MANHOLE CONNECTION

N.T.S.



1 / C201 SLIP LINE INSTALLATION VIEWS

N.T.S.

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ELK STREET COMMERCE PARK

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

1 BABCOCK STREET
BUFFALO, NY 14210

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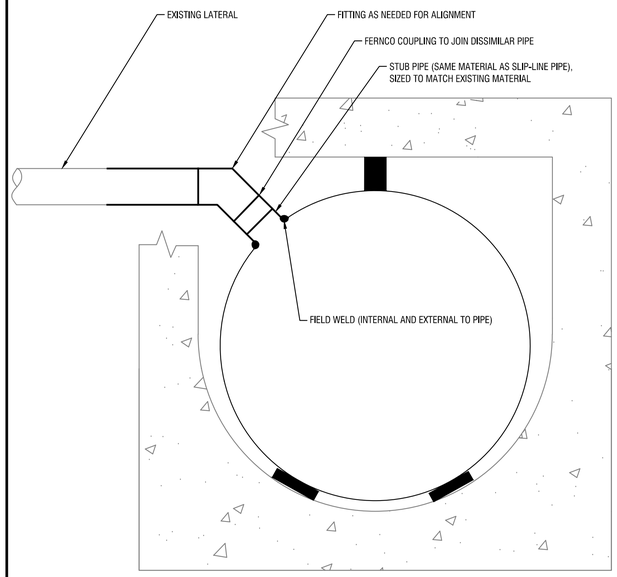
DRAWING NAME:

CONSTRUCTION DETAILS (1 OF 3)

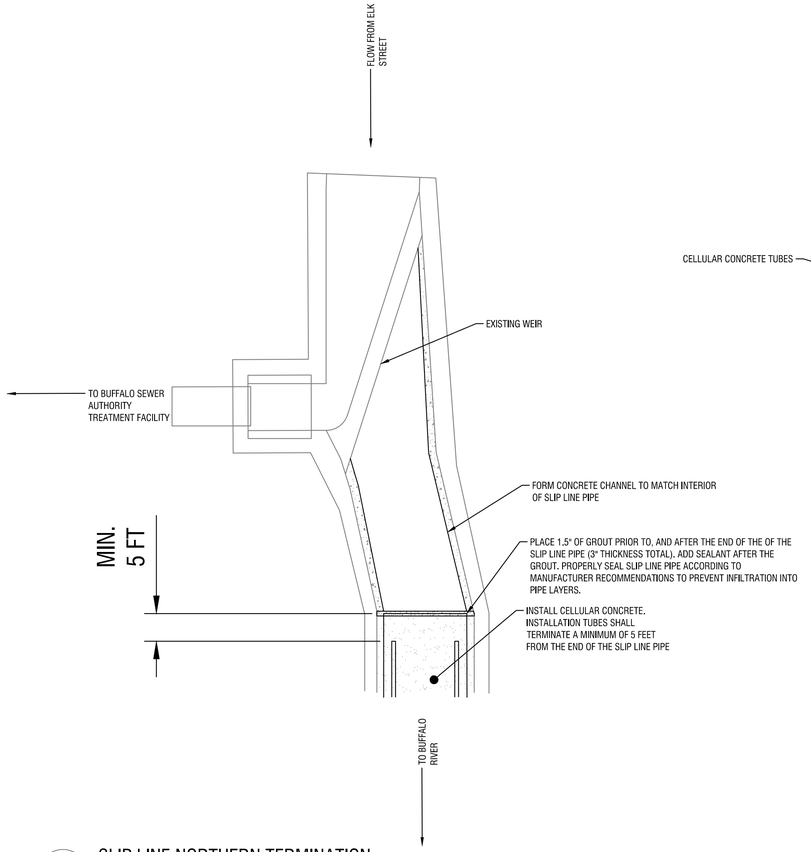
DRAWING NUMBER:

C201



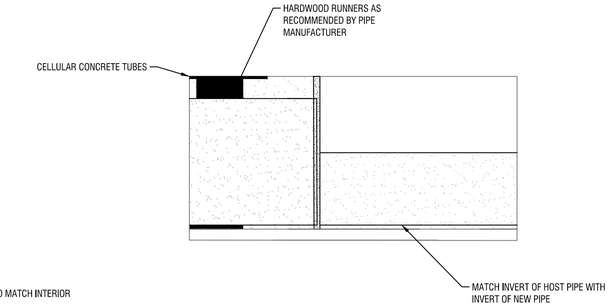
3 C202 LATERAL REINSTATEMENT

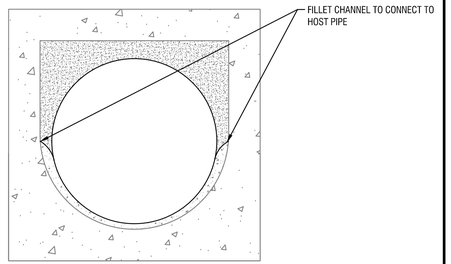
N.T.S.

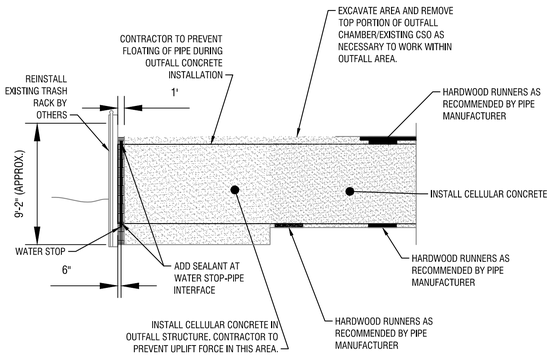


2 C202 SLIP LINE NORTHERN TERMINATION

N.T.S.





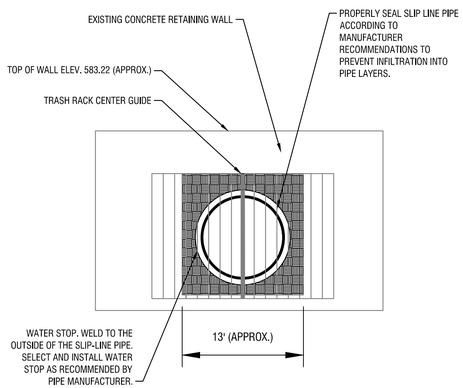


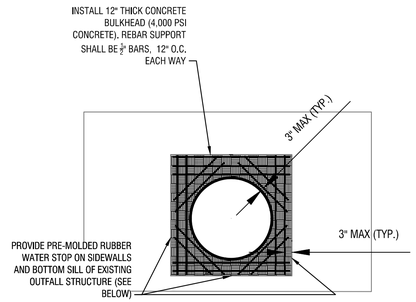
SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL PIPE TO THE EDGE OF THE OUTFALL STRUCTURE AS SHOWN (SUPPORT PIPE WITHIN OUTFALL STRUCTURE TO PREVENT SAGGING). ADD WATER STOP AROUND PIPE AREA TO BE ENCLOSED BY THE BULKHEAD. ADD SEALANT TO WATER STOP-PIPE INTERFACE.
2. INSTALL REBAR AND CONCRETE BULKHEAD. ADD SEALANT TO EXTERIOR (RIVER SIDE) BULKHEAD-PIPE INTERFACE.
3. REINSTATE STORMWATER LATERAL IN OUTFALL STRUCTURE.
4. REMOVE TEMPORARY SUPPORT UNDERNEATH THE PIPE SECTION IN THE OUTFALL STRUCTURE AND ADD CELLULAR CONCRETE.

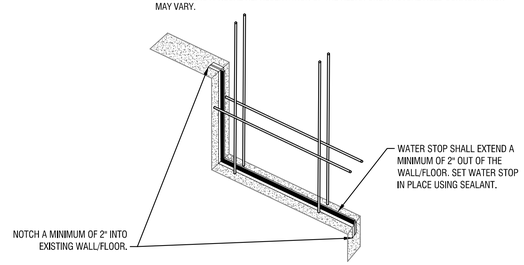
1 C202 COMBINED SEWER OVERFLOW EXIT

N.T.S.





NOTE: THIS IS A VISUAL REPRESENTATION OF THE REBAR ONLY. ACTUAL FIELD CONFIGURATION MAY VARY.



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BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

1 BABCOCK STREET
BUFFALO, NY 14210

NO:	DATE:	DESCRIPTION:
6		
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Revisions

PROJECT NUMBER: 2200012

DRAWN BY: DMB

REVIEWED BY: BBU

ISSUED FOR: SUBMISSION SET

DATE: DECEMBER 2021

DRAWING NAME:

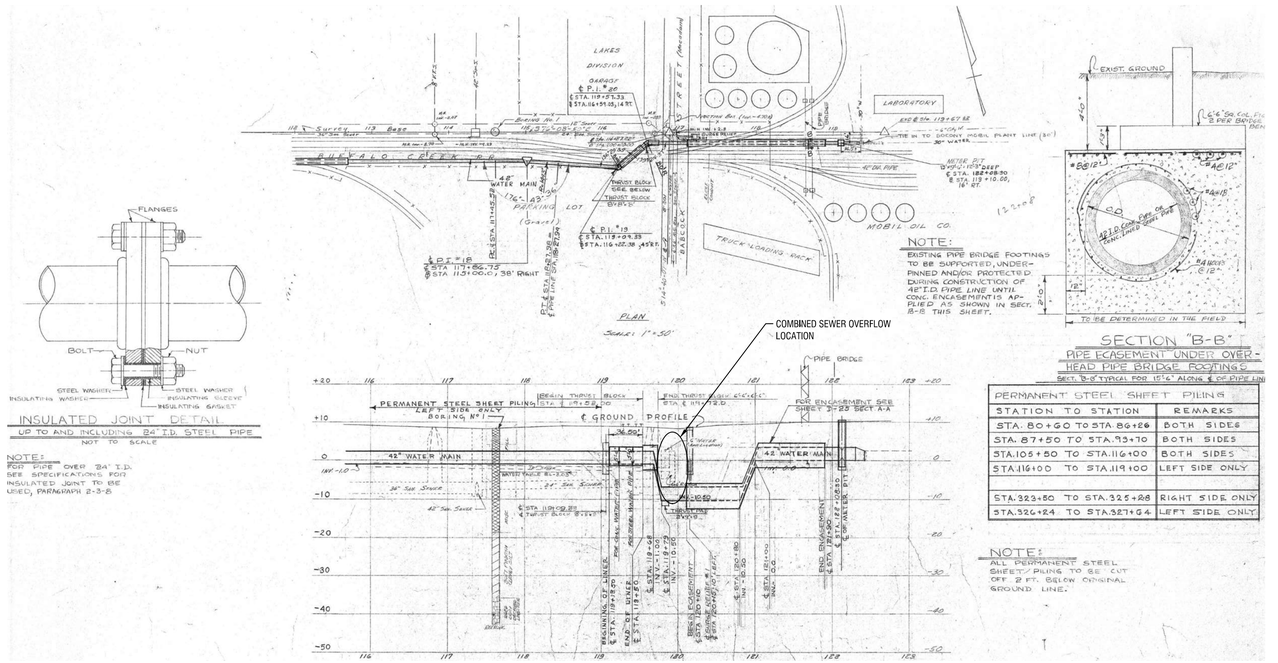
CONSTRUCTION DETAILS (2 OF 3)

DRAWING NUMBER:

C202

3 C203 DESIGNATED STORMWATER DIVERSION SURFACE DISCHARGE AREAS

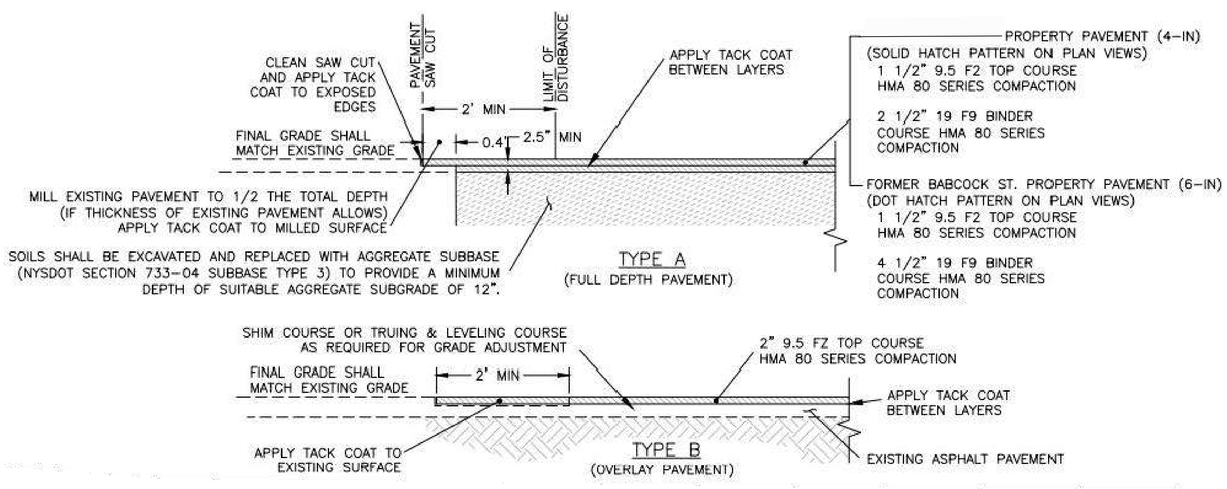
N.T.S.



PERMANENT STEEL SHEET PILING	
STATION TO STATION	REMARKS
STA. 80+60 TO STA. 86+26	BOTH SIDES
STA. 87+50 TO STA. 93+70	BOTH SIDES
STA. 105+50 TO STA. 116+00	BOTH SIDES
STA. 116+00 TO STA. 119+00	LEFT SIDE ONLY
STA. 323+50 TO STA. 325+28	RIGHT SIDE ONLY
STA. 326+24 TO STA. 327+64	LEFT SIDE ONLY

2 C203 ABANDONED BRIC WATER LINE (PASSES UNDERNEATH COMBINED SEWER OVERFLOW)

N.T.S.



1 C203 PAVEMENT DETAIL

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BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

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ISSUED FOR: SUBMISSION SET
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CONSTRUCTION DETAILS (3 OF 3)

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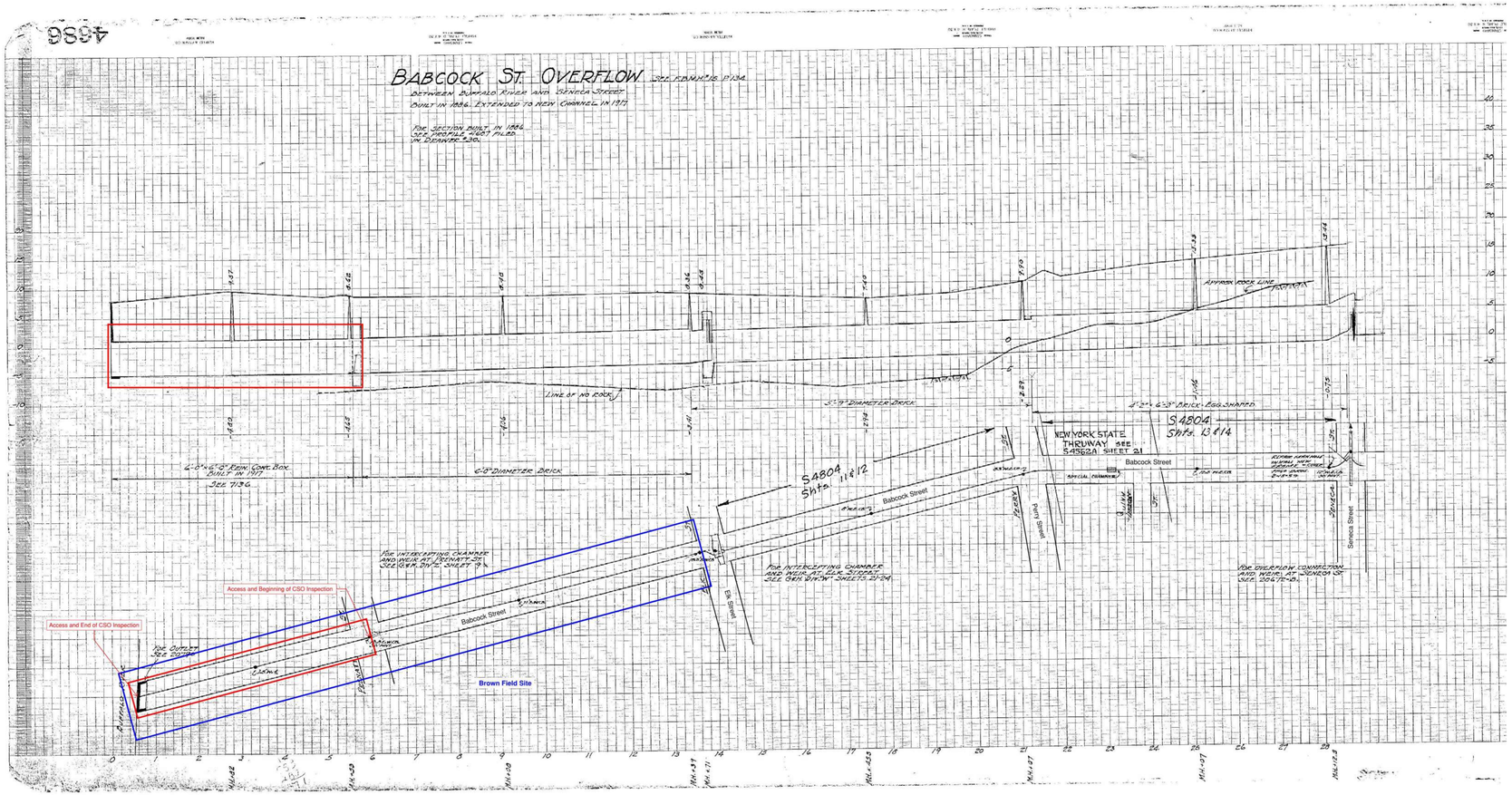
C203



1 R001 SEWER PLAN AND PROFILE REFERENCE DRAWING

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ISSUED FOR: SUBMISSION SET

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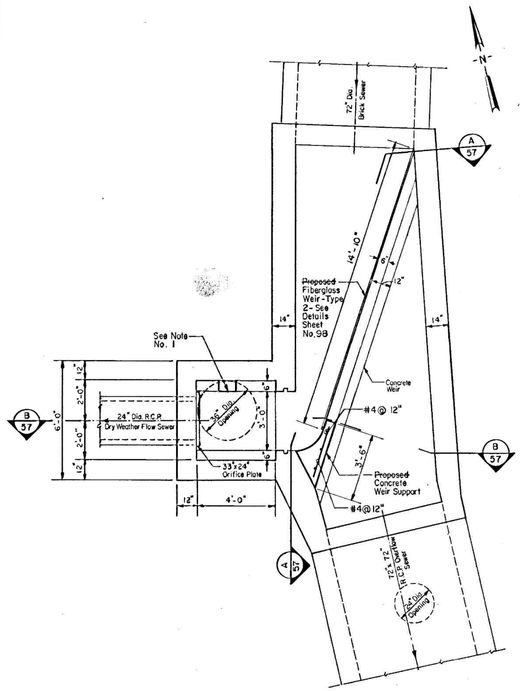
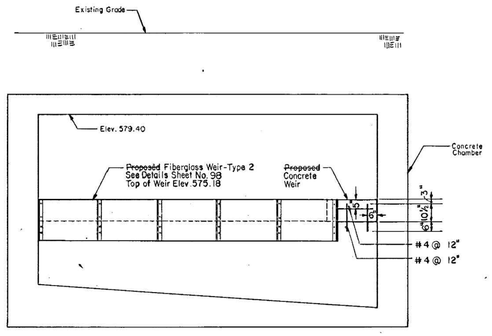
REFERENCE DRAWING NOT IN CONTRACT (1 OF 2)

DRAWING NUMBER:

R001



IMPROVEMENT PLAN
Scale: 3/8"=1'-0"



SECTION A 57
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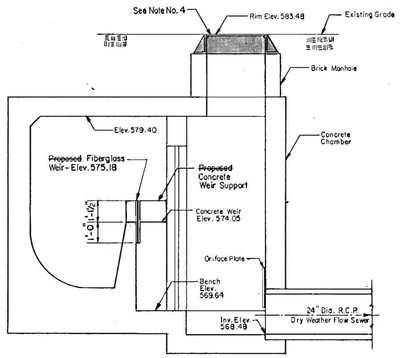

SECTION B 57
Scale: 3/8"=1'-0"

DEMOLITION NOTES:

1. Existing manhole steps are to be removed before installing proposed gunite lining.

IMPROVEMENT NOTES:

2. Entire structure is to receive a Type VII Gunite Lining. See Details on Sheet No. 104.
3. New manhole steps are to be installed as directed by the Engineer. See Details on Sheet 100.
4. Existing manhole frame and cover is to be removed and a new 36" frame with two covers is to be installed. See Details on Sheet No. 100.

AS BUILT
AS - BUILT
Inspector: D.B., R.K.
Made by: N.G.
Checked by:
Date:
S4805

NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

3/8"=1'-0" 1 0 1 2 3 4 5 6 7 Ft.

REVISIONS
6/83

BUFFALO SEWER AUTHORITY — BUFFALO, NEW YORK

BACKWATER PROTECTION IMPROVEMENTS

CONTRACT NO. IA - SITE NO. 80

IMPROVEMENT PLAN

Calocerinos & Spina CONSULTING ENGINEERS Buffalo, New York 14202

DATE: MARCH 21, 1983
SCALE: AS SHOWN
FILE NO. 140.009.001
SHEET NO. 57

IN CHARGE OF: F.N. Drake Jr.
MADE BY: R. Kilmczar
CHECKED BY: M.F. Leydecker

1 / R002 COMBINED SEWER OVERFLOW WEIR REFERENCE DRAWING
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ELK STREET COMMERCE PARK

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR
1 BABCOCK STREET
BUFFALO, NY 14210

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REVIEWED BY: BBU
ISSUED FOR: SUBMISSION SET
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DRAWING NAME:

REFERENCE DRAWING NOT IN CONTRACT (2 OF 2)

DRAWING NUMBER:

R002

CONTRACT DOCUMENTS

for the

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

Prepared for:

ELK STREET COMMERCE PARK
BUFFALO, NEW YORK

Prepared by:

LABELLA ASSOCIATES, D.P.C.
300 STATE STREET
ROCHESTER, NEW YORK 14614

LaBella Project No. 2200012

December 2021

TABLE OF CONTENTS

LIST OF CONTRACT DRAWINGS

LIST OF REFERENCE DRAWINGS

DIVISION 0

DOCUMENT 000107 - SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

A. Civil Process Engineer: Jason Ebbs

END OF DOCUMENT 000107

SECTION 003126 - EXISTING HAZARDOUS MATERIAL INFORMATION

1.1 EXISTING HAZARDOUS MATERIAL INFORMATION

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Contractor's convenience and are intended to supplement rather than serve in lieu of Contractor's own investigations. They are made available for Contractor's convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. Portions of an existing Hydrogeologic Investigation report for the Project, prepared by LaBella Associates, D.P.C., dated July, 2021, is available for viewing as appended to this Document. Only pertinent information related to the Project is included in the attachment.

C. Related Requirements:

1. Section 024119 “Selective Demolition” for notification requirements if materials suspected of containing hazardous materials are encountered.

END OF DOCUMENT 003126

ATTACHMENTS:

A. HYDROGEOLOGIC INVESTIGATION REPORT BABCOCK STREET COMBINED SEWER OVERFLOW: FIGURE NOS. 5-8; BORING LOGS CS-SB-5, CSO-SB-6, AND CSO-SB-15.

ATTACHMENT A

HYDROGEOLOGIC INVESTIGATION REPORT BABCOCK STREET COMBINED SEWER OVERFLOW: FIGURE NOS. 5-8; BORING LOGS CS-SB-5, CSO-SB-6, AND CSO-SB-15

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

Creator: JR

Path: \\projects1\projectsAM\Elk Street Commerce Park\2200012 - OM&M Elk St Commerce\GIS\MXD\Hydro_Investigation\2021_06\Figure 5 - Lines of Cross Sections.mxd

LaBella
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Hydrogeologic Investigation Report

Babcock Street Combined Sewer Overflow Area ExxonMobil Former Buffalo Terminal Operable Unit No. 3

N

0 50 100 Feet

Legend

- CSO Manhole
- Monitoring Well
- Pump Test Well
- Stilling Well
- Soil Boring
- Piezometer
- Cross-Section Location
- Babcock St. CSO Structure
- Slurry Wall
- Operational Unit 3 (OU-3) Boundary

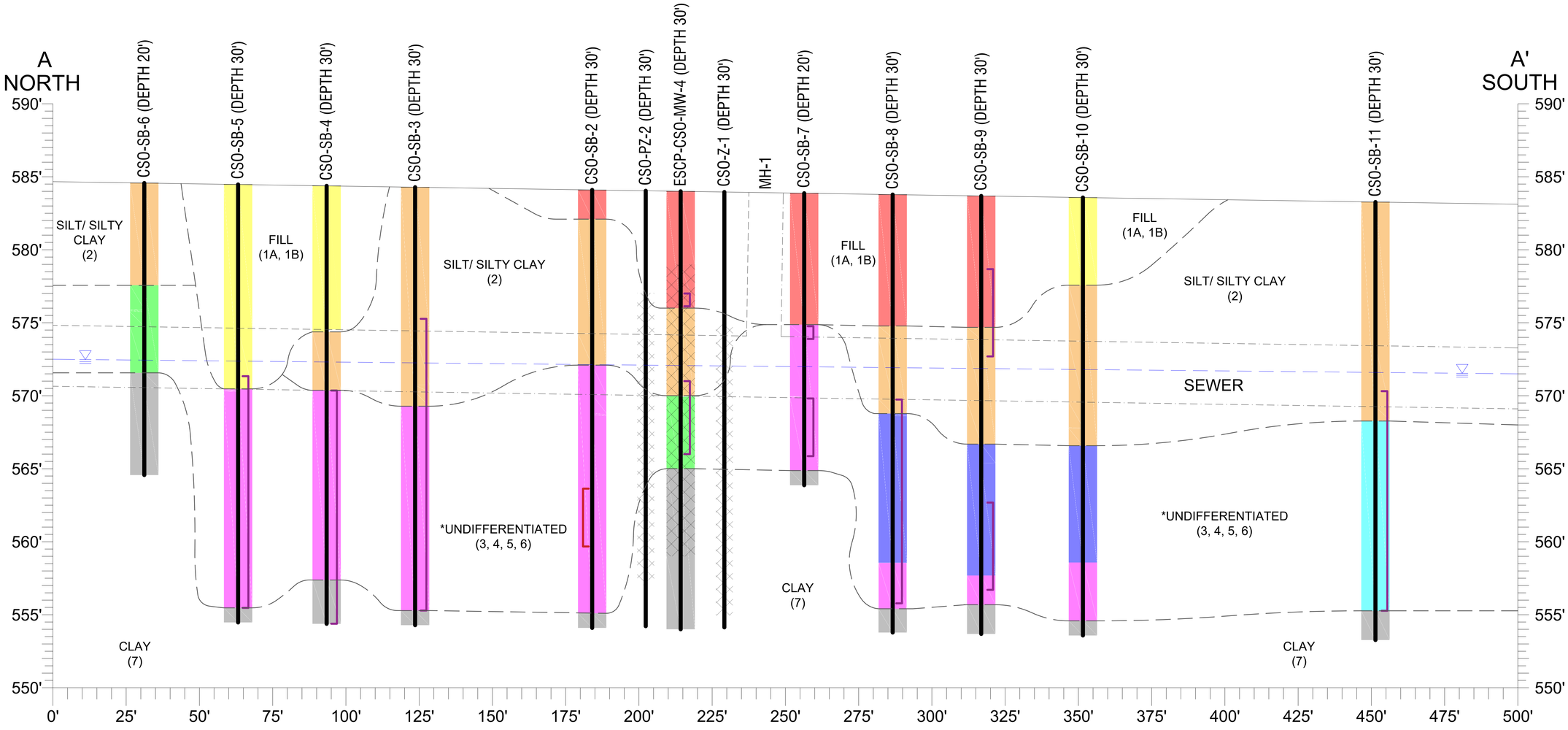
Note: Well ESCP-CSO-MW-4 installed at the borehole location for CSO-SB-1.

Sources: Bing 2020; Erie County 2020; LaBella 2021.

Lines of Cross-Sections

Figure 5

LaBella Project No: 2200012
Date: May 2021



GROUNDWATER
AMBER PRODUCT OBSERVED
DARK PRODUCT OBSERVED

* UNDIFFERENTIATED SILTY/SAND GRAVEL (3)/ INTERBEDDED BROWN CLAY AND SANDY GRAVEL LENSING (4)/ FINE SAND (5)/ SANDY GRAVEL (6)

1A = FILL - WOOD, BRICK, CONCRETE IN SILTY CLAY MATRIX
1B = FILL - WOOD, BRICK, CONCRETE IN SILTY SANDY GRAVELLY MATRIX
2 = SILT/SILTY CLAY
3 = SILTY/SANDY GRAVEL
4 = INTERBEDDED BROWN CLAY AND SANDY GRAVEL LENSING
5 = FINE SAND
6 = SANDY GRAVEL
7 = CLAY
SCREEN

NO.	REVISION	BY	DATE

LaBella
Powered by partnership.

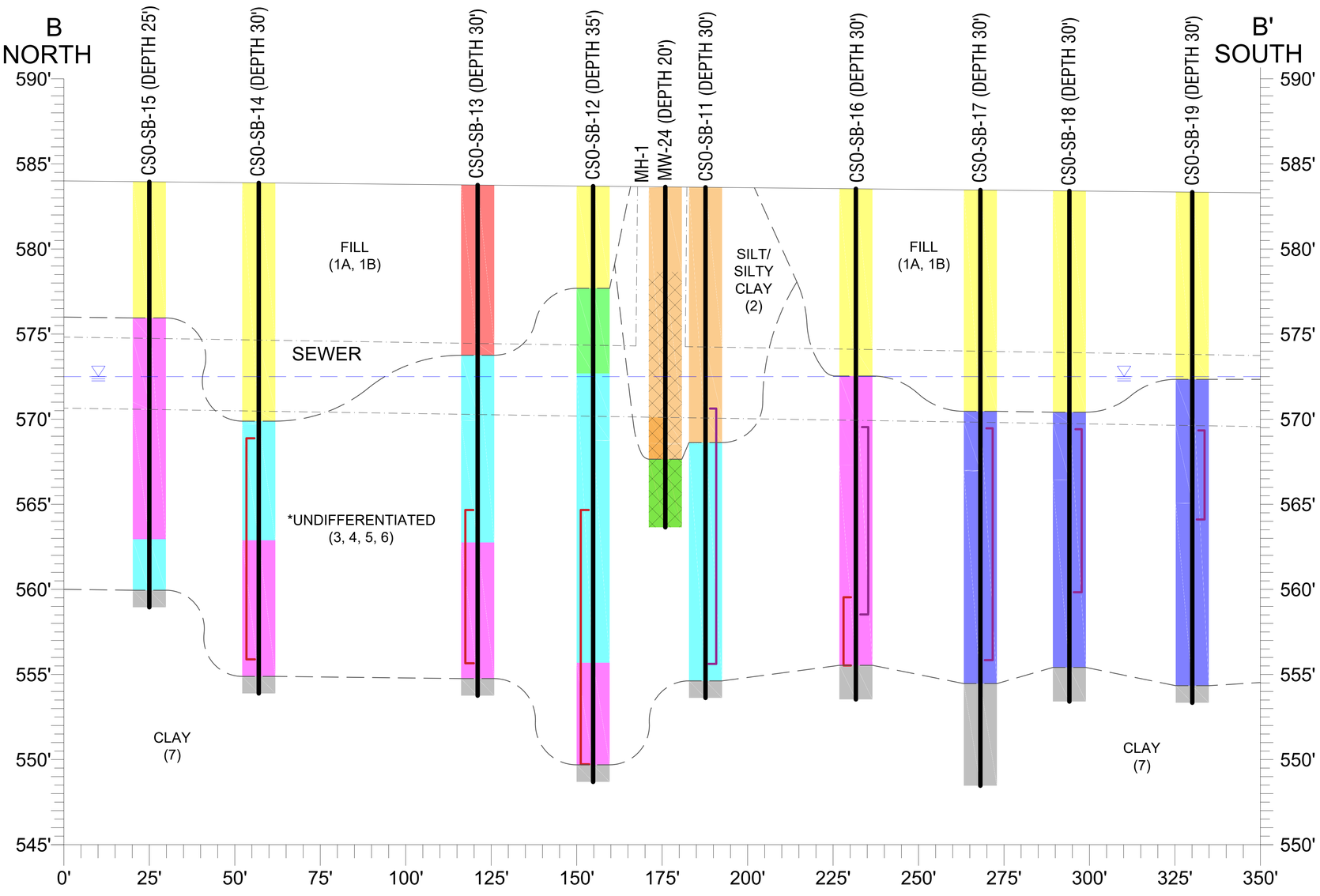
PROJECT/CLIENT
HYDROGEOLOGIC INVESTIGATION REPORT
BABCOCK STREET COMBINED SEWER OVERFLOW AREA
EXXONMOBILE FORMER BUFFALO TERMINAL OPERABLE UNIT NO. 3

DRAWING TITLE
CROSS SECTION A-A'

DESIGNED BY: RH
DRAWN BY: DRP
REVIEWED BY: RH
ISSUED FOR: FINAL
DATE: MAY, 2021

PROJECT/DRAWING NUMBER
2200012

FIGURE 6



GROUNDWATER
AMBER PRODUCT OBSERVED
DARK PRODUCT OBSERVED

* UNDIFFERENTIATED SILTY/SAND GRAVEL (3)/ INTERBEDDED BROWN CLAY AND SANDY GRAVEL LENSING (4)/ FINE SAND (5)/ SANDY GRAVEL (6)

1A = FILL - WOOD, BRICK, CONCRETE IN SILTY CLAY MATRIX

1B = FILL - WOOD, BRICK, CONCRETE IN SILTY SANDY GRAVELLY MATRIX

2 = SILT/SILTY CLAY

3 = SILTY/SANDY GRAVEL

4 = INTERBEDDED BROWN CLAY AND SANDY GRAVEL LENSING

5 = FINE SAND

6 = SANDY GRAVEL

7 = CLAY

SCREEN

NO.	REVISION	BY	DATE

LaBella
Powered by partnership.

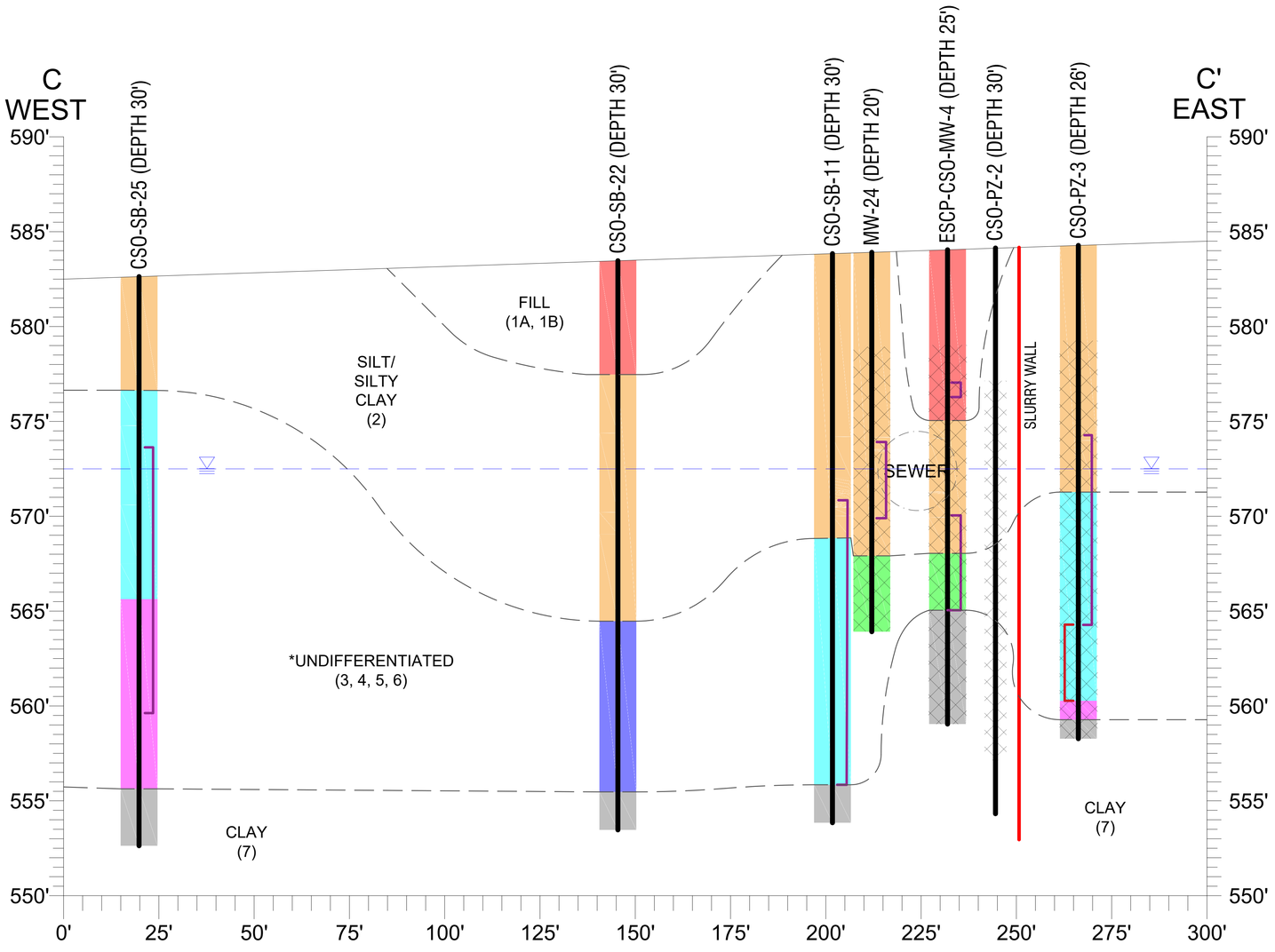
PROJECT/CLIENT
HYDROGEOLOGIC INVESTIGATION REPORT
BABCOCK STREET COMBINED SEWER OVERFLOW AREA
EXXONMOBILE FORMER BUFFALO TERMINAL OPERABLE UNIT NO. 3

DRAWING TITLE
CROSS SECTION B-B'

ISSUED FOR: FINAL
DATE: MAY, 2021
DESIGNED BY: RH
DRAWN BY: DRP
REVIEWED BY: RH

PROJECT/DRAWING NUMBER
2200012

FIGURE 7



GROUNDWATER
AMBER PRODUCT OBSERVED
DARK PRODUCT OBSERVED

* UNDIFFERENTIATED SILTY/SAND GRAVEL (3)/ INTERBEDDED BROWN CLAY AND SANDY GRAVEL LENSING (4)/ FINE SAND (5)/ SANDY GRAVEL (6)

1A = FILL - WOOD, BRICK, CONCRETE IN SILTY CLAY MATRIX
1B = FILL - WOOD, BRICK, CONCRETE IN SILTY SANDY GRAVELLY MATRIX
2 = SILT/SILTY CLAY
3 = SILTY/SANDY GRAVEL
4 = INTERBEDDED BROWN CLAY AND SANDY GRAVEL LENSING
5 = FINE SAND
6 = SANDY GRAVEL
7 = CLAY
SCREEN

NO.	REVISION	BY	DATE

LaBella
Powered by partnership.

PROJECT/CLIENT
HYDROGEOLOGIC INVESTIGATION REPORT
BABCOCK STREET COMBINED SEWER OVERFLOW AREA
EXXONMOBILE FORMER BUFFALO TERMINAL OPERABLE UNIT NO. 3

DRAWING TITLE
CROSS SECTION C-C'

DESIGNED BY: RH
DRAWN BY: DRP
REVIEWED BY: RH
ISSUED FOR: FINAL
DATE: MAY, 2021

PROJECT/DRAWING NUMBER
2200012

FIGURE 8

LaBella Powered by partnership. **300 PEARL STREET, BUFFALO, NY** **ENVIRONMENTAL ENGINEERING CONSULTANTS**	Elk Street Commerce Park, LLC CSO Investigation	**BORING:** **CSO-SB-5** SHEET 1 OF 1 **JOB:** **ESCP #2200012** CHKD BY:

CONTRACTOR:	LaBella LLC	BORING LOCATION: Babcock Street CSO Outfall	
DRILLER:	Neal Short	GROUND SURFACE ELEVATION	NA
LABELLA REPRESENTATIVE:	Andy Janik	START DATE:	4/5/2021 1515

TYPE OF EQUIPMENT:	GP-6610DT	DRIVE SAMPLER TYPE:	Acetate liners
AUGER SIZE AND TYPE:	Direct Push	INSIDE DIAMETER:	1.5"
OVERBURDEN SAMPING METHOD	Field Screening	OTHER:	-

DEPTH	SAMPLE BLOW COUNT	SAMPLE RECOVERY	STRATA CHANGE	VISUAL CLASSIFICATION	PID FIELD SCREEN (PPM)	NOTES
0-5'	-	95%	-	Pavement, Fill- brick, stone, concrete	10.4	
5'-10'	-	50%	-	Fill- concrete, brick; to medium Gravel	2.3	
10'-15'	-	30%	-	Moist to wet Sandy Gravel at 14', with sheen	144.5	Observed Groundwater at 14'
15'-20'	-	10%	-	Push	28.6	
20'-25'	-	10%	-	Push	7.8	
25'-30'	-	20%	-	Continued wet, Sandy Gravel, gray, some residual sheen to smooth red/brown Clay at 29'	13.4	Observed Clay at 29'
						Impacts observed at location

WATER LEVEL DATA			DEPTH (FT)			NOTES:	
DATE	TIME	ELASPED TIME	BOTTOM OF CASING	BOTTOM OF BORING	GROUNDWATER ENCOUNTERED	NA = Not Applicable	WH = Weight of Hammer
						ND = Non Detect	WR = Weight of Rod
-	-	-	-	-	-		

GENERAL NOTES

1) STRATIFICATION LINES REPRESENT APPROXMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCURE DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

LaBella Powered by partnership. **300 PEARL STREET, BUFFALO, NY** **ENVIRONMENTAL ENGINEERING CONSULTANTS**	Elk Street Commerce Park, LLC CSO Investigation	**BORING:** **CSO-SB-6** SHEET 1 OF 1 **JOB:** **ESCP #2200012** CHKD BY:

CONTRACTOR:	LaBella LLC	BORING LOCATION: Babcock Street CSO Outfall	
DRILLER:	Neal Short	GROUND SURFACE ELEVATION	NA
LABELLA REPRESENTATIVE:	Andy Janik	START DATE:	4/6/2021 0815

TYPE OF EQUIPMENT:	GP-6610DT	DRIVE SAMPLER TYPE:	Acetate liners
AUGER SIZE AND TYPE:	Direct Push	INSIDE DIAMETER:	1.5"
OVERBURDEN SAMPING METHOD	Field Screening	OTHER:	-

DEPTH	SAMPLE			VISUAL CLASSIFICATION	PID FIELD SCREEN (PPM)	NOTES
	BLOW COUNT	SAMPLE RECOVERY	STRATA CHANGE			
0-5'	-	100%	-	Pavement, concrete, to olive, black stained Silt	44.8	
5'-10'	-	70%	-	Olive Silty/Sandy/Clay, with trace organics to wet, black, coarse Gravel	80.4	Observed Groundwater at 10'
10'-15'	-	60%	-	Wet, coarse, Gravel, to moist, smooth, red/brown Clay	6.8	Observed Clay at 12'
15'-20'	-	10%	-	Push	28.6	

WATER LEVEL DATA			DEPTH (FT)			NOTES:	
DATE	TIME	ELASPED TIME	BOTTOM OF CASING	BOTTOM OF BORING	GROUNDWATER ENCOUNTERED	NA = Not Applicable	WH = Weight of Hammer
-	-	-	-	-	-	ND = Non Detect	WR = Weight of Rod

GENERAL NOTES

1) STRATIFICATION LINES REPRESENT APPROXMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCURE DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

LaBella Powered by partnership. **300 PEARL STREET, BUFFALO, NY** **ENVIRONMENTAL ENGINEERING CONSULTANTS**	Elk Street Commerce Park, LLC CSO Investigation	**BORING:** **CSO-SB-15** SHEET 1 OF 1 **JOB:** **ESCP #2200012** CHKD BY:

CONTRACTOR:	LaBella LLC	BORING LOCATION: Babcock Street CSO Outfall	
DRILLER:	Neal Short	GROUND SURFACE ELEVATION	NA
LABELLA REPRESENTATIVE:	Andy Janik	START DATE:	4/8/2021 0900

TYPE OF EQUIPMENT:	GP-6610DT	DRIVE SAMPLER TYPE:	Acetate liners
AUGER SIZE AND TYPE:	Direct Push	INSIDE DIAMETER:	1.5"
OVERBURDEN SAMPING METHOD	Field Screening	OTHER:	-

DEPTH	SAMPLE			VISUAL CLASSIFICATION	PID FIELD SCREEN (PPM)	NOTES
	BLOW COUNT	SAMPLE RECOVERY	STRATA CHANGE			
0-5'	-	100%	-	Pavement/concrete, to brown, Silty Sandy Fill	1.3	
5'-10'	-	85%	-	Continued Silty Sandy Fill to moist, black, oily Silty Sand	21.9	
10'-15'	-	85%	-	Wet, gray, Sandy Gravel	28.6	Observed Groundwater at 13'
15'-20'	-	90%	-	Wet, medium Sand, some Gravel, trace of oil, to moist brown Clay at 19.5'	242.8	
20'-25'	-	100%	-	Wet, intermittent brown Clay and Sandy Gravel lenses to smooth, red/brown Clay at 23'	15.4	Observed Clay at 23'
						Impacts observed at location

WATER LEVEL DATA			DEPTH (FT)		
DATE	TIME	ELASPED TIME	BOTTOM OF CASING	BOTTOM OF BORING	GROUNDWATER ENCOUNTERED
-	-	-	-	-	-

NOTES:
NA = Not Applicable WH = Weight of Hammer
ND = Non Detect WR = Weight of Rod

GENERAL NOTES

1) STRATIFICATION LINES REPRESENT APPROXMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCURE DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

DIVISION 1

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Contract description.
2. Work by Owner or others at the Site.
3. Contractor's use of Site.
4. Owner occupancy.

1.2 CONTRACT DESCRIPTION

A. General Construction

1. Work within the Project includes excavation and removal of a portion of the existing combined sewer overflow pipe (also referred to as the “host pipe”), slip-lining the combined sewer overflow pipe with a new pipe, placement of cellular concrete within the annular space between the host pipe and the new pipe, backfilling the area where the host pipe is removed, and installing a new water valve to 1 Babcock Street. Contractor will be responsible for capping stormwater laterals prior to and reinstating stormwater laterals after the installation of the new pipe. Contractor shall coordinate all lateral work with the owner. Contractor is responsible for purchasing and installing equipment/piping listed in the Specifications and Drawings.

a. Contractor is responsible for all dewatering and bypass pumping activities. Bypass pumping will require Buffalo Sewer Authority and/or New York State Department of Environmental Conservation approval.

b. Contractor will be required to complete a pre-installation inspection, to field verify conditions.

1.3 CONTRACTOR'S USE OF SITE

A. Construction Operations: Limited to areas indicated on Drawings

B. Utility Outages and Shutdown:

1. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing and under the following conditions.
2. Coordinate and schedule electrical and other utility outages with Owner.
3. Outages: Allowed only at previously agreed upon times.
4. At least 10 business days before scheduled outage, submit Outage Request Plan to Engineer itemizing the dates, times, and duration of each requested outage. Outage Request Plan form will be provided to Contractor upon Contractor’s request.

C. Sound Level Restrictions: Sound pressure level measured at boundary of Site shall not exceed 80 dBA.

D. Construction Plan: Before start of construction, submit construction plan regarding access to Work, use of Site, phasing of demolition, and utility outages for acceptance by Owner. After acceptance of plan, construction operations shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.4 OWNER OCCUPANCY

A. The Owner shall have the right to take possession of and use any completed or partially completed portions of the Work notwithstanding at the time for completing the entire Work or such portion may not have expired; but such taking possession and use shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents nor shall it relieve the Contractor of any obligation to complete the Work, nor shall it bear upon the start of the warranty period.
   1. Owner's use and occupancy of designated areas before Substantial Completion of the entire Project do not relieve Contractor of responsibility to maintain specified insurance coverages on a 100 percent basis until date of final payment.

B. Owner will occupy Site during entire period of construction.

C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

D. Schedule the Work to accommodate Owner occupancy.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 011000

DIVISION 2

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of combined sewer overflow pipe and stormwater laterals.
2. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

F. Abandon In Place: To leave an item/piece of equipment in its current location, after disconnecting it from the process it had previously belonged to.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PRECONSTRUCTION MEETING

A. Section 013000 – Administrative Requirements: Requirements for preconstruction meeting.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Predemolition Photographs: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Present in items and structures to be selectively demolished.
   1. Known information regarding the presence of existing hazardous materials on Site is documented in the attachments, "Hydrogeologic Investigation Report Babcock Street Combined Sewer Overflow" and "Babcock Street Properties Area Investigation Completion Report Volume I of II", to Section 003126 – Existing Hazardous Material Information. These documents are presented with the intention to reduce, but not eliminate, uncertainty regarding the potential for hazardous materials at the Site.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
   3. If a hazardous material, or an item or material suspected to contain hazardous materials, is encountered and procedures for remediation or that material are not included in the Contract Documents, do not disturb, immediately notify Engineer and Owner.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

   1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped as necessary before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
   1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
   2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished as necessary.
   1. Arrange to shut off utilities with utility companies and/or Owner.
   2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems.
   3. Disconnect, demolish, remove, and reinstate stormwater laterals.
      a. Piping to Be Removed and Reinstalled: Remove portion of stormwater lateral piping indicated to be removed and coordinate bypass pumping with Owner. Reinstate lateral piping upon completion of slip lining process.

3.3 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Maintain fire watch during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
8. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse as directed by the engineer
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition**,** cleaned, and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved construction and demolition waste disposal site or landfill acceptable to authorities having jurisdiction. Transportation and disposal shall comply with all applicable regulations.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

DIVISION 31

SECTION 312316 - EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavation for site structures.

1.2 REFERENCES

A. Local utility standards when working within 24 inches of utility lines.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with NYS DOT standards. Excavated material shall be disposed of offsite in accordance with NYSDEC and USEPA standards. Coordinate disposal with Owner.

B. Maintain one copy of each document on site.

1.5 QUALIFICATIONS

Prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of New York.

1.6 PRODUCTS

Not Used.

PART 2 - EXECUTION

2.1 EXCAVATION

A. Underpin adjacent structures which may be damaged by excavation work.

B. Excavate subsoil to accommodate building foundations, slabs-on-grade, paving, and site structures, and construction operations.

C. Excavate to working elevation for piling work.

D. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Section 312323.

E. Slope banks with machine to angle of repose or less until shored.

F. Do not interfere with 45 degree bearing splay of foundations.

G. Grade top perimeter of excavation to prevent surface water from draining into excavation.

H. Trim excavation. Remove loose matter.

I. Remove lumped subsoil, boulders, and rock.

J. Notify Engineer of unexpected subsurface conditions.

K. Correct areas over excavated as directed by Engineer.

L. Remove excavated material from site. Excavated material shall be disposed of offsite in accordance with NYSDEC and USEPA standards. Coordinate disposal with Owner.

M. Repair or replace items indicated to remain damaged by excavation.

2.2 FIELD QUALITY CONTROL

A. Request visual inspection of bearing surfaces by Engineer before installing subsequent work.

2.3 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION 312316

ATTACHMENTS:

A. EXCAVATION WORK PLAN EXCERPT

ATTACHMENT A

EXCAVATION WORK PLAN EXCERPT

BABCOCK STREET COMBINED SEWER OVERFLOW REPAIR

APPENDIX D – EXCAVATION WORK PLAN (EWP)

D-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

Table 1: Notifications*

NYSDEC Regional Hazardous Waste Engineer	716-851-7220
For Health and Safety Matters, Contact NYSDOH Bureau of Environmental Exposure	518-402-7860

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix I of this SMP;
- Identification of disposal facilities for potential waste streams; and

- Identification of sources of any anticipated backfill, along with required chemical testing results.

D-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section F of this Appendix.

D-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

D-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee invasive work and the excavation and load-out of excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

D-5 MATERIALS TRANSPORT OFF-SITE

Transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes will be provided with EWP a the time of notification to the NYSDEC. Trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport;
Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

D-6 MATERIALS DISPOSAL OFH-SITE

Material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

D-7 MATERIALS REUSE ON-SITE

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

D-8 FLUIDS MANAGEMENT

Liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

D-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Decision Document. The existing cover system is comprised of a minimum of 12-inches of clean soil/crushed stone, or asphalt pavement, concrete covered sidewalks and concrete building. Inside of the hydraulic containment area, in areas not paved a 60-mil linear low-density polyethylene liner is installed below 12-inches of crushed stone. The demarcation layer, consisting of (e.g. orange snow fencing material, white geotextile or equivalent material, etc.) will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special

conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

D-10 BACKFILL FROM OFF-SITE SOURCES

Materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

Imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards should meet the commercial soil clean-up objectives. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

D-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. Necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

Undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

D-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report within 24 hours of collecting data. Camp data will be provided to NYSDEC and NYSDOH on a weekly basis.

D-13 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan will be prepared and submitted with the notification to the NYSDEC.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers within 24 hours of collecting the data. CAMP data will be provided to NYSDEC and NYSDOH on a weekly basis.

D-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until nuisance odors have been abated. NYSDEC and NYSDOH will be notified of odor events and of any other complaints about the project. Implementation of odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

Necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils;. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

D-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved though the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

D-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during remedial work.

A plan will be developed and utilized by the contractor for remedial work to ensure compliance with local noise control ordinances.

SECTION 312323.33 – CELLULAR CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cellular Concrete for:

a. Annular space in between slip line pipe and host pipe.

B. Related Requirements:

1. Section 312316 – Excavation: General building excavation.

1.2 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, manhole, tank, or cable.

B. Excavatable Cellular Concrete: Lean cement concrete fill used where future excavation may be required, such as fill for utility trenches, bridge abutments, and culverts.

C. Non-excavatable Cellular Concrete: Lean cement concrete fill used where future excavation is not anticipated, such as fill below structure foundations and filling abandoned utilities.

1.3 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C33 - Standard Specification for Concrete Aggregates.
2. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
3. ASTM C150 - Standard Specification for Portland Cement.
4. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
5. ASTM C403/C403M - Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
6. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
7. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
8. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
9. ASTM C1040 - Standard Test Methods for Density of Unhardened and Hardened Concrete in Place By Nuclear Methods.
10. ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.

1.4 SUBMITTALS

A. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

B. Field Quality-Control Submittals:

1. Mix Design:

a. Furnish cellular concrete mix design for each specified strength.
b. Furnish separate mix designs when admixtures are require for the following:

1) Cellular concrete Work during hot and cold weather.
2) Air entrained cellular concrete Work.

c. Identify design mix ingredients, proportions, properties, admixtures, and tests.

2. Furnish test results to certify cellular concrete mix design properties meet or exceed specified requirements.

C. Delivery Tickets:

1. Furnish duplicate delivery tickets indicating actual materials delivered to Project Site.

D. Qualifications Statements:

1. Submit qualifications for supplier.

1.5 QUALITY ASSURANCE

A. Perform Work according to ASTM standards.

B. Maintain one copy of each standard affecting the Work of this Section on Site.

1.6 QUALIFICATIONS

A. Supplier:

1. Company specializing in supplying products specified in this Section with minimum three years' documented experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Minimum Conditions: Do not install cellular concrete during inclement weather or when ambient temperature is less than 32 degrees F.

1.8 FIELD MEASUREMENTS

A. Verify field measurements before installing cellular concrete to establish quantities required to complete the Work.

PART 2 - PRODUCTS

2.1 CELLULAR CONCRETE

A. Cellular Concrete: Non-excavatable type. Concrete shall be impermeable to petroleum product migration.

2.2 MATERIALS

A. Cement: The portland cement shall comply with ASTM C 150. Other supplemental cementitious materials, such as fly ash, may be used when approved by the project engineer. Supplementary cementitious materials should be tested prior to the start of the project for compatibility with the foaming agent.

B. Foam Liquid Concentrate: AERLITE-iX shall be supplied by Aerix Industries and shall comply with the standard specifications of ASTM C 869 when tested in accordance with ASTM C 796

C. Admixtures: Admixtures for accelerating, water reducing, and other specific properties may be used when specifically approved by the project engineer. Admixtures should be tested prior to the start of the project for compatibility with the foaming agent.

D. Water: use water that is potable and free from deleterious amounts of alkali, acid, and organic materials, which would adversely affect the setting or strength of the cellular concrete.

2.3 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Fly Ash: ASTM C618 Class C or F obtained from residue of electric generating plant using ground or powdered coal.

2.4 MIXES

A. The following mixes will be acceptable, and shall be created per manufacturer recommendations:

1. AERLITE-iX Low-Density Cellular Concrete,
2. or equal

B. Cellular Concrete Design Properties:

Cast Density, pcf (ASTM C 796)	30	36	42
Average Compressive Strength, psi (ASTM C 495)	40 – 140	80 - 210	120 - 330

Cast density and compressive strength shall be per pipe manufacturer's recommendation.

C. Provide water content in design mix to produce self-leveling, cellular concrete material at time of placement.

D. Design mix air entrainment and unit mass are for laboratory design mix and source quality control only.

2.5 SOURCE QUALITY CONTROL

A. Test properties of cellular concrete design mix and certify results for the following:

1. Design mix proportions by weight of each material.
2. Aggregate: ASTM C33 for material properties and gradation.
3. Properties of plastic cellular concrete design mix including:

    a. Temperature.
    b. Slump.
    c. Air entrainment.
    d. Wet unit mass.
    e. Yield.
    f. Cement factor.

4. Properties of hardened cellular concrete design mix including:

    a. Compressive strength at 1 day, 7 days, and 28 days. Report compressive strength of each specimen and average specimen compressive strength.
    b. Unit mass for each specimen and average specimen unit mass at time of compressive strength testing.

B. Prepare delivery tickets containing the following information:

1. Project designation.
2. Date.
3. Time.
4. Class and quantity of cellular concrete.
5. Actual batch proportions.
6. Free moisture content of aggregate.
7. Quantity of water withheld.

PART 3 - EXECUTION

3.1 SUBGRADE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions that may be determined to be detrimental to timely and proper completion of the work. Do not proceed until satisfactory conditions are established.

B. The area to be filled shall not have any standing water in it prior to placement of cellular concrete.

C. Any items to be encased in cellular concrete shall be properly set and stable prior to the installation.

3.2 WEATHER CONDITIONS

A. Avoid freezing before the initial set of cellular concrete occurs.

B. Do not place at temperatures lower than 32 degrees Fahrenheit or when freezing conditions are expected in less than 24 hours, unless you have consulted the cellular concrete manufacturer to assure acceptable installation.

3.3 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Support and restrain utilities to prevent movement and flotation during installation of cellular concrete.

C. Protect structures and utilities from damage caused by hydraulic pressure of cellular concrete before fill hardens.

D. Protect utilities to prevent intrusion of cellular concrete.

E. Provide proper conveyance tubing and air releases as recommended by manufacturer

3.4 MIXING AND CONVEYING

A. Install per manufacturer recommendations and according to the following:

1. Use the job site proportioning, mixing, and placing equipment approved by cellular concrete manufacturer.
2. Mix the materials according to the mix design and convey promptly to point of final placement.
3. Avoid excess handling of cellular concrete according to industry standards.
4. Place cellular concrete in lifts not to exceed 48 inches in depth, unless otherwise recommended by cellular concrete manufacturer and approved by the engineer.

5. Backfill or other usual loadings on the cellular concrete shall not be permitted until the cellular concrete has attained a compressive strength of at least 20 psi.
6. After filling pipes and conduits seal ends.

3.5 FIELD QUALITY CONTROL

A. During placement of the initial batches, check the density and adjust the mix as required to obtain the specified cast density at the point of placement per ASTM.

B. Four (4) specimens shall be taken for each 100 cubic yards of AERLITE-iX LDCC or as recommended per project engineer.

3.6 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Remove spilled and excess cellular concrete from Project Site.

C. Restore facilities and Site areas damaged or contaminated by cellular concrete installation to existing condition before installation.

END OF SECTION 312323.33

DIVISION 40

SECTION 400531.13 - HDPE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. High-density polyethylene (HDPE) piping used for the distribution and transmission of combined sewer overflow water.
2. Manholes and connections.

1.2 DEFINITIONS

A. CC1, CC2, CC3 (Highest Performance): The oxidative resistance categories as set forth in PPI TN-44.

B. Polyethylene (PE) Plastics: A type of plastic or resin prepared by the polymerization of no less than 85 percent ethylene and no less than 95 percent of total olefins with additional compounding ingredients.

C. Slow Crack Growth (SCG): A phenomenon by which a stress crack may form, comprised of a crack initiation phase and a crack propagation phase.

D. Slow Crack Growth (SCG) Resistance: The primary material property that relates quality and the critical component for assessing service life, measured using the notched, constant ligament-stress (NCLS) test per ASTM F2136.

E. Stress Crack: An external or internal fracture in plastic caused by tensile stresses less than its short-time mechanical strength.

F. Virgin Polyethylene (PE): A type of plastic material in the form of pellets, granules, powder, floc, or liquid that has not been subjected to use or processing other than required for initial manufacture.

1.3 REFERENCE STANDARDS

A. American Public Works Association:

1. APWA Uniform Color Code.

B. American Water Works Association:

1. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C651 - Disinfecting Water Mains.
3. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13 mm) through 3 In. (76 mm), for Water Service.

4. AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks.
5. AWWA M55 - PE Pipe - Design and Installation.

C. ASTM International:

1. ASTM C923/C923M - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
2. ASTM D1598 - Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.
3. ASTM D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings.
4. ASTM D1603 - Standard Test Method for Carbon Black in Olefin Plastics.
5. ASTM D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.
6. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
7. ASTM D2774 - Standard Practice for Underground Installation of Thermoplastic Pressure Piping.
8. ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.
9. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
10. ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
11. ASTM D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
12. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
13. ASTM D4218 - Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.
14. ASTM F412 - Standard Terminology Relating to Plastic Piping Systems.
15. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
16. ASTM F585 - Standard Guide for Insertion of Flexible Polyethylene Pipe Into Existing Sewers.
17. ASTM F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.
18. ASTM F894 - Standard Practice for Underground Installation of Thermoplastics Pipe for Sewers and Other Gravity Flow Applications.
19. ASTM F1055 - Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing.
20. ASTM F1290 - Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings.
21. ASTM F1417 - Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air.
22. ASTM F1668 - Standard Guide for Construction Procedures for Buried Plastic Pipe.
23. ASTM F1962 - Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings.

24. ASTM F2136 - Standard Test Method for Notched, Constant Ligament-Stress (NCLS) Test to Determine Slow-Crack-Growth Resistance of HDPE Resins or HDPE Corrugated Pipe.
25. ASTM F2263 - Standard Test Method for Evaluating the Oxidative Resistance of Polyethylene (PE) Pipe to Chlorinated Water.
26. ASTM F2620 - Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
27. ASTM F3190 - Standard Practice for Heat Fusion Equipment (HFE) Operator Qualification on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings.

D. NSF International:

1. NSF/ANSI/CAN 61 - Drinking Water System Components - Health Effects.

E. Plastics Pipe Institute (PPI):

1. PPI - Handbook of Polyethylene Pipe.
2. PPI - Polyethylene Piping Systems Field Manual for Municipal Water Applications.
3. PPI TN-38 - Bolt Torque for Polyethylene Flanged Joints.
4. PPI TN-44 - Long Term Resistance of AWWA C906 Polyethylene (PE) Pipe to Potable Water Disinfectants.
5. PPI TR-4 - PPI Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe.
6. PPI TR-34 - Disinfection of Newly Constructed Polyethylene Water Mains.
7. PPI TR-46 - Guidelines for Use of Mini-Horizontal Directional Drilling for Placement of High Density Polyethylene Pipe.

1.4 COORDINATION

A. Coordinate Work of this Section with Work of other Sections.

B. Coordinate Work of this Section with termination of CSO piping, trenching, and connection to public sewer

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site.

B. Convene minimum one week prior to commencing Work of this Section.

1.6 SEQUENCING

A. Sequence Work of this Section to prevent interference with adjacent other construction activities, or Owner related activities (e.g. active remediation).

1.7 SUBMITTALS

A. Product Data:

1. Submit data on pipe materials, fittings, and accessories.
2. Submit piping manufacturer's catalog information.

B. Shop Drawings:

1. Shop drawings are required when the product supplied varies from the contract documents.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Test and Evaluation Reports: Indicate results of inspections and performance testing.

E. Manufacturer Instructions: Submit special procedures required to install specified products and detailed instructions on installation requirements, including storage and handling procedures, and pipe extrusion welding techniques.

F. Field Quality-Control Submittals:

1. Indicate results of Contractor-furnished tests and inspections.
2. Extrusion Welding Technician Requirements: Indicate qualifications to perform each type and size of extrusion welded joint.

G. Manufacturer Reports: Certify that HDPE piping has been installed according to manufacturer instructions.

H. Qualifications Statements:

1. Submit qualifications for manufacturer.
2. Submit manufacturer's approval of installer.
3. Submit qualifications for extrusion welding technicians.

1.8 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of HDPE piping, pipe runs, connections, lateral connections, manhole connections, invert elevations, and termination points.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

C. Installed Record Information Requested by Engineer, Owner, and/or Buffalo Sewer Authority

1. The Contractor or extrusion welding provider is required to provide written reports for each extrusion welded joint performed on the Project, including joints that were rejected. Include the following in joint report:

a. Pipe or fitting size and dimension ratio (DR) or pressure class rating.
b. Extrusion welding equipment size and identification.

c. Extrusion welding technician identification.
d. Job identification number.
e. Extrusion weld umber.
f. Extrusion weld joining parameters.
g. Ambient temperature.

1.9 QUALITY ASSURANCE

A. Perform Work according to ASTM D3350, ASTM F894, and PPI standards.

B. Maintain one copy of each standard affecting Work of this Section on Site.

C. Ensure piping materials bear label, stamp, or other markings of specified testing agency.

1.10 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

B. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' documented experience.

C. Installer: Company specializing in performing Work of this Section shall be approved by manufacturer.

D. Extrusion Welding Technician: Technician shall be qualified to weld all joints and shall be approved by the manufacturer.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store HDPE piping according to manufacturer instructions.

C. Protect from external factors such as moisture, weather, vandalism, etc.

D. Handle the pipe in accordance with the PPI Handbook of Polyethylene Pipe (2nd Edition), Chapter 2 using approved strapping and equipment rated for loads encountered.

E. Minor scuffing or scratching does not reduce the serviceability of the pipe. Gouges or sharp cuts that are greater than 10% of the wall shall be repaired as per pipe manufacturer’s recommendation.

F. When handling the pipe with slings, use wide fabric choker slings capable of safely carrying the load. Use such slings for lifting, moving, and lowering pipe and fittings. When lifting the pipe, two (2) lift points are required. This may be accomplished by using an inverted ‘Y’ or a spreader bar to separate the fabric slings. Wire rope and chains are prohibited.

1.12 AMBIENT CONDITIONS

A. Installation conditions per manufacturer recommendations.

1.13 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 HDPE PROCESS PIPE

A. Manufacturers:

1. Weholite HDPE Pipe, or
2. JM Eagle HDPE Pipe, or
3. Spirolite HDPE Pipe, or
4. Approved Equal.

B. Size: 60” inner diameter, 20’-25’ lengths

C. Wall thickness: As recommended by manufacturer.

D. Shall be water tight up to 10 psi of exterior water pressure.

E. Non-corrugated (smooth) interior.

2.2 MATERIALS

A. HDPE Resin Material Properties:

1. Provide material for pipe production from an engineered compound of virgin and/or recycled HDPE.
2. Conform with the minimum requirements of cell classification as described in ASTM F894 as defined and described in the latest version of ASTM D3350.
3. Verify compatibility, as determined by design engineer, with overall system, including structural, hydraulic, material, and installation requirements for a given application.

2.3 EXTRUSION WELDED JOINTS

A. Assemble pipe and fittings in the field with extrusion welding joints using pipe manufacturer's (or manufacturer recommended) extrusion welding machines.

1. Comply with ASTM D3212 and pipe manufacturer's procedures for extrusion welding.

B. Perform field extrusion welded joint work using qualified extrusion welding technicians.

C. Record and document field extrusion welded joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that excavation base is ready to receive Work of this Section.

B. Verify that excavations, dimensions, and elevations are as indicated on Drawings.

C. Soil investigation should attempt to evaluate conditions at the nominal placement depth of the product pipe.

D. The Contractor shall inspect all pipe and accessories for shortages, loss or damage upon receipt of the shipped material at the time of unloading, recording this information directly on the waybill received from the carrier.

E. The Contractor shall notify the manufacturer Service immediately in writing detailing any shortages, loss or damages. Where possible electronic photos should be taken of all damage claims.

3.2 PREPARATION

A. Correct over-excavation with coarse aggregate.

B. Remove large stones or other hard materials that could damage pipe or impede consistent backfilling or compaction.

C. Protect and support existing storm drainage lines, utilities, and appurtenances.

D. Utilities:

1. Maintain profiles of utilities.
2. Coordinate with other utilities to eliminate interference.
3. Notify Architect/Engineer if crossing conflicts occur.

E. Preliminary Investigation/Cleaning for Sliplining:

1. Visually inspect the condition of large-diameter host piping over short distances.
2. Use closed-circuit TV inspection equipment to provide details of problem areas, such as offset joints, crushed walls, or obstructions, and to locate service and other lateral connections and protrusions.
3. Remove obstructions, debris, and protruding service lines that interfere with inserting the HDPE pipe.
4. Conduct a test-head of the same diameter as the PE pipe through the host pipe to ensure free passage. Make test-heads from a short section of the PE pipe with pulling cables

attached to both ends. Inspect test-head for damage after passing test-head through the host pipe.

3.3 INSTALLATION - PIPING

A. Install HDPE pipe in accordance with ASTM D2321, ASTM D3212, ASTM F1668, and manufacturer's recommended installation guidelines.

B. Sliplining or Insertion within a Host Pipe: Install Work according to ASTM F585, ASTM F894, the PPI handbook, and manufacturer instructions.

1. The insertion area should be located considering conditions of the host culvert, surface conditions and pulling or pushing distances. This area should provide clear access to the host culvert in which to align and join adjacent lengths of liner pipe.
2. The liner pipe grade shall be maintained parallel to grade of the host culvert.
3. When the annular space between liner pipe and host culvert is sufficiently large, wood blocks or other timber framing may be positioned above the liner pipe to maintain the invert at the desired elevation during the grouting operation. A plan detailing how the liner pipe will be maintained at the desired elevation shall be submitted by the contractor to the owner for approval.

3.4 INSPECTIONS

A. Owner’s Engineer shall periodically inspect welds completed by the welding technician. Contractor shall correct any field welds deemed unsuitable for usage by the engineer at no cost to the Owner.

3.5 PIPE CONNECTIONS

A. The liner pipe shall be capable of being joined into a continuous length via extrusion welding or slip on joint. **For extrusion welded pipe, both the interior and exterior of each joint shall be extrusion welded.** The joint and pipe shall be adequate for pushing and/or pulling the liner pipe through the host culvert without damage to the new pipe.

B. After the liner pipe is installed, the contractor shall restore service to all laterals. Connections shall be water tight.

3.6 SEALING AT TERMINATION POINTS

A. The annulus between the liner pipe and the host pipe shall be sealed at termination points. The bulkheads should be capable of resisting all forces that may occur during the grouting operation. Depending on the grouting method employed, grout tubes and ventilation tubes shall be constructed into the bulkheads.

END OF SECTION 400531.13

APPENDIX B

BUFFALO
SEWER AUTHORITY

October 18, 2021

Mr. Matthew Pearson
Property Manager
Elk Street Commerce Park, LLC
503 Elk Street 14210
Buffalo, New York 14210

RE: B.P.D.E.S. Permit #21-10-TP282

Dear Mr. Pearson:

Enclosed is your recently revised BPDES Permit #21-10-TP282. This permit is issued by The Buffalo Sewer Authority.

Your recent request for 24-hour discharge allowability, as well as additional discharge quantities has been approved, but only during dry weather conditions.

This permit must be maintained at your Elk Street facility and must be available for inspection at all times. It is your responsibility to assure continual compliance with the terms and conditions of this permit.

If you have any further questions, please call Mike Szilagyi at 716-851-4664, ext. 5253, or myself at 716-851-4664, ext. 5250.

Very truly yours,
BUFFALO SEWER AUTHORITY

Leslie Sedita
Industrial Waste Administrator

cc: A. Emmerson
M. Szilagyi

Permit No.: 21-10-TP282

EPA CATEGORY 40 CFR 403
Expiration Date: September 30, 2022
Date Paid: September 24, 2021

BUFFALO SEWER AUTHORITY

TEMPORARY DISCHARGE PERMIT

Permittee: Elk Street Commerce Park, LLC

Mailing Address: 4 Centre Drive, Orchard Park, NY 14217

The above named Permittee is hereby approved to discharge **treated groundwater** to the BSA Wastewater Treatment Plant only, from:

1 Babcock Street, Buffalo, New York 14210

to the Buffalo Sewer Authority facilities in accordance with the Buffalo Sewer Authority Regulations, Article VI, Section 14, and subject to the following conditions:

ARTICLE 1 CONDITIONS OF ACCEPTANCE

The discharge of the approved waste by the Permittee shall be subject to the following conditions:

a. Times. Location & Rate

The following location is designated for discharge during the hours listed and subject to the limit for rate of discharge specified:

Location: **1 Babcock Street, Buffalo, New York 14210**

Time Discharge is Permitted: **12:00am – 12:00am, Sunday - Saturday**

Limit on Rate of Discharge: **800 gallons per minute,** Buffalo Sewer Authority Wastewater Treatment Plant only, **dry weather only**

(Revised 10/18/2021)

b. Operations

The Permittee shall maintain cleanliness, minimize odors, and ensure necessary sediment control measures are in place and maintained and protect the Buffalo Sewer Authority facilities during the permittee's operations. The Permittee shall not permit any condition to arise which may pose a threat to public health or safety.

c. Samples and Analyses

The Buffalo Sewer Authority may from time to time, require the Permittee to sample and analyze its waste discharges. Such sampling and analyses shall be performed and results submitted by a New York State Dept. of Health certified laboratory. The analyses required shall be as specified by the Buffalo Sewer Authority, which also reserves the right, at its convenience, to sample wastes discharged by the Permittee.

d. Refusal to Discharge

The Buffalo Sewer Authority may refuse the Permittee permission to discharge wastes at any time and for any reason whatsoever, for the protection of sewer facilities against damage or flooding; to assure the proper operation and maintenance of said facilities; or to protect public health, safety or welfare.

e. Local Limits

Except as otherwise specified in this permit, the permit holder shall comply with all specific prohibitions, limits on pollutants or pollutant parameters set forth in the Buffalo Sewer Authority Sewer Use Regulations, as amended from time to time, and such prohibitions, limits and parameters shall be deemed pretreatment standards for purposes for the Clean Water Act.

ARTICLE 2 REGULATIONS

The Permittee must conform to all Buffalo Sewer Authority regulations and appropriate Federal, State and County Statutes, rules, mandates, directives, and orders concerning the collection, transportation, treatment and disposal of wastewaters.

ARTICLE 3 INSURANCE AND INDEMNIFICATION

The Permittee, agrees to indemnify and hold harmless the Buffalo Sewer Authority and its agents and employees against any and all claims resulting from work performed under this permit. The permittee shall be solely responsible for any and all injury or damage to its employees or property arising from use of Buffalo Sewer Authority facilities under this permit.

In the event of any alteration, non-renewal or cancellation of these policies, at least (45) forty-five days advance notice shall be given to the Industrial Waste Section, Bird Island Treatment Plant, 90 West Ferry Street, Buffalo, New York 14213 - before such change shall be effective.

ARTICLE 4 TERMINATION FOR VIOLATION OF AGREEMENT

In the event of a violation of any of the terms and conditions of this permit by the Permittee or upon the failure to pay the charges herein specified, the Buffalo Sewer Authority shall terminate the permit by service of notice of termination by registered mail at the Permittee's office address as set forth above.

ARTICLE 5 PERMITTEE APPROVAL

Official: BOB MOLNAR (Print Name) Title: Project Manager (Print)

Signature: Bob Mol Date: 10/7/21

ARTICLE 6 BUFFALO SEWER AUTHORITY APPROVAL

Approved as to Content:

Signature: Louise Seduta (Industrial Waste Administrator) Date: 10/12/2021

Effective this 15th day of October, 20 21

General Manager
Buffalo Sewer Authority

APPENDIX C

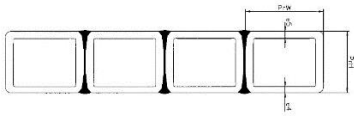
INFRAPIPE SOLUTIONS LTD.

WEHOLITE® STRUCTURAL PROFILE WALL HDPE PIPE

PRODUCT BULLETIN

Typical Applications:

Weholite structural profile wall HDPE pipe is design for a variety of applications such as sanitary and storm sewers, irrigation, hydroelectric, stormwater detention, reline, culverts, odor control and ventilation, rainwater harvesting, wastewater storage, marine installations (intakes and outfalls), geothermal vaults, above and below ground tanks, pump stations and manholes.



Manufacturing Standard:

ASTM F894 - *Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe*. Weholite is certified by 3rd party auditors[1] to confirm that the requirements of ASTM F894 are met.

Sizes and Available Lengths:

Weholite is available in diameters from 18 in (460 mm) to 132 in (3355 mm) inches. For sizes ≤ 96" NPS the standard laying length are 16.5 ft/5.03 m, 25 ft/7.62 m and 50 ft/15.24 m. For sizes > 96" NPS the standard laying length are 20 ft/6.09 m and 40 ft/12.19 m.

Pressure Ratings:

Weholite is designed for standard working pressure up to 7.5 psi /0.5 bar. With profile wall design modifications continuous pressures up to 29 psi / 2 bar can be accommodated.

[1] Le Bureau de normalisation du Québec (BNQ) for Huntsville plant, NSF International for Huntsville and Saskatoon plant.

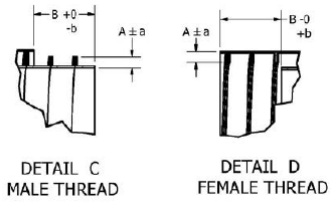
Typical Material Properties[1]:

Manufactured from a high-density polyethylene pressure grade material which meets or exceeds the minimum cell classification requirements of 334433C for PE plastic compound as specified in ASTM F894 when classified in accordance with ASTM D3350.

Cell class per ASTM D3350	Density (g/cm³)	Melt Index (g/10 minutes)	Flexural Modulus (psi)	Tensile Strength at Yield (psi)	Slow Crack Resistance, PENT (hours)	HDB (psi)
334433C (minimum per ASTM F894)	>0.940-0.947	<0.4-0.15	80,000 to <110,000	3000 to <3500	unspecified	1250
345464C (PE3608)	>0.940-0.947	<0.15	110,000 to <160,000	3000 to <3500	>100	1600
445574C (PE4710)	>0.947-0.955	<0.15	110,000 to <160,000	3500 to <4000	>500	1600

Joining Methods:

Extrusion welding joint (watertight), Threaded joints (sand and silt tight).



Surge Pressure for continuous pressure applications:

Infra Pipe Solution deem the resistance to surge pressures of Weholite pipe for continuous pressure applications (i.e. hydropower) just as the resistance to polyethylene solid wall pressure pipe…i.e occasional surge pressure may induce pressure surges of 2 x the working pressure rating of the pipe, and recurring surge may induce pressure surges of 1.5 x the working pressure rating of the pipe . The math for determination of the surge pressure associated with flow of water in Weholite is the same as for the solid wall polyethylene pressure pipe. Please refer to PPI Handbook, Chapter 6.

Temperature Range:

The maximum allowable temperature of the pipe contents for long-term applications is 140°F/ 60. Short-term applications up to 180°F/ 82°C are permissible. For buried applications, exposure to variable temperatures is generally not a design concern because of the restraining action of the surrounding soil and the inherent stress relieving characteristics of the pipe material.

Weatherability:

Weholite is produced from the PE compound containing a minimum of 2% carbon black. It has been demonstrated that this amount of well-dispersed very fine particle carbon black is sufficient protection for continuous outdoor service.

[1] Typical properties will vary within specification limits.

Corrosion and Chemical Resistance:

Weholite HDPE pipe will not rust, rot, pit, corrode, tuberculate or support biological growth. It is resistant to corrosion resulting from the presence of Hydrogen Sulfide and pH values between 2 and 13. HDPE is generally resistant to attack from many chemicals. The PPI TR-19 *Chemical Resistance of Thermoplastic Piping Materials* has been developed as an informative guide on resistance of thermoplastic materials to chemical attack.

Bending Radius:

The long-term bend radius of Weholite is 200 times the pipe OD. Only pipe joined by extrusion welded joints is suitable for bending.

Installation:

The ASTM D2321-*Standard Practice for Underground Installation of Thermoplastic Pipe for Sewer and Other Gravity – Flow Applications* serves as the basis for successfully installation of Weholite pipe.

Major Dimensions:

	NPS		OD ave		OD max		ID min		Shipping Weight		Burial Depth min[1]		Unconstrained Pipe Wall Buckling[2]	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(lbs/ft)	(kg/m)	(ft)	(m)	kPa	psi
RSC160	18	460	20.3	516	20.8	528	17.6	448	18	27	2.0	0.61	72	10.5
	19.5	495	22.0	558	22.4	570	19.1	486	20	30	2.0	0.61	67	9.6
	21	530	23.6	600	24.1	612	20.6	524	21	31	2.0	0.61	62	9.0
	24	609.6	26.9	684	27.4	697	23.6	600	24	36	2.0	0.61	54	7.9
	27	690	30.2	768	30.8	781	26.6	676	27	40	2.0	0.61	49	7.1
	30	760	33.5	851	34.0	864	29.6	752	30	45	2.0	0.61	42	6.1
	33	840	36.7	932	37.2	946	32.6	829	38	57	2.0	0.61	38	5.6
	36	910	40.5	1028	41.0	1043	35.6	905	42	62	2.0	0.61	46	6.7
	40	1016	44.5	1130	45.1	1145	39.6	1006	46	68	2.0	0.61	34	5.0
	42	1070	46.5	1181	47.1	1196	41.6	1056	52	77	2.0	0.61	30	4.3
	48	1220	52.8	1341	53.5	1359	47.5	1207	60	89	2.0	0.61	24	3.5
	54	1370	59.4	1509	60.2	1529	53.5	1358	70	104	2.0	0.61	25	3.6
	60	1520	65.4	1662	66.3	1683	59.4	1509	90	134	2.0	0.61	18	2.7
	66	1680	71.9	1825	72.8	1849	65.4	1660	100	149	2.0	0.61	18	2.6
	72	1830	78.3	1989	79.3	2014	71.3	1811	120	179	2.0	0.61	17	2.5
	78	1980	84.7	2152	85.8	2179	77.2	1961	150	223	2.0	0.61	16	2.3
	84	2130	91.1	2315	92.3	2344	83.1	2112	160	238	2.0	0.61	16	2.3
	90	2290	97.5	2478	98.8	2509	89.1	2263	170	253	2.0	0.61	15	2.2
	96	2440	103.5	2630	104.8	2663	95.0	2414	190	283	2.0	0.61	12	1.8
	102	2591	110.0	2793	111.3	2828	101.0	2565	215	320	2.0	0.61	12	1.8
	108	2740	116.3	2955	117.8	2992	106.9	2716	240	357	2.0	0.61	12	1.7
	120	3050	129.1	3280	130.7	3320	118.8	3018	280	417	2.0	0.61	11	1.6
	132	3355	141.5	3594	143.2	3638	130.7	3319	330	491	2.0	0.61	10	1.4

[1] Minimum covers presented were calculated assuming Class II backfill material compacted to 95% SPD, no hydrostatic pressure and with AASHTO HS-25 or CL-625 vehicle loading. For maximum burial depths of Weholite refer to Infra Pipe online burial calculator available at www.infrapipes.com

[2] Factor of Safety used in calculations is 1.5. Pipe ovality is assumed not to exceed 2%. Poisson's ratio of 0.35 has been used. 10 hr / 100° F material modulus of elasticity value of 46,900 psi has been used. Use PPI's Engineering Handbook, Chapter 6 to determine 'collapse resistance' characteristics at temperatures and load durations different from those indicated above.

Major Dimensions (continued):

	NPS		OD ave		OD max		ID min		Shipping Weight		Burial Depth min[1]		Unconstrained Pipe Wall Buckling[2]	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(lbs/ft)	(kg/m)	(ft)	(m)	kPa	psi
RSC250	33	840	37.5	952	38.0	966	32.6	829	47	70	2.0	0.61	59	8.6
	36	910	40.8	1036	41.4	1051	35.6	905	51	76	2.0	0.61	55	8.0
	40	1016	44.8	1138	45.4	1153	39.6	1006	60	89	2.0	0.61	41	6.0
	42	1070	46.9	1192	47.6	1209	41.6	1056	70	104	2.0	0.61	40	5.7
	48	1220	53.4	1357	54.1	1375	47.5	1207	80	119	2.0	0.61	35	5.1
	54	1370	59.9	1521	60.7	1541	53.5	1358	90	134	2.0	0.61	31	4.5
	60	1520	66.3	1684	67.2	1706	59.4	1509	100	149	2.0	0.61	29	4.1
	66	1680	72.7	1847	73.7	1871	65.3	1660	120	179	2.0	0.61	26	3.8
	72	1830	79.1	2010	80.2	2036	71.3	1811	150	223	2.0	0.61	24	3.5
	78	1980	85.5	2173	86.6	2201	77.2	1961	160	238	2.0	0.61	22	3.3
	84	2130	92.0	2336	93.1	2366	83.2	2112	190	283	2.0	0.61	21	3.1
	90	2290	98.3	2498	99.6	2530	89.1	2263	200	298	2.0	0.61	20	2.9
	96	2440	104.7	2660	106.1	2694	95.0	2414	230	342	2.0	0.61	19	2.7
	102	2591	111.1	2822	112.5	2858	101.0	2565	250	372	2.0	0.61	18	2.6
	108	2740	117.5	2984	119.0	3022	106.9	2716	270	402	2.0	0.61	17	2.5
	120	3050	130.2	3308	131.9	3350	118.8	3018	330	491	2.0	0.61	16	2.3
	132	3355	143.0	3631	144.8	3677	130.7	3319	370	551	2.0	0.61	15	2.1
RSC400	90	2290	100.2	2545	101.6	2581	90.9	2309	220	327	2.0	0.61	36	5.2
	96	2440	106.2	2697	107.6	2733	97.0	2463	250	372	2.0	0.61	30	4.3
	102	2590	113.0	2870	114.5	2908	103.0	2617	290	432	2.0	0.61	30	4.4
	108	2740	119.0	3023	120.5	3061	109.1	2771	330	491	2.0	0.61	26	3.7
	120	3050	131.9	3350	133.6	3393	121.2	3079	410	610	2.0	0.61	25	3.7

Infra Pipe Solutions
6507 Mississauga Road
Mississauga, ON L5N 1A6 CANADA
Tel: 1.866.594.7473
Fax: 905.858.0208
Web: www.infrapipes.com

[1] Minimum covers presented were calculated assuming Class II backfill material compacted to 95% SPD, no hydrostatic pressure and with AASHTO HS-25 or CL-625 vehicle loading. For maximum burial depths of Weholite refer to Infra Pipe online burial calculator available at www.infrapipes.com

[2] Factor of Safety used in calculations is 1.5. Pipe ovality is assumed not to exceed 2%. Poisson's ratio of 0.35 has been used. 10 hr / 100° F material modulus of elasticity value of 46,900 psi has been used. Use PPI's Engineering Handbook, Chapter 6 to determine 'collapse resistance' characteristics at temperatures and load durations different from those indicated above.

APPENDIX D

Plant
37 Centre Str. North
Huntsville, ON P1H 2K8
Tel: (705) 789-2396
Fax: (705) 789-7003

Plant
348 Edson Street
Saskatoon, SK
Tel: (306) 242-0755
Fax: (306) 934-8625

INFRAPIPE

WELDING PROCEDURE SPECIFICATION (WPS)

WELDING PROCEDURE SPECIFICATION NO.: 01 **By:** Claudiu Opris
Approved: Gerry Groen

Revision No. 4 **Date:** 06-02-2010
Welding process: PLASTIC EXTRUSION WELDING FOR WEHOLITE PIPING SYSTEMS
Type: MANUAL

JOINT DESIGN: 30^0 or 90^0 PROFILE CUT ENDS: **Detail:** 1

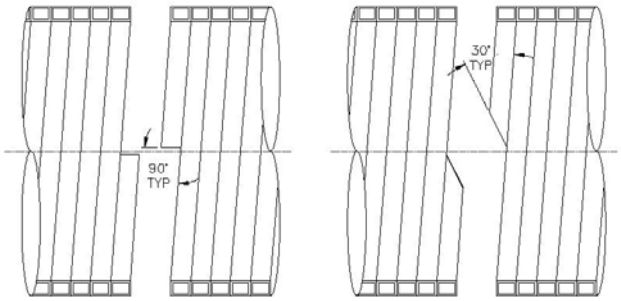


Fig: 1

NOTES:
Chamfer pipe ends with router. Grind pipe OD at end to expose fresh HDPE surface materials for 1"(25mm) width on both sides of weld area. Weld to a minimum depth of 1.5 times the matching wall thickness.

BASE MATERIAL:	HDPE (High Density Polyethylene)
Plastic Pipe Institute Classification:	PE 3608
ASTM D3350 Cell Classification:	minimum 334433C
Pipe diameter range:	33" TO 132" ID
Pipe ring stiffness range:	All.

FILLER MATERIAL:	HDPE (High Density Polyethylene)
Plastic Pipe Institute Classification:	PE 3608 or Equivalent.
Size of filler rod:	Dia. 3/16" (5mm) coiled on a spool for a continuous feed.
Weld thickness range:	Minimum 1.5 times the profile wall thickness.
Other: Trade name	N/A

POSITION:	Perpendicular to the pipe surface.
Location:	Inside and/or outside welding.
Welding progression:	Preheat the surface to be welded .. the welding shoe must always follow the blower.
Other:	Maintain constant pressure on the extruded material.

PREHEAT: The molten polyethylene filler material shall not be extruded until base materials are suitably preheated. Suitable base material preheat is indicated by a change in the sheen from a flat or dull black appearance to a darker 'shiny' appearance, and a softening of the base materials that can be confirmed by probing with a screwdriver or other device.

Preheat temperature of blower: Blower preheat temperature, and blower flow rate shall conform to the manufacturers recommendations. Blower air shall always be clean and moisture free. A summary of selected manufacturers recommendations is appended to this procedure. **Extrusion barrel (welding rod):** Set the temperature of the welding barrel in accordance with the manufacturers recommendations. Selected manufacturers recommendations are appended. NOTE: Barrel temperatures may need to be adjusted due to environmental conditions.

POST WELD HEAT TREATMENT: NONE

OUPUT RATE(SPEED): See manufacturers' recommendations. Output speed will vary with changes in wall thickness, pipe diameter, gap to be bridged, etc.

TECHNIQUE:

Weld bead: Continuous

Shoe orifice size: Variable

Initial cleaning: Remove grease and oils as necessary. Cleaning agents which may have a dissolving or swelling effect on the plastic shall not be used. The surface to be welded must be dry. Do not weld in fog or rain or on wet surface(s).

Refinish of welding seam: Welds should be produced in a way that refinishing is not required. Where 'touch up' is required, indents or notches are unacceptable.

EQUIPMENT USED: See appended manufacturer' equipment list.

ADDITIONAL REMARKS:

WPS KWH01 Rev 2, Supplemental

Intent

The intent of this document is to clarify the WPS KWH01 (Weld Procedure Specification). It covers the preparation for, and extrusion welding between, pipe wall OD or ID surfaces with a thickness between 0.19" and 0.68", and HDPE plate with a thickness of up to 2.0".

Joint Design

Weholite pipe is formed by helically winding a rectangular profile on to a drum. It is normally cut off square (perpendicular) to the centerline of the pipe. The last profile winding is consequently cut diagonally. The normal stresses introduced into the inner and outer walls (skins) of the pipe during the manufacturing process cause both the inner and outer walls to deflect towards the middle of the pipe wall. The amount of movement increases with increasing distance from the vertical profile walls. The ***Weholite*** pipe ends to be attached by extrusion welding, must be 'cut back' to a vertical profile wall by removing the inner and outer skin of the pipe. The 'profile end' cut has a step where the last wound profile terminates. (**See Figure A**). This is done at the factory when the pipe is ordered with 'profile cut ends'. Profile Cut Ends may be cut at 30° (as illustrated … PC30), or cut at 90° (PC 90).

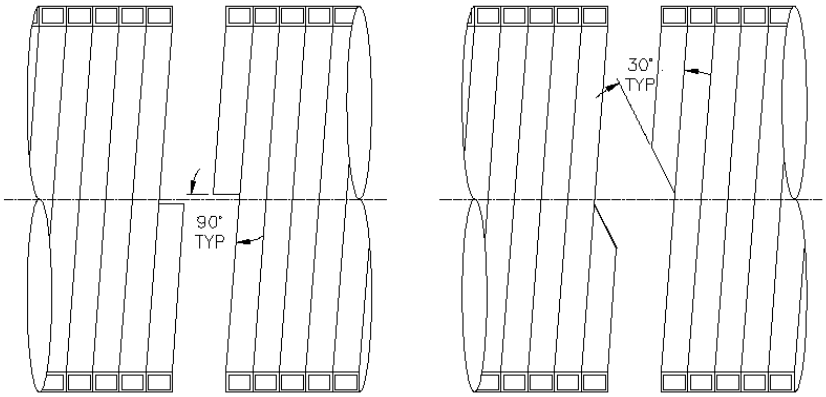


FIG. A

Note: Factory produced pipes with Profile Wall ends will have the step at the same clock position at both ends of the pipe segment.

It will be necessary to create a 'profile cut' end in the field prior to extrusion welding a pipe that has been cut to length in the field. The 'step' is a transition between the leading and trailing vertical walls of the last profile winding. It must be cut at 30° or 90° (see above). When pipe joints are to be made by welding on the ID, it is not necessary to plate the open profile. When pipe joints are to be made by welding on the OD, the open profile must be sealed by welding a HDPE plate (½ "thick) across the open face. A ¼' chamfer must be produced on all surfaces of the ½" plate to be welded to the walls of the last open profile. (**See Figure B**)

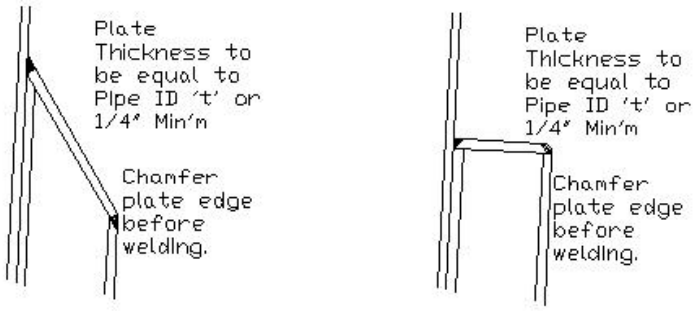


FIGURE "B"

To complete the preparation of the 'profile cut' end, it will be necessary to machine (by milling or grinding) the joint area for the extrusion weld(s) between adjacent profiles. A chamfer must be created that is equal in depth from 1.5 to 2 times the thickness of the inner or outer skin (as applicable). The resultant groove must have an angle between 45° and 90° (**See Figure C**).

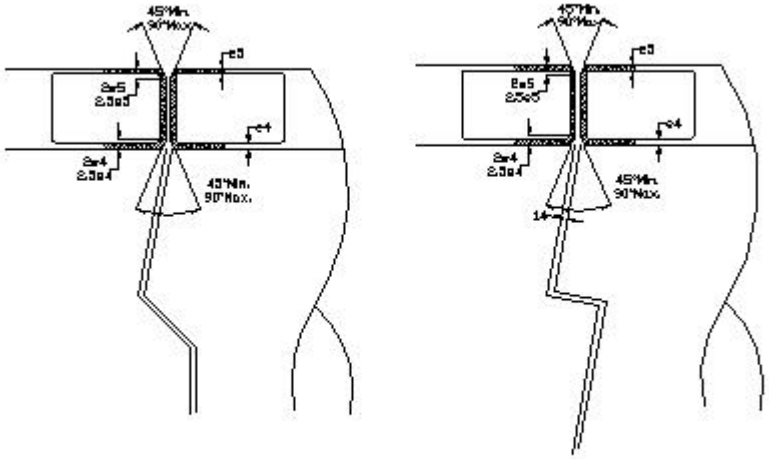


FIGURE "C"

Surface Preparation

All surfaces to be welded must be cut immediately before welding to prevent 'weathering or oxidation' of the surface. Surface 'weathering' prevents the proper mixing of the parent material and extrudate. To alleviate this potential problem, an area extending approximately ½ inch (1 cm) to either side of the chamfered surfaces, should be scraped to remove the exposed weathered surface. *Do not use chemical agents that may dissolve the parent HDPE surface or cause it to swell to remove this 'weathering'.*

Filler Material

The filler material must be of the same type as the pipe to ensure that the density and melt flow index of all materials to be welded together are the same. It can be either granulate or filler rod as required by the welding gun used. The material must be PE3608 as defined by PPI.

Welding Process Setup

The prepared surface is heated to the required temperature (425 – 450 °F) by directing heated dry clean air across the prepared joint area. Filler material, heated to the same temperature, is extruded into the joint. Pressure is applied to form the desired surface shape during the initial cooling period.

The heated air must be clean and dry to avoid contamination of the weld. The compressed air supply used must have a suitable filtering system to remove impurities. The surface to be welded must be dry. Suitable welding guns will generally have an air heating section consisting of a heater and blower. Generally it will be possible to set and control the 'preheat' air temperature. The actual temperature setting will vary depending on the geometry of the joint to be welded, and the environmental conditions. The air nozzle must be of a design that will ensure that the surfaces to be welded are evenly heated. In general, the root of the joint area should not be completely sealed. A gap of 1/16" to 1/8" in the root will generally be adequate. This is to permit the flow of hot air to all of the parent material in the joint area. (**See Figure D**). The appropriate temperature setting and design of the nozzle are those that will cause a change in the appearance of the parent material from 'flat or dull' to a 'shiny' appearance evenly throughout the joint area or probe for softness in the parent material with a screwdriver.

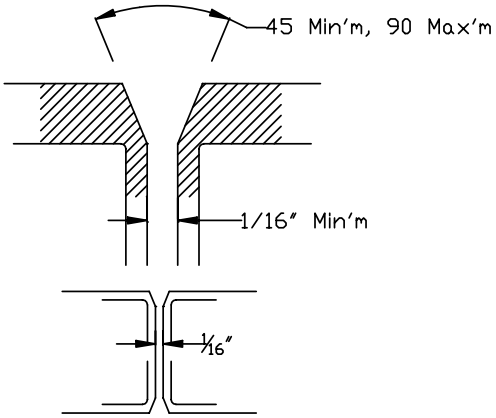


Fig. D

The extrudate is introduced into the welding groove by the screw feed rate selected. The rate at which the filler material fills the groove establishes the linear welding speed. The shoe of the gun has two (2) parts; a nose and a pressure sliding surface. The welding shoe is typically made from PTFE (Teflon). The design of the welding shoe is tailored to the weld joint geometry.

The nose is shaped to conform to the weld profile. This ensures that the extruded filler material acts to push the nose forward while pressing the filler evenly on to all joint surfaces. The sliding surface is shaped to the desired finished weld surface. The length of the sliding surface is about 2.25 times the depth of the weld. This length is adequate to shape and holds the extrudate until it has set by cooling.

Executing the Weld

Be sure to preheat the PTFE shoe prior to welding to obtain a smooth final weld surface. Before commencing the weld, the temperature of the extrudate and the hot air must be measured and the welding equipment set to the desired values. The hot air shall be measured at a distance of ¼" from the mid point of the nozzle. The extrudate temperature shall be measured in the middle of the weld cord.

Do not move the gun faster or slower than that which is required to produce the desired weld finish profile. Filler weld production rates vary from 4 to 10 lbs. per hour depending on the capacity of the gun (both extrusion capacity and hot air capacity) and the design of the joint. In addition to managing the linear speed of the gun, the operator is required to apply pressure as the filler is extruded into the weld area. Adequate pressure must be applied to ensure that the filler makes contact with all surfaces in the joint area to be welded. However, the pressure should not cause excessive flow of the material through and beyond the root area of the joint.