

Remedial Action Work Plan

441 Ohio Street Site
BCP Site No. C915285
Buffalo, New York

February 2017

0292-013-002

Prepared For:

441 Ohio Street, LLC



Prepared By:



REMEDIAL ACTION WORK PLAN

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BUFFALO, NEW YORK
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Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218

Certification

I, Thomas H. Forbes, certify that I am currently a NYS registered professional engineer and that this February 2017 Remedial Action Work Plan (RAWP) for the 441 Ohio Street Site (C915285) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

2-14-17
Date



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Buffalo, New York

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1.0 INTRODUCTION

Benchmark Environmental Engineering and Science, PLLC (Benchmark) has prepared this Remedial Action (RA) Work Plan on behalf of 441 Ohio Street, LLC. 441 Ohio Street, LLC has elected to pursue cleanup and redevelopment of the property, located at 441 Ohio Street, Buffalo, New York (see Figures 1 and 2), under the New York State Brownfield Cleanup Program (BCP or Program) and executed a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on April 30, 2014.

This document presents the scope of work and procedures for completion of planned remedial activities on the Site. The remedial activities will be completed by contractors under contract to 441 Ohio Street, LLC and/or Benchmark. The work will be completed in general accordance with 6NYCRR Part 375 and NYSDEC DER-10 guidelines.

1.1 Site Background

The subject property (hereinafter, the “Project Site” or the “Site”) consists of an approximate 1.8 acre portion of a larger 2.25 acres property, located in a highly developed mixed use industrial, commercial, residential, and recreational area of the City of Buffalo, Erie County, New York (see Figures 1 and 2). It should be noted that the prior operations at the Site were addressed as both the 9 South Street and 441 Ohio Street addresses. For the purposes of the BCP, the Site is referred to herein as the 441 Ohio Street Site.

The Site has been utilized for various freight and warehousing operations since at least 1889, including the Erie Elevator, New York Lake Erie and Western RR Freight, Erie RR Exchange – Lake and Transfer Warehouse, and most recently Great Lakes Paper Fibers Corp. Operations included multiple rail lines, including interior building rail line, material handling and shipping equipment use and maintenance, freight storage and paper recycling.

1.2 Previous Environmental History

A summary of the findings of the environmental investigations completed at the Site is provided below. Figure 3 shows the historic and RI sample locations and the RI soil analytical results.

1.2.1 November 2011 - Phase I Environmental Site Assessment

RJS Environmental Consultants (RJS) conducted a Phase I Environmental Site Assessment (ESA) of the 441 Ohio Street parcel. The findings of the report are summarized below

- The property was historically used for warehousing purposes. The building, constructed in 1892 and condemned in 2011, was most recently occupied by Great Lakes Paper Fibers Corp., a bailed paper warehouse operation. Operations associated with Great Lakes Paper Fibers Corp. included paper cutting and maintenance of on-site equipment (forklifts, cutting machines, etc.). Previous site occupants historically included Erie Railroad Flour Warehouse, Erie Railroad Exchange - Lake and Transfer Warehouse, Great Lakes Paper Stock, Inc., Seaboard Great Lakes, Buffalo Waterfront Corp., and Erie Railroad Corp.
- In addition to the industrial nature of the property, the ESA identified several Recognized Environmental Conditions (RECs) and historic RECs associated with the site and its prior use, including:
 - Historic on-site operations reportedly included repair/maintenance of on-site bobcats, forklifts, and paper bailing and cutting machines.
 - Hazardous/regulated materials (antifreeze, hydraulic oil, solvents for degreasing, etc.) and miscellaneous equipment were present on-site.
 - Stained soils were observed proximate to dumpsters and a propane storage area located south of the on-site building.
 - A railroad spur was observed to run north-south along the eastern portion of the Site. Rail operations are frequently associated with elevated levels of semi-volatile organic compounds (SVOCs) and metals.
 - The south adjacent property reportedly includes a sub-grade gun range. Lead impacts are often associated with gun ranges. Adjacent/nearby properties were also identified to include gasoline tanks, a truck repair/welding operation, and railroad tracks.
 - Three "closed" spills, one of which was identified as a duplicate spill incident, were identified in connection with the Site.
 - Numerous "inactive" and "closed" spill incidents were identified in connection with adjacent/nearby properties.

1.2.2 November 2013 - Limited Phase II Site Investigation

Benchmark completed a Limited Phase II Site Investigation on the 441 Ohio Street parcel. The limited Phase II included the advancement of eight (8) soil borings across accessible portions of the Site. The soil boring locations are shown on Figure 3. The soil borings were advanced by direct-push drill rig to approximately 12 fbg. Samples were collected continuously with a macro-core sampler to allow for field characterization of the subsurface lithology and collection of samples for laboratory analysis. Field personnel scanned each core sample for total volatile organic compounds (VOCs) with a photoionization detector (PID) and recorded visual and/or olfactory observations. No olfactory indications of adverse impacts were observed and no elevated PID readings were detected.

In general, the borings indicated the presence of 0-6 feet of fill materials overlying clayey and/or sandy native soils. Fill materials were typically comprised of fine sand and gravel with some slag pieces. Groundwater was generally encountered at approximately nine (9) fbg. Four (4) soil boring locations were selected for chemical analysis to represent general conditions for the soil/fill quality across the Site.

Analytical results indicated exceedance of the Part 375 Unrestricted Use, Residential Use, Restricted Residential Use, and/or Commercial Use soil cleanup objectives (SCOs). Specifically:

- Elevated SVOCs, primarily PAHs, were identified above their respective Restricted Residential Use SCOs (RRSCOs). However, in all cases, total PAHs were below 500 ppm, with all but one location being below 100 ppm.
- RCRA-regulated metals (arsenic, chromium, lead and mercury) were detected above SCOs at one or more locations, with arsenic and lead detected above RRSCOs.
- Total PCBs were detected above Unrestricted Use SCOs (USCOs).

The limited Phase II also included the collection of a groundwater sample from an existing piezometer located just north of the property boundary of the Site. The location of the piezometer is shown on Figure 3. The piezometer was gauged and contained water from approximately 9.5 fbg. The piezometer terminus was located at 27.5 fbg. Groundwater analytical results were generally reported as non-detect, with all constituents identified at concentrations below their respective NY State Class GA Groundwater Quality Standards and Guidance Values.

1.2.3 BCP Remedial Investigation (RI)

A Remedial Investigation was completed to more fully characterize the Site in accordance with the BCP requirements. The RI included the advancement of soil borings, installation of one monitoring well to assess soil and groundwater at greater depths than previous investigations, and the collection of soil and groundwater samples.

Based on the results of the previous investigations and the RI, it was determined that remediation of the Site was necessary. A RI/AAR was prepared to provide a summary of the investigations, and complete and assessment of remedial alternatives capable of achieving the Remedial Action Objectives (RAOs) for the Site. Results of the RI are provided below.

1.2.4 Summary of Environmental Conditions

Based on the Remedial Investigation and historic investigations, the following environmental conditions exist at the Site:

Geology/Hydrogeology

- Investigation activities at the Site characterized the overburden soil/fill as generally consisting of wood debris, brick fragments, and slag with varying amounts of granular soils (silts, sands and gravels) from 0-4 fbgs. The fill progressed to approximately 8 feet below grade with the lower 4 feet generally described as mostly reworked clay soil with diminishing amounts of fill. The reworked-fill is underlain by native soil described as brown lean clays with varying amounts of sands, silts and gravels.
- The uppermost water bearing unit was encountered at approximately 9-14 fbgs across the Site. Based on the findings of the RI, localized groundwater flow was estimated to flow to the west toward the Buffalo River. Groundwater is not expected to be encountered during remedial activities.

Contamination

Surface-Near Surface Soil/Fill:

Investigation results identified select PAHs, PCBs, and metals above RRSCOs and/or CSCOs.

Subsurface Soil/Fill:

Select elevated metals above USCOs, RRSCOs, and Commercial Use SCOs (CSCOs), respectively were detected, primarily associated with the reworked soil/fill from 2-8 fbs.

Groundwater:

One PAH, benzo(b)flouranthene, was detected above its GWQS, and can be likely attributed to the elevated turbidity of the collected groundwater. Dissolved metals detected above GWQS are primarily naturally occurring minerals. Select pesticides were detected above their respective GWQS, including the upgradient wells, indicating a potential background condition associated with subsurface soil/fill material predominant in urban environments. Soil analytical results did not report elevated detections of pesticides, indicating that they originate off-site and/or are ubiquitous.

1.3 Primary Constituents of Concern (COCs)

Based on historical investigation and the RI findings to date, the Constituents of Concern (COCs) for a restricted residential cleanup are presented by media below:

- Soil/Fill: SVOCs, PCBs and metals.

1.4 Remedial Action Objectives

The remedial actions for the 441 Ohio Street must satisfy Remedial Action Objectives (RAOs). RAOs are site-specific statements that convey the goals for minimizing substantial risks to public health and the environment. For the Site, appropriate RAOs have been defined as:

Soil:

RAO for Public Health Protection

- Prevent ingestion of and/or direct contact with contaminated soil/fill.

RAO for Environmental Protection

- Prevent migration of contaminants that would result in groundwater and/or surface water contamination.

Groundwater:

RAO for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

The RI/AAR recommended a Track IV remedial approach involving excavation and offsite disposal of soil/fill within certain areas of concern, followed by placement of a cover system to protect against contact with low level concentrations of parameters in remaining impacted soils. In general, the remedial activities will include: excavation and off-site disposal of soil/fill exceeding RRSCOs for PCBs; cover system placement; and implementation of a Site Management Plan (SMP). Details of the planned remedial action are presented below.

1.5 Remedial Areas of Concern (AOCs)

Based on the results of the RI certain individual PAHs, metals (arsenic, barium, copper and lead) and PCBs were detected on-Site above the RRSCOs. However, lead falls below the CSCCO, and the remaining metals were generally present at low concentrations typical of urban fill. Similarly, low-level detections of PAHs are also typical of urban fill and are generally consistent across the Site, with Total PAHs at or below approximately 100 ppm.

The elevated PCBs detected in SB-102 (0-2) appear to be limited to this one location. PCBs are not naturally occurring, and as such their presence suggests an isolated, site-specific impact. Therefore, elevated PCBs detected at SB-102 are identified as a remedial AOC and will be included for excavation and off-site disposal. Construction of the cover will limit exposure to low level PAH and metal constituents exceeding RRSCOs below the cover system.

1.6 Project Organization and Responsibilities

441 Ohio Street, LLC was accepted into the BCP as a non-responsible party (volunteer) per ECL§27-1405. Benchmark will manage the brownfield cleanup on behalf of 441 Ohio Street, LLC. The NYSDEC Division of Environmental Remediation (Region 9), in consultation with the New York State Department of Health (NYSDOH) shall monitor the remedial actions to verify that the work is performed in accordance with the Brownfield Cleanup Agreement, the approved RA Work Plan, and NYSDEC DER-10 guidance.

2.0 PRE-REMEDICATION TASKS

2.1 Public Information and Outreach

The NYSDEC will prepare a fact sheet containing information about the planned remedial work, and the fact sheet will be sent to those individuals on the Brownfield Site Contact List of the Citizen Participation Plan, including subscribed property owners and residents adjacent to the Site, environmental groups, local political representatives, and interested regulatory agencies. Furthermore, a copy of this Work Plan will be made available for public review at the NYSDEC Region 9 office and the Erie County Public Library, the designated document repository.

2.2 Underground Utilities Location

The remediation subcontractor will contact underground facilities protection organization (Dig Safely New York, UFPO) to locate utility lines within the work area.

2.3 Health and Safety Plan

A Health and Safety Plan (HASP) will be prepared and enforced by the remediation contractor in accordance with the requirements of 29 CFR 1910.120. The HASP will cover all on-site remedial activities. Benchmark will be responsible for Site control and for the health and safety of its authorized site workers. Benchmark's HASP is provided for informational purposes in Appendix A. The remediation contractor will be required to develop a HASP as or more stringent than Benchmark's HASP.

2.4 Mobilization and Site Preparation

The remediation contractor's field operations at the Site will commence with mobilizing equipment and materials to the Site and erecting safety fencing and other temporary controls as described below.

2.5 Temporary Facilities and Controls

Temporary facilities for use during the remedial work may include a construction field trailer and portable toilet(s). Temporary controls will be employed for protection against off-site migration of soil and safety hazards during construction, including safety fencing, dust suppression, and erosion control as further described below.

2.5.1 Access Controls

Daily work areas will be identified with construction cones and/or temporary fencing. Work areas will be determined daily based on the planned remedial activities, and may be changed throughout the work day to ensure safe operations. Access control will consider site worker and general public safety, and tenant access requirements.

2.5.2 Dust Monitoring and Controls

A Community Air Monitoring Plan (CAMP), as more fully described in Section 4.1, will be implemented during Site excavation work. If community air monitoring indicates the need for dust suppression or if dust is visually observed leaving the Site, the remediation contractor will apply a water spray across the excavation and surrounding areas, and on Site haul roads as necessary to mitigate airborne dust formation and migration. Potable water will either be obtained from a public hydrant or provided by the on-site water service, if available.

2.5.3 Storm Water Pollution Prevention Plan

A Storm Water Pollution Prevention Plan (SWPPP) was prepared for the Site, and has been approved by the local municipal separate storm sewer system (MS4) operator (i.e., City of Buffalo) and the NYSDEC. Electronic copies of the SWPPP, Notice of Intent (NOI) and MS4 approval have been provided to the Department for reference. A copy of the SWPPP and approvals are provided electronically in Appendix C.

2.5.4 Western Boundary – Stability Assessment

Though the BCP western boundary of the Site is set at the top of the bank, the former building stone wall and the river embankment south of the wall are effectively engineering controls that preclude erosion/slumping of BCP site soils toward the Buffalo River and prevent exposure to remaining on-Site soil/fill on the face of the western Site boundary. As such, a stability assessment will be completed by a licensed professional(s) to determine what

repairs and/or modifications, if any, are necessary to stabilize the existing stone wall and western embankment.

Based on the findings of the structural assessment, any necessary repairs and/or modification of the wall and embankment, and/or western BCP boundary will be presented to the Department for review in the form of P.E.-certified design drawings.

3.0 CLEANUP APPROACH

The NYSDEC approved Alternatives Analysis Report identified the cleanup approach for the Site. Specifically, the selected remedy is a Restricted Residential Track 4 approach incorporating the following major remedial elements:

- Removal and disposal of remnant railroad ties.
- Excavation and off-site disposal of shallow PCB impacted soil/fill exceeding RRSCOs at SB-102 (see Figure 5).
- Placement of Cover System, in accordance with 6NYCRR Part 375 and NYSDEC DER-10 guidelines. The cover system will include the redevelopment hardscaped areas (asphalt and concrete; and, landscaped areas) to limit exposure to remaining contamination. In non-hardscaped areas, a minimum of 24-inches of approved clean backfill material meeting the import criteria for restricted residential use sites, in accordance with Appendix 5 of DER-10, will be placed on top of a demarcation layer to identify remaining in-place soil-fill.

A conceptual cover system layout is provided on Figure 6. Copies of the construction details of the redevelopment elements that are components of the cover system, prepared by others, are included electronically in Appendix D.

- Implementation of a Site Management Plan (SMP) for post certificate of completion (COC) monitoring and reporting.

3.1 Waste Characterization

Waste characterization samples will be collected in accordance with the disposal and/or recycling facilities requirements. Pre-characterization of the soil/fill will allow for direct loading and off-site transportation at the time of soil/fill removal. Based on the results of the waste characterization sampling, impacted soil/fill will be managed according to all federal, state and local waste disposal regulations.

3.2 Remnant Railroad Ties

Remnants of a former rail line is located along the eastern boundary of the Site. Railroad ties will be removed and transported off-site for disposal/recycling in accordance with the NYSDEC regulations. Additional wood debris, both from the former building and

vegetation will also be transported off-site for disposal/recycling. Disposal documents will be provided in the Final Engineering Report.

3.3 Remedial Excavation Activities

Based on the findings of the RI, approximately 300 CY of shallow PCB impacted soil/fill in the vicinity of SB-102 has been deemed an Area of Concern and will be excavated and disposed off-site (see Figure 5). All excavation work will be directed by an experienced Benchmark professional to remove impacted material. Lateral and vertical excavation will continue until PCB impacted soil/fill is removed, SCOs are met, excavation has reached the property line and/or utility, or NYSDEC agrees that no further excavation is required.

Following removal of this AOC, all exposed soils not otherwise covered by the components of the redevelopment of the site (e.g., buildings, pavement) will be covered by material meeting the requirements of the generic soil cleanup table contained in Part 375-6.7(d) for the applicable future site use (i.e., Restricted Residential). A photoionization detector (PID) and visual/olfactory observations will be used to screen soil/fill materials and assist in verifying removal of impacted soil/fill.

3.3.1 Post-Excavation Confirmation Sampling

Post excavation confirmatory samples will be collected from the SB-102 remedial excavation area. A minimum of one sample per 30 linear feet of sidewall and one sample for each 900 square feet of excavation bottom will be collected. All samples will be analyzed by a NYSDOH ELAP certified analytical laboratory for PCBs in accordance with latest USEPA SW-846 Methodology with an equivalent Category B deliverables package to facilitate data evaluation by a third-party validation expert. Expedited turnaround times may be requested for the analytical results to minimize the time that the excavation(s) remains open.

If differentiable soil/fill material is encountered during the remedial excavation, additional sampling will be discussed with the Department.

3.3.2 Off-Site Transportation and Disposal of Non-Hazardous Soil/Fill

The transportation and disposal of soil/fill from the PCB-impacted areas will be based on the waste characterization sampling completed prior to the start of the excavation activities. Non-hazardous soil/fill will be transported off-site for disposal at a permitted commercial

solid waste disposal facility by licensed haulers. Disposal documents will be provided in the Final Engineering Report.

3.3.3 Groundwater Management

Water removed from excavations during remedial activities will be handled on-site prior to discharge. In general, water removed from excavations will be stored/settled in a portable storage tank, and if deemed necessary, sampled to determine if additional pretreatment measures are necessary to discharge.

Benchmark or the Site owner will coordinate with the City of Buffalo to obtain any necessary temporary sewer discharge permits.

3.4 Placement of Backfill

Backfilling will closely follow the excavation work to minimize the amount of open excavation. However, backfill soil will be maintained at a sufficient distance from the working face of the excavation to prevent contact or mixing with fill soils designated for removal. Wetting of the backfill soil during placement, spreading, and compaction will be performed as required to control fugitive dust within the Community Air Monitoring Plan action limits. Additionally, a demarcation layer will be placed at the bottom of each excavation to identify the bottom of the cover system (see Figure 6).

3.4.1 Acceptable Backfill Materials

In accordance with DER-10, backfill material used on-site may consist of the following materials:

- Gravel, rock, or stone, consisting of virgin material, from a permitted mine or quarry may be imported, without chemical testing, if it meets the requirements of DER-10, or as otherwise approved by NYSDEC.
- Recycled concrete or brick from a NYSDEC-registered construction and demolition debris processing facility may be imported, without chemical testing, if it meets the requirements of DER-10, or as otherwise approved by NYSDEC.
- Imported soil/fill originating from known off-site sources having no evidence of disposal or releases of hazardous substances, hazardous, toxic or radioactive wastes, or petroleum that meets the chemical criteria of Table 1. No off-site materials meeting the definition of a solid waste as defined in 6NYCRR, Part 360-1.2(a) shall be used as backfill.

- On-site crushed concrete/brick with no visible or olfactory evidence of impacts.
- On-site reuse of soil/fill that is placed at least two-feet below the final surface grade beneath the cover system demarcation layer in accordance with Part 375 Track 4 requirements.

3.4.2 Off-site Source Backfill Characterization Requirements

In addition to the above criteria, backfill materials being imported to the Site will be subject to the following characterization requirements in accordance with DER-10 Table 5.4(e)10:

Required Minimum Number of Soil Samples for Soil Imported to a Site			
Soil Quantity (CY)	VOCs	SVOCs, Inorganics & PCBs/Pesticides	
	Discrete Samples	Composite	Grab/Composite Samples
0-50	1	1	3-5 grab samples from different locations in the fill being provided will comprise a composite sample for analysis.
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1,000	7	2	
>1,000	Add an additional 2 VOC and 1 composite for each additional 1,000 CY or consult with DER		

Characterization testing will be performed by an independent, NYSDOH ELAP-approved laboratory. An equivalent Category B deliverables package will be furnished with the data to allow data evaluation and preparation of a Data Usability Summary Report by an independent, third party data validation expert.

3.5 Cover System

Sampling results indicate that certain metals and PAHs are present in surface/near-surface soil/fill on-site above Part 375 Restricted Residential SCOs. The remedial evaluation conducted in the RI/AA Report concluded that a Track 2 Residential cleanup remedy was not practicable; therefore, placement of a cover system is a feasible engineering control to protect human health and the environment. The cover system will be comprised of:

- **Non-Vegetated (Hardscape) Areas:** These areas will be covered by asphalt, concrete and/or building foundations. Subbase materials brought to the Site will be assessed in accordance with DER-10, or as otherwise approved by NYSDEC.

Select components of the redevelopment are also elements of the BCP cover system, including asphalt and concrete covered areas. Therefore, those specific components of the cover system, that are also part of the redevelopment, will be constructed in general accordance with the municipally approved building details. Construction details are provided electronically in Appendix D for reference.

- **Vegetated Areas:** A minimum of 24 inches of imported backfill or re-used on-site soil/fill, in accordance with DER-10 requirements, will be placed above demarcation layer placed on the remaining in-place soil/fill. The demarcation layer (e.g., snow fence, plastic mesh, etc.) will be placed where hardscape (concrete/asphalt) will not be present.

The planned cover system includes different cover types, including the new building, asphalt and concrete, with non-hardscaped areas, including landscaped beds and grass areas. A planned cover system layout is provided on Figure 6. Where soil cover system transitions to hardscape, and/or at the limits of the BCP property, the cover will be keyed-in as necessary to achieve the minimum 24-inches of approved backfill material without tapering as shown on Figure 6 and supplemental cover details are provided in Appendix D. Additional construction details related to the building, asphalt, concrete, and landscaping, prepared by others, is provided electronically in Appendix D.

3.5.1 Cover System – Construction Oversight

Benchmark personnel will be present during construction of the BCP cover elements to verify that the different cover system elements are constructed in general accordance with the municipally approved civil details, as applicable; and/or soil cover areas are constructed in accordance with Part 375 and DER-10 requirements.

BCP cover system elements construction oversight will include:

- Material Conformance – backfill and surface soil materials will be verified to comply with import criteria per Part 375 and DER-10. The Department will be consulted to confirm import material acceptability.
- Placement of demarcation layer – Per DER-10, areas of the site not covered by hardscape are required to place a demarcation layer to visually identify

remaining in-place soil/fill that may exceed the Site SCOs. Demarcation layer will be placed 24-inches below the finished surface grade, and approved cover material meeting the Site import criteria will be placed above the demarcation layer to the surface. Where applicable, Benchmark will verify the placement of geotextile or equivalent, as identified in municipally approved civil design documents (Appendix D).

- Cover System Thickness – Per DER-10, Restricted Residential cleanups are required to have a minimum of 24-inches of approved surface material meeting the RRSCOs in areas of the site not covered by hardscape. Benchmark personnel will field verify that a minimum of 24-inches of acceptable cover material is placed above the demarcation layer to achieve the final surface grade using various measuring methods, including: traditional survey equipment, GPS, laser levels, grade stakes, hand rulers, and/or any combination thereof, as deemed acceptable by the BCP Project Officer (NYS PE), to sufficiently verify that cover thickness meets the BCP requirements and allow certification thereof in the Final Engineering Report. Pre- and post- cover material placement measurements and locations, as applicable, will be recorded by field personnel in the field log; Third-party grade control via site laser, and/or field quantity survey may also be used to verify cover system placement and thickness. Verification measurements will be collected in accordance with general construction practices of 1 per every 50' by 50' (250 sq. ft).

Where applicable, Benchmark personnel will verify that hardscape cover elements, subbase and cover material thicknesses are constructed in general accordance with the municipally-approved civil design. Any field substitution of materials (e.g., placement of stone in lieu of soils) will be verified conformant with Part 375 and DER-10 and will be identified in the FER.

3.6 Site Management Plan

For any BCP site not cleaned up to NYSDEC Part 375 Unrestricted Use, preparation of a Site Management Plan (SMP) that describes site-specific Institutional Controls and/or Engineering Controls (IC/EC) is a required component of the final remedy. Therefore, as part

of the final remedy for the BCP Site, an SMP will be prepared. Consistent with NYSDEC BCP requirements, the SMP will include the following components:

- **Engineering and Institutional Controls Plan.** Engineering controls include any physical barrier or method employed to actively or passively contain, stabilize, or monitor contaminants; restrict the movement of contaminants; or eliminate potential exposure pathways to contaminants. Institutional controls at the site will include groundwater use restrictions and use restrictions of the site to restricted residential or less restrictive (commercial or industrial) purposes.
- **Operation and Maintenance Plan** that describes the measures necessary to monitor and maintain the cover system.
- **Excavation Work Plan** to assure that post-remediation intrusive activities and soil/fill handling at the Property related to redevelopment, operation, and maintenance are completed in a safe and environmentally responsible manner.
- **Site Monitoring Plan** that includes: provisions for Property-wide inspection program to assure that the IC/ECs remain effective.
- **Environmental Easement** filed with Erie County.

4.0 REMEDIAL ACTIVITIES SUPPORT DOCUMENTS

4.1 Health and Safety Protocols

Benchmark has prepared a Health and Safety Plan (HASP) for use by our employees in accordance with 40 CFR 300.150 of the NCP and 29 CFR 1910.120. The HASP, provided in Appendix A, includes the following site-specific information:

- A hazard assessment.
- Training requirements.
- Definition of exclusion, contaminant reduction, and other work zones.
- Monitoring procedures for Site operations.
- Safety procedures.
- Personal protective clothing and equipment requirements for various field operations.
- Disposal and decontamination procedures.

The HASP also includes a contingency plan that addresses potential site-specific emergencies, and a Community Air Monitoring Plan that describes required particulate monitoring to protect the neighboring community during intrusive site remediation activities.

Health and safety activities will be monitored throughout the remedial field activities. A member of the field team will be designated to serve as the Site Safety and Health Officer (SSHO) throughout the field program. This person will report directly to the Project Manager and the Corporate Health and Safety Coordinator. The HASP will be subject to revision as necessary, based on new information that is discovered during the field investigation and/or remedial activities.

4.1.1 Community Air Monitoring

Real-time community air monitoring will be performed during intrusive remedial activities at the Site. A CAMP is included with Benchmark's HASP. Particulate and VOC monitoring will be performed along the downwind perimeter of the work area during excavation, grading and soil/fill handling activities in accordance with this plan. Upwind concentrations will be field monitored at the start and periodically throughout the work day. Monitoring locations will be evaluated throughout the work day, as described in the CAMP.

The CAMP is consistent with the requirements for community air monitoring at remediation sites as established by the New York State Department of Health (NYSDOH) and NYSDEC. Accordingly, it follows procedures and practices outlined under NYSDEC's DER-10 (May 2010) Appendix 1A (NYSDOH's Generic Community Air Monitoring Plan) and Appendix 1B (Fugitive Dust and Particulate Monitoring).

4.2 Citizen Participation Activities

NYSDEC will coordinate and lead community relations throughout the course of the project with support from Benchmark as requested. A Citizen Participation (CP) Plan has been prepared by Benchmark and approved by NYSDEC. A copy of the CP Plan has been placed in the Buffalo and Erie County Public Library, the designated project document repository. The NYSDEC, with input from Benchmark and 441 Ohio Street, LLC, will issue project fact sheets to keep the public informed of remedial activities.

5.0 REPORTING

5.1 Remedial Activities Reporting

Benchmark will be on-Site full-time during the remedial actions to document remedial activities. Monitoring and documentation of the RA activities will include: construction stake-out; record drawings; daily reports of activities; community air monitoring results; post-injection sampling and analysis; and progress photographs and sketches.

5.1.1 Field Oversight/Monitoring

Standard daily reporting procedures will include preparation of an Inspector's Daily Report and, when appropriate, problem identification and corrective measures reports. Appendix C contains sample project documentation forms. Information that may be included on the daily report form includes:

- Weather and Site conditions.
- Processes and locations of construction under way.
- Equipment and personnel working in the area, including subcontractors.
- Number and type of truckloads of soil/fill removed from the site.
- Approximate sampling locations (sketches) or GPS (Trimble) coordinates and sample designations for pre-excavation characterization.
- Excavation locations and depths being excavated.

The completed reports will be available on-site and submitted to the NYSDEC as part of the Final Engineering Report. The NYSDEC will be promptly notified of problems requiring modifications to this Work Plan prior to proceeding or completion of the construction item.

Photo documentation of the remedial activities will be prepared by a field representative throughout the duration of the project as necessary to convey typical work activities, changed conditions, and/or special circumstances. Verification of cover system may include: field verification of presence/absence via field note/photos; applicable design element thickness via in-place measurements, pre- and post- survey, grade stakes; sieve analysis, sample laboratory analysis, and material handling in general accordance with the municipally approved building details, Part 375 and DER-10, as applicable.

5.2 Final Engineering Report

A Final Engineering Report (FER) will be prepared at the conclusion of remedial activities. The FER will include the following information and documentation, consistent with the NYSDEC's DER-10 Technical Guidance for Site Remediation:

- Introduction and background.
- A Site or area planimetric map showing the parcel(s) remediated, including significant site features.
- A Site map showing the lateral limits of any excavations, including end-point sample locations.
- Tabular summaries of unit quantities including: volume of soil excavated and disposition of excavated soil.
- Documentation on the disposition of impacted soil removed from the Site.
- Documentation of the cover system, including survey elevations and licensed professional engineer stamped record drawings.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Photo documentation of remedial activities.
- Text describing the remedial activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that the Site activities were carried out in accordance with this Work Plan.

In addition, Benchmark will subcontract for third-party data review of post-excavation verification data by a qualified, independent data validation expert. Specifically, a Data Usability Summary Report (DUSR) will be prepared, with appropriate data qualifiers added to the results. The DUSR format will follow the NYSDEC's September 1997 DUSR guidelines and draft DER-10 guidance. The DUSR and any necessary qualifications to the data will be appended to the FER.

5.3 Site Management Plan

As described above, a SMP will be prepared for the Site. The SMP will include an: Engineering and Institutional Control Plan; Operation and Maintenance Plan; Excavation Plan; a Site Monitoring Plan; and, an Environmental Easement.

6.0 PROJECT SCHEDULE

The anticipated project schedule for the major tasks to be performed are planned as follows:

- *January 2016* – Submit draft Remedial Action Work Plan
- *Late February-March 2016* – Complete Remedial Excavation Activities
- *August-September 2016* – Complete Stability Assessment
- *September-December 2016* – Complete Remedial Construction
- *November-December 2016* – Submit Draft Site Management Plan (SMP)
- *December 2016* – Submit Draft Final Engineering Report (FER)
- *February 2017* – Submit Final SMP and FER
- *March 2017* – Receive Certificate of Completion (COC)

7.0 REFERENCES

1. New York State Department of Environmental Conservation. *DER-10; Technical Guidance for Site Investigation and Remediation*. May 2010.
2. RJS Environmental. *Phase I Environmental Site Assessment, 441 Ohio Street (aka 9 South Street), Buffalo, New York*. November 2011.
3. Benchmark Environmental Engineering & Science, PLLC, *Limited Phase II Site Investigation Report, 441 Ohio Street Site, Buffalo, NY*. December 2013.
4. Benchmark Environmental Engineering & Science, PLLC. *Remedial Investigation/ Alternative Analysis Report (RI/AAR) Report, 441 Ohio Street Site, Buffalo, New York, BCP Site No. C915285*. July 2016.

TABLE

TABLE 1
CRITERIA FOR USE OF OFF-SITE SOIL
REMEDIAL ACTION WORK PLAN
441 OHIO STREET SITE
BUFFALO, NEW YORK

Parameter	Allowable Concentration ¹ for Use of Off-Site Soil
Volatile Organic Compounds (mg/kg)	
1,1,1-Trichloroethane	0.68
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02
1,2-Dichloroethene(cis)	0.25
1,2-Dichloroethene(trans)	0.19
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1
Acetone	0.05
Benzene	0.06
Butylbenzene	12
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene	1
Hexachlorobenzene	1.2
Methyl ethyl ketone	0.12
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
Propylbenzene-n	3.9
Sec-Butylbenzene	11
Tert-Butylbenzene	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47
Trimethylbenzene-1,2,4	3.6

TABLE 1
CRITERIA FOR USE OF OFF-SITE SOIL
REMEDIAL ACTION WORK PLAN
441 OHIO STREET SITE
BUFFALO, NEW YORK

Parameter	Allowable Concentration ¹ for Use of Off-Site Soil
Volatile Organic Compounds (mg/kg)	
Trimethylbenzene-1,3,5	8.4
Vinyl chloride	0.02
Xylene (mixed)	1.6
Semi-Volatile Organic Compounds (mg/kg)	
Acenaphthene	98
Acenaphthylene	100
Anthracene	100
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(g,h,i)perylene	100
Benzo(k)fluoranthene	1.7
Chrysene	1
Dibenz(a,h)anthracene	0.33
Fluoranthene	100
Fluorene	100
Indeno(1,2,3-cd)pyrene	0.5
m-Cresol(s)	0.33
Naphthalene	12
o-Cresol(s)	0.33
p-Cresol(s)	0.33
Pentachlorophenol	0.8
Phenanthrene	100
Phenol	0.33
Pyrene	100

TABLE 1
CRITERIA FOR USE OF OFF-SITE SOIL
**REMEDIAL ACTION WORK PLAN
 441 OHIO STREET SITE
 BUFFALO, NEW YORK**

Parameter	Allowable Concentration ¹ for Use of Off-Site Soil
Metals (mg/kg)	
Arsenic	16
Barium	400
Beryllium	47
Cadmium	4.3
Chromium, Hexavalent ²	19
Chromium, Trivalent ²	180
Copper	270
Cyanide	27
Lead	400
Manganese	2000
Mercury (total)	0.73
Nickel	130
Selenium	4
Silver	8.3
Zinc	2480
PCBs/Pesticides (mg/kg)	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE	8.9
4,4'-DDT	7.9
4,4'-DDD	13
Aldrin	0.097
Alpha-BHC	0.02
Beta-BHC	0.09
Chlordane (alpha)	2.9
Delta-BHC	0.25
Dibenzofuran	59
Dieldrin	0.1
Endosulfan I	24
Endosulfan II	24

TABLE 1

CRITERIA FOR USE OF OFF-SITE SOIL

REMEDIAL ACTION WORK PLAN

441 OHIO STREET SITE

BUFFALO, NEW YORK

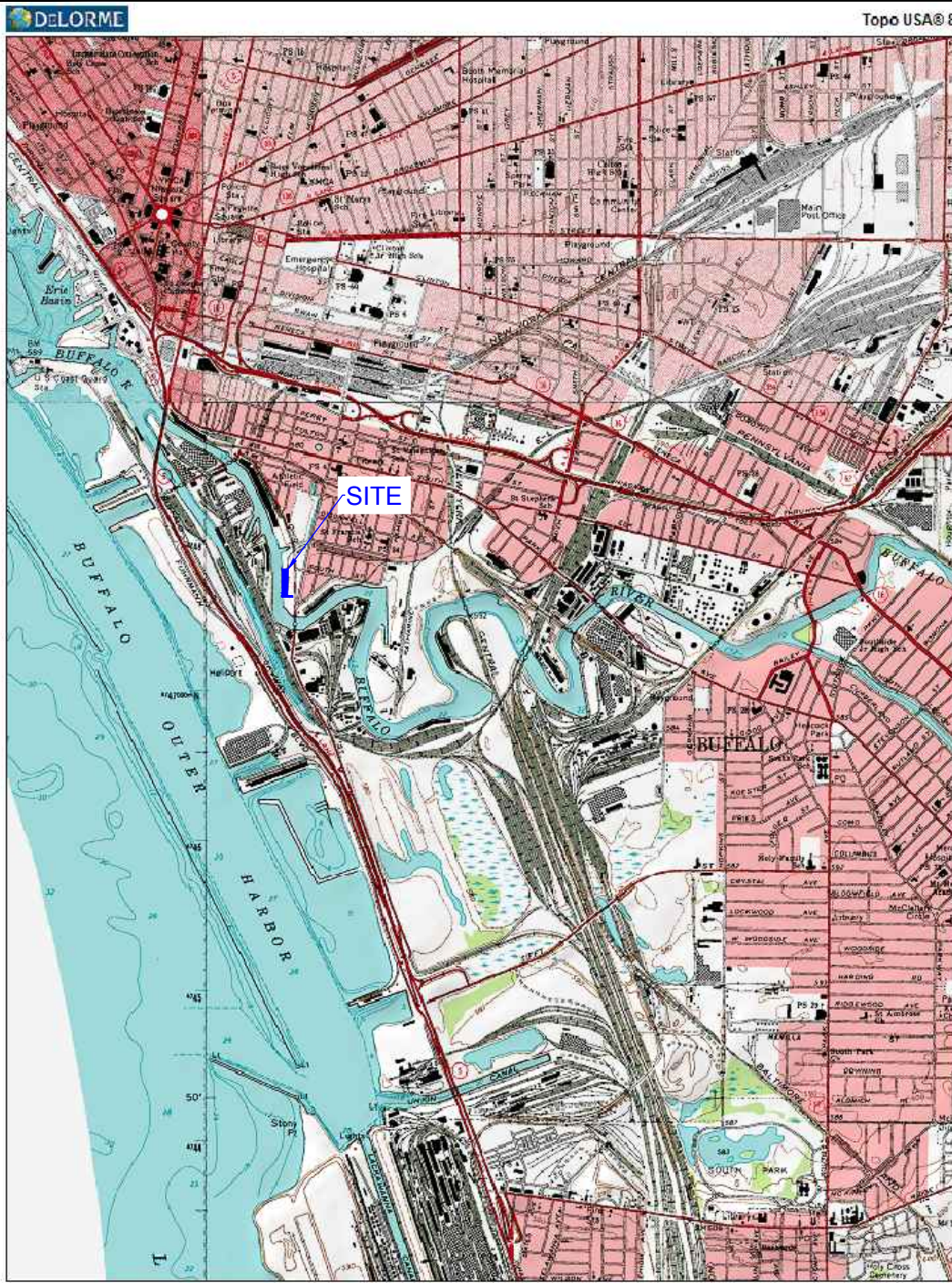
Parameter	Allowable Concentration¹ for Use of Off-Site Soil
PCBs/Pesticides (mg/kg)	
Endosulfan sulfate	24
Endrin	0.06
Heptachlor	0.38
Lindane	0.1
Polychlorinated biphenyls	1

Notes:

1. Values per DER-10, Appendix 5 for Restricted Residential Use Sites.
2. The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.

FIGURES

FIGURE 1



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2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

SITE LOCATION AND VICINITY MAP

REMEDIAL ACTION WORK PLAN

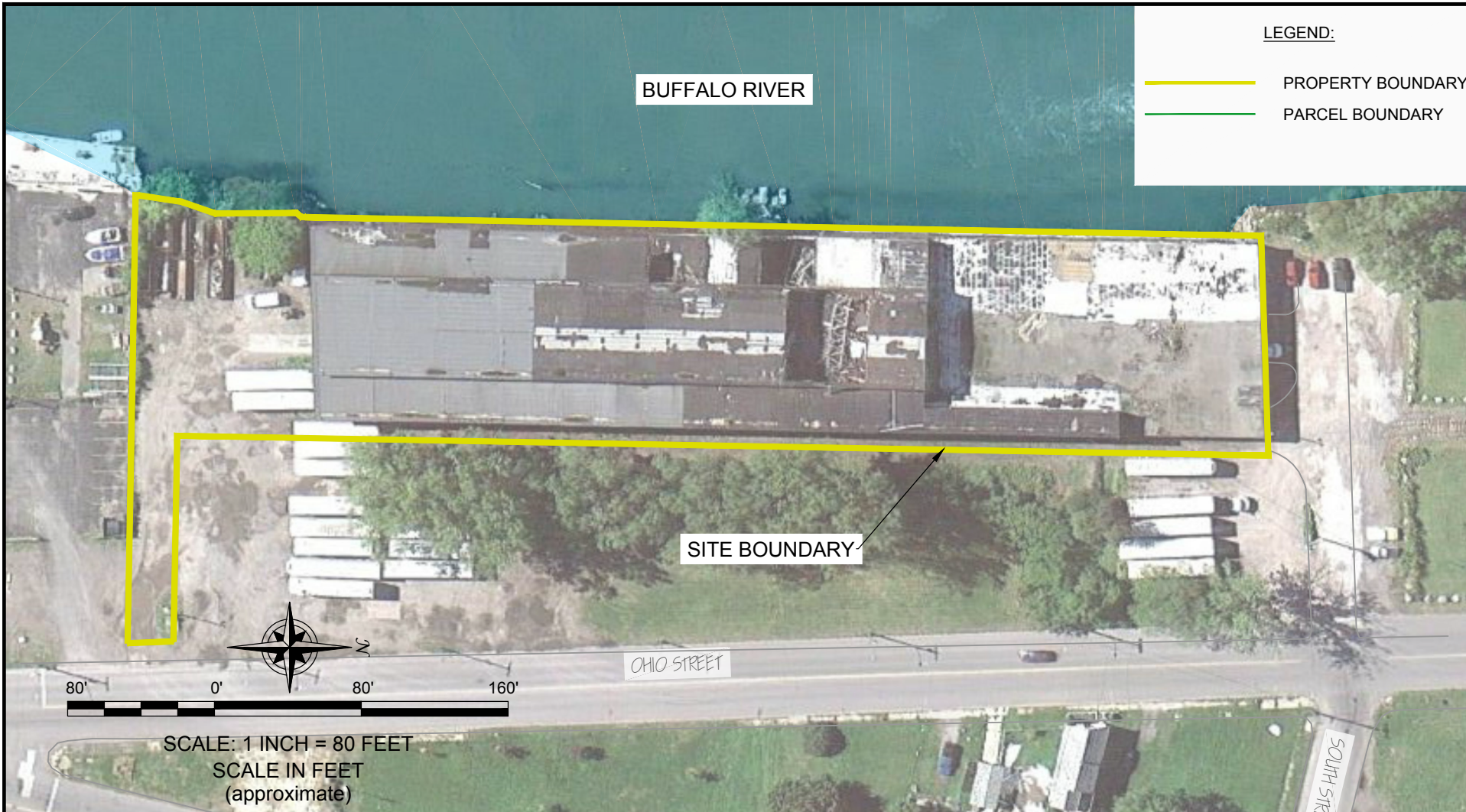
441 OHIO STREET SITE
BCP SITE NO. C915285
BUFFALO, NEW YORK
PREPARED FOR
441 OHIO STREET, LLC

PROJECT NO.: 0292-013-002

DATE: JANUARY 2016

DRAFTED BY: KRR

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ENVIRONMENTAL
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2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0292-013-002

DATE: JANUARY 2016

DRAFTED BY: KRR

SITE PLAN (AERIAL)

REMEDIAL ACTION WORK PLAN

441 OHIO STREET SITE
BCP SITE NO. C915285
BUFFALO, NEW YORK
PREPARED FOR
441 OHIO STREET, LLC

FIGURE 2

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DATE: REVISED DECEMBER 2015
DRAFTED BY: BLR/KRR

LEGEND:

- PROPERTY BOUNDARY
- - - PARCEL BOUNDARY
- FORMER BUILDING
- FENCE
- SB-110 RI SOIL BORING LOCATION
- ◆ SB-106/TMW-2 RI TEMPORARY MONITORING WELL LOCATION
- SB-5 HISTORIC SOIL BORING LOCATIONS (BENCHMARK)
- ◆ B-1/PZ GEOTECHNICAL BORING/PIEZOMETER LOCATIONS (BY OTHERS)

NOTES:

J = ESTIMATED VALUE; RESULT IS LESS THAN THE SAMPLE QUANTITATIVE LIMITS BUT GREATER THAN ZERO.
ONLY EXCEEDING RESTRICTED RESIDENTIAL SOIL CLEANUP OBJECTIVES (RRSCOs) SHOWN. RRSCOs VALUE IN MG/KG.

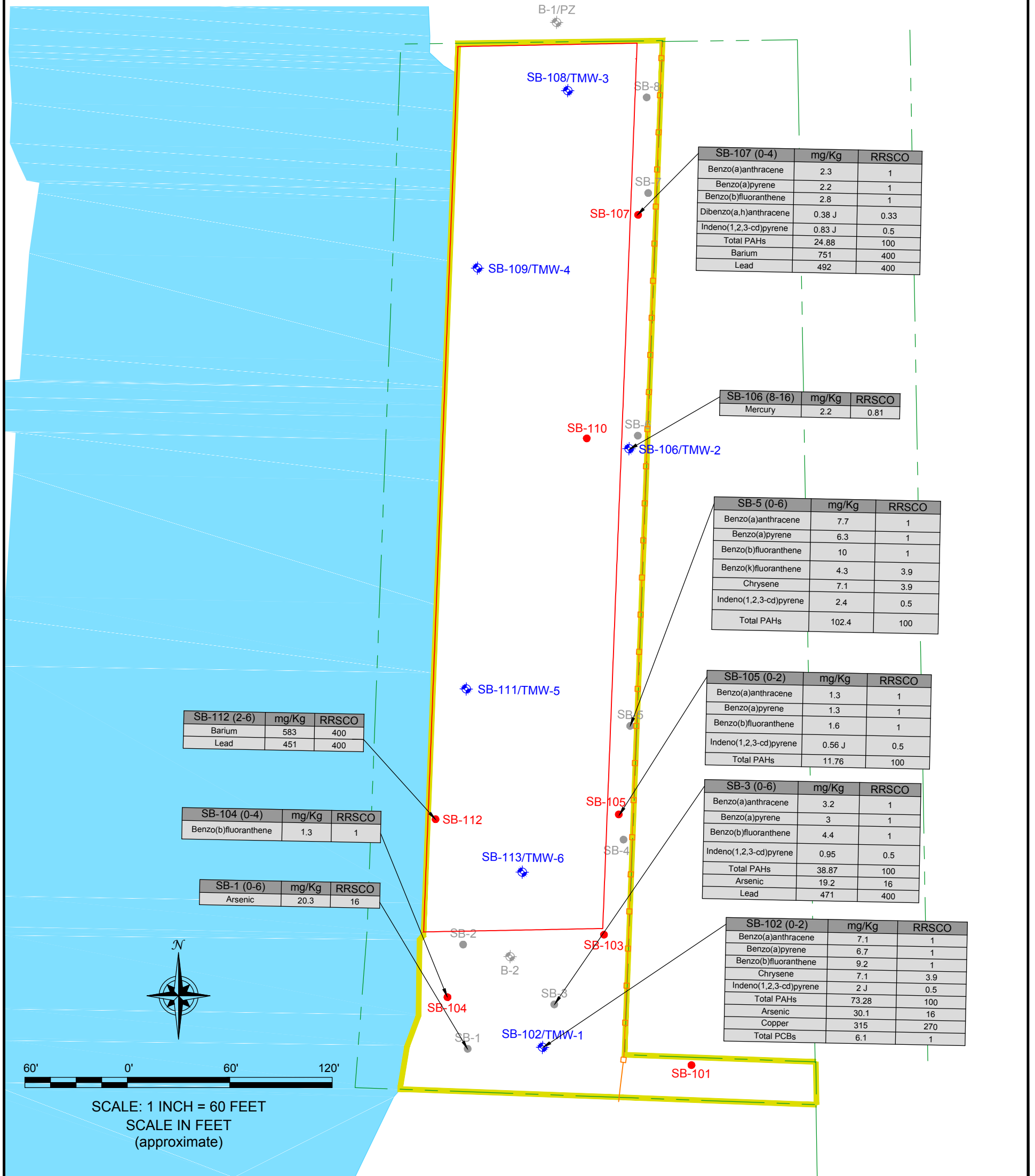


FIGURE 3	<p>HISTORIC & RI SAMPLE LOCATIONS</p> <p>REMEDIAL ACTION WORK PLAN</p> <p>441 OHIO STREET SITE BCP SITE NO. C915285 BUFFALO, NEW YORK</p> <p>PREPARED FOR 441 OHIO STREET, LLC</p>	<p>2558 HAMBURG TURNPIKE SUITE 300 BUFFALO, NY 14218 (716) 856-0599</p> <p>JOB NO.: 0292-013-002</p>
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DATE: JANUARY 2016
DRAFTED BY: KRR

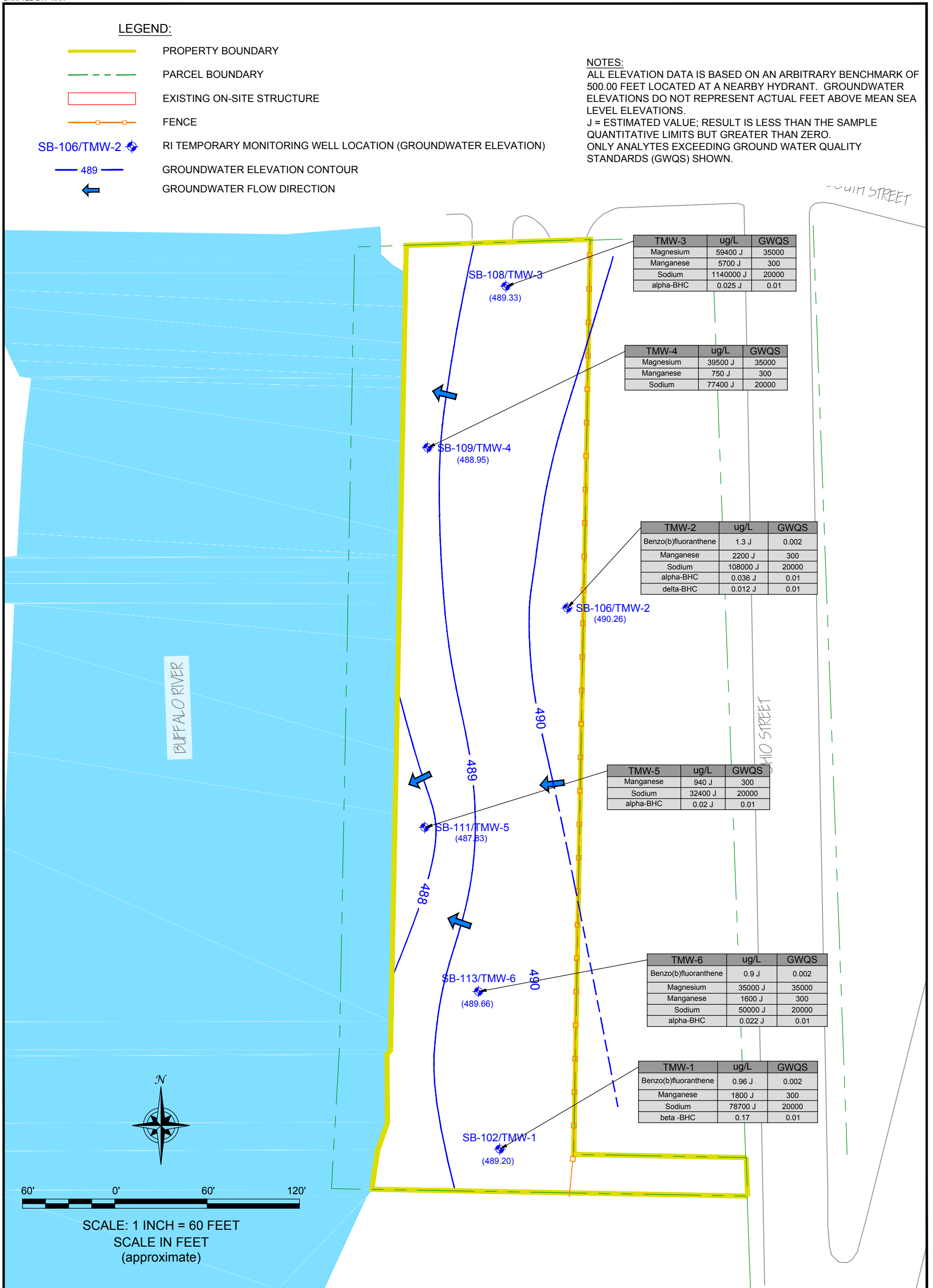


FIGURE 4	RI GROUNDWATER INVESTIGATION RESULTS	<p>2558 HAMBURG TURNPIKE SUITE 300 BUFFALO, NY 14218 (716) 856-0599</p>
	REMEDIAL ACTION WORK PLAN 441 OHIO STREET SITE BCP SITE NO. C915285 BUFFALO, NEW YORK PREPARED FOR 441 OHIO STREET, LLC	

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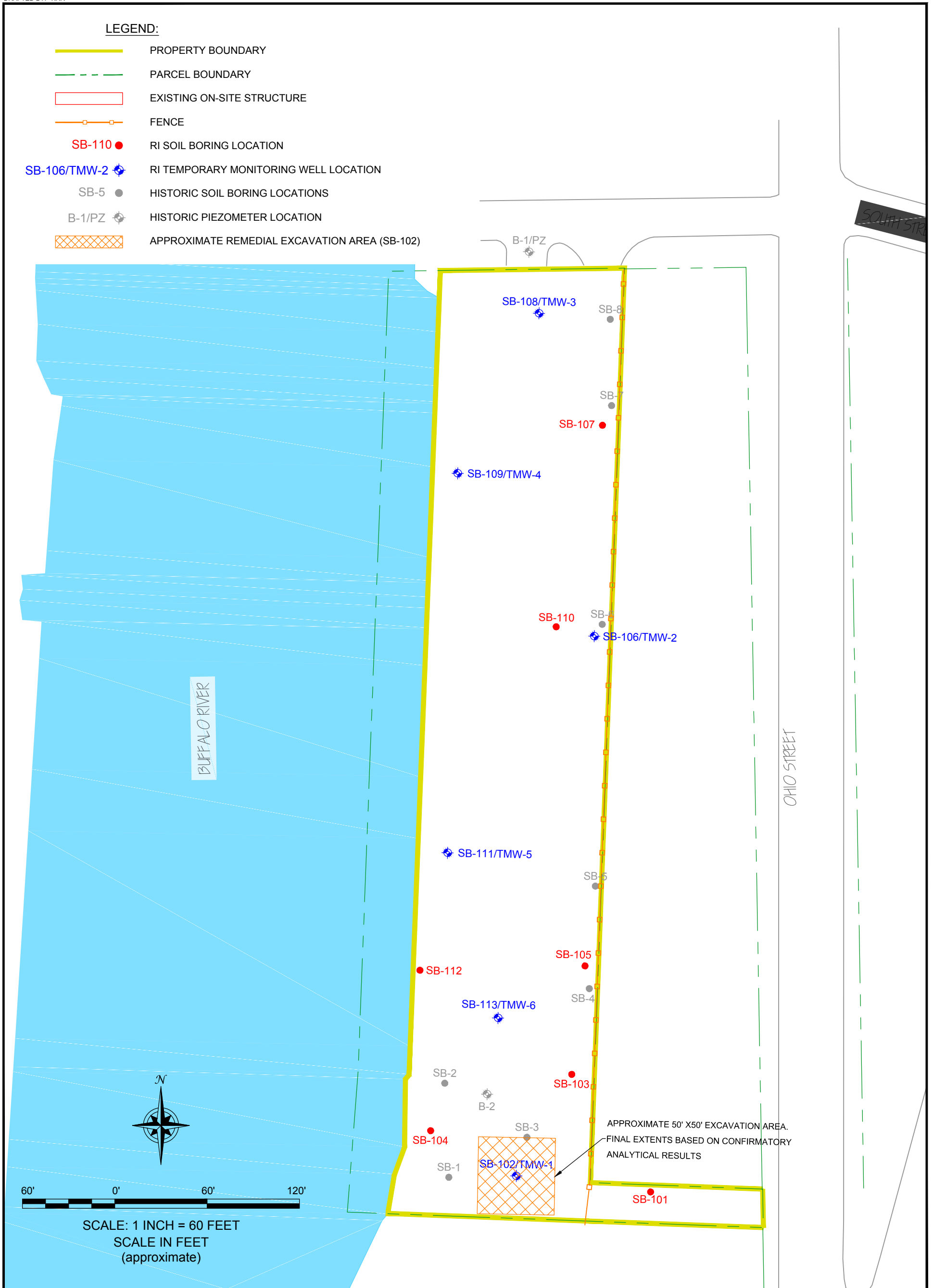









FIGURE 5	PLANNED REMEDIAL EXCAVATION ACTIVITIES	 2558 HAMBURG TURNPIKE SUITE 300 BUFFALO, NY 14218 (716) 856-0599
	REMEDIAL ACTION WORK PLAN 441 OHIO STREET SITE BCP SITE NO. C915285 BUFFALO, NEW YORK PREPARED FOR 441 OHIO STREET, LLC	

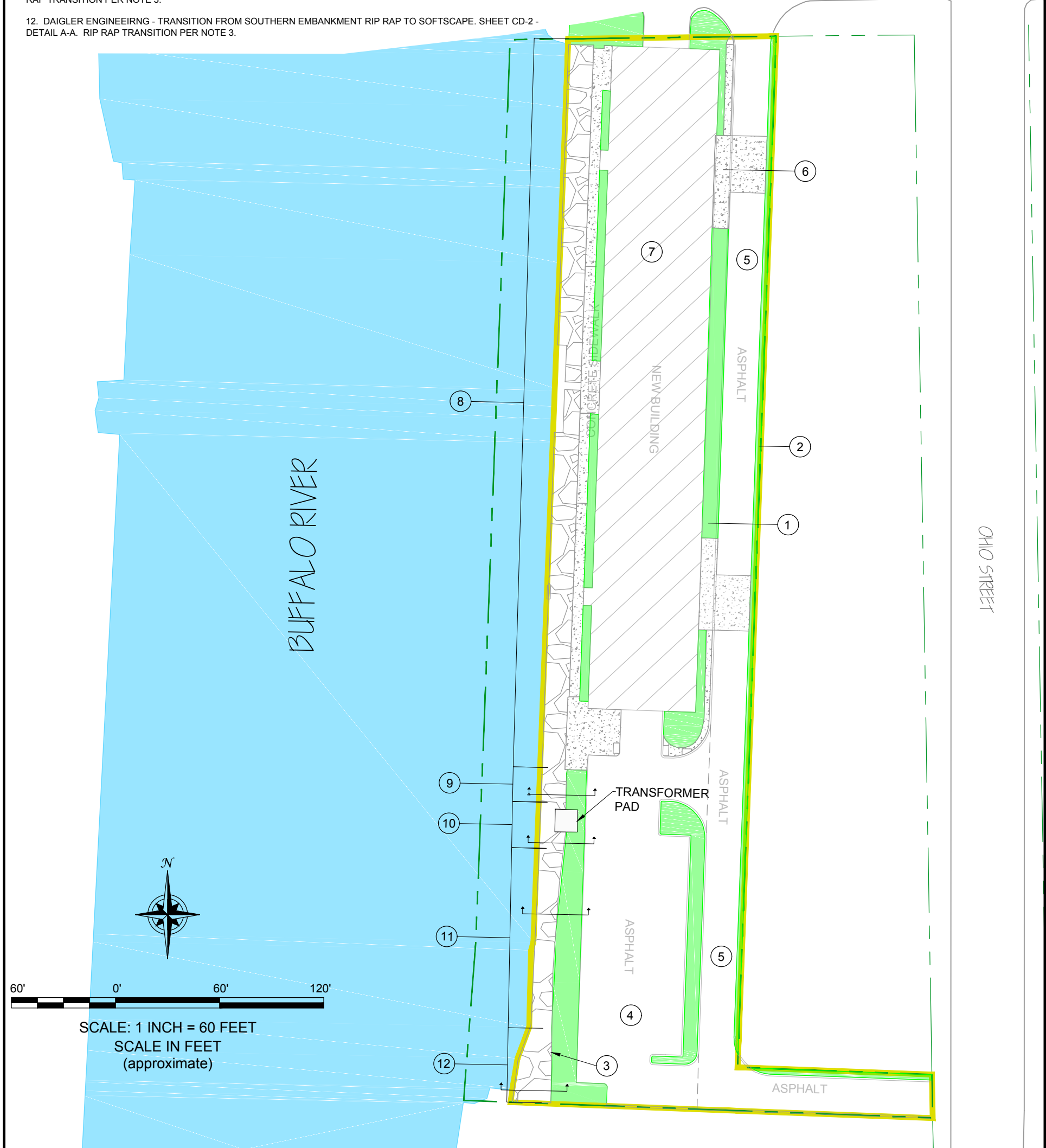
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NOTES:

1. TYPICAL SOIL COVER TRANSITION TO HARDSCAPE - SEE BM DETAILS - DETAIL 1
2. TYPICAL SOIL COVER TRANSITION TO BCP PROPERTY BOUNDARY - SEE BM DETAILS - DETAIL 2
3. TRANSITION FROM RIP RAP TO SOFTSCAPE SOIL COVER - SEE BM DETAILS - DETAIL3
4. TYPICAL TYPE 1 ASPHALT - TREDOSHEET C201 - DETAIL 1
5. TYPICAL TYPE 2 ASPHALT - TREDOSHEET C201 - DETAIL 2
6. TYPICAL CONCRETE SIDEWALK (PEDESTRIAN/DRIVEWAY) - TREDOSHEET C201 - DETAIL 3
7. TYPICAL SLAB ON GRADE DETAIL - TREDOSHEET S-207 - DETAIL 6
8. PROFESSIONAL ENGINEERING SOLUTIONS - TRANSITION FROM SEA WALL TO RIP RAP TO CONCRETE PATIO. SHEET SP-2 DETAIL 1. CONCRETE DETAIL PER NOTE 6.
9. DAIGLER ENGINEERING - TRANSITION FROM SEA WALL TO RIP RAP TO STORM SEWER DISCHARGE TO HARDSCAPE - SHEET CD-2 - DETAIL D-D. RIP RAP TRANSITION PER NOTE 3. HARDSCAPE DETAIL PER NOTE 4.
10. DAIGLER ENGINEERING - ELECTRICAL TRANSFORMER AREA - TRANSITION FROM SEA WALL TO SHEET PILE TO TRANSFORMER SURFACE COVER. SHEET CD-2 DETAIL C-C. RIP RAP TRANSITION PER NOTE 3.
11. DAIGLER ENGINEERING - TRANSITION FROM SEA WALL TO RIP RAP TO SOFTSCAPE. SHEET CD-2 - DETAIL B-B. RIP RAP TRANSITION PER NOTE 3.
12. DAIGLER ENGINEERING - TRANSITION FROM SOUTHERN EMBANKMENT RIP RAP TO SOFTSCAPE. SHEET CD-2 - DETAIL A-A. RIP RAP TRANSITION PER NOTE 3.

LEGEND:

-  BCP PROPERTY BOUNDARY
-  PARCEL BOUNDARY
-  NEW BUILDING
-  SOIL COVER AREA
-  RIP RAP COVER AREA
-  CONCRETE WALKWAY/DRIVEWAY COVER AREA



PLANNED COVER SYSTEM LAYOUT

REMEDIAL ACTION WORK PLAN
 441 OHIO STREET SITE
 BCP SITE NO. C915285
 BUFFALO, NEW YORK
 PREPARED FOR
 441 OHIO STREET, LLC



2558 HAMBURG TURNPIKE
 SUITE 300
 BUFFALO, NY 14218
 (716) 856-0599

JOB NO.: 0292-013-002

FIGURE 6

APPENDIX A

HEALTH AND SAFETY PLAN

SITE HEALTH AND SAFETY PLAN
for
BROWNFIELD CLEANUP PROGRAM
REMEDIAL ACTIVITIES

441 OHIO STREET SITE
BUFFALO, NEW YORK

December 2016

0292-013-002

Prepared for:

441 OHIO STREET, LLC

**441 OHIO STREET SITE
HEALTH AND SAFETY PLAN FOR REMEDIAL ACTIVITIES**

ACKNOWLEDGEMENT

Plan Reviewed by (initial):

Corporate Health and Safety Director: _____ Thomas H. Forbes, P.E.

Project Manager: _____ Thomas H. Forbes, P.E.

Designated Site Safety and Health Officer: _____ Nathan T. Munley

Acknowledgement:

I acknowledge that I have reviewed the information contained in this site-specific Health and Safety Plan, and understand the hazards associated with performance of the field activities described herein. I agree to comply with the requirements of this plan.

NAME (PRINT)	SIGNATURE	DATE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**441 OHIO STREET SITE
HEALTH AND SAFETY PLAN FOR REMEDIAL ACTIVITIES**

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HEALTH AND SAFETY PLAN FOR REMEDIAL ACTIVITIES**

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**441 OHIO STREET SITE
HEALTH AND SAFETY PLAN FOR REMEDIAL ACTIVITIES**

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Attachment B	Hot Work Permit Form
Attachment C	Community Air Monitoring Plan

1.0 INTRODUCTION

1.1 General

In accordance with OSHA requirements contained in 29 CFR 1910.120, this Health and Safety Plan (HASP) describes the specific health and safety practices and procedures to be employed by Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC employees (referred to jointly hereafter as “Benchmark-TurnKey”) during remedial activities at the 441 Ohio Street Site (Site) located in the City of Buffalo, Erie County, New York (see Figure 1). This HASP presents procedures for Benchmark-TurnKey employees who will be involved with remedial field activities; it does not cover the activities of other contractors, subcontractors or other individuals on the Site. These firms will be required to develop and enforce their own HASPs as discussed in Section 2.0. Benchmark-TurnKey accepts no responsibility for the health and safety of contractor, subcontractor or other personnel.

This HASP presents information on known Site health and safety hazards using available historical information, and identifies the equipment, materials and procedures that will be used to eliminate or control these hazards. Environmental monitoring will be performed during the course of field activities to provide real-time data for on-going assessment of potential hazards.

1.2 Background

The Site consists of a portion of the property identified by the City of Buffalo Assessors’ Office as 9 South Street and referred to herein as 441 Ohio Street (SBL 122.14-1-1). The BCP Site includes approximately 1.8 acres of the 2.3-acre parcel. The majority of the BCP Site is covered by a 47,000 square foot vacant commercial/industrial structure situated along the Buffalo River (see Figure 2).

The structure was constructed in 1892. Historical Site uses included storage/freight house, railroad, and paper fiber processing. Environmental assessments/investigations completed at the Site have identified contamination related to the former uses of the Site. Elevated concentrations of semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) have been detected on-Site in exceedance of regulatory guidelines.

1.3 Known and Suspected Environmental Conditions

Benchmark-TurnKey completed a Remedial Investigation (RI) of the 441 Ohio Street Site. The RI, in addition, to previous investigations, identified contamination at the Site requiring remediation in order to satisfy the requirements for Restricted Residential Track 4 cleanup. Contaminates identified that require remedial action include:

- Surface soil/fill with semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals above their respective restricted residential soil cleanup objectives (RRSCOs) or commercial soil cleanup objectives (CSCOs) were identified in the soil/fill on the Site.
- Subsurface soil/fill with metals above their respective USCOs, RRSCOs, and CSCOs, were detected at the Site. Elevated metals were detected in the vicinity of SB-112 and SB-106, primarily associated with the reworked soil/fill from 2-8 fbg.
- Groundwater with SVOCs, dissolved metals, and pesticides above their respective NYSDEC Class GA Groundwater Quality Standards and Guidance Values (GWQS/GVs) were detected at the Site. One PAH, benzo(b)fluoranthene, was detected above its GWQS, and can be likely attributed to the elevated turbidity of the collected groundwater. Dissolved metals detected above GWQS are primarily naturally occurring minerals. Select pesticides were detected above their respective GWQS, including the upgradient wells, indicating a potential background condition associated with subsurface soil/fill material predominant in urban environments. Soil analytical results did not report elevated detections of pesticides, indicating that they originate off-site and/or are ubiquitous.

1.4 Parameters of Interest

Based on the previous investigations, constituents of potential concern (COPCs) in soil and, potentially groundwater, at the Site include:

- **Semi-Volatile Organic Compounds (SVOCs)** – SVOCs present at elevated concentrations may include base-neutral semi-volatile organic compounds (SVOCs) from oils, greases, and fuels associated with the operation of locomotive engines, steel mills, petroleum bulk storage, and other historic steel manufacturing operations. Specifically, polycyclic aromatic hydrocarbons (PAHs), which are byproducts of incomplete combustion and impurities in petroleum products. Although PAHs are commonly found in urban soil environments, they may be

present at the Site at concentrations that are elevated compared to typical “background” levels. Naphthalene is a natural component of fossil fuels such as petroleum and coal; it is also formed when natural products such as wood or tobacco are burned.

- **Polychlorinated Biphenyls (PCBs)** – The potential impact of surface and subsurface soils by PCBs in discrete areas associated with former substations, rail yards, and hydraulic pump houses.
- **Inorganic Compounds** – Inorganic COPCs potentially present at elevated concentrations due to railway activities may include arsenic, chromium, lead, and mercury.

1.5 Overview of Remedial Activities

Benchmark-TurnKey personnel will be on-site to observe and perform remedial activities. The field activities to be completed as part of the remedial activities are summarized below. Planned remedial activities are more fully described in the Remedial Action Work Plan (RAWP) for the Site.

Remedial Action Activities

1. **Waste Characterization Sampling:** Waste characterization samples will be collected from the one (1) area from which soil/fill excavations will be completed. The number of samples to be collected and the analytical parameters will be in accordance with the disposal facility requirements.
2. **Excavation & Offsite Disposal of Contaminant Source Areas:** One (1) area of PCB impacted soil/fill will require soil excavation activity. The excavation activity will include confirmation sampling. The extent of excavation will be adjusted as determined by field observations and confirmatory post-excavation sampling.
3. **Confirmation Sampling:** Benchmark-TurnKey personnel will collect confirmation soil samples to verify that excavations attain the RRSCOs for the PCB impacted excavation area.
4. **Backfill:** Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil or complete the backfilling of excavations and establish the designed grades at the Site below the cover system.

- 5. Cover System:** The cover will consist either of the structures, such as buildings, pavement, and sidewalks comprising the site development; pavement and sidewalks shall be constructed to conform to requirements specified in locally approved redevelopment plans for hardscape covered areas; or, 24-inches minimum cover soil/stone material that conforms to the Site import criteria per DER-10 Appendix 5 above a demarcation layer.

2.0 ORGANIZATIONAL STRUCTURE

This section of the HASP describes the lines of authority, responsibility and communication as they pertain to health and safety functions at the Site. The purpose of this chapter is to identify the personnel who impact the development and implementation of the HASP and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations and establish the lines of communications among them for health and safety matters. The organizational structure described in this chapter is consistent with the requirements of 29 CFR 1910.120(b)(2). This section will be reviewed by the Project Manager and updated as necessary to reflect the current organizational structure at this Site.

2.1 Roles and Responsibilities

All Benchmark-Turnkey personnel on the Site must comply with the minimum requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this Site are detailed in the following paragraphs.

2.1.1 Corporate Health and Safety Director

The Benchmark-TurnKey Corporate Health and Safety Director is *Mr. Thomas H. Forbes, P.E.* The Corporate Health and Safety Director responsible for developing and implementing the Health and Safety program and policies for Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC, and consulting with corporate management to ensure adequate resources are available to properly implement these programs and policies. The Corporate Health and Safety Director coordinates Benchmark-TurnKey's Health and Safety training and medical monitoring programs and assists project management and field staff in developing site-specific health and safety plans.

2.1.2 Project Manager

The Project Manager for this Site is *Mr. Thomas H. Forbes, P.E.* The Project Manager has the responsibility and authority to direct all Benchmark-TurnKey work operations at the Site. The Project Manager coordinates safety and health functions with the Site Safety and Health Officer, and bears ultimate responsibility for proper implementation

of this HASP. He may delegate authority to expedite and facilitate any application of the program, including modifications to the overall project approach as necessary to circumvent unsafe work conditions. Specific duties of the Project Manager include:

- Preparing and coordinating the Site work plan.
- Providing Benchmark-TurnKey workers with work assignments and overseeing their performance.
- Coordinating health and safety efforts with the Site Safety and Health Officer (SSHO).
- Reviewing the emergency response coordination plan to assure its effectiveness.
- Serving as the primary liaison with Site contractors and the property owner.

2.1.3 Site Safety and Health Officer

The Site Safety and Health Officer (SSHO) for this Site is *Mr. Nathan Munley*. The qualified alternate SSHO is *Mr. Bryan C. Hann*. The SSHO reports to the Project Manager. The SSHO is on-site or readily accessible to the Site during all work operations and has the authority to halt Site work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

- Managing the safety and health functions for Benchmark-TurnKey personnel on the Site.
- Serving as the point of contact for safety and health matters.
- Ensuring that Benchmark-TurnKey field personnel working on the Site have received proper training (per 29 CFR Part 1910.120(e)), that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134), and that they are properly trained in the selection, use and maintenance of personal protective equipment, including qualitative respirator fit testing.
- Performing or overseeing Site monitoring as required by the HASP.
- Assisting in the preparation and review of the HASP.

- Maintaining site-specific safety and health records as described in this HASP.
- Coordinating with the Project Manager, Site Workers, and Contractor's SSHO as necessary for safety and health efforts.

2.1.4 Site Workers

Site workers are responsible for: complying with this HASP or a more stringent HASP, if appropriate (i.e., Contractor and Subcontractor's HASP); using proper PPE; reporting unsafe acts and conditions to the SSHO; and following the safety and health instructions of the Project Manager and SSHO.

2.1.5 Other Site Personnel

Other Site personnel who will have health and safety responsibilities will include the Drilling Contractor, who will be responsible for developing, implementing and enforcing a Health and Safety Plan equally stringent or more stringent than Benchmark-TurnKey's HASP. Benchmark-TurnKey assumes no responsibility for the health and safety of anyone outside its direct employ. Each Contractor's HASP shall cover all non-Benchmark/TurnKey Site personnel. Each Contractor shall assign a SSHO who will coordinate with Benchmark-TurnKey's SSHO as necessary to ensure effective lines of communication and consistency between contingency plans.

In addition to Benchmark-TurnKey and Contractor personnel, other individuals who may have responsibilities in the work zone include subcontractors and governmental agencies performing Site inspection work (i.e., the New York State Department of Environmental Conservation). The Contractor shall be responsible for ensuring that these individuals have received OSHA-required training (29 CFR 1910.120(e)), including initial, refresher and site-specific training, and shall be responsible for the safety and health of these individuals while they are on-Site.

3.0 HAZARD EVALUATION

Due to the presence of certain contaminants at the Site, the possibility exists that workers will be exposed to hazardous substances during field activities. The principal points of exposure would be through direct contact with and incidental ingestion of soil, and through the inhalation of contaminated particles or vapors. Other points of exposure may include direct contact with groundwater. In addition, the use of drilling and/or medium to large-sized construction equipment (e.g., excavator) will also present conditions for potential physical injury to workers. Further, since work will be performed outdoors, the potential exists for heat/cold stress to impact workers, especially those wearing protective equipment and clothing. Adherence to the medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, establishment work zones and Site control, appropriate decontamination procedures and contingency planning outlined herein will reduce the potential for chemical exposures and physical injuries.

3.1 Chemical Hazards

As discussed in Section 1.3, historical activities have potentially resulted in impacts to Site soils and groundwater. Table 1 lists exposure limits for airborne concentrations of the COPCs identified in Section 1.4 of this HASP. Brief descriptions of the toxicology of the prevalent COPCs and related health and safety guidance and criteria are provided below.

- **Arsenic (CAS #7440-38-2)** is a naturally occurring element and is usually found combined with one or more elements, such as oxygen or sulfur. Inhalation is a more important exposure route than ingestion. First phase exposure symptoms include nausea, vomiting, diarrhea and pain in the stomach. Prolonged contact is corrosive to the skin and mucus membranes. Arsenic is considered a Group A human carcinogen by the USEPA. Exposure via inhalation is associated with an increased risk of lung cancer. Exposure via the oral route is associated with an increased risk of skin cancer.
- **Barium (CAS #7440-39-3)** is a silver white metal, produced by the reduction of barium oxide. Local effects and symptoms of exposure to barium compounds, such as the hydroxide or carbonate, may include irritation of the eyes, throat, nose and skin. Systemic effects from ingestion include increased muscle contractility, reduction of heart rate/potential arrest, intestinal peristalsis, vascular constriction, and bladder contraction.

- **Lead (CAS #7439-92-1)** can affect almost every organ and system in our bodies. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed. Lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect memory. Lead may cause anemia.
- **Mercury (CAS #7439-97-6)** is used in industrial applications for the production of caustic and chlorine, and in electrical control equipment and apparatus. Over-exposure to mercury may cause coughing, chest pains, bronchitis, pneumonia, indecision, headaches, fatigue, and salivation. Mercury is a skin and eye irritant.
- **Polycyclic Aromatic Hydrocarbons (PAHs)** are formed as a result of the pyrolysis and incomplete combustion of organic matter such as fossil fuel. PAH aerosols formed during the combustion process disperse throughout the atmosphere, resulting in the deposition of PAH condensate in soil, water and on vegetation. In addition, several products formed from petroleum processing operations (e.g., roofing materials and asphalt) also contain elevated levels of PAHs. Hence, these compounds are widely dispersed in the environment. PAHs are characterized by a molecular structure containing three or more fused, unsaturated carbon rings. Seven of the PAHs are classified by USEPA as probable human carcinogens (USEPA Class B2). These are: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The primary route of exposure to PAHs is through incidental ingestion and inhalation of contaminated particulates. PAHs are characterized by an organic odor, and exist as oily liquids in pure form. Acute exposure symptoms may include acne-type blemishes in areas of the skin exposed to sunlight.
- **Polychlorinated Biphenyls (PCBs)** are associated with former substations, rail yards, and hydraulic pump houses on the Site. PCBs can be absorbed into the body by inhalation of its aerosol, through the skin, and by ingestion. Repeated or prolonged contact with skin may cause dermatitis. PCBs may have effects on the liver. Animal tests show that PCBs possibly cause toxic effects in human reproduction. In the food chain, bioaccumulation takes place, specifically in aquatic organisms. A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

With respect to the anticipated remedial activities discussed in Section 1.5, possible routes of exposure to the above-mentioned contaminants are presented in Table 2. The use

of proper respiratory equipment, as outlined in Section 7.0 of this HASP, will minimize the potential for exposure to airborne contamination. Exposure to contaminants through dermal and other routes will also be minimized through the use of protective clothing (Section 7.0), safe work practices (Section 6.0), and proper decontamination procedures (Section 12.0).

3.2 Physical Hazards

Remedial activities at the 441 Ohio Street Site may present the following physical hazards:

- The potential for physical injury during heavy construction equipment use, such as backhoes, excavators and drilling equipment.
- The potential for heat/cold stress to employees during the summer/winter months (see Section 10.0).
- The potential for slip and fall injuries due to rough, uneven terrain and/or open excavations.

These hazards represent only some of the possible means of injury that may be present during remedial operations and sampling activities at the Site. Since it is impossible to list all potential sources of injury, it shall be the responsibility of each individual to exercise proper care and caution during all phases of the work.

4.0 TRAINING

4.1 Site Workers

All personnel performing remedial activities at the Site (such as, but not limited to, equipment operators, general laborers, and drillers) and who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors/managers responsible for the Site shall receive training in accordance with 29 CFR 1910.120(e) before they are permitted to engage in operations in the exclusion zone or contaminant reduction zone. This training includes an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor. Additional site-specific training shall also be provided by the SSHO prior to the start of field activities. A description of topics to be covered by this training is provided below.

4.1.1 Initial and Refresher Training

Initial and refresher training is conducted by a qualified instructor as specified under OSHA 29 CFR 1910.120(e)(5), and is specifically designed to meet the requirements of OSHA 29 CFR 1910.120(e)(3) and 1910.120(e)(8). The training covers, as a minimum, the following topics:

- OSHA HAZWOPER regulations.
- Site safety and hazard recognition, including chemical and physical hazards.
- Medical monitoring requirements.
- Air monitoring, permissible exposure limits, and respiratory protection level classifications.
- Appropriate use of personal protective equipment (PPE), including chemical compatibility and respiratory equipment selection and use.
- Work practices to minimize risk.
- Work zones and Site control.

- Safe use of engineering controls and equipment.
- Decontamination procedures.
- Emergency response and escape.
- Confined space entry procedures.
- Heat and cold stress monitoring.
- Elements of a Health and Safety Plan.
- Spill containment.

Initial training also incorporates workshops for PPE and respiratory equipment use (Levels A, B and C), and respirator fit testing. Records and certification received from the course instructor documenting each employee's successful completion of the training identified above are maintained on file at Benchmark-TurnKey's Buffalo, NY office. Contractors and Subcontractors are required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not been certified as having received health and safety training in conformance with 29 CFR 1910.120(e) is prohibited from working in the exclusion and contamination reduction zones, or to engage in any on-site work activities that may involve exposure to hazardous substances or wastes.

4.1.2 Site Training

Site workers are given a copy of the HASP and provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with the HASP and the information and requirements it contains. The Site briefing shall be provided by the SSHO prior to initiating field activities and shall include:

- Names of personnel and alternates responsible for Site safety and health.
- Safety, health and other hazards present on the Site.
- The site lay-out including work zones and places of refuge.

- The emergency communications system and emergency evacuation procedures.
- Use of PPE.
- Work practices by which the employee can minimize risks from hazards.
- Safe use of engineering controls and equipment on the site.
- Medical surveillance, including recognition of symptoms and signs of over-exposure as described in Chapter 5 of this HASP.
- Decontamination procedures as detailed in Chapter 12 of this HASP.
- The emergency response plan as detailed in Chapter 15 of this HASP.
- Confined space entry procedures, if required, as detailed in Chapter 13 of this HASP.
- The spill containment program as detailed in Chapter 9 of this HASP.
- Site control as detailed in Chapter 11 of this HASP.

Supplemental health and safety briefings will also be conducted by the SSHO on an as-needed basis during the course of the work. Supplemental briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing Site characterization and analysis. Conditions for which the SSHO may schedule additional briefings include, but are not limited to: a change in Site conditions (e.g., based on monitoring results); changes in the work schedule/plan; newly discovered hazards; and safety incidents occurring during Site work.

4.2 Supervisor Training

On-site safety and health personnel who are directly responsible for or who supervise the safety and health of workers engaged in hazardous waste operations (i.e., SSHO) shall receive, in addition to the appropriate level of worker training described in Section 4.1, above, 8 additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

4.3 Emergency Response Training

Emergency response training is addressed in Attachment A of this HASP, Emergency Response Plan.

4.4 Site Visitors

Each Contractor's SSHO will provide a site-specific briefing to all Site visitors and other non-Benchmark/TurnKey personnel who enter the Site beyond the Site entry point. The site-specific briefing will provide information about Site hazards, the Site layout including work zones and places of refuge, the emergency communications system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

Site visitors will not be permitted to enter the exclusion zone or contaminant reduction zones unless they have received the level of training required for Site workers as described in Section 4.1.

5.0 MEDICAL MONITORING

Medical monitoring examinations are provided to Benchmark-TurnKey employees as stipulated under 29 CFR Part 1910.120(f). These exams include initial employment, annual and employment termination physicals for all Benchmark-TurnKey employees involved in hazardous waste site field operations. Post-exposure examinations are also provided for employees who may have been injured, received a health impairment, or developed signs or symptoms of over-exposure to hazardous substances or were accidentally exposed to substances at concentrations above the permissible exposure limits without necessary personal protective equipment. Such exams are performed as soon as possible following development of symptoms or the known exposure event.

Medical evaluations are performed by Health Works, an occupational health care provider under contract with Benchmark-TurnKey. Health Works is located in Seneca Square Plaza, 1900 Ridge Road, West Seneca, New York 14224. The facility can be reached at (716) 823-5050 to schedule routine appointments or post-exposure examinations.

Medical evaluations are conducted according to the Benchmark-TurnKey Medical Monitoring Program and include an evaluation of the workers' ability to use respiratory protective equipment. The examinations include:

- Occupational/medical history review.
- Physical exam, including vital sign measurement.
- Spirometry testing.
- Eyesight testing.
- Audio testing (minimum baseline and exit, annual for employees routinely exposed to greater than 85db).
- EKG (for employees >40 yrs age or as medical conditions dictate).
- Chest X-ray (baseline and exit, and every 5 years).
- Blood biochemistry (including blood count, white cell differential count, serum multiplastic screening).
- Medical certification of physical requirements (i.e., sight, musculoskeletal,

cardiovascular) for safe job performance and to wear respiratory protection equipment.

The purpose of the medical evaluation is to determine an employee's fitness for duty on hazardous waste sites; and to establish baseline medical data.

In conformance with OSHA regulations, Benchmark-TurnKey will maintain and preserve medical records for a period of 30 years following termination of employment. Employees are provided a copy of the physician's post-exam report, and have access to their medical records and analyses.

6.0 SAFE WORK PRACTICES

All Benchmark-TurnKey employees shall conform to the following safe work practices during all on-site work activities conducted within the exclusion and contamination reduction zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth contact is strictly prohibited.
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Respiratory protective equipment and clothing must be worn by all personnel entering the Site as required by the HASP or as modified by the Site safety officer. Excessive facial hair (i.e., beards, long mustaches or sideburns) that interferes with the satisfactory respirator-to-face seal is prohibited.
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross contamination and need for decontamination.
- Medicine and alcohol can synergize the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the Benchmark-TurnKey occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during the workday.
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.
- On-site personnel shall use the “buddy” system. No one may work alone (i.e., out of earshot or visual contact with other workers) in the exclusion zone.
- Personnel and equipment in the contaminated area shall be minimized, consistent with effective Site operations.
- All employees have the obligation to immediately report and if possible, correct unsafe work conditions.
- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for Benchmark-TurnKey employees, as requested and required.

The recommended specific safety practices for working around the contractor's equipment (e.g., backhoes, bulldozers, excavators, drill rigs etc.) are as follows:

- Although the Contractor and subcontractors are responsible for their equipment and safe operation of the Site, Benchmark-TurnKey personnel are also responsible for their own safety.
- Subsurface work will not be initiated without first clearing underground utility services.
- Heavy equipment should not be operated within 20 feet of overhead wires. This distance may be increased if windy conditions are anticipated or if lines carry high voltage. The Site should also be sufficiently clear to ensure the project staff can move around the heavy machinery safely.
- Care should be taken to avoid overhead wires when moving heavy-equipment from location to location.
- Hard hats, safety boots and safety glasses should be worn at all times in the vicinity of heavy equipment. Hearing protection is also recommended.
- The work Site should be kept neat. This will prevent personnel from tripping and will allow for fast emergency exit from the Site.
- Proper lighting must be provided when working at night.
- Construction activities should be discontinued during an electrical storm or severe weather conditions.
- The presence of combustible gases should be checked before igniting any open flame.
- Personnel shall stand upwind of any construction operation when not immediately involved in sampling/logging/observing activities.
- Personnel will not approach the edge of an unsecured trench/excavation closer than 2 feet.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 Equipment Selection

Personal protective equipment (PPE) will be donned when work activities may result in exposure to physical or chemical hazards beyond acceptable limits, and when such exposure can be mitigated through appropriate PPE. The selection of PPE will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the Site, the task-specific conditions and duration, and the hazards and potential hazards identified at the Site.

Equipment designed to protect the body against contact with known or suspect chemical hazards are grouped into four categories according to the degree of protection afforded. These categories designated A through D consistent with United States Environmental Protection Agency (USEPA) Level of Protection designation, are:

- **Level A:** Should be selected when the highest level of respiratory, skin and eye protection is needed.
- **Level B:** Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required. Level B protection is the minimum level recommended on initial Site entries until the hazards have been further defined by on-site studies. Level B (or Level A) is also necessary for oxygen-deficient atmospheres.
- **Level C:** Should be selected when the types of airborne substances are known, the concentrations have been measured and the criteria for using air-purifying respirators are met. In atmospheres where no airborne contaminants are present, Level C provides dermal protection only.
- **Level D:** Should not be worn on any Site with elevated respiratory or skin hazards. This is generally a work uniform providing minimal protection.

OSHA requires the use of certain PPE under conditions where an immediate danger to life and health (IDLH) may be present. Specifically, OSHA 29 CFR 1910.120(g)(3)(iii) requires use of a positive pressure self-contained breathing apparatus, or positive pressure air-line respirator equipped with an escape air supply when chemical exposure levels present a substantial possibility of immediate serious injury, illness or death, or impair the ability to

escape. Similarly, OSHA 29 CFR 1910.120(g)(3)(iv) requires donning totally-encapsulating chemical protective suits (with a protection level equivalent to Level A protection) in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate serious illness, injury or death, or impair the ability to escape.

In situations where the types of chemicals, concentrations, and possibilities of contact are unknown, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the personal protective gear itself. Ensemble components are detailed below for levels A/B, C, and D protection.

7.2 Protection Ensembles

7.2.1 Level A/B Protection Ensemble

Level A/B ensembles include similar respiratory protection, however Level A provides a higher degree of dermal protection than Level B. Use of Level A over Level B is determined by: comparing the concentrations of identified substances in the air with skin toxicity data, and assessing the effect of the substance (by its measured air concentrations or splash potential) on the small area of the head and neck unprotected by Level B clothing.

The recommended PPE for level A/B is:

- Pressure-demand, full-face piece self-contained breathing apparatus (MSHA/-NIOSH approved) or pressure-demand supplied-air respirator with escape self-contained breathing apparatus (SCBA).
- Chemical-resistant clothing. For Level A, clothing consists of totally-encapsulating chemical resistant suit. Level B incorporates hooded one-or two-piece chemical splash suit.
- Inner and outer chemical resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

7.2.2 Level C Protection Ensemble

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions permit wearing an air-purifying device. The device (when required) must be an air-purifying respirator (MSHA/NIOSH approved) equipped with filter cartridges. Cartridges must be able to remove the substances encountered. Respiratory protection will be used only with proper fitting, training and the approval of a qualified individual. In addition, an air-purifying respirator can be used only if: oxygen content of the atmosphere is at least 19.5% in volume; substances are identified and concentrations measured; substances have adequate warning properties; the individual passes a qualitative fit-test for the mask; and an appropriate cartridge/canister is used, and its service limit concentration is not exceeded.

Recommended PPE for Level C conditions includes:

- Full-face piece, air-purifying respirator equipped with MSHA and NIOSH approved organic vapor/acid gas/dust/mist combination cartridges or as designated by the SSHO.
- Chemical-resistant clothing (hooded, one or two-piece chemical splash suit or disposable chemical-resistant one-piece suit).
- Inner and outer chemical-resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

An air-monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators. Continual surveillance using direct-reading instruments is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

7.2.3 Level D Protection Ensemble

As indicated above, Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated, where there are no inhalable toxic substances

and where the atmospheric contains at least 19.5% oxygen.

Recommended PPE for Level D includes:

- Coveralls.
- Safety boots/shoes.
- Safety glasses or chemical splash goggles.
- Hardhat.
- Optional gloves; escape mask; face shield.

7.2.4 Recommended Level of Protection for Site Tasks

Based upon current information regarding both the contaminants suspected to be present at the Site and the various tasks that are included in the remedial activities, the minimum required levels of protection for these tasks shall be as identified in Table 3.

8.0 EXPOSURE MONITORING

8.1 General

Based on the results of historic sample analysis and the nature of the proposed work activities at the Site, the possibility exist that organic vapors and/or particulates may be released to the air during intrusive construction activities. Ambient breathing zone concentrations may at times, exceed the permissible exposure limits (PELs) established by OSHA for the individual compounds (see Table 1), in which case respiratory protection will be required. Respiratory and dermal protection may be modified (upgraded or downgraded) by the SSHO based upon real-time field monitoring data.

8.1.1 On-Site Work Zone Monitoring

Benchmark-TurnKey personnel will conduct routine, real-time air monitoring during all intrusive construction phases such as excavation, backfilling, drilling, etc. The work area will be monitored at regular intervals using a photo-ionization detector (PID), combustible gas meter and a particulate meter. Observed values will be recorded and maintained as part of the permanent field record.

Additional air monitoring measurements may be made by Benchmark-TurnKey personnel to verify field conditions during subcontractor oversight activities. Monitoring instruments will be protected from surface contamination during use. Additional monitoring instruments may be added if the situations or conditions change. Monitoring instruments will be calibrated in accordance with manufacturer's instructions before use.

8.1.2 Off-Site Community Air Monitoring

In addition to on-site monitoring within the work zone(s), monitoring at the down-wind portion of the Site perimeter will be conducted. This will provide a real-time method for determination of vapor and/or particulate releases to the surrounding community as a result of ground intrusive investigation work.

Ground intrusive activities are defined in the Generic Community Air Monitoring Plan and attached as Attachment C. Ground intrusive activities include soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells. Non-intrusive activities include the collection of soil and sediment samples or the

collection of groundwater samples from existing wells. Continuous monitoring is required for ground intrusive activities and periodic monitoring is required for non-intrusive activities. Periodic monitoring consists of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring while bailing a well, and taking a reading prior to leaving a sampling location. This may be upgraded to continuous if the sampling location is in close proximity to individuals not involved in the Site activity (i.e., on a curb of a busy street). The action levels below will be used during periodic monitoring.

8.2 Monitoring Action Levels

8.2.1 On-Site Work Zone Action Levels

The PID, or other appropriate instrument(s), will be used by Benchmark-TurnKey personnel to monitor organic vapor concentrations as specified in this HASP. Combustible gas will be monitored with the “combustible gas” option on the combustible gas meter or other appropriate instrument(s). In addition, fugitive dust/particulate concentrations will be monitored during major soil intrusion (viz., well/boring installation) using a real-time particulate monitor as specified in this plan. In the absence of such monitoring, appropriate respiratory protection for particulates shall be donned. Sustained readings obtained in the breathing zone may be interpreted (with regard to other Site conditions) as follows for Benchmark-TurnKey personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to 1 ppm above background on the PID) - Continue operations under Level D (see Appendix A).
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings from >1 ppm to 5 ppm above background on the PID (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue operations under Level C.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of >5 ppm to 50 ppm above background on the PID - Continue operations under Level B, re-evaluate and alter (if possible) construction methods to achieve lower vapor concentrations.

- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the PID - Discontinue operations and exit the work zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities and during handling of Site soil/fill. Action levels based on the instrument readings shall be as follows:

- Less than 50 mg/m³ - Continue field operations.
- 50-150 mg/m³ - Don dust/particulate mask or equivalent
- Greater than 150 mg/m³ - Don dust/particulate mask or equivalent. Initiate engineering controls to reduce respirable dust concentration (viz., wetting of excavated soils or tools at discretion of Site Health and Safety Officer).

Readings from the field equipment will be recorded and documented on the appropriate Project Field Forms. All instruments will be calibrated before use on a daily basis and the procedure will be documented on the appropriate Project Field Forms.

8.2.2 Community Air Monitoring Action Levels

In addition to the action levels prescribed in Section 8.2.1 for Benchmark-TurnKey personnel on-site, the following criteria shall also be adhered to for the protection of downwind receptors consistent with NYSDOH requirements (Attachment C):

- o **ORGANIC VAPOR PERIMETER MONITORING:**
 - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone exceeds 5 ppm above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the sustained organic vapor decreases below 5 ppm over background, work activities can resume with continued monitoring.
 - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone are greater than 5 ppm over background but less than 25 ppm for the 15-minute average, activities can resume provided that: the organic vapor level 200 feet downwind of the working site or half the distance to the nearest off-site residential or commercial structure, whichever

is less, but in no case less than 20 feet, is below 5 ppm over background; and more frequent intervals of monitoring, as directed by the Site Health and Safety Officer, are conducted.

- If the sustained organic vapor level is above 25 ppm at the perimeter of the exclusion zone for the 15-minute average, the Site Health and Safety Officer must be notified and work activities shut down. The Site Health and Safety Officer will determine when re-entry of the exclusion zone is possible and will implement downwind air monitoring to ensure vapor emissions do not impact the nearest off-site residential or commercial structure at levels exceeding those specified in the *Organic Vapor Contingency Monitoring Plan* below. All readings will be recorded and will be available for New York State Department of Environmental Conservation (DEC) and Department of Health (DOH) personnel to review.

o **ORGANIC VAPOR CONTINGENCY MONITORING PLAN:**

- If the sustained organic vapor level is greater than 5 ppm over background 200 feet downwind from the work area or half the distance to the nearest off-site residential or commercial property, whichever is less, all work activities must be halted.
- If, following the cessation of the work activities or as the result of an emergency, sustained organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest off-site residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest off-site residential or commercial structure (20-foot zone).
- If efforts to abate the emission source are unsuccessful and if sustained organic vapor levels approach or exceed 5 ppm above background within the 20-foot zone for more than 30 minutes, or are sustained at levels greater than 10 ppm above background for longer than one minute, then the *Major Vapor Emission Response Plan* (see below) will automatically be placed into effect.

o **MAJOR VAPOR EMISSION RESPONSE PLAN:**

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in this Health and Safety Plan and the Emergency Response Plan (Attachment A) will be advised.

2. The local police authorities will immediately be contacted by the Site Health and Safety Officer and advised of the situation.
3. Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two sustained successive readings below action levels are measured, air monitoring may be halted or modified by the Site Health and Safety Officer.

The following personnel are to be notified in the listed sequence in the event that a Major Vapor Emission Plan is activated:

Responsible Person	Contact	Phone Number
SSHO	Police	911
SSHO	State Emergency Response Hotline	(800) 457-7362

Additional emergency numbers are listed in the Emergency Response Plan included as Attachment A.

o **EXPLOSIVE VAPORS:**

- Sustained atmospheric concentrations of greater than 10% LEL in the work area - Initiate combustible gas monitoring at the downwind portion of the Site perimeter.
- Sustained atmospheric concentrations of greater than 10% LEL at the downwind Site perimeter – Halt work and contact local Fire Department.

o **AIRBORNE PARTICULATE COMMUNITY AIR MONITORING**

Respirable (PM-10) particulate monitoring will be performed on a continuous basis at the upwind and downwind perimeter of the exclusion zone. The monitoring will be performed using real-time monitoring equipment capable of measuring PM-10 and integrating over a period of 15-minutes for comparison to the airborne particulate action levels. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. All readings will be recorded and will be available for NYSDEC and NYSDOH review. Readings will be interpreted as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m^3) greater than the background (upwind perimeter) reading for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression provided that the downwind PM-10 particulate levels do not exceed $150 \text{ ug}/\text{m}^3$ above the upwind level and that visible dust is not migrating from the work area.
- If, after implementation of dust suppression techniques downwind PM-10 levels are greater than $150 \text{ ug}/\text{m}^3$ above the upwind level, work activities must be stopped and dust suppression controls re-evaluated. Work can resume provided that supplemental dust suppression measures and/or other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ ug}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

Pertinent emergency response information including the telephone number of the Fire Department is included in the Emergency Response Plan (Attachment A).

9.0 SPILL RELEASE/RESPONSE

This chapter of the HASP describes the potential for and procedures related to spills or releases of known or suspected petroleum and/or hazardous substances on the Site. The purpose of this Section of the HASP is to plan appropriate response, control, countermeasures and reporting, consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii). The spill containment program addresses the following elements:

- Potential hazardous material spills and available controls.
- Initial notification and evaluation.
- Spill response.
- Post-spill evaluation.

9.1 Potential Spills and Available Controls

An evaluation was conducted to determine the potential for hazardous material and oil/petroleum spills at this Site. For the purpose of this evaluation, hazardous materials posing a significant spill potential are considered to be:

- CERCLA Hazardous Substances as identified in 40 CFR Part 302, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Extremely Hazardous Substances as identified in 40 CFR Part 355, Appendix A, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Hazardous Chemicals as defined under Section 311(e) of the Emergency Planning and Community Right-To-Know Act of 1986, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Toxic Chemicals as defined in 40 CFR Part 372, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Chemicals regulated under 6NYCRR Part 597, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).

Oil/petroleum products are considered to pose a significant spill potential whenever the following situations occur:

- The potential for a “harmful quantity” of oil (including petroleum and non-petroleum-based fuels and lubricants) to reach navigable waters of the U.S. exists (40 CFR Part 112.4). Harmful quantities are considered by USEPA to be volumes that could form a visible sheen on the water or violate applicable water quality standards.
- The potential for any amount of petroleum to reach any waters of NY State, including groundwater, exists. Petroleum, as defined by NY State in 6NYCRR Part 612, is a petroleum-based heat source, energy source, or engine lubricant/maintenance fluid.
- The potential for any release, to soil or water, of petroleum from a bulk storage facility regulated under 6NYCRR Part 612. A regulated petroleum storage facility is defined by NY State as a site having stationary tank(s) and intra-facility piping, fixtures and related equipment with an aggregate storage volume of 1,100 gallons or greater.

The evaluation indicates that, based on Site history and decommissioning records, a hazardous material spill and/or a petroleum product spill is not likely to occur during RI efforts.

9.2 Initial Spill Notification and Evaluation

Any worker who discovers a hazardous substance or oil/petroleum spill will immediately notify the Project Manager and SSHO. The worker will, to the best of his/her ability, report the material involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, if any, and any associated injuries. The Emergency Response Plan presented in Attachment A of this HASP will immediately be implemented if an emergency release has occurred.

Following initial report of a spill, the Project Manager will make an evaluation as to whether the release exceeds RQ levels. If an RQ level is exceeded, the Project Manager will notify the Site owner and NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies (e.g., USEPA) are to be contacted regarding the release, and will follow-up with written reports as required by the applicable regulations.

9.3 Spill Response

For all spill situations, the following general response guidelines will apply:

- Only those personnel involved in overseeing or performing containment operations will be allowed within the spill area. If necessary, the area will be roped, ribboned, or otherwise blocked off to prevent unauthorized access.
- Appropriate PPE, as specified by the SSHO, will be donned before entering the spill area.
- Ignition points will be extinguished/removed if fire or explosion hazards exist.
- Surrounding reactive materials will be removed.
- Drains or drainage in the spill area will be blocked to prevent inflow of spilled materials or applied materials.

For minor spills, the Contractor will maintain a Spill Control and Containment Kit in the Field Office or other readily accessible storage location. The kit will consist of, at a minimum, a 50 lb. bag of “speedy dry” granular absorbent material, absorbent pads, shovels, empty 5-gallon pails and an empty open-top 55-gallon drum. Spilled materials will be absorbed, and shoveled into a 55-gallon drum for proper disposal (NYSDEC approval will be secured for on-site treatment of the impacted soils/absorbent materials, if applicable). Impacted soils will be hand-excavated to the point that no visible signs of contamination remains, and will be drummed with the absorbent.

In the event of a major release or a release that threatens surface water, a spill response contractor will be called to the Site. The response contractor may use heavy equipment (e.g., excavator, backhoe, etc.) to berm the soils surrounding the spill Site or create diversion trenching to mitigate overland migration or release to navigable waters. Where feasible, pumps will be used to transfer free liquid to storage containers. Spill control/cleanup contractors in the Western New York area that may be contacted for assistance include:

- The Environmental Service Group of NY, Inc.: (716) 695-6720
- Environmental Products and Services, Inc.: (716) 447-4700
- Op-Tech: (716) 873-7680

9.4 Post-Spill Evaluation

If a reportable quantity of hazardous material or oil/petroleum is spilled as determined by the Project Manager, a written report will be prepared as indicated in Section 9.2. The report will identify the root cause of the spill, type and amount of material released, date/time of release, response actions, agencies notified and/or involved in cleanup, and procedures to be implemented to avoid repeat incidents. In addition, all re-useable spill cleanup and containment materials will be decontaminated, and spill kit supplies/disposable items will be replenished.

10.0 HEAT/COLD STRESS MONITORING

Since some of the work activities at the Site will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to Benchmark-TurnKey employees. The Site Safety and Health Officer and/or his or her designee will be responsible for monitoring Benchmark-TurnKey field personnel for symptoms of heat/cold stress.

10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, a common and potentially serious illness often encountered at construction, landfill, waste disposal, industrial or other unsheltered sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain temperature equilibrium (via evaporation and convection), and require increased energy expenditure due to its bulk and weight.

Proper training and preventive measures will mitigate the potential for serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat (i.e., eight fluid ounces must be ingested for approximately every 1 lb of weight lost). The normal thirst

mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost perspiration. When heavy sweating occurs, workers should be encouraged to drink more.

- Train workers to recognize the symptoms of heat related illness.

Heat-Related Illness - Symptoms:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include: muscle spasms; pain in the hands, feet and abdomen.
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness; nausea; fainting.
- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are: red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 100 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest periods stay the same, if the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%.
- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period

should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period remains the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the work cycle may be further shortened by 33%. Oral temperature should be measured at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No Benchmark-TurnKey employee will be permitted to continue wearing semi-permeable or impermeable garments when his/her oral temperature exceeds 100.6 degrees Fahrenheit.

10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:
 - 1) **Frost nip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102 to 108 degrees Fahrenheit) and drinking a warm beverage. Do not rub skin to generate friction/ heat.
 - 2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish gray area of tissue, which will be firm to the touch but will yield little pain. The treatment is identical for Frost nip.
 - 3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard and will yield little to no pain. Treatment is identical to that for Frost nip.

- **Hypothermia** is a serious cold stress condition occurring when the body loses heat at a rate faster than it is produced. If untreated, hypothermia may be fatal. The stages of hypothermia may not be clearly defined or visible at first, but generally include:
 - 1) Shivering
 - 2) Apathy (i.e., a change to an indifferent or uncaring mood)

- 3) Unconsciousness
- 4) Bodily freezing

Employees exhibiting signs of hypothermia should be treated by medical professionals. Steps that can be taken while awaiting help include:

- 1) Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)
- 2) Perform active re-warming with hot liquids for drinking (Note: do not give the victim any liquid containing alcohol or caffeine) and a warm water bath (102 to 108 degrees Fahrenheit).
- 3) Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Education of workers to recognize the symptoms of frostbite and hypothermia.
- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in a heated area, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if hypothermia has set in).
- For monitoring the body's recuperation from excess cold, oral temperature recordings should occur:
 - At the Site Safety Technicians discretion when suspicion is based on changes in a worker's performance or mental status.
 - At a workers request.
 - As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind chill less than 20 degrees Fahrenheit or wind chill

less than 30 degrees Fahrenheit with precipitation).

- As a screening measure, whenever anyone worker on-site develops hypothermia.

Any person developing moderate hypothermia (a core body temperature of 92 degrees Fahrenheit) will not be allowed to return to work for 48 hours without the recommendation of a qualified medical doctor.

11.0 WORK ZONES AND SITE CONTROL

Work zones around the areas designated for construction activities will be established on a daily basis and communicated to all employees and other Site users by the SSHO. It shall be each Contractor's Site Safety and Health Officer's responsibility to ensure that all Site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- Exclusion Zone ("Hot Zone") - The area where contaminated materials may be exposed, excavated or handled and all areas where contaminated equipment or personnel may travel. Flagging tape will delineate the zone. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.
- Contamination Reduction Zone - The zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment and samples must remain in the Contamination Reduction Zone until decontaminated.
- Support Zone - The part of the site that is considered non-contaminated or "clean." Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

In the absence of other task-specific work zone boundaries established by the SSHO, the following boundaries will apply to all investigation and construction activities involving disruption or handling of Site soils or groundwater:

- Exclusion Zone: 50 foot radius from the outer limit of the sampling/construction activity.
- Contaminant Reduction Zone: 100 foot radius from the outer limit of the sampling/construction activity.
- Support Zone: Areas outside the Contaminant Reduction Zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the SSHO. Only personnel who are essential to the

completion of the task will be allowed access to these areas and only if they are wearing the prescribed level of protection. Entrance of all personnel must be approved by the SSHO.

The SSHO will maintain a Health and Safety Logbook containing the names of Benchmark-TurnKey workers and their level of protection. The zone boundaries may be changed by the SSHO as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

12.0 DECONTAMINATION

12.1 Decontamination for Benchmark-TurnKey Employees

The degree of decontamination required is a function of a particular task and the environment within which it occurs. The following decontamination procedure will remain flexible, thereby allowing the decontamination crew to respond appropriately to the changing environmental conditions that may arise at the Site. All Benchmark-TurnKey personnel on-site shall follow the procedure below, or the Contractor's procedure (if applicable), whichever is more stringent.

Station 1 - Equipment Drop: Deposit visibly contaminated (if any) re-useable equipment used in the contamination reduction and exclusion zones (tools, containers, monitoring instruments, radios, clipboards, etc.) on plastic sheeting.

Station 2 - Boots and Gloves Wash and Rinse: Scrub outer boots and outer gloves. Deposit tape and gloves in waste disposal container.

Station 3 - Tape, Outer Boot and Glove Removal: Remove tape, outer boots and gloves. Deposit tape and gloves in waste disposal container.

Station 4 - Canister or Mask Change: If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot cover donned, and worker returns to duty.

Station 5 - Outer Garment/Face Piece Removal: Protective suit removed and deposited in separate container provided by Contractor. Face piece or goggles are removed if used. Avoid touching face with fingers. Face piece and/or goggles deposited on plastic sheet. Hard hat removed and placed on plastic sheet.

Station 6 - Inner Glove Removal: Inner gloves are the last personal protective equipment to be removed. Avoid touching the outside of the gloves with bare fingers. Dispose of these gloves in waste disposal container.

Following PPE removal, personnel shall wash hands, face and forearms with absorbent wipes. If field activities proceed for duration of 6 consecutive months or longer, shower facilities will be provided for worker use in accordance with OSHA 29 CFR 1910.120(n).

12.2 Decontamination for Medical Emergencies

In the event of a minor, non-life threatening injury, personnel should follow the decontamination procedures as defined, and then administer first-aid.

In the event of a major injury or other serious medical concern (e.g., heat stroke), immediate first-aid is to be administered and the victim transported to the hospital in lieu of further decontamination efforts unless exposure to a Site contaminant would be considered “Immediately Dangerous to Life or Health.”

12.3 Decontamination of Field Equipment

The Contractor in accordance with his approved Health and Safety Plan in the Contamination Reduction Zone will conduct decontamination of heavy equipment. As a minimum, this will include manually removing heavy soil contamination, followed by steam cleaning on an impermeable pad.

Benchmark-TurnKey personnel will conduct decontamination of all tools used for sample collection purposes. It is expected that all tools will be constructed of nonporous, nonabsorbent materials (i.e., metal), which will aid in the decontamination effort. Any tool or part of a tool made of porous, absorbent material (i.e., wood) will be placed into suitable containers and prepared for disposal.

Decontamination of bailers, split-spoons, spatula knives, and other tools used for environmental sampling and examination shall be as follows:

- Disassemble the equipment
- Water wash to remove all visible foreign matter.
- Wash with detergent.
- Rinse all parts with distilled-deionized water.
- Allow to air dry.
- Wrap all parts in aluminum foil or polyethylene.

13.0 CONFINED SPACE ENTRY

OSHA 29 CFR 1910.146 identifies a confined space as a space that is large enough and so configured that an employee can physically enter and do assigned work, has limited or restricted means for entry and exit, and is not intended for continuous employee occupancy. Confined spaces include, but are not limited to, trenches, storage tanks, process vessels, pits, sewers, tunnels, underground utility vaults, pipelines, sumps, wells, and excavations.

Confined space entry by Benchmark-TurnKey employees is not anticipated to be necessary to complete the remedial activities identified in Section 2.0. In the event that the scope of work changes or confined space entry appears necessary, the Project Manager will be consulted to determine if feasible engineering alternatives to confined space entry can be implemented. If confined space entry by Benchmark-TurnKey employees cannot be avoided through reasonable engineering measures, task-specific confined space entry procedures will be developed and a confined-space entry permit will be issued through Benchmark-TurnKey's corporate Health and Safety Director. Benchmark-TurnKey employees shall not enter a confined space without these procedures and permits in place.

14.0 FIRE PREVENTION AND PROTECTION

14.1 General Approach

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper Site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

14.2 Equipment and Requirements

Fire extinguishers will be provided by each Contractor and are required on all heavy equipment and in each field trailer. Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary. Recharge or replacement shall be mandatory immediately after each use.

14.3 Flammable and Combustible Substances

All storage, handling or use of flammable and combustible substances will be under the supervision of qualified persons. All tanks, containers and pumping equipment, whether portable or stationary, used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the National Fire Protection Association.

14.4 Hot Work

If the scope of work necessitates welding or blowtorch operation, the hot work permit presented in Attachment B will be completed by the SSHO and reviewed/issued by the Project Manager.

15.0 EMERGENCY INFORMATION

In accordance with OSHA 29 CFR Part 1910, an Emergency Response Plan is attached to this HASP as Attachment A. The hospital route map is presented within Attachment A as Figure 1.

16.0 REFERENCES

1. New York State Department of Environmental Conservation. *DER-10; Technical Guidance for Site Investigation and Remediation*. May 2010.

TABLES

TABLE 1

TOXICITY DATA FOR CONSTITUENTS OF POTENTIAL CONCERN

**441 Ohio Street Site
Buffalo, New York**

Parameter	Synonyms	CAS No.	Code	Concentration Limits		
				PEL	TLV	IDLH
<i>Semi-volatile Organic Compounds (SVOCs): ppm</i>						
Benzo(a)anthracene	<i>none</i>	56-55-3	<i>none</i>	--	--	--
Benzo(a)pyrene	<i>none</i>	50-32-8	<i>none</i>	--	--	--
Benzo(b)fluoranthene	<i>none</i>	205-99-2	<i>none</i>	--	--	--
Benzo(k)fluoranthene	<i>none</i>	207-08-9	<i>none</i>	--	--	--
Chrysene	<i>none</i>	218-01-9	<i>none</i>	--	--	--
Indeno(1,2,3-cd)pyrene	<i>none</i>	193-39-5	<i>none</i>	--	--	--
<i>Polychlorinated Biphenyls (PCBs): ppm</i>						
Total PCBs	<i>none</i>	--	<i>none</i>	--	--	--
<i>Inorganic Compounds: ppm</i>						
Arsenic	<i>none</i>	7440-38-2	Ca	0.01	0.01	5
Barium	<i>none</i>	7440-39-3	<i>none</i>	0.5	0.5	50
Copper	<i>none</i>	7440-50-8	<i>none</i>	0.1	0.2	200
Lead	<i>none</i>	7439-92-1	<i>none</i>	0.05	0.15	100
Nickel	<i>none</i>	7440-02-0	<i>none</i>	0.001	0.05	7
Zinc	<i>none</i>	7440-66-6	<i>none</i>	--	--	--
Mercury	<i>none</i>	7439-97-6	C-0.1	0.1	0.05	10

Ca = NIOSH considers constituent to be a potential occupational carcinogen.

IDLH = Immediately Dangerous to Life or Health.

TLV = Threshold Limit Value, established by American Conference of Industrial Hygienists (ACGIH), equals the maximum exposure concentration allowable for 8 hours/day @ 40 hours/week.

TLVs are the amounts of chemicals in the air that almost all healthy adult workers are predicted to be able to tolerate without adverse effects. There are three types.

TLV-TWA (TLV-Time-Weighted Average) which is averaged over the normal eight-hour day/forty-hour work week. (Most TLVs.)

TLV-STEL or Short Term Exposure Limits are 15 minute exposures that should not be exceeded for even an instant. It is not a stand alone value but is accompanied by the TLV-TWA.

TLV-C or Ceiling limits are the concentration that should not be exceeded during any part of the working exposure.

Unless the initials "STEL" or "C" appear in the Code column, the TLV value should be considered to be the eight-hour TLV-TWA.

PEL = Permissible Exposure Limit, established by OSHA, equals the maximum exposure concentration allowable for 8 hours per day @ 40 hours per week

TABLE 2

**POTENTIAL ROUTES OF EXPOSURE TO THE
CONSTITUENTS OF POTENTIAL CONCERN**

**441 Ohio Street Site
Buffalo, New York**

Activity ¹	Direct Contact with Soil/Fill	Inhalation of Vapors or Dust	Direct Contact with Groundwater
Remedial Investigation Tasks			
Waste Characterization	x	x	x
Excavation & Offsite Disposal of Contaminant Source Areas	x	x	x
Soil Confirmation Sampling	x	x	
Groundwater and Surface Water Management		x	x
Monitoring Well Sampling	x	x	x

Notes:

1. Activity as described in Section 1.5 of the Health and Safety Plan.

TABLE 3

**REQUIRED LEVELS OF PROTECTION
FOR REMEDIAL ACTIVITIES**

**441 Ohio Street Site
Buffalo, New York**

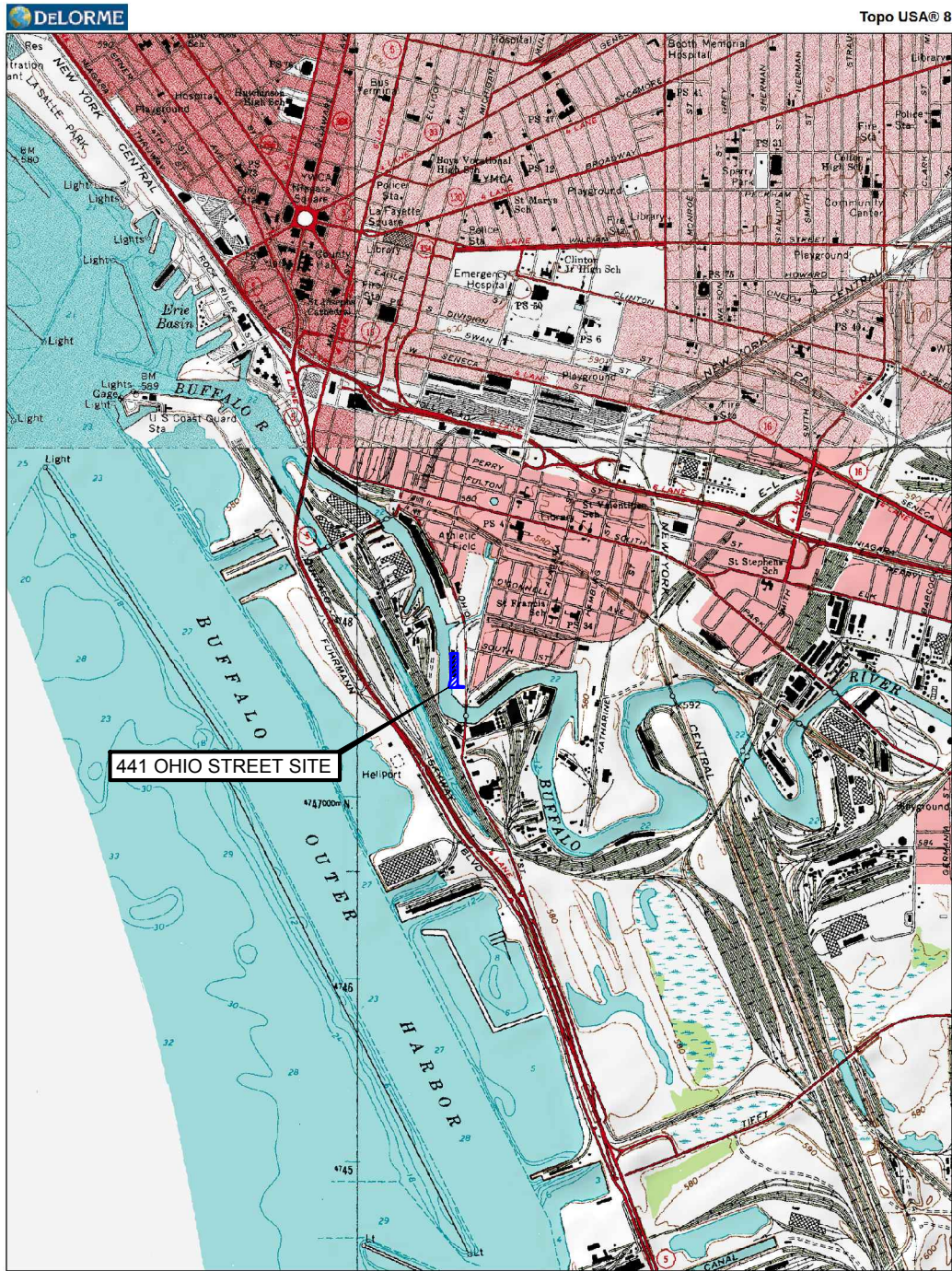
Activity	Respiratory Protection¹	Clothing	Gloves²	Boots^{2,3}	Other Required PPE/Modifications^{2,4}
Remedial Investigation Tasks					
Waste Characterization	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
Excavation & Offsite Disposal of Contaminant Source Areas	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
Soil Confirmation Sampling	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
Groundwater and Surface Water Management	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
Groundwater Monitoring	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS

Notes:

1. Respiratory equipment shall conform to guidelines presented in Section 7.0 of this HASP. The Level C requirement is an air-purifying respirator equipped with organic compound/acid
2. HH = hardhat; L= Latex; L/N = latex inner glove, nitrile outer glove; N = Nitrile; SGSS = safety glasses with sideshields; STSS = steel toe safety shoes.
3. Latex outer boot (or approved overboot) required whenever contact with contaminated materials may occur. SSHO may downgrade to STSS (steel-toed safety shoes) if contact will be limited to cover/replacement soils.
4. Dust masks shall be donned as directed by the SSHO (site safety and health officer) or site safety technician whenever potentially contaminated airborne particulates (i.e., dust) are present

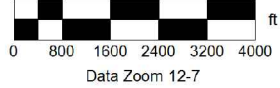
FIGURES

FIGURE 1



Data use subject to license.
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 www.delorme.com

MN (10.6° W)



2558 HAMBURG TURNPIKE
 SUITE 300
 BUFFALO, NY 14218
 (716) 856-0599

SITE LOCATION AND VICINITY MAP

HEALTH AND SAFETY PLAN

441 OHIO STREET SITE

BUFFALO, NEW YORK

PREPARED FOR

441 OHIO STREET, LLC

PROJECT NO.: 0292-013-002

DATE: NOVEMBER 2015

DRAFTED BY: BLR

DISCLAIMER:
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F:\CAD B\441 OHIO STREET\RAW\HASP\F\1 SITE\441 OHIO STREET\441 OHIO STREET.MXD

ATTACHMENT A

EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE PLAN
for
BROWNFIELD CLEANUP PROGRAM
REMEDIAL ACTIVITIES

441 OHIO STREET SITE
BUFFALO, NEW YORK

November 2015

0292-013-002

Prepared for:

441 OHIO STREET, LLC

441 OHIO STREET SITE
HEALTH AND SAFETY PLAN FOR REMEDIAL ACTIVITIES
APPENDIX A: EMERGENCY RESPONSE PLAN

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Figure A-1 Hospital Route Map

1.0 GENERAL

This report presents the site-specific Emergency Response Plan (ERP) referenced in the Site Health and Safety Plan (HASP) prepared for Remedial activities at the 441 Ohio Street Site in Buffalo, New York. This appendix of the HASP describes potential emergencies that may occur at the Site; procedures for responding to those emergencies; roles and responsibilities during emergency response; and training all workers must receive in order to follow emergency procedures. This ERP also describes the provisions this Site has made to coordinate its emergency response planning with other contractors on-site and with off-site emergency response organizations.

This ERP is consistent with the requirements of 29 CFR 1910.120(l) and provides the following site-specific information:

- Pre-emergency planning.
- Personnel roles, lines of authority, and communication.
- Emergency recognition and prevention.
- Safe distances and places of refuge.
- Evacuation routes and procedures.
- Decontamination procedures.
- Emergency medical treatment and first aid.
- Emergency alerting and response procedures.
- Critique of response and follow-up.
- Emergency personal protective equipment (PPE) and equipment.

2.0 PRE-EMERGENCY PLANNING

This Site has been evaluated for potential emergency occurrences, based on site hazards, the required work tasks, the site topography, and prevailing weather conditions. The results of that evaluation indicate the potential for the following site emergencies to occur at the locations indicated.

Type of Emergency:

1. Medical, due to physical injury

Source of Emergency:

1. Slip/trip/fall

Location of Source:

1. Non-specific

3.0 ON-SITE EMERGENCY RESPONSE EQUIPMENT

Emergency procedures may require specialized equipment to facilitate worker rescue, contamination control and reduction, or post-emergency clean up. Emergency response equipment available on the Site is listed below. The equipment inventory and storage locations are based on the potential emergencies described above. This equipment inventory is designed to meet on-site emergency response needs and any specialized equipment needs that off-site responders might require because of the hazards at this Site but not ordinarily stocked.

Any additional personal protective equipment (PPE) required and stocked for emergency response is also listed in below. During an emergency, the Emergency Response Coordinator (ERC) is responsible for specifying the level of PPE required for emergency response. At a minimum, PPE used by emergency responders will comply with Section 7.0, Personal Protective Equipment, of this HASP. Emergency response equipment is inspected at regular intervals and maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Emergency Equipment	Quantity	Location
First Aid Kit	1	Site Vehicle
Chemical Fire Extinguisher	2 (minimum)	All heavy equipment and Site Vehicle

Emergency PPE	Quantity	Location
Full-face respirator	1 for each worker	Site Vehicle
Chemical-resistant suits	4 (minimum)	Site Vehicle

4.0 EMERGENCY PLANNING MAPS

An area-specific map of the Site will be developed on a daily basis during performance of field activities. The map will be marked to identify critical on-site emergency planning information, including: emergency evacuation routes, a place of refuge, an assembly point, and the locations of key site emergency equipment. Site zone boundaries will be shown to alert responders to known areas of contamination. There are no major topographical features, however the direction of prevailing winds/weather conditions that could affect emergency response planning are also marked on the map. The map will be posted at site-designated place of refuge and inside the Benchmark personnel field vehicle.

5.0 EMERGENCY CONTACTS

The following identifies the emergency contacts for this ERP.

Emergency Telephone Numbers:

Project Manager: *Thomas H. Forbes, P.E.*

Work: (716) 856-0599

Mobile: (716) 848-0599

Corporate Health and Safety Director: *Thomas H. Forbes, P.E.*

Work: (716) 856-0599

Mobile: (716) 848-0599

Site Safety and Health Officer (SSHO): *Bryan C. Hann*

Work: (716) 856-0635

Mobile: (716) 870-1165

Alternate SSHO: *Nathan Munley*

Work: (716) 856-0635

Mobile: (716) 289-1072

BUFFALO GENERAL HOSPITAL (ER):	(716) 859-5600
FIRE:	911
AMBULANCE:	911
BUFFALO POLICE:	911
STATE EMERGENCY RESPONSE HOTLINE:	(800) 457-7362
NATIONAL RESPONSE HOTLINE:	(800) 424-8802
NYSDOH:	(716) 847-4385
NYSDEC:	(716) 851-7220
NYSDEC 24-HOUR SPILL HOTLINE:	(800) 457-7252

The Site location is:

441 Ohio Street

Buffalo, New York 14204

Site Phone Number: (Insert Cell Phone or Field Trailer): _____

6.0 EMERGENCY ALERTING & EVACUATION

Internal emergency communication systems are used to alert workers to danger, convey safety information, and maintain site control. Any effective system can be employed. Two-way radio headsets or field telephones are often used when work teams are far from the command post. Hand signals and air-horn blasts are also commonly used. Every system must have a backup. It shall be the responsibility of each contractor's Site Health and Safety Officer to ensure all personnel entering the site understand an adequate method of internal communication. Unless all personnel are otherwise informed, the following signals shall be used.

- 1) Emergency signals by portable air horn, siren, or whistle: two short blasts, personal injury; continuous blast, emergency requiring site excavation.
- 2) Visual signals: hand gripping throat, out of air/cannot breathe; hands on top of head, need assistance; thumbs up, affirmative/ everything is OK; thumbs down, no/negative; grip partner's wrist or waist, leave area immediately.

If evacuation notice is given, site workers leave the worksite with their respective buddies, if possible, by way of the nearest exit. Emergency decontamination procedures detailed in Section 12.0 of the HASP are followed to the extent practical without compromising the safety and health of site personnel. The evacuation routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by rehearsals and inputs from emergency response organizations. Wind direction indicators are located so that workers can determine a safe up wind or cross wind evacuation route and assembly area if not informed by the emergency response coordinator at the time the evacuation alarm sounds. Since work conditions and work zones within the site may be changing on daily basis, it shall be the responsibility of the construction Site Health and Safety Officer to review evacuation routes and procedures as necessary and to inform all Benchmark-TurnKey workers of any changes.

Personnel exiting the site will gather at a designated assembly point. To determine that everyone has successfully exited the site, personnel will be accounted for at the assembly

HEALTH & SAFETY PLAN
APPENDIX A: EMERGENCY RESPONSE PLAN

site. If any worker cannot be accounted for, notification is given to the SSHO (*Bryan Hann* or *Nathan Munley*) so that appropriate action can be initiated. Contractors and subcontractors on this site have coordinated their emergency response plans to ensure that these plans are compatible and that source(s) of potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

7.0 EXTREME WEATHER CONDITIONS

In the event of adverse weather conditions, the Site Safety and Health Officer in conjunction with the Contractor's SSHO will determine if engineering operations can continue without sacrificing the health and safety of site personnel. Items to be considered prior to determining if work should continue include but are not limited to:

- Potential for heat/cold stress.
- Weather-related construction hazards (e.g., flooding or wet conditions producing undermining of structures or sheeting, high wind threats, etc).
- Limited visibility.
- Potential for electrical storms.
- Limited site access/egress (e.g., due to heavy snow)

8.0 EMERGENCY MEDICAL TREATMENT & FIRST AID

Personnel Exposure:

The following general guidelines will be employed in instances where health impacts threaten to occur acute exposure is realized:

- **Skin Contact:** Use copious amounts of soap and water. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide medical attention. Eyewash stations will be provided on site. If necessary, transport to Buffalo General Hospital.
- **Inhalation:** Move to fresh air and, if necessary, transport to Hospital.
- **Ingestion:** Decontaminate and transport to Hospital.

Personal Injury:

Minor first-aid will be applied on-site as deemed necessary. In the event of a life threatening injury, the individual should be transported to Hospital via ambulance. The Site Health and Safety Officer will supply available chemical specific information to appropriate medical personnel as requested.

First aid kits will conform to Red Cross and other applicable good health standards, and shall consist of a weatherproof container with individually sealed packages for each type of item. First aid kits will be fully equipped before being sent out on each job and will be checked weekly by the SSHO to ensure that the expended items are replaced.

Directions to Buffalo General Hospital (see Figure 1):

The following directions describe the best route from the Site to Buffalo General Hospital:

- Head north on Ohio Street toward South Street
- Turn right onto Michigan Avenue
- Turn left onto High Street

9.0 EMERGENCY RESPONSE CRITIQUE & RECORD KEEPING

Following an emergency, the SSHO and Project Manager shall review the effectiveness of this Emergency Response Plan (ERP) in addressing notification, control and evacuation requirements. Updates and modifications to this ERP shall be made accordingly. It shall be the responsibility of each contractor to establish and assure adequate records of the following:

- Occupational injuries and illnesses.
- Accident investigations.
- Reports to insurance carrier or State compensation agencies.
- Reports required by the client.
- Records and reports required by local, state, federal and/or international agencies.
- Property or equipment damage.
- Third party injury or damage claims.
- Environmental testing logs.
- Explosive and hazardous substances inventories and records.
- Records of inspections and citations.
- Safety training.

10.0 EMERGENCY RESPONSE TRAINING

All persons who enter the worksite, including visitors, shall receive a site-specific briefing about anticipated emergency situations and the emergency procedures by the SSHO. Where this site relies on off-site organizations for emergency response, the training of personnel in those off-site organizations has been evaluated and is deemed adequate for response to this site.

FIGURES

ATTACHMENT B

HOT WORK PERMIT FORM

PART 1 - INFORMATION

Issue Date:

Date Work to be Performed: Start:

Finish (permit terminated):

Performed By:

Work Area:

Object to be Worked On:

PART 2 - APPROVAL

(for 1, 2 or 3: mark Yes, No or NA)*

Will working be on or in:

Finish (permit terminated):

- | | | |
|--|-----|----|
| 1. Metal partition, wall, ceiling covered by combustible material? | yes | no |
| 2. Pipes, in contact with combustible material? | yes | no |
| 3. Explosive area? | yes | no |

* = If any of these conditions exist (marked "yes"), a permit will not be issued without being reviewed and approved by Thomas H. Forbes (Corporate Health and Safety Director). Required Signature below.

PART 3 - REQUIRED CONDITIONS**

(Check all conditions that must be met)

PROTECTIVE ACTION		PROTECTIVE EQUIPMENT	
<input type="checkbox"/>	Specific Risk Assessment Required	<input type="checkbox"/>	Goggles/visor/welding screen
<input type="checkbox"/>	Fire or spark barrier	<input type="checkbox"/>	Apron/fireproof clothing
<input type="checkbox"/>	Cover hot surfaces	<input type="checkbox"/>	Welding gloves/gauntlets/other:
<input type="checkbox"/>	Move movable fire hazards, specifically	<input type="checkbox"/>	Wellintons/Knee pads
<input type="checkbox"/>	Erect screen on barrier	<input type="checkbox"/>	Ear protection: Ear muffs/Ear plugs
<input type="checkbox"/>	Restrict Access	<input type="checkbox"/>	B.A.: SCBA/Long Breather
<input type="checkbox"/>	Wet the ground	<input type="checkbox"/>	Respirator: Type:
<input type="checkbox"/>	Ensure adequate ventilation	<input type="checkbox"/>	Cartridge:
<input type="checkbox"/>	Provide adequate supports	<input type="checkbox"/>	Local Exhaust Ventilation
<input type="checkbox"/>	Cover exposed drain/floor or wall cracks	<input type="checkbox"/>	Extinguisher/Fire blanket
<input type="checkbox"/>	Fire watch (must remain on duty during duration of permit)	<input type="checkbox"/>	Personal flammable gas monitor
<input type="checkbox"/>	Issue additional permit(s):	<input type="checkbox"/>	

Other precautions:

** Permit will not be issued until these conditions are met.

SIGNATURES

Originating Employee:

Date:

Project Manager:

Date:

Part 2 Approval:

Date:

ATTACHMENT C

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

Appendix C1
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix C2 Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.
2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.
3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:
 - (a) Objects to be measured: Dust, mists or aerosols;
 - (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
 - (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
 - (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
 - (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;
 - (f) Particle Size Range of Maximum Response: 0.1-10;
 - (g) Total Number of Data Points in Memory: 10,000;
 - (h) Logged Data: Each data point with average concentration, time/date and data point number
 - (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
 - (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
 - (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
 - (l) Operating Temperature: -10 to 50° C (14 to 122° F);
 - (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.
4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.
5. The action level will be established at 150 ug/m³ (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m³ above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m³ continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM₁₀ at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m³ action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX B

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

(PROVIDED ELECTRONICALLY)



Department of
Environmental
Conservation

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

**MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance
Form**

for

Construction Activities Seeking Authorization Under SPDES General Permit
(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information

1. Owner/Operator Name: 141 OLLIO STREET, LLC
2. Contact Person: KEVIN P. HAYS
3. Street Address: 500 SENECA STREET, SUITE 508
4. City/State/Zip: BUFFALO, NEW YORK 14204

II. Project Site Information

5. Project/Site Name: BUFFALO RIVER LANDING
6. Street Address: 1 SOUTH STREET
7. City/State/Zip: BUFFALO/NY/14204

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information

8. SWPPP Reviewed by: REGINA L. HARRIS
9. Title/Position: JUNIOR SANITARY ENGINEER
10. Date Final SWPPP Reviewed and Accepted: 12/9/15

IV. Regulated MS4 Information

11. Name of MS4: BUFFALO SEWER AUTHORITY
12. MS4 SPDES Permit Identification Number: NYR20A 461
13. Contact Person: ROSALEEN B. NOGLE, P.E.
14. Street Address: 65 NIAGARA SQUARE, CITY HALL 1038
15. City/State/Zip: BUFFALO, NY 14202
16. Telephone Number: (716) 851-4664 ext 4219

MS4 SWPPP Acceptance Form - continued

**V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or
Duly Authorized Representative**

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 6 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).
Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name: CATHERINE H. KNAB, P.E.

Title/Position: PRINCIPAL SANITARY ENGINEER

Signature: Catherine H. Knab

Date: 12/10/15

VI. Additional Information

NOTICE OF INTENT

New York State Department of Environmental Conservation



Division of Water

625 Broadway, 4th Floor

NYR
(for DEC use only)

Albany, New York 12233-3505

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002 All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

- IMPORTANT -
RETURN THIS FORM TO THE ADDRESS ABOVE
OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information	
Owner/Operator (Company Name/Private Owner Name/Municipality Name)	
441 OHLIO STREET, LLC	
Owner/Operator Contact Person Last Name (NOT CONSULTANT)	
HAYS	
Owner/Operator Contact Person First Name	
KEVIN	
Owner/Operator Mailing Address	
500 SENECA STREET - SUITE 508	
City	
BUFFALO	
State	Zip
NY	14204-1927
Phone (Owner/Operator)	Fax (Owner/Operator)
716-332-5959	716-332-5968
Email (Owner/Operator)	
KEVIN.HAYS@SAVARELINO.COMPANIES.COM	
FED. TAX ID	
45-4316019 (not required for individuals)	

Project Site Information

Project/Site Name

B U F F A L O R I V E R L A N D I N G

Street Address (NOT P.O. BOX)

1 S O U T H S T R E E T

Side of Street

North South East West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

B U F F A L O

State

N Y

Zip

1 4 2 0 4

County

E R I E

DEC Region

9

Name of Nearest Cross Street

O H I O S T R E E T

Distance to Nearest Cross Street (feet)

1 0 0

Project In Relation to Cross Street

North South East West

Tax Map Numbers

Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you must go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/inmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i" (identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

1 8 3 9 8 8

Y Coordinates (Northing)

4 7 5 3 0 5 4

2. What is the nature of this construction project?

- New Construction
- Redevelopment with increase in impervious area
- Redevelopment with no increase in impervious area

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? Yes No Unknown

16. What is the name of the municipality/entity that owns the separate storm sewer system?

B U F F A L O S E W E R A U T H O R I T Y

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? Yes No Unknown

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? Yes No

19. Is this property owned by a state authority, state agency, Federal government or local government? Yes No

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) Yes No

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? Yes No

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? Yes No
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? Yes No

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required
if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- Preservation of Undisturbed Areas
- Preservation of Buffers
- Reduction of Clearing and Grading
- Locating Development in Less Sensitive Areas
- Roadway Reduction
- Sidewalk Reduction
- Driveway Reduction
- Cul-de-sac Reduction
- Building Footprint Reduction
- Parking Reduction

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6 ("Soil Restoration") of the Design Manual (2010 version).

- All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- Compacted areas were considered as impervious cover when calculating the WQV Required, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQV) required for this project (based on final site plan/layout).

Total WQV Required:

, acre-feet.

29. Identify the RR techniques (Area Reduction), RR techniques (Volume Reduction) and Standard SMPs with RRV Capacity in Table 1 (See Page 9) that were used to reduce the Total WQV Required (#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQV required. If runoff reduction techniques will not be used to reduce the required WQV, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

<u>RR Techniques (Area Reduction)</u>	<u>Total Contributing Area (acres)</u>	and/or	<u>Total Contributing Impervious Area (acres)</u>
<input type="checkbox"/> Conservation of Natural Areas (RR-1) ...	[][] . [][]		[][] . [][]
<input type="checkbox"/> Sheetflow to Riparian Buffers/Filters Strips (RR-2)	[][] . [][]		[][] . [][]
<input checked="" type="checkbox"/> Tree Planting/Tree Pit (RR-3)	[][] 0 . 1 7		[][] . [][]
<input type="checkbox"/> Disconnection of Rooftop Runoff (RR-4) ..	[][] . [][]		[][] . [][]
<u>RR Techniques (Volume Reduction)</u>			
<input type="checkbox"/> Vegetated Swale (RR-5)			[][] . [][]
<input type="checkbox"/> Rain Garden (RR-6)			[][] . [][]
<input type="checkbox"/> Stormwater Planter (RR-7)			[][] . [][]
<input type="checkbox"/> Rain Barrel/Cistern (RR-8)			[][] . [][]
<input type="checkbox"/> Porous Pavement (RR-9)			[][] . [][]
<input type="checkbox"/> Green Roof (RR-10)			[][] . [][]
<u>Standard SMPs with RRV Capacity</u>			
<input type="checkbox"/> Infiltration Trench (I-1)			[][] . [][]
<input type="checkbox"/> Infiltration Basin (I-2)			[][] . [][]
<input type="checkbox"/> Dry Well (I-3)			[][] . [][]
<input type="checkbox"/> Underground Infiltration System (I-4)			[][] . [][]
<input type="checkbox"/> Bioretention (F-5)			[][] . [][]
<input type="checkbox"/> Dry Swale (O-1)			[][] . [][]
<u>Standard SMPs</u>			
<input type="checkbox"/> Micropond Extended Detention (P-1)			[][] . [][]
<input type="checkbox"/> Wet Pond (P-2)			[][] . [][]
<input type="checkbox"/> Wet Extended Detention (P-3)			[][] . [][]
<input type="checkbox"/> Multiple Pond System (P-4)			[][] . [][]
<input type="checkbox"/> Pocket Pond (P-5)			[][] . [][]
<input type="checkbox"/> Surface Sand Filter (F-1)			[][] . [][]
<input type="checkbox"/> Underground Sand Filter (F-2)			[][] . [][]
<input type="checkbox"/> Perimeter Sand Filter (F-3)			[][] . [][]
<input type="checkbox"/> Organic Filter (F-4)			[][] . [][]
<input type="checkbox"/> Shallow Wetland (W-1)			[][] . [][]
<input type="checkbox"/> Extended Detention Wetland (W-2)			[][] . [][]
<input type="checkbox"/> Pond/Wetland System (W-3)			[][] . [][]
<input type="checkbox"/> Pocket Wetland (W-4)			[][] . [][]
<input type="checkbox"/> Wet Swale (O-2)			[][] . [][]

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv (=Total WQv Required in 28 - Total RRV Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRV Capacity identified in question 29.

WQv Provided

		0	.	1	0	2
--	--	---	---	---	---	---

 acre-feet

Note: For the standard SMPs with RRV capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRV provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRV provided (#30) and the WQv provided (#33a).

		0	.	1	0	2
--	--	---	---	---	---	---

35. Is the sum of the RRV provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? Yes No

If Yes, go to question 36.
 If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPV) required and provided or select waiver (36a), if applicable.

CPV Required

			.			
--	--	--	---	--	--	--

 acre-feet

CPV Provided

			.			
--	--	--	---	--	--	--

 acre-feet

36a. The need to provide channel protection has been waived because:

- Site discharges directly to tidal waters or a fifth order or larger stream.
- Reduction of the total CPV is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

			.		
--	--	--	---	--	--

 CFS

Post-development

			.		
--	--	--	---	--	--

 CFS

Total Extreme Flood Control Criteria (Qf)

Pre-Development

			.		
--	--	--	---	--	--

 CFS

Post-development

			.		
--	--	--	---	--	--

 CFS

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

KEVIN

MI

P

Print Last Name

HAYS

Owner/Operator Signature

Kevin Hays

Date

12/15/2015

ENGINEERS REPORT & STORMWATER POLLUTION PREVENTION PLAN

for

BUFFALO RIVER LANDING
1 SOUTH STREET
CITY OF BUFFALO, NY

Revised November 23, 2015

Prepared By:

tredo
ENGINEERS

CIVIL | STRUCTURAL | ENGINEERING

755 Seneca Street, Suite 202
Buffalo, New York 14210
716.876.7147 ph

Seal

For:

CJS Architects
755 Seneca Street
Buffalo, NY

I. SUMMARY

This project includes the construction of a 5-story multi-family facility containing (78) apartment units with a first floor parking garage and paved surface parking. The proposed facility shall be located at the west terminus of South Street on the west side of Ohio Street on a 2.2± acre developed parcel along the northeast banks of the Buffalo River. Driveway access is from both South Street and Ohio Street. Current site conditions in the area of development consist of the remains of a demolished structure, pavement and gravel surface parking lot and railroad tracks.

The existing 6-inch public watermain found in South Street shall provide new water services. Domestic and fire-protection services shall be brought into the building on the west wall with metering and backflow prevention devices inside the facility mechanical room. An existing hydrant located in South Street adjacent to the curb cut entrance and fire lane, shall provide coverage for fire fighting.

Sanitary sewer service shall be provided with a new tap on the existing 8-inch sewer pipe located on the south of South Street. A new 8-inch PVC lateral shall be extended from the north wall of the facility to the proposed tap.

Currently, storm water runoff generated by the site flows overland west into the Buffalo River. After the proposed development occurs, runoff from the new building roofs and paved surface parking lot will be collected and conveyed to a water treatment vault prior to discharge into the Buffalo River.

This development will result in a decrease in impervious surfaces on this site with the addition of landscaping and lawn areas replacing pavements. In turn, there will be a decrease in the rate of storm water runoff. The proposed runoff will not be conveyed to the Buffalo Sewer Authority storm sewer (located in Ohio St.) therefore, no detention is provided.

This project is required to comply with the re-development regulations and water quality requirements of the Phase II regulations of the NYSDEC SPDES Permit, as the total soil disturbance area is greater-than the one-acre threshold within a previously developed parcel area. However, channel-protection, 10-yr and 100-yr detention requirements of this permit are not required as the discharge is directed to the Buffalo River, a fifth-order stream.

The scope of development does not disturb the bed and banks of the Buffalo River thus a Joint Permit Application to the USAC and NYSDEC is not required.

II. WATER SERVICE

New water services for domestic consumption and fire-protection will be connected to the existing 6-inch public main located at the property frontage of South Street. The proposed facility will contain a 6" ductile-iron service and fire-suppression sprinkler system with public fire hydrant along South St. providing fire-protection coverage to the 4-story structure. A fire apparatus access point for the proposed building greater-than 30-ft high, is at South Street.

A new 4-inch ductile domestic service is proposed for the residential units. Domestic usage is estimated at 150 gal/min peak for various simultaneous uses within the facility. Metering and backflow prevention is contained within the facility water room. A Backflow Prevention Application shall be provided, by others, to the Buffalo Water Authority on behalf of the water customer.

III. SANITARY SEWER SERVICE

The existing public 8-inch PVC sanitary sewer lateral, as installed to the subject parcel and within the parcel frontage and the terminus of South Street, will provide waste conveyance from the proposed multi-family residential facility. The proposed development will generate a calculated 10,120 gal/day (gpd) of residential sanitary load as per the following: 2 bed unit (x14) + 1 bed unit (x64) = 92 bedrooms x 110 gpd*/bedroom ~ **10,120 gal/day (0.010 MGD)**. Ref. architectural floor plans for total of (78) apartment units and (92) bedrooms.

The proposed sanitary lateral will be an 8-inch PVC (SDR35) and one (1) 8-inch lateral connection installed and inspected per the requirements of the Buffalo Sewer Authority. Note that a new tap on the 8" PVC mainline under South Street is not required. A cast iron vent and trap shall be installed at the facility entry point along the north wall. An 8-inch sewer pipe sloped at +0.40% is capable of conveying approx. 408 gpm or over 580,000 gpd. The proposed inflow is less than 2% of the total calculated daily conveyance capacity of the 8-inch main.

Reference the Downstream Sewer Capacity Analysis contained in Appendix E and NYSDEC Application for Approval of Plans for a Wastewater Disposal System as a requirement of the sewer district for residential waste loading over 2500 gal/day.

*Reference "NYS Design Standards for Intermediate Sized Treatment Works, March 2014".

IV. BACKGROUND INFORMATION

I. Project Description

This project includes the construction of (78) apartment units in a 5-story facility. The proposed facility shall be located south of South St. and west side of Ohio Street on a 2.2± acre developed parcel along the northeast banks of the Buffalo River.

II. Existing (Pre-Development) Conditions

The parcel area considered for this development currently contains the remains of a demolished structure, railroad tracks and a gravel-paved surface parking area.

III. Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils within the proposed project disturbance area consists of Type Ud, Urban development, Group D. (ref USDA Soils Survey)

IV. Proposed (Post-Development) Conditions

Storm water generated by the new development will flow overland to receivers and conveyed below-ground to a water treatment vault prior to discharge into the Buffalo River.

The water quality treatment of runoff utilizes a flow-thru style proprietary filtration device as defined as an allowable alternative SMP practice per the NYSDEC SWDM Chpt 9. Refer to Appendix B for treatment vault sizing and cut sheet of the basis-of-design product selected.

The proposed discharge of stormwater directly to the Buffalo River, a fifth order stream, does not require channel protection or detention facilities.

V. STORMWATER MANAGEMENT

I. Design Criteria

The design of the storm water facilities will be in accordance with the following:

- i. New York State Department of Environmental Conservation (NYSDEC) SPDES Permit for Storm Water Discharges from a Construction Activity

II. Stormwater Conveyance

The stormwater runoff generated by this development will be collected and conveyed to a filtration vault before being discharged to the Buffalo River. The end pipe outfall conditions shall be coordinated with and core-drilled thru the existing seawall. Future development within the bed and banks of the Buffalo River is not included in this contract.

Tributary roof areas were estimated for the receivers that the runoff drains to and the runoff directly tributary to the water treatment vault; each was calculated using the Rational Method. Ref. Appendix A for stormwater pipe sizing calculations.

III. Stormwater Detention

According to the BSA policy for storm water drainage, detention is required when the storm water runoff from a site is increased due to the increase in impervious surfaces resulting from a new development. The proposed construction of the apartment facility replaces an existing building and parking lot and will result in a decrease in impervious surfaces. The proposed discharge of stormwater to the Buffalo River, a fifth-order stream, is not jurisdictional to the BSA and therefore storm water detention is not provided.

In providing water quality treatment sizing for low-flow conditions, we have utilized the NYSDEC SWDM redevelopment chapter #9: The total WQv required is calculated as 0.101 ac-ft from a 1.70 acre tributary drainage area. While only 75% of the WQv is required be treated under redevelopment regulations, the alternate SMP method selected is capable of treating 100% of the peak WQv, and is also capable of bypass of the 10-yr storm event thru standpipes or weirs. Thus the selected SMP is not required to be routed 'off-line' for the higher-event storm conveyance. Ref. Appendix B for WQv calculations and SMP detail(s) selected.

The pre-engineered stormwater vault selected shall meet the minimum requirements for treatment and flow-thru volumes. Operations and maintenance are provided in Appendix D.

VI. COMPONENTS OF EROSION CONTROL

CONTRACTOR RESPONSIBILITIES

I. Daily Site Maintenance (Performed by Contractor)

At the beginning and end of each day of construction, the Contractor shall walk the site to determine the presence of any extraneous material (litter) and to review all stormwater outfall locations. All debris shall be picked up and disposed of in an appropriate manner.

Construction chemicals shall be stored in an area that is away from any temporary or permanent stormwater drainage facilities and in an area that is elevated above ground surface, so that surface water runoff does not deteriorate the associated container/bag. All containers shall be adequately sealed at the end of each workday or

at the end of use. Large fuel tank(s), if required, shall be located within a secondary containment vessel, size equal to or greater than the capacity of the fuel tank used.

Construction debris shall be stockpiled in one particular area within the site that is located away from any permanent or temporary storm drainage facility. All construction debris shall be removed from the site and disposed of in an appropriate manner. Locate trash receptacle on high ground so as not to allow stormwater runoff to collect within the bin(s). The material/equipment storage shall be monitored on a daily basis for any identified chemical (oil, grease, etc.) spills.

II. Construction Sequence

- Obtain all necessary shop drawing approvals and applicable permits.
- Conduct a pre-construction meeting.
- Perform stakeout of property limits and facilities.
- Utilize the existing paved driveway entrance for construction vehicles; install wheel wash/dust control station from an existing hydrant (permit required) or portable water tank.
- Install silt fencing where shown.
- Remove existing building and pavements from the project site, and placement and compaction of fill as needed.
- Construct site utilities, stormwater drainage inlets, piping and basins. Install all remaining protection measures including backfill to one-foot below rim of receivers (drop inlet protection).
- Construct and install building and pavements.
- Maintain all erosion and sediment control devices throughout the construction period.
- Final grade entire site including topsoil placement, seed and mulch landscaped areas.
- Remove silt fence and other erosion control devices after vegetation has been established in topsoil/seeded areas.

III. Post Construction Operation & Maintenance (Performed by Owner)

- a. On a quarterly basis and following rain events of 0.5-inch or greater, perform the following:
 1. Inspect catch basins and storm piping for debris and sediments;
 2. Remove and properly dispose of any collected debris from the structures;
 3. Flush piping with water, if necessary to remove accumulated sediment.
 4. Inspect grassed/landscaped areas for un-vegetated area or areas with less than 80% healthy stand of grass and reseed and mulch as necessary. Water areas daily if reseeded through July and August.
 5. Maintain all lawn areas by regular mowing, including the grassed slopes and bottom of the stormwater detention basin and drainage swales. Any eroded areas shall be re-graded, seeded and mulched immediately.

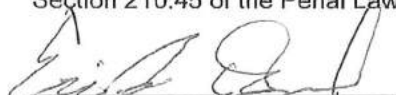
OWNER RESPONSIBILITIES

The responsible party for implementation of all components of the stormwater Pollution Prevention Plan (SWPPP) will be Savarino Companies, LLC represented by Eric P. Diamond, who will be responsible for meeting the requirements as defined within this SWPPP and the conditions of the SPDES General Permit GP-0-15-002. These responsibilities include but are not necessarily limited to the following:

- An initial site assessment shall be performed prior to start of construction.
- Ensure that daily and weekly maintenance requirements are met.
- Notify all contractors and subcontractors of the required practices and will also be responsible for making sure that a qualified professional (as defined by the SPDES General Permit) completes the required inspection services.
- He shall ensure that the SWPPP is kept current and is amended whenever there is a significant change in design, construction, operation or maintenance or if the SWPPP proves to be ineffective or when any new contractor or subcontractor will be implementing any measures of the SWPPP.
- He shall ensure that all inspection reports are maintained in a site log book, that a current copy of the SWPPP, NOI and other related documentation are kept on-site and are readily available for review by NYSDEC, the Town or other interested parties from the date of initiation of construction activities until the date of final site stabilization.
- He shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis. (Recommend a pole-mounted mailbox labeled "SWPPP")
- He shall prepare a written summary of its status with respect to compliance with the SPDES General Permit at least once every three (3) months during which coverage under the permit exists. The summary should address the status of achieving each component of the SWPPP.
- Upon final site stabilization, a final site inspection shall be performed.
- He shall file a Notice of Termination (NOT) with NYSDEC identifying the termination of permit coverage (a copy of blank NOT is included herein).
- He shall retain copies of all SWPPP and related documents for a period of at least five (5) years from the date the site is finally stabilized.

VII. OWNER/OPERATOR CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that false statements made here in are punishable as a Class A Misdemeanor pursuant to Section 210.45 of the Penal Law."


Owner/Operator Signature


Vice President
Title

Eric R. Diamond
Name (Printed)

10/22/15
Date

VI. *CONTRACTOR CERTIFICATION:

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."


Contractor Signature

Vice President
Title

Eric R. Diamond
Name (Printed)

10/22/15
Date

- Note: Only contractors/subs that disturb soil or implement SMP's and Erosion Control measures are required to sign.

The certifications must be executed before Public/Private Improvement Permits can be issued.

V. PERMITS

The proposed construction of the apartment structure, parking lot and utilities must receive approvals from the City of Buffalo Permit office and Buffalo Sewer and Water Authorities. A Notice of Intent and MS4 Acceptance must be completed for application to the NYSDEC SPDES Permit for Stormwater Discharge from a construction activity.

PLANNED EROSION AND SEDIMENTATION CONTROL PRACTICES

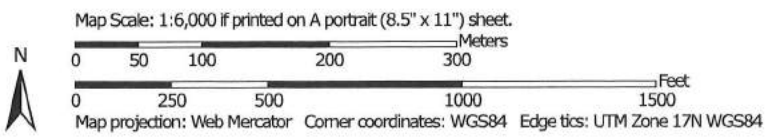
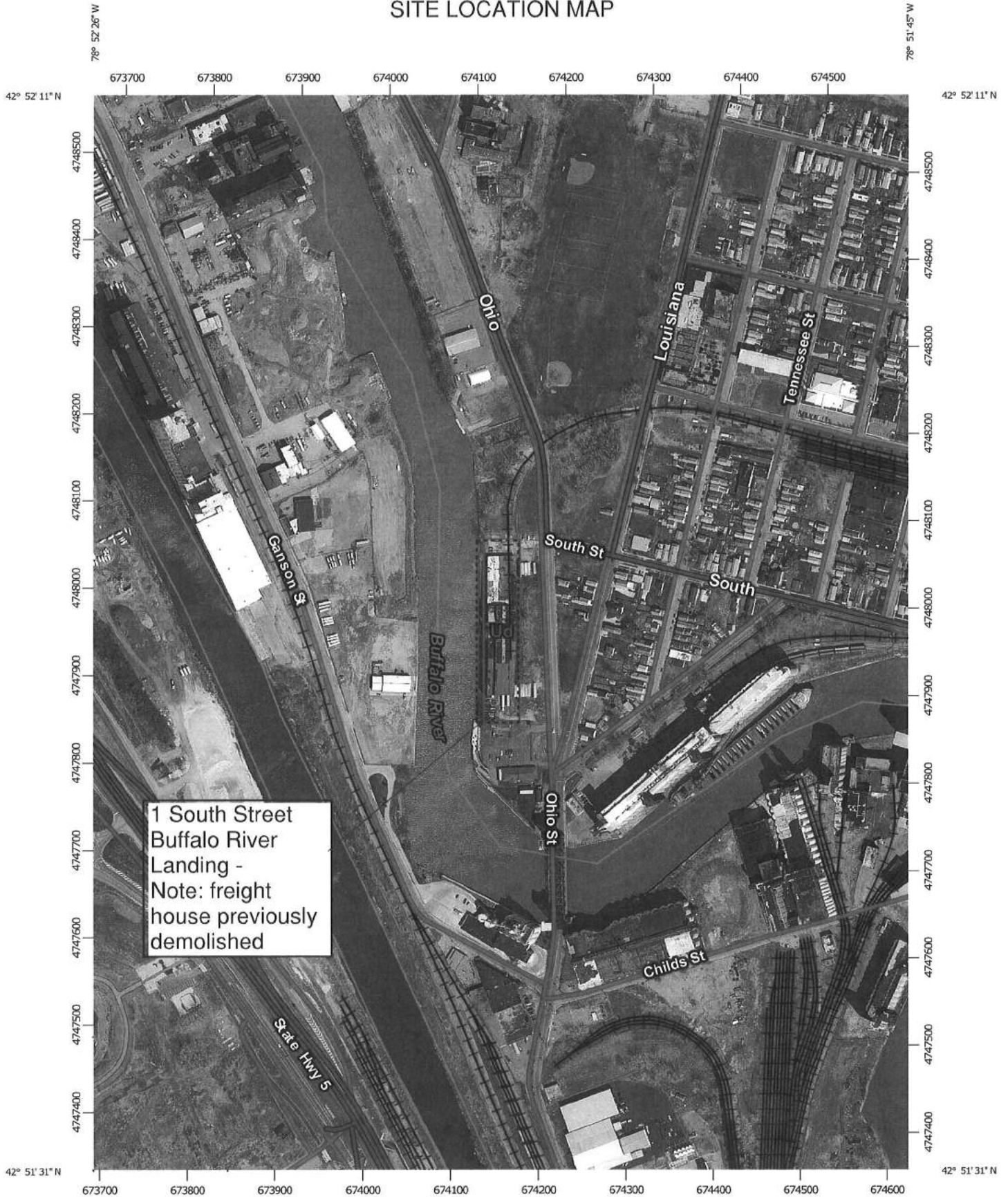
1. **Construction Entrance/Exit:** A gravel driveway entrance shall be utilized from South Street. **A wheel wash station** shall be installed adjacent to the driveway connected to the public hydrant with an approved backflow preventer and meter – or – the contractor may elect to use a water storage tank. All vehicles exiting onto public roadways shall be cleaned of sediment and stones.
2. **Silt Fencing:** Sediment control fencing shall be installed along the new west building wall and east property line.
3. **Surface Stabilization:** All disturbed soils shall be stabilized as soon as grade is established, either in fill or cut areas, with either vegetation or mulch or geotextile fabric and stone subbase in paved parking lot and building footprint.
4. **Dust Control:** Dust shall be controlled by sprinkling during extended periods of soil exposure. See item #1 above for optional temporary water sources.
5. **Excavated Storm Drain Inlet Protection:** Installation of receivers shall leave the rim above the surrounding grades to allow for pooling and settlement of sediment prior to runoff entering the storm sewer piping. A geotextile fabric shall also be installed under the grate of each receiver, which shall be regularly cleaned of any built-up sediment.

Stormwater Operational Maintenance Schedule

1. **Construction Entrance/Exit:** The public roadways shall be cleaned immediately of any sediment and stone deposited from a construction vehicle.
2. **Silt Fencing:** Sediment control fencing shall be inspected daily with removal of built-up sediments at 6-inches depth of accumulation. Repairs to fencing shall be made as necessary.
3. **Surface Stabilization:** All seeded areas shall be fertilized and re-seeded and mulched as necessary to maintain vigorous, dense cover.
4. **Dust Control:** As necessary.
5. **Excavated Storm Drain Inlet Protection:** Excavated inlet protection shall be inspected daily with removal of built-up sediments at 50% depth of accumulation of the storage capacity. Block & stone-type: gravel shall be cleaned or replaced when sediment pool no longer drains.
6. **Stormwater Inlet sumps and Water Quality Treatment Device:** Sediments shall be removed from sumps when level reaches the inlet pipe invert (+/- 12" depth). Clean storm piping as necessary. Sediments shall be removed from the Water Quality Treatment vault a minimum of once prior to project closeout and when the maximum recommended depth of sediments is reached. Reference vault supplier's maintenance instructions for methods, including replacement interval of any media filters.

APPENDIX A

SITE LOCATION MAP



SEQRA Notice of Determination

Non Significance

Negative Declaration

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (SEQR – State Environmental Quality Review) of the Environmental Conservation Law.

Lead Agency: City of Buffalo Planning Board
Room 901, City Hall
65 Niagara Square
Buffalo New York 14202

As per the provisions of SEQR, the Lead Agency has reviewed the following action as it relates to the environment:

Action Title: Freight House Landing
Location: 441 Ohio Street
Type of Action: uncoordinated - unlisted

Description: Savarino Companies on behalf of the owner, 441 Ohio Street LLC is proposing the construction of a mixed use facility located at 441 Ohio Street, Buffalo New York. The project is being coordinated by a team of real estate investors and developers that include Savarino companies, FFZ Holdings, LLC both of which have had a number of successful adaptive reuse projects. Freight House Landing will be a mixed use facility providing office space and up to seventy eight market rate apartments along the Buffalo River and the future "Ohio Street Parkway". The five story building will feature secured ground floor parking, a mix of 900 SF 1-bedroom units and 1,800 SF 2-bedroom units, high end amenities, passive green space on the water's edge, roof top gardens, floating docks for river access and secure personal storage for recreational water craft. It is expected that the project will begin in late 2013 and be completed in approximately 12 months. The project site is home to one of the former Erie Freight Houses. It has been neglected for many years and is in a state of major disrepair. As per the owner's comments, the building is not able to be saved due to significant damages, shifting and exposure to the elements. The project sponsor has reviewed options with the New York State Office of Parks, Recreation and Historic Preservation which has confirmed a partial reuse will not be eligible for Historic Tax Credits. In an effort to best reuse the existing building while accounting for the structural and economic realities of the building, the developers has engaged preservation specialist Karry Traynor of KTA Preservation Specialties and Preservation Buffalo/Niagara (PBN) to assist with conducting research and recording the features and history of the property. Both parties will be participating in a deconstruction and offering recommendations for reuse of the building's elements to respect the property's history and allow for the reusable elements of the building to be repurposed. This project also allows for an opportunity to assist with the revitalization of the Buffalo River. The Buffalo Riverkeepers will be consulting on design to assist with picking Native Plantings respectful of the ecosystem and promoting and activating water use as part of the Blueway Trail. The cooperative efforts have included the creation of a 25' setback from the river's edge, a living wall design, active water user and cooperation with Riverkeepers Habitat Restoration Program on a portion of the property. Work is also being coordinated with the Erie Canal Harbor Development Corporation to coordinate efforts on the site design and utilities placement in future plans for South Street and the neighboring DEC Park. In addition to working with local and state Preservationists, PBN, and the Riverkeepers, the development team has taken efforts to keep both local public officials and the public informed. A community meeting was held at the Old First Ward community Center to present the plans for the project and answer any questions that were raised. As per the developers, the meeting was positive and the attendees were supportive of the project.

As a result of this Environmental Review, the Lead Agency has determined the undertaking of This action will not have a significant adverse affect on the quality of the environment. No further environmental review of this action will be conducted prior to project implementation and a Draft Environmental Impact Statement will not be prepared.

Reasons Supporting This Determination: This project will preserve elements of the existing freight for future generations, as well as assist with the development of the Buffalo River improvements in this area. It will encourage the use of the river and assist with the ongoing, fast paced development of the First Ward community. The identified potential negative impacts appear to be primarily short-term site preparation and construction related activities, and do not appear to be significant in magnitude or effect. There are no actions related to the construction of this project which will have a significant adverse impact on the environment.

For further information relative to this Negative Declaration, contact Mr. Martin Grunzweig, Land Use Controls Coordinator, Room 901 City Hall, Buffalo New York 14202 – 716 851-5085

Dated: July 2, 2013

CC: City Clerk
City of Buffalo Public Works, Parks, Streets Department
City of Buffalo Economic Development, Permits and Inspection
Savarino Companies



ANDREW M. CUOMO
Governor

**Parks, Recreation
and Historic Preservation**

ROSE HARVEY
Commissioner

August 11, 2015

Andrew Marino
Project Manager
Tredo Engineers
755 Seneca St
Suite 202
Buffalo, NY 14210

Re: USACE; DEC
Buffalo River Landing Apartment
9 South Street, Buffalo, NY
15PR03682
GP-0-15-002

Dear Mr. Marino:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based upon this review, the New York SHPO has determined that no historic properties will be affected by this undertaking.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

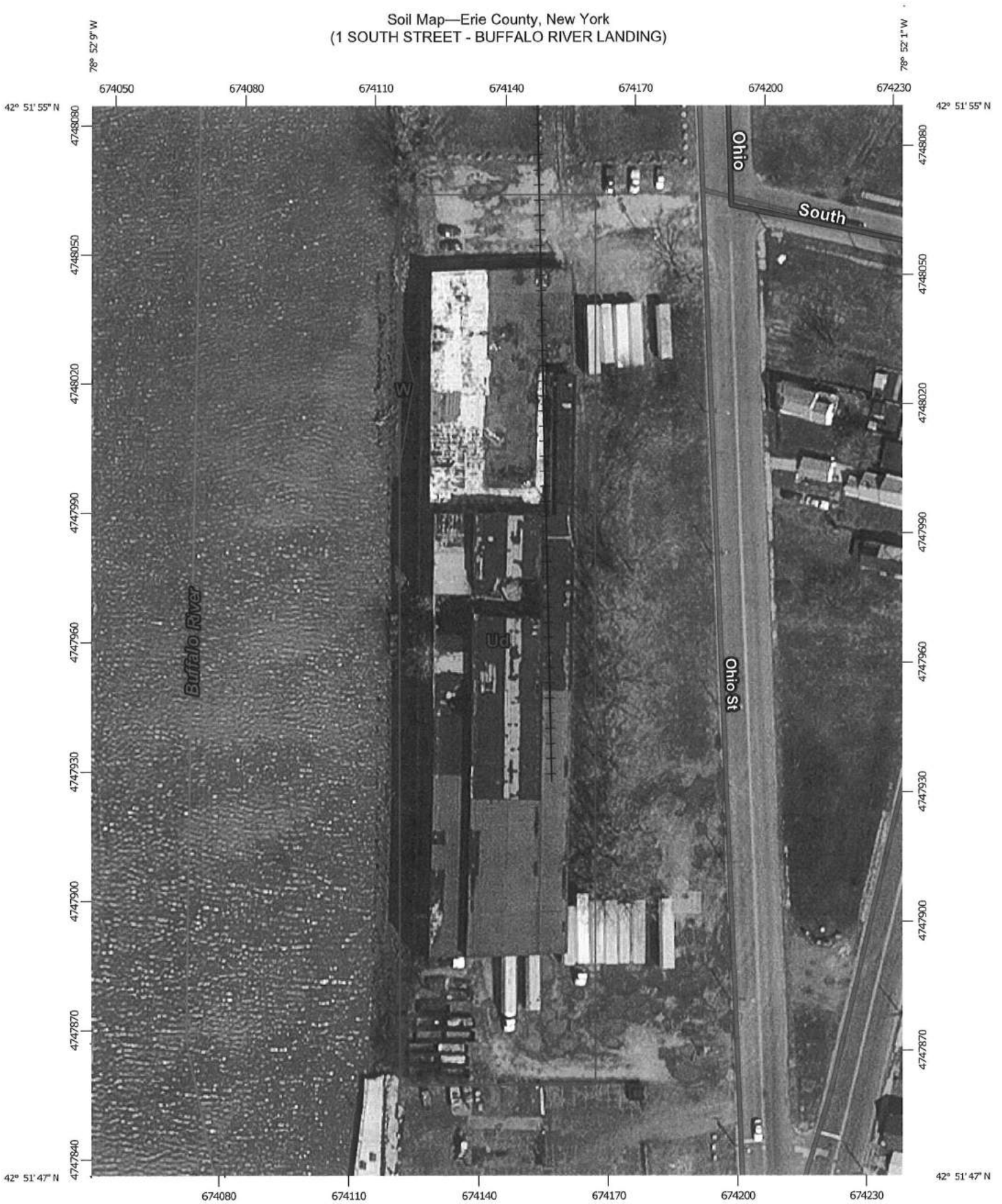
Sincerely,

Ruth L. Pierpont
Deputy Commissioner for Historic Preservation

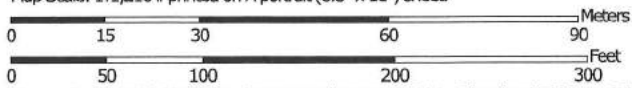
Division for Historic Preservation

P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • www.nysparks.com

Soil Map—Erie County, New York
(1 SOUTH STREET - BUFFALO RIVER LANDING)












































Map Scale: 1:1,210 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84



MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soils	 Stony Spot
 Area of Interest (AOI)	 Very Stony Spot
 Soil Map Unit Polygons	 Wet Spot
 Soil Map Unit Lines	 Other
 Soil Map Unit Points	 Special Line Features
 Special Point Features	 Streams and Canals
 Blowout	 Transportation
 Borrow Pit	 Rails
 Clay Spot	 Interstate Highways
 Closed Depression	 US Routes
 Gravel Pit	 Major Roads
 Gravelly Spot	 Local Roads
 Landfill	 Background
 Lava Flow	 Aerial Photography
 Marsh or swamp	
 Mine or Quarry	
 Miscellaneous Water	
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Erie County, New York
Survey Area Data: Version 13, Sep 15, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Erie County, New York (NY029)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ud	Urban land	2.3	99.4%
W	Water	0.0	0.6%
Totals for Area of Interest		2.3	100.0%

APPENDIX B

Project: Buffalo River Landing Project #: 13 60 Sheet #: _____ of _____
 Description: Water Quality & RRv Calcs Date: July 2015 Drawn by: _____ avm _____

Water Quality Volume (WQv) and Runoff Reduction Volume (RRv) Calculations:

Base Data

Location: City of Buffalo, NY
 Site Area 2.24 acres
 Existing surface water on-site 0.54 acres (Buffalo River channel)
 Total Drainage Area (DA) = 1.70 acres
 Existing Impervious Area (EIA) = 1.68 acres (Existing Building Roof and Pavements)
 Proposed Impervious Area (PIA) = 1.25 acres (Proposed Building Roof and Pavements)
 Net Increase in Impervious Area = -0.43 acres **26% reduction**

Site Soil Types (HSG)	A	B	C	D
Percentage	0%	0%	0%	100%
Soil Description	-	-	-	Ud

Computation of Preliminary Stormwater Storage Volumes and Peak Discharges

Water Quality Volume, WQv

Compute Impervious Cover

Use both on-site and off-site drainage:

I = 73.5

Compute Runoff Coefficient, Rv

Rv = 0.71

Compute WQv (Includes both on-site and off-site drainage)

Use the 90% capture rule with 1.0 inches of rainfall (Ref NYS SWMDM Figure 4.1)

WQv = 0.101 ac-ft

Compute Water Quality Peak Flow

P = 1.00 inches
 Q = 0.97 inches
 CN = 100 per NYSDEC App B
 Ia/P = 0.11
 tc = 6 min 0.1 hrs
 C0 = 2.553
 C1 = -0.062
 C2 = -0.016
 K = 2.598

therefore qu = 397 cfs/sq mi/inch

Qp = qu x A x WQv

A = 0.00195 sq miles
 WQv = 0.97 watershed inches

therefore Qp = **0.75 cfs**

Runoff Reduction Volume (RRv): **not used** - Ref. SWDM Chpt. 9: Redevelopment

Flow-thru alternate SMP Sizing:

shall be based on peak **75% WQv** flow of **0.56 cfs** (SWDM chpt 9)
 see pipe sizing chart in Appendix A for 10-yr storm event inflow to alternate SMP (no diversion required)
 see attached alternate practice device cut sheet for additional info

Compute Stream Channel Protection Volume, (Cpv) **not used** - runoff discharges directly to the Buffalo River, a 5th-order stream.

HLR Calculator

Note:

Use this calculation for each basin.
 If the BMP has more than one vault, calculate the footprint of each vault.
 The calculator will sum the areas for you.
 Vaults may be parallel or in series if they are part of one BMP
 If you have separate BMPs or a separate basin, do not sum HLR
 Use either the Length x Width or a Diameter for each vault, not both
 In the example provided, a 6' x 4' vault is used for a Water Quality (WQ) flow of 1 cfs

Inputs (Enter your data here)		(cfs)	gpm	Footprint (Sq. Ft.)	
Outputs (Do not enter here)		1.5	673.25	24	56.54867
> 0.75 cfs					
Vault 1	Rectangular	Length or Diameter	Width	0	MINIMUM
- or -	Circular	6	4	28.27	56.54867
Vault 2	Rectangular	0	0	0	
- or -	Circular	0		0.00	
Vault 3	Rectangular	0	0	0	
- or -	Circular	0		0.00	
Total Footprint (Sq. Ft.)				52.27	
HLR (Flow / Area)				12.88	gpm/sf

APPENDIX C

NOTICE OF INTENT



New York State Department of Environmental Conservation
Division of Water

625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002
All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE
OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information	
Owner/Operator (Company Name/Private Owner Name/Municipality Name)	
441 01110 STREET, LLC	
Owner/Operator Contact Person Last Name (NOT CONSULTANT)	
HAYS	
Owner/Operator Contact Person First Name	
KEVIN	
Owner/Operator Mailing Address	
500 SENECA STREET - SUITE 508	
City	
BUFFALO	
State	Zip
NY	14204-1927
Phone (Owner/Operator)	Fax (Owner/Operator)
716-332-5959	716-332-5968
Email (Owner/Operator)	
KEVINH@SAVAKINOCOMPANIES.COM	
FED TAX ID	
45-4316019 (not required for individuals)	

Project Site Information

Project/Site Name

B U F F A L O R I V E R L A N D I N G

Street Address (NOT P.O. BOX)

1 S O U T H S T R E E T

Side of Street

North South East West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

B U F F A L O

State

N Y

Zip

1 4 2 0 4

County

E R I E

DEC Region

9

Name of Nearest Cross Street

O H I O S T R E E T

Distance to Nearest Cross Street (Feet)

1 0 0

Project In Relation to Cross Street

North South East West

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you must go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/insmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i" (identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

1 8 3 9 8 8

Y Coordinates (Northing)

4 7 5 3 0 5 4

2. What is the nature of this construction project?

- New Construction
- Redevelopment with increase in impervious area
- Redevelopment with no increase in impervious area

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? Yes No Unknown

16. What is the name of the municipality/entity that owns the separate storm sewer system?

E U F F A L O S E W E R A U T H O R I T Y

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? Yes No Unknown

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? Yes No

19. Is this property owned by a state authority, state agency, federal government or local government? Yes No

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) Yes No

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? Yes No

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? Yes No
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? Yes No

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- Preservation of Undisturbed Areas
- Preservation of Buffers
- Reduction of Clearing and Grading
- Locating Development in Less Sensitive Areas
- Roadway Reduction
- Sidewalk Reduction
- Driveway Reduction
- Cul-de-sac Reduction
- Building Footprint Reduction
- Parking Reduction

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6 ("Soil Restoration") of the Design Manual (2010 version).

- All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- Compacted areas were considered as impervious cover when calculating the WQv Required, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

acre-feet

29. Identify the RR techniques (Area Reduction), RR techniques (Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required (#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

<u>RR Techniques (Area Reduction)</u>	<u>Total Contributing Area (acres)</u>	and/or	<u>Total Contributing Impervious Area (acres)</u>
<input type="radio"/> Conservation of Natural Areas (RR-1) ...	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Sheetflow to Riparian Buffers/Filter Strips (RR-2)	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input checked="" type="radio"/> Tree Planting/Tree Pit (RR-3)	<input type="text"/> <input type="text"/> 0 . 1 7 <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Disconnection of Rooftop Runoff (RR-4) ..	<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
<u>RR Techniques (Volume Reduction)</u>			
<input type="radio"/> Vegetated Swale (RR-5)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Rain Garden (RR-6)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Stormwater Planter (RR-7)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Rain Barrel/Cistern (RR-8)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Porous Pavement (RR-9)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Green Roof (RR-10)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<u>Standard SMPs with RRV Capacity</u>			
<input type="radio"/> Infiltration Trench (I-1)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Infiltration Basin (I-2)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Dry Well (I-3)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Underground Infiltration System (I-4)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Bioretention (F-5)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Dry Swale (O-1)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<u>Standard SMPs</u>			
<input type="radio"/> Micropool Extended Detention (P-1)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Wet Pond (P-2)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Wet Extended Detention (P-3)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Multiple Pond System (P-4)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Pocket Pond (P-5)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Surface Sand Filter (F-1)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Underground Sand Filter (F-2)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Perimeter Sand Filter (F-3)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Organic Filter (F-4)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Shallow Wetland (W-1)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Extended Detention Wetland (W-2)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Pond/Wetland System (W-3)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Pocket Wetland (W-4)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>
<input type="radio"/> Wet Swale (O-2)	<input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/>

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv (=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

0 1 0 2 acre-feet

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

0 1 0 2

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? Yes No

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

. acre-feet

CPv Provided

. acre-feet

36a. The need to provide channel protection has been waived because:

- Site discharges directly to tidal waters or a fifth order or larger stream.
- Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

. CFS

Post-development

. CFS

Total Extreme Flood Control Criteria (Qf)

Pre-Development

. CFS

Post-development

. CFS

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

KEVIN

MI

P

Print Last Name

HAYS

Owner/Operator Signature

[Handwritten Signature]

Date

/ /



Department of
Environmental
Conservation

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

**MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance
Form**
for

Construction Activities Seeking Authorization Under SPDES General Permit
***(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)**

I. Project Owner/Operator Information

1. Owner/Operator Name: 441 OHIO STREET, LLC

2. Contact Person: KEVIN P. HAYS

3. Street Address: 500 SENECA STREET, SUITE 508

4. City/State/Zip: BUFFALO, NEW YORK 14204

II. Project Site Information

5. Project/Site Name: BUFFALO RIVER LANDING

6. Street Address: 1 SOUTH STREET

7. City/State/Zip: BUFFALO/NY/14204

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information

8. SWPPP Reviewed by:

9. Title/Position:

10. Date Final SWPPP Reviewed and Accepted:

IV. Regulated MS4 Information

11. Name of MS4:

12. MS4 SPDES Permit Identification Number: NYR20A _____

13. Contact Person:

14. Street Address:

15. City/State/Zip:

16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

APPENDIX D

SPDES STORMWATER POLLUTION PREVENTION PLAN (SWPPP) REVISION

JOB STAMP

Date: _____

Day of Week: S M T W T F S

Sheet No. ____ of ____

This form is to be used when revisions to the current Stormwater Pollution Prevention Plan (SWPPP) are required by SPDES General Permit for Construction Activity, *GP-0-15-002*. The completed form must be filed in the Engineer's Field Office.

Reason for the Revision(s): Revision(s) were requested by NYSDEC: Yes No

Describe the Revision(s) to the SWPPP:

Engineer-in-Charge Signature: _____

EICs Name & Title: _____

Date Completed: _____

Copy to Contractor: _____

**New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505**

(NOTE: Submit completed form to address above)

**NOTICE OF TERMINATION for Storm Water Discharges Authorized
under the SPDES General Permit for Construction Activity**

Please indicate your permit identification number: NYR _____

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person:

4a. Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. *Date final stabilization completed (month/year): _____

9b. Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR _____
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? yes no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? yes no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

**NOTICE OF TERMINATION for Storm Water Discharges Authorized under the
SPDES General Permit for Construction Activity - continued**

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? yes no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

- Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.
- Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).
- For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.
- For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____
(acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? yes
 no
(If Yes, complete section VI - "MS4 Acceptance" statement)

V. Additional Information/Explanation:
(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:

Date:

**NOTICE OF TERMINATION for Storm Water Discharges Authorized under the
SPDES General Permit for Construction Activity - continued**

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

(NYS DEC Notice of Termination - January 2015)

STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL

SAMPLE STORMWATER CONTROL FACILITY MAINTENANCE AGREEMENT

Whereas, the Town of _____ ("Town") and the _____ ("facility owner") want to enter into an agreement to provide for the long term maintenance and continuation of stormwater control measures approved by the Municipality for the below named project, and

Whereas, the Municipality and the facility owner desire that the stormwater control measures be built in accordance with the approved project plans and thereafter be maintained, cleaned, repaired, replaced and continued in perpetuity in order to ensure optimum performance of the components. Therefore, the Municipality and the facility owner agree as follows:

1. This agreement binds the Municipality and the facility owner, its successors and assigns, to the maintenance provisions depicted in the approved project plans which are attached as Schedule A of this agreement.
2. The facility owner shall maintain, clean, repair, replace and continue the stormwater control measures depicted in Schedule A as necessary to ensure optimum performance of the measures to design specifications. The stormwater control measures shall include, but shall not be limited to, the following: drainage ditches, swales, dry wells, infiltrators, drop inlets, pipes, culverts, soil absorption devices and retention ponds.
3. The facility owner shall be responsible for all expenses related to the maintenance of the stormwater control measures and shall establish a means for the collection and distribution of expenses among parties for any commonly owned facilities.
4. The facility owner shall provide for the periodic inspection of the stormwater control measures, not less than once in every five-year period, to determine the condition and integrity of the measures. Such inspection shall be performed by a Professional Engineer licensed by the State of New York. The inspecting engineer shall prepare and submit to the Municipality within 30 days of the inspection, a written report of the findings including recommendations for those actions necessary for the continuation of the stormwater control measures.
5. The facility owner shall not authorize, undertake or permit alteration, abandonment, modification or discontinuation of the stormwater control measures except in accordance with written approval of the Municipality.
6. The facility owner shall undertake necessary repairs and replacement of the stormwater control measures at the direction of the Municipality or in accordance with the recommendations of the inspecting engineer.
7. The facility owner shall provide to the Municipality within 30 days of the date of this agreement, a security for the maintenance and continuation of the stormwater control measures in the form of (a Bond, letter of credit or escrow account).
8. This agreement shall be recorded in the Office of the County Clerk, County of _____ together with the deed for the common property and shall be included in the offering plan and/or prospectus approved pursuant to _____.
9. If ever the Municipality determines that the facility owner has failed to construct or maintain the stormwater control measures in accordance with the project plan or has failed to undertake corrective action specified by the Municipality or by the inspecting engineer, the Municipality is authorized to undertake such steps as reasonably necessary for the preservation, continuation or maintenance of the stormwater control measures and to affix the expenses thereof as a lien against the property.
10. This agreement is effective _____.

APPENDIX E

Date: September 15, 2015

COMBINED SYSTEM DRY WEATHER FLOW CAPACITY STUDY – Summary Review

Prepared For: 1 South - DS Capacity Analysis

Andrew Marino
Tredo Engineers
755 Seneca Street, Suite 202
Buffalo, NY 14210

Project Name: 1 South

Flow Monitoring Period: August 13, 2015 to September 11, 2015

Dry Week days Monitored: August 13, August 17, August 19, August 21, August 24, August 26-28, August – September 2, September 4, September 7-8, September 10-11.

Dry Weekend days Monitored: August 16, August 22, August 23, August 30, September 6.

Number of Monitoring Nodes: Three (3) downstream manholes

Node Locations and Descriptions:

- Node 1 Ohio and South (10")
- Node 2 South and Louisiana (24")
- Node 3 172 Louisiana (24")

Summary Conclusion:

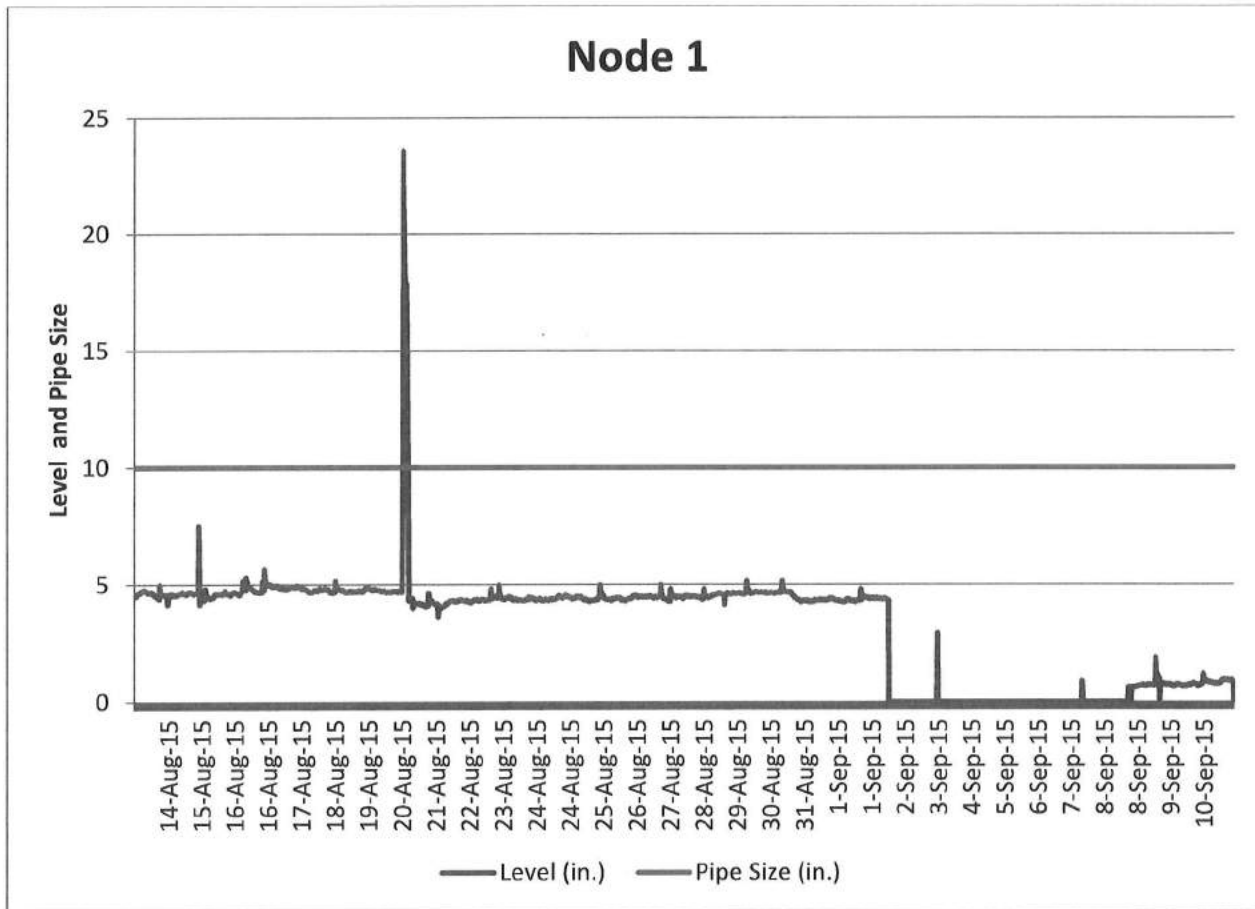
Based on the data presented in this report, specifically the flow depth measurements recorded (see graphs below):

- At no time did the flow depth exceed pipe diameter at any of the downstream monitoring points during the dry vents monitored.
- At no time during the monitoring period did the flow at any point slow or stall which would have caused a backup or flooding at the manhole.
- It appears that the sanitary sewer sections monitored have available capacity.

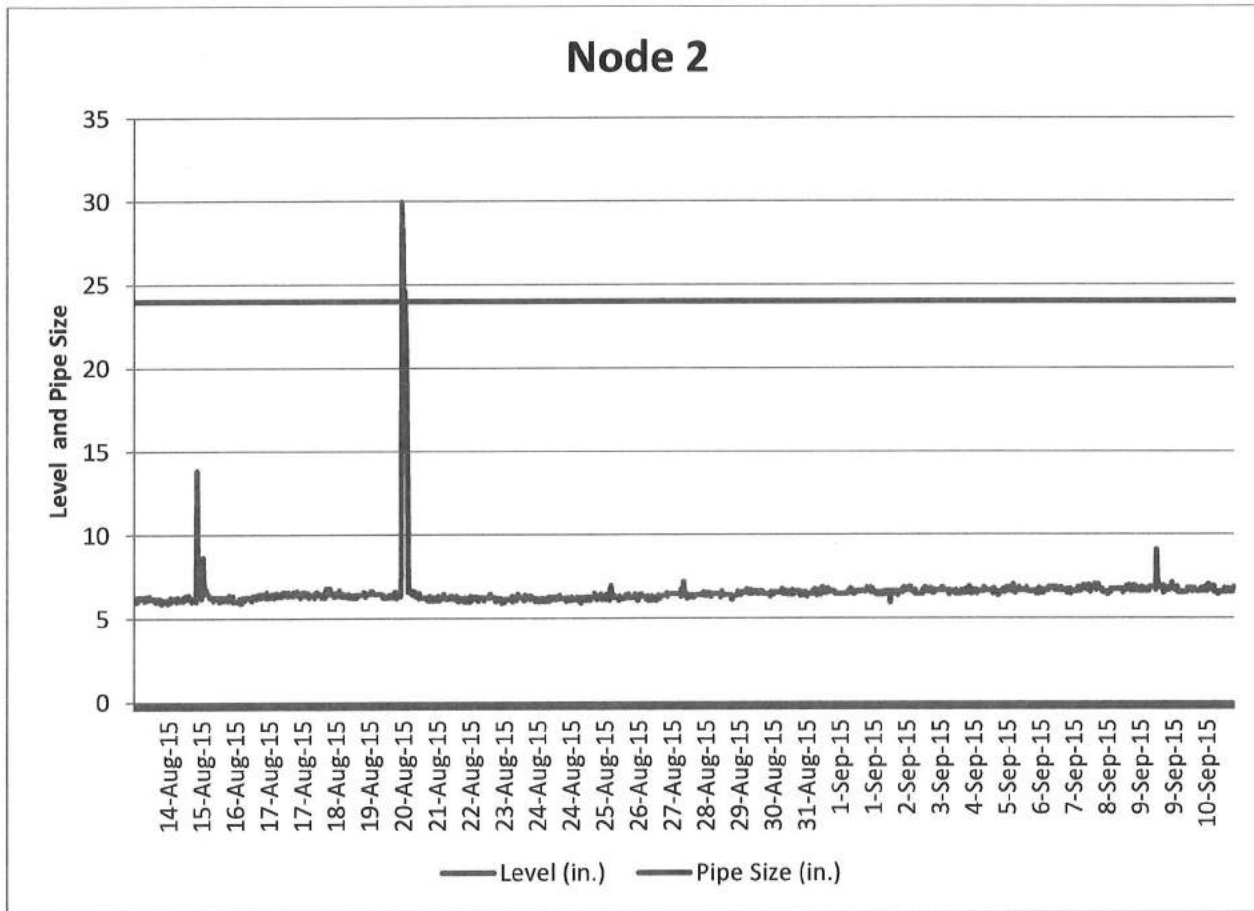
Depth of Flow Capacity Summary:

Depth of flow capacity is based on diameter of pipe. See graphs below.

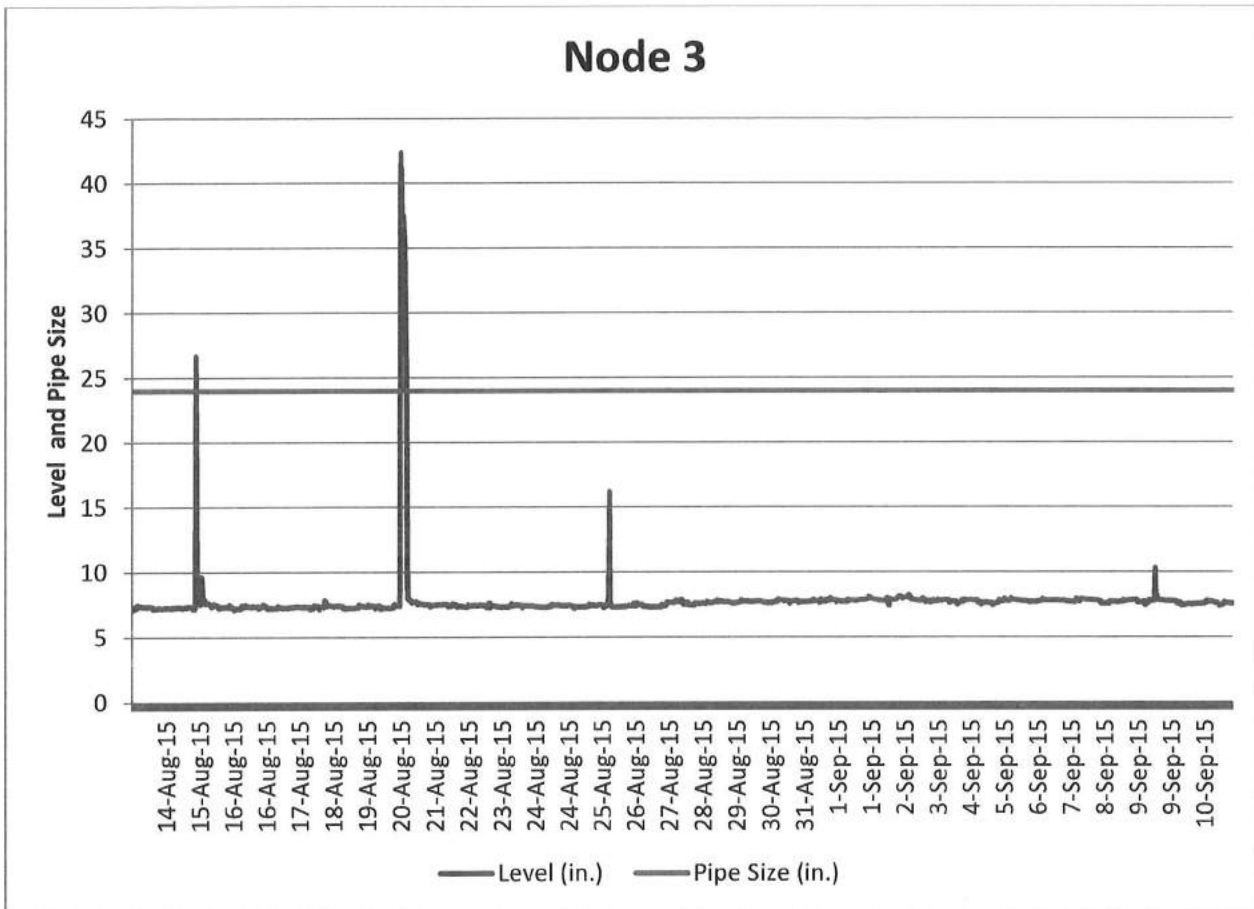
- At no time during the monitoring period did depth of flow exceed pipe diameter at Node 1.



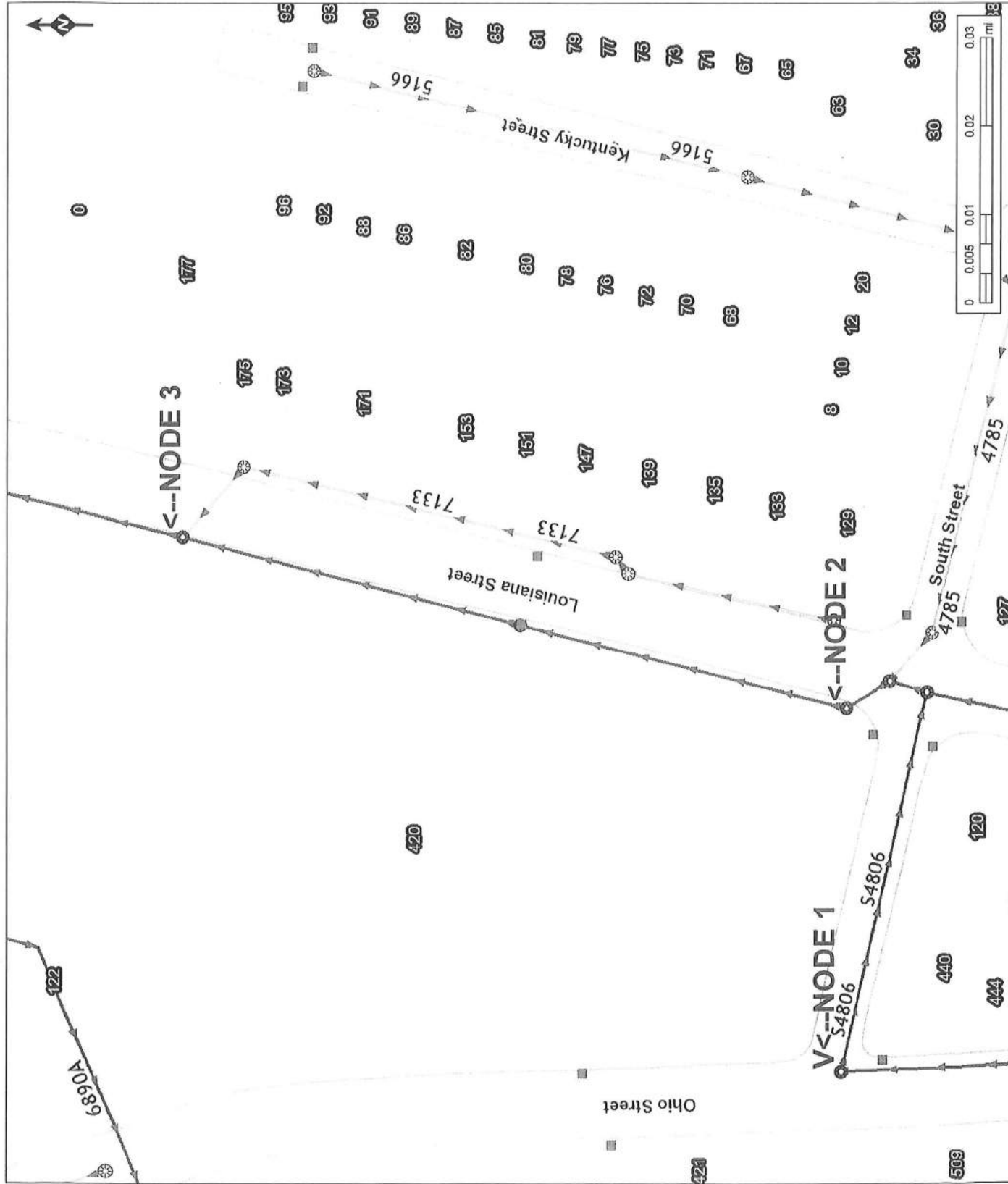
- At no time during the monitoring period did depth of flow exceed pipe diameter at Node 2.



- At no time during the monitoring period did depth of flow exceed pipe diameter at Node 3.



7/30/15-#NODES FOR #9 (#1) SOUTH ST



LEGEND

- Permit Issued
- Sewer Patrol Points
- Sewer_Receivers
- Catch Basins
- Combined Sewer Overflows
- Combined
- Sanitary
- Interceptor
- Storm Overflow
- Storm Relief
- Storm
- Chamber
- Interceptor Chamber
- L Lift Station
- Overflow Chamber
- Siphon
- Weir
- Storm Sewer Outfalls
- Major Industrial Dischargers
- High Water Users
- Sewer Direction
- Combined
- Sanitary
- Interceptor
- Storm Overflow
- Storm Relief
- Storm
- Sewer Laterals

SUMMARY READINGS

Date	Node 1			Node 2			Node 3			Rain (Inches)
	Ohio and South (10")			South and Louisiana (24")			172 Louisiana (24")			
	FLOW (GAL x 1000)	PEAK FLOW (MGD)	PEAK LEVEL (IN)	FLOW (GAL x 1000)	PEAK FLOW (MGD)	PEAK LEVEL (IN)	FLOW (GAL x 1000)	PEAK FLOW (MGD)	PEAK LEVEL (IN)	
08/13/15	5.378	0.009	4.771	22.496	0.043	6.353	105.699	0.428	7.476	0
08/14/15	8.909	0.010	4.984	40.830	0.044	6.416	202.555	0.444	7.366	0.05
08/15/15	8.903	0.017	7.519	44.875	0.121	13.843	352.601	1.237	26.712	2.85
08/16/15	9.514	0.012	5.660	41.804	0.045	6.578	192.586	0.478	7.517	0
08/17/15	9.683	0.010	4.993	43.739	0.046	6.635	186.806	0.335	7.396	0
08/18/15	9.363	0.010	5.153	44.036	0.047	6.804	206.967	0.507	7.827	0.02
08/19/15	9.341	0.010	4.869	43.736	0.046	6.642	178.509	0.384	7.508	0
08/20/15	13.575	0.240	23.569	104.197	1.066	29.973	330.873	1.269	42.385	0.81
08/21/15	7.904	0.009	4.646	41.683	0.044	6.466	200.067	0.358	7.597	0
08/22/15	8.314	0.010	4.815	41.485	0.044	6.466	185.928	0.372	7.625	0
08/23/15	8.438	0.010	4.984	41.458	0.044	6.466	188.654	0.341	7.565	0
08/24/15	8.453	0.009	4.566	41.067	0.044	6.409	191.715	0.375	7.508	0
08/25/15	8.461	0.010	4.984	41.807	0.047	6.804	195.531	0.443	7.819	0.08
08/26/15	8.505	0.009	4.546	42.309	0.049	6.973	188.802	0.669	16.181	0
08/27/15	8.596	0.010	4.984	43.100	0.051	7.198	169.723	0.284	7.908	0
08/28/15	8.725	0.010	4.815	43.642	0.046	6.635	166.274	0.198	7.846	0
08/29/15	9.047	0.010	5.153	44.261	0.047	6.747	168.672	0.173	7.846	0.01
08/30/15	9.008	0.010	5.153	44.873	0.047	6.747	170.913	0.288	7.914	0
08/31/15	8.242	0.008	4.424	45.054	0.048	6.860	171.655	0.268	8.015	0
09/01/15	8.333	0.010	4.815	45.316	0.048	6.860	173.279	0.204	8.128	0
09/02/15	2.973	0.009	4.442	45.376	0.048	6.867	175.790	0.204	8.240	0
09/03/15	0.050	0.005	2.936	45.758	0.048	6.860	176.721	0.519	7.987	0.1
09/04/15	0.000	0.000	0.000	45.559	0.048	6.916	171.631	0.288	7.902	0
09/05/15	0.000	0.000	0.000	46.210	0.050	7.029	171.073	0.214	8.018	0.32
09/06/15	0.000	0.000	0.000	46.357	0.048	6.869	171.073	0.176	7.959	0
09/07/15	0.000	0.000	0.886	46.741	0.050	7.029	174.047	0.269	7.959	0
09/08/15	0.000	0.000	0.668	46.538	0.049	6.973	169.272	0.174	7.876	0
09/09/15	0.000	0.000	1.900	47.790	0.071	9.113	210.462	1.382	10.316	0.23
09/10/15	0.000	0.000	1.224	46.258	0.050	7.029	168.400	0.295	7.794	0
09/11/15	0.000	0.000	0.953	24.690	0.048	6.860	87.900	0.199	7.690	0
---	---	---	---	---	---	---	---	---	---	4.47

PEAK
0.012 →

0.669 →
0.051 →

WET
WEEKEND
WEEKDAY
WEEKDAY

Yellow Highlights are Dry Weather Week Days
 Blue Highlights are Dry Weather Weekend Days
 Red Highlights Peak Dry Weather Flow

Summary - Downstream Sewer Capacity Analysis:

Rule Requirements:

The NYSDEC mandates that proposals which expect to produce sanitary sewage flows of 2500 GPD or greater must undergo the Sewer Extension Approval Process, including review by the Erie County Dept of Health, for the Buffalo Sewer Authority (BSA) for connections to public conveyance and wastewater treatment systems.

Definitions:

Annual Average Daily Flow – the total volume of wastewater flowing into a treatment facility during any consecutive 365 days divided by 365 and expressed in units of million gallons per day (MGD).

Design Capacity – the average daily flow projected for the design year which serves as a basis for the sizing and design of wastewater facilities.

Domestic Wastewater – sewage derived principally from dwellings, businesses, institutions, etc.

Monthly Average Daily Flow – the total volume of wastewater flowing into a treatment facility during a calendar month divided by the number of days in that month and expressed in MGD.

Peak Hourly Flow – the ratio of the Peak Hourly Flow to Design Average Flow per Figure 1 in the Ten States Standards 2014 shall be used to determine the peaking factor.

Permitted Capacity – the treatment capacity for which a plant is approved by the dept. permit expressed in MGD. The permit shall specify the time-frame associated with the permitted capacity.

Three-month Average Daily Flow – the total volume of wastewater flowing into a treatment facility during a period of three consecutive months, divided by the number of days in this period and expressed in MGD.

Description:

Type of Report: Initial capacity analysis on downstream wastewater conveyances within the district, in a pipe reach from the subject parcel. Within the period of study, the measurements taken include daily and weekend durations of dry weather. The theoretical design capacity for each portion of the reach is then calculated, the proposed load added to the average for the period considered, and the resulting percentage of total available pipe capacity is concluded.

Investigation:

Downstream sewer routing and flow meter installation locations, as provided by BSA, and included in Appendix E with the flow data readings, date of flow meter calibration, and

technician performing the work, identified in weekly monitoring reports. The readings are taken in three (3) manhole (node) locations indicated thus:

- Node 1**, 10-inch diameter 'Ohio & South Streets'
- Node 2**, 24-inch diameter 'South & Louisiana Streets'
- Node 3**, 24-inch diameter '172 Louisiana Street'

Theoretical Pipe Size Capacity (Q):

Using Mannings equation and assumed pipe roughness coefficient (n) of 0.013, area (A), hydraulic radius (R), and a pipe slope (S), (note: 'S' assumed here to provide a minimum cleansing velocity of 2 fps), solve for Q at each node:

$$Q = \frac{1.49}{n} AR^{2/3}S^{1/2}$$

- Node 1**, 10-inch at S=0.25%: Q = 1.10 cfs = 494 GPM = 710,948 GPD = **0.71 MGD**
- Node 2**, 24-inch at S=0.08%: Q = 6.42 cfs = 2881 GPM = 4,149,354 GPD = **4.14 MGD**
- Node 3**, 24-inch at S=0.08%: Q = 6.42 cfs = 2881 GPM = 4,149,354 GPD = **4.14 MGD**

Meter Read Results + Proposed Loading:

Proposed Population served (P) = 92/1000 = 0.092 (for population in thousands)
 Peaking factor is calculated thus: $Q \text{ Peak Hourly} / Q \text{ Design Average} = (18 + P^{0.5} / 4 + P^{0.5}) = (18 + 0.092^{0.5} / 4 + 0.092^{0.5}) = 4.25$
 Peak Hourly Flow: Peak Factor x Design Daily Flow = 4.25 x 0.010 MGD = 0.043 MGD

Summary Peak Flow Capacities (actual peak dry-weather reading & date):

- Node 1**, Q Existing flow reading (8/16/15) = 0.012 MGD / 0.71 = 1.7%;
 + Q Proposed Peak 0.043 MGD / 0.71 = 6.1%; thus **7.8%** of theoretical 10-inch pipe capacity used.
- Node 2**, Q Existing flow reading (8/27/15) = 0.051 MGD / 4.14 = 1.2%;
 + Q Proposed Peak 0.043 MGD / 4.14 = 1.0%; thus **2.2%** of theoretical 24-inch pipe capacity used.
- Node 3**, Q Existing flow reading (8/26/15) = 0.669 MGD / 4.14 = 16.2%;
 + Q Proposed Peak 0.043 MGD / 4.14 = 1.0%; thus **17.2%** of theoretical 24-inch pipe capacity used.

Conclusion:

Based on the dry-weather readings taken to date, the proposed downstream sewer conveyances appear to be capable of supporting the proposed sanitary sewage loading from this development with reserve capacity.

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
APPLICATION FOR APPROVAL OF PLANS FOR A WASTEWATER DISPOSAL SYSTEM**

1. NAME OF APPLICANT 441 Ohio Street, LLC		2. LOCATION OF WORKS (City, Village, Town) City of Buffalo		3. COUNTY Erie	
4. ENTITY OR AREA SERVED 1 South Street		5. TYPE OF OWNERSHIP <input type="checkbox"/> Commercial <input type="checkbox"/> Municipal <input type="checkbox"/> Industrial <input type="checkbox"/> Sewage Works Corp <input type="checkbox"/> Private - Home <input checked="" type="checkbox"/> Private - Other <input type="checkbox"/> Private - Institutional <input type="checkbox"/> Board of Education <input type="checkbox"/> Authority <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Interstate <input type="checkbox"/> International <input type="checkbox"/> Indian Reservation			
6. TYPE AND NATURE OF CONSTRUCTION Collection System <input type="checkbox"/> New <input checked="" type="checkbox"/> Additions or Alterations		Treatment and/or Disposal <input type="checkbox"/> New <input type="checkbox"/> Additions or Alterations		7. ESTIMATED COST OF CONSTRUCTION Collection System \$ 10,000 Treatment and/or Disposal \$	
8. TYPE OF WASTE <input checked="" type="checkbox"/> Sewage <input type="checkbox"/> Industrial (Specify) <input type="checkbox"/> Other (Specify)					
9. NAME OF RECEIVING TREATMENT WORKS BSA - Bird Island Wastewater Treatment Plant		10. POINT OF DISCHARGE Surface Water: (Name of Watercourse) Niagara River Ground Water: (Name of Watercourse to which ground water is tributary)			Class A-Special Class
11. IS STATE OR FEDERAL AID APPLIED FOR? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		LOCATION (City, Village, Town) Buffalo	TYPE OF PERMIT <input type="checkbox"/> NYDES <input checked="" type="checkbox"/> SPDES	PERMIT NO. 0028410	DATE ISSUED 7/1/14
12. NAME OF DESIGN ENGINEER Edward F. Tredo, PE				NEW YORK STATE LICENSE NO. 060965	
ADDRESS 755 Seneca St, Buffalo, NY 14210				TELEPHONE 716-876-7147	
13. WATER CONSUMPTION (GPD) Present -0- Future 10,120		Design Year 2035			
14. POPULATION SERVED Present -0- Future 92		Design Year 2035			
15. AVERAGE DAILY FLOW FOR NEW OR EXISTING TREATMENT WORKS (GPD) Present -0- Future 10,120		Design Year 2035			
16. SOURCE OF WATER SUPPLY (if private well; give location, type, depth and character of soil) Buffalo Water Authority			17. DESIGN EQUIVALENT POPULATION (BOD Basis) 101.2 180 MGD Design Flow GPD Design Plant Efficiency 85 %		
18. GIVE NUMBER, CHARACTER AND DISTANCE OF ANY BUILDINGS WHICH MAY BE AFFECTED BY THE PROPOSED TREATMENT WORKS N/A			19. DESCRIBE PROPOSED OR EXISTING STORM WATER DISPOSAL Proposed runoff discharge to Buffalo River (on-site)		
ADDITIONAL INFORMATION MUST BE SUBMITTED FOR PRIVATE AND INSTITUTIONAL SYSTEMS.					
20. INDICATE OF U.S.G.S. TOPOGRAPHIC MAP EXACT LOCATION OF SEWAGE TREATMENT WORKS AND ADJACENT BUILDINGS. SHOW LOCATION OF ALL WELLS OR OTHER SOURCES OF WATER SUPPLY WITHIN 200' OF THE PROPOSED WORKS. GIVE DESCRIPTION OF THESE SOURCES AND CHARACTER OF SOIL N/A					
21. STATE DEPTH BELOW EXISTING GROUND SURFACE AT WHICH GROUND WATER IS ENCOUNTERED +/- 9-ft			22. DESCRIBE SOIL AT SITE OF PROPOSED WORKS. GIVE DESIGN BASIS AND OBSERVED SOIL PERCOLATION RATE DATA (Use additional sheet, if necessary) N/A		
DATE: Aug. 2013					

NOTE: All applications must be accompanied by plans, specifications and completed Form BSP-65 (appropriate portions). The submission must conform to a previously approved engineering report describing the system in detail. The plans must be stamped with the designing engineer's seal and must be of sufficient clarity and eligibility to permit satisfactory microfilming. Only white prints will be accepted because of the difficulty of microfilming blue prints. There must be a blank area, at least 4" X 7", in the lower right corner of each sheet so that the approval stamp may be placed on the face of the plans.


Any deviation from the Department's standards for wastewater collection and treatment facilities must be explained in detail.

Approved plans are to be returned to: Applicant Engineer

If the application is signed by a person other than the applicant shown in Item 1, the application must be accompanied by a letter of authorization. Failure to comply with this provision may be grounds for the rejection of any submission.

I hereby affirm under penalty of perjury that information provided on this form is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Signatures and Official Titles:


_____, MEMBER

Mailing Address:

500 SENECA STREET, SUITE 508

BUFFALO, NY 14204

Date of Application:

9/17/15

REMARKS:

Enclosed \$300.00 for ECDOH sanitary sewer connection review

TECHNICAL REVIEW OF PLANS AND SPECIFICATIONS
FOR SEWAGE AND WASTE TREATMENT SYSTEMS

PROJECT DATA

1. Type of Facility Multi-family Residential
(Treatment plant, interceptor, pumping station, additions, etc.)
2. Location 1 South Street, Buffalo, NY
3. Type of sewer system COMBINED
(separate or combined)
4. Population to be immediately served 78 Apartments: Total 92 bedrooms
Design Population 92
5. Design Period 20-years
6. Hydraulic Loading

	Present flow (mgd)	Design flow (mgd)
Sanitary sewage	<u>-0-</u>	<u>0.010</u>
Institutional sewage	<u> </u>	<u> </u>
Industrial waste	<u> </u>	<u> </u>
Infiltration	<u> </u>	<u> </u>
<u>Total</u>	<u>-0-</u>	<u>0.010</u>
Minimum flow	<u> </u>	<u>0.0005</u>
Maximum flow	<u> </u>	<u>0.043</u>

Engineer's Signature and Seal:

ENGINEERING REPORT - SEWER SYSTEM

Ref.	Point Under Review	Standard	This Project	Remarks
11.	Does the engineering report include a tabular form giving depths and velocities of flow at minimum, average, and maximum daily sewage flows for all sewers proposed?	yes	X	
	If the project is for sewer extensions only, is the engineering report prepared in accordance with section 11.1 and 11.2? The report should state:	yes	X	
	(1) Name and exact location of the treatment plant to which the proposed sewer extensions will be tributary.	-	BSA - Bird Island Treatment Plant	
	(2) Present average daily sewage flow received by the plant.	-	129mgd/86mgd (dry)	
	(3) Design flow and the design year for the plant.	-	180mgd/2034	
(4) The date when the permit for the plant was issued.	-	12/01/2013		

OUTFALL SEWERS

Ref.	Point Under Review	Standard	This Project	Remarks
55.	Is the outfall sewer submerged?	yes	N/A	
	Is the discharge end of the outfall sewer extended into the middle of the receiving stream?	yes	N/A	
	Are diffusion facilities provided?	yes	N/A	

Remarks including explanation of departures from standard practice:

SEWER SYSTEM

Ref.*	Point Under Review	Standard	This Project	Remarks
31.	Is the proposed sewer system separate or combined?	separate	separate	
	Does sewage overflow from proposed intercepting sewers?	no	no	
32.	Is sewer system designed for estimated ultimate tributary population?	yes	yes	
33.	Are sewers sized to meet requirements of sections 32, 33.1, 33.2 and 33.3?	yes	yes	
11.24	What average unit sewage flow (gpcd) is proposed for design?	100 gpcd	100	
33.1	What is maximum diameter of sewers?	8"	8"	
33.2	Are sewers designed deep enough to drain all basements and to prevent freezing?	yes	yes	
33.4	Will all sewers be constructed at or greater than the specified minimum gradient?	yes	yes	
	Does the design comply with requirements stated in subsections 33.4, 33.5, 33.6, 33.7, and 33.8?	yes	yes	
34.	Are manholes designed and specified according to Section 34?	yes	N/A	
34.3	What is minimum manhole diameter?	48"	N/A	
35.	Are inverted siphons, if any, designed in accordance with Section 35?	yes	N/A	
38.	Where water lines are close to proposed sewers, does design protect water supplies according to Section 38?	yes	yes	

Remarks including explanation of departures from standard practice:

* Reference numbers refer to numbers of Sections and Paragraphs of Great Lakes - Upper Mississippi River Board of State Sanitary Engineers 1990 Edition, Recommended Standards for Sewage Works.

APPENDIX C

PROJECT DOCUMENTATION FORMS

INSPECTOR'S DAILY REPORT

(CONTINUED)

Page of

CONTRACTOR:	JOB NO.:
CLIENT:	DATE:

MEETINGS HELD & RESULTS:

CONTRACTOR'S WORK FORCE AND EQUIPMENT								
DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Field Engineer						Front Loader Ton		
Superintendent						Bulldozer		
Laborer-Foreman						DJ Dump Truck		
Laborer						Water Truck		
Operating Engineer			Equipment			Backhoe		
Carpenter			Generators			Excavator		
Ironworker			Welding Equipment			Pad foot roller		
Concrete Finisher			Roller					
			Paving Equipment					
			Air Compressor					

REMARKS:

REFERENCES TO OTHER FORMS:

SAMPLES COLLECTED:

Sample Number: _____

Approx. Location of Stockpile: _____

No. of Stockpile _____

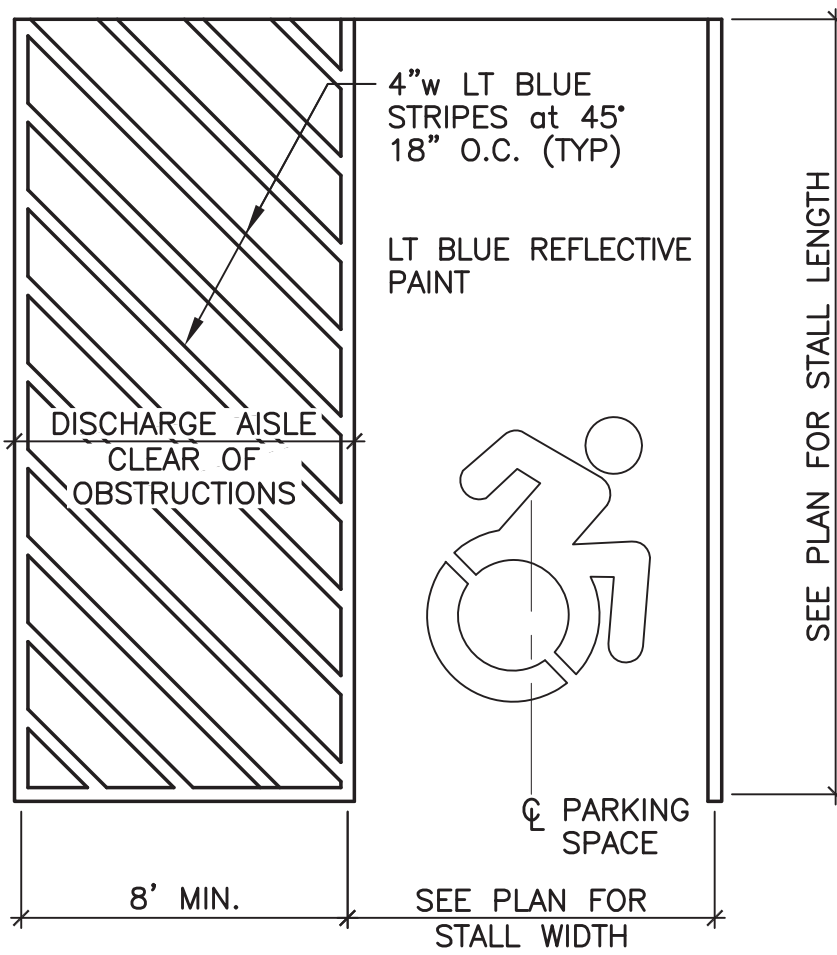
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Weather: _____

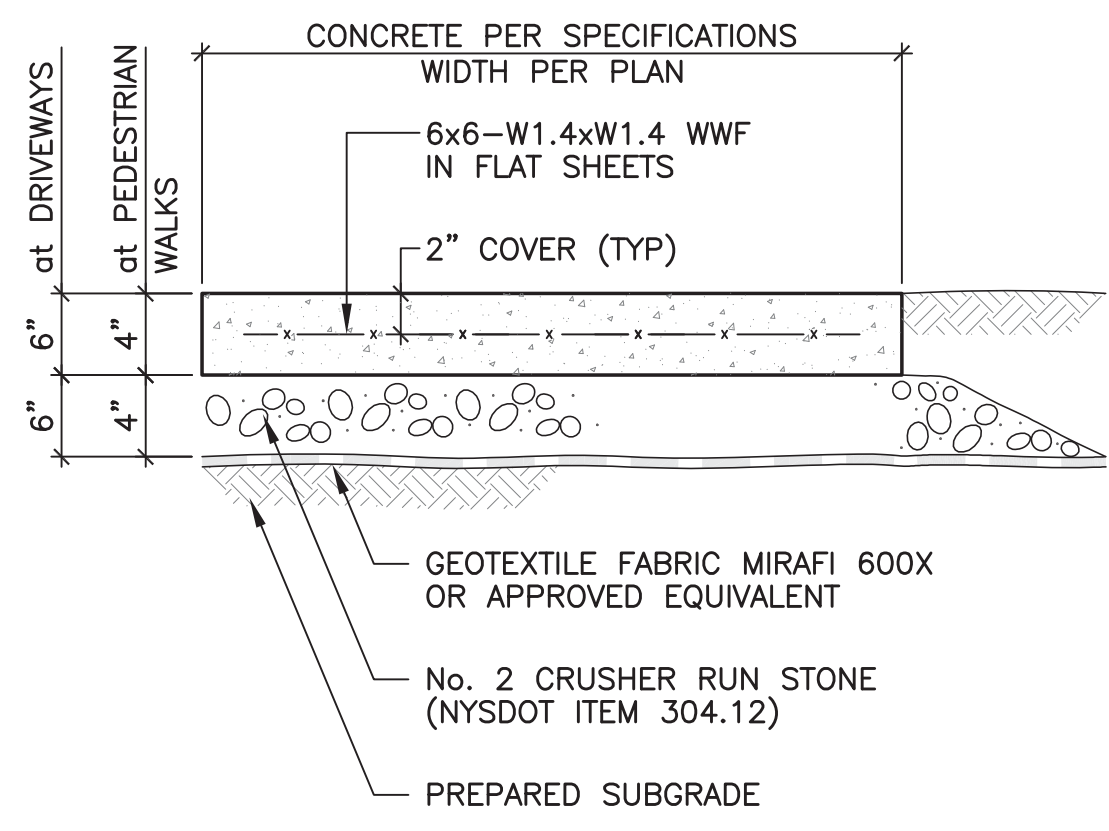
Field Observations: _____

APPENDIX D

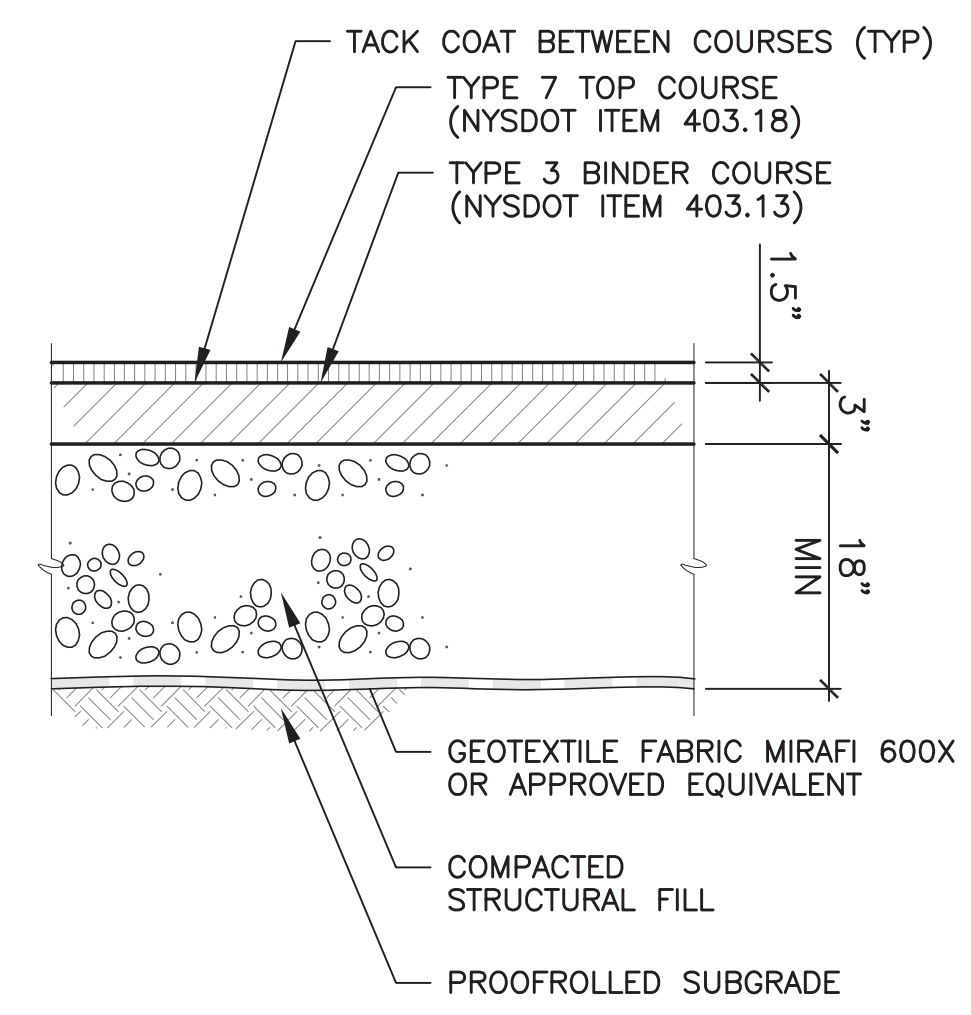
CONSTRUCTION DOCUMENTS
(PROVIDED ELECTRONICALLY)



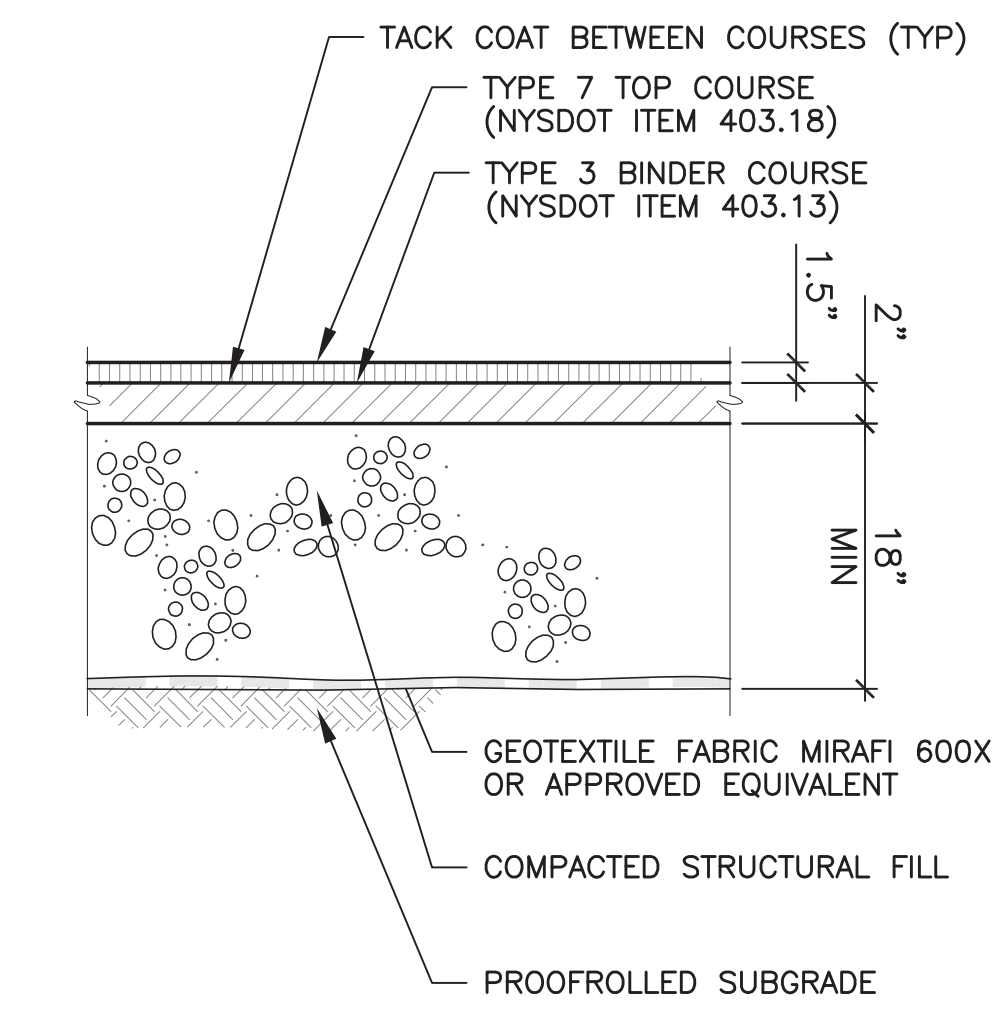
4 HANDICAP SYMBOL DETAIL



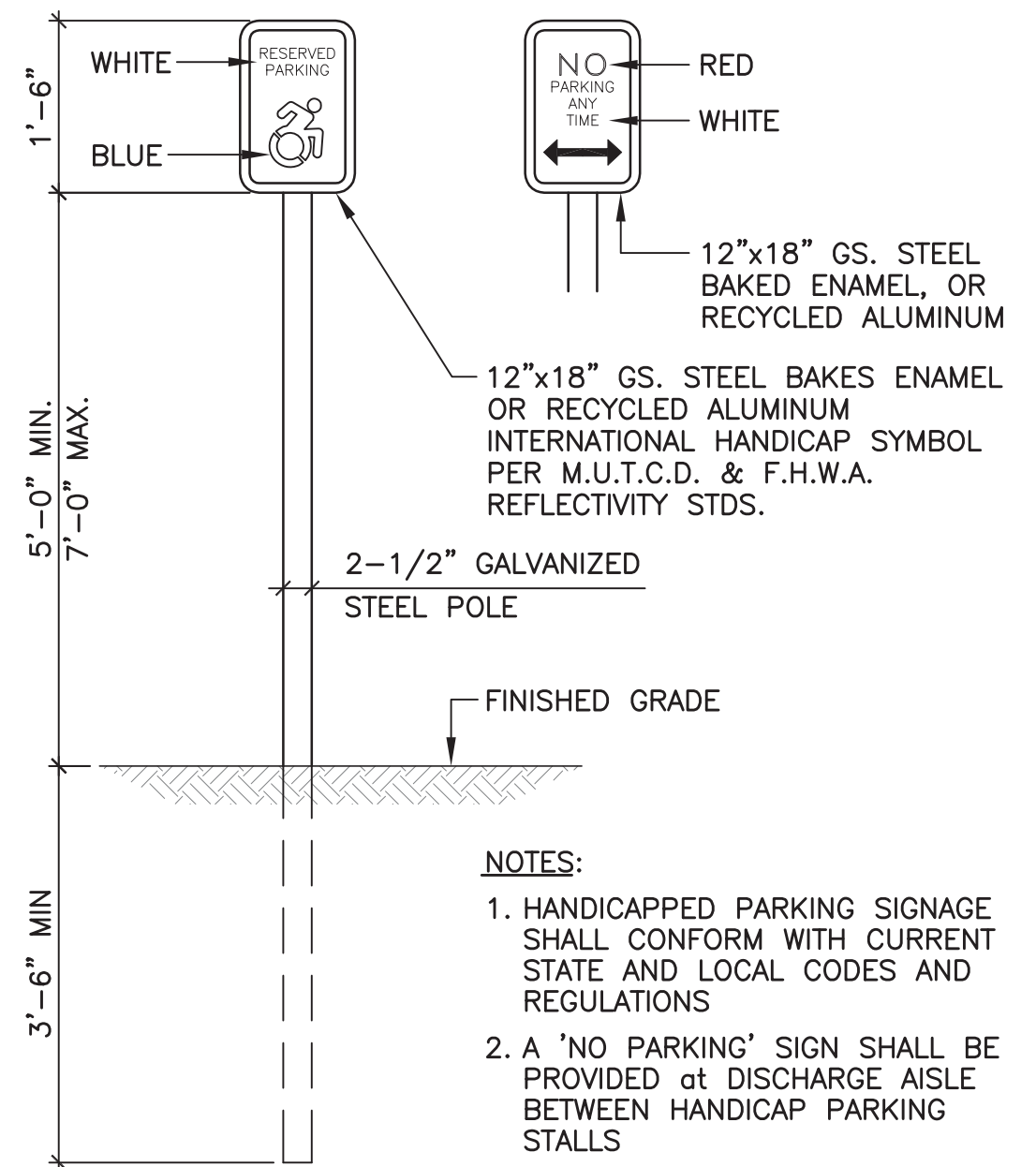
3 TYPICAL CONCRETE SIDEWALK



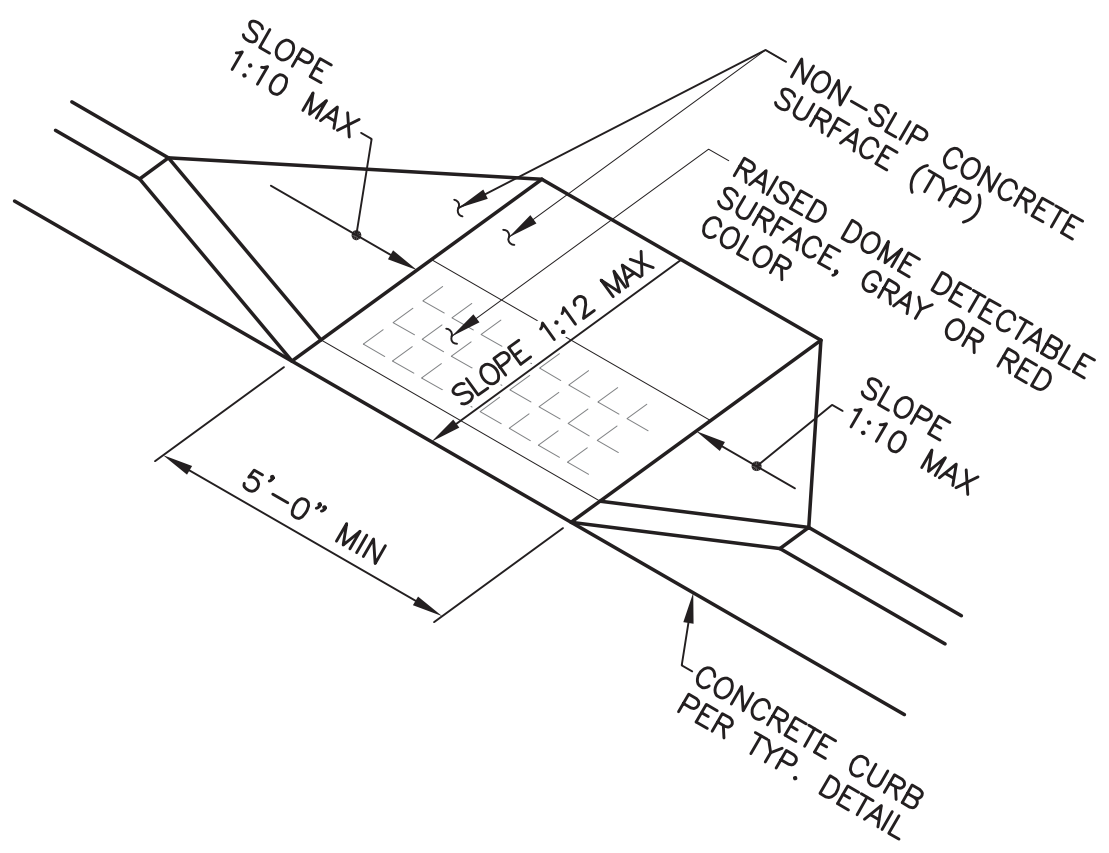
2 TYPICAL TYPE II BITUMINOUS PAVEMENT SECTION



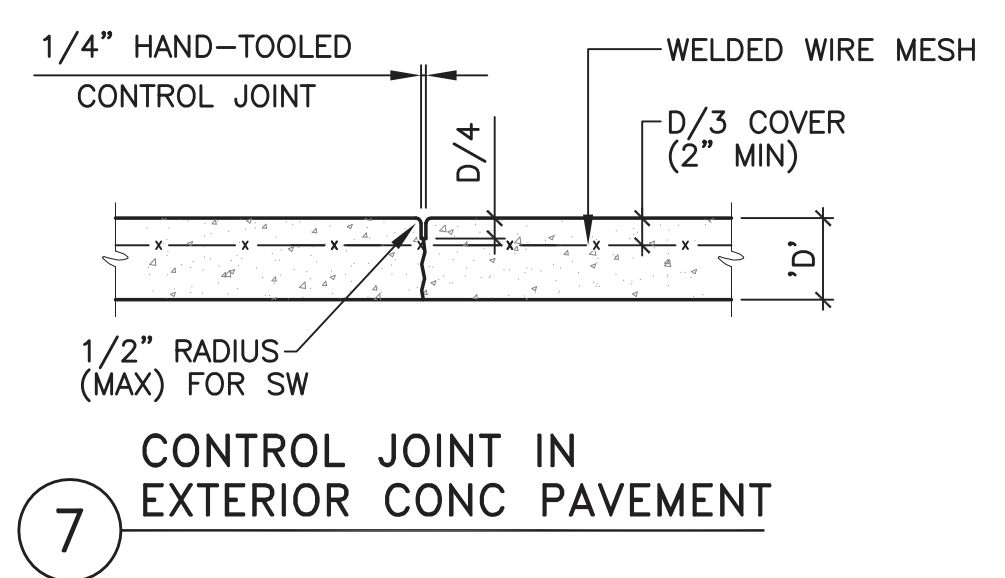
1 TYPICAL TYPE I BITUMINOUS PAVEMENT SECTION



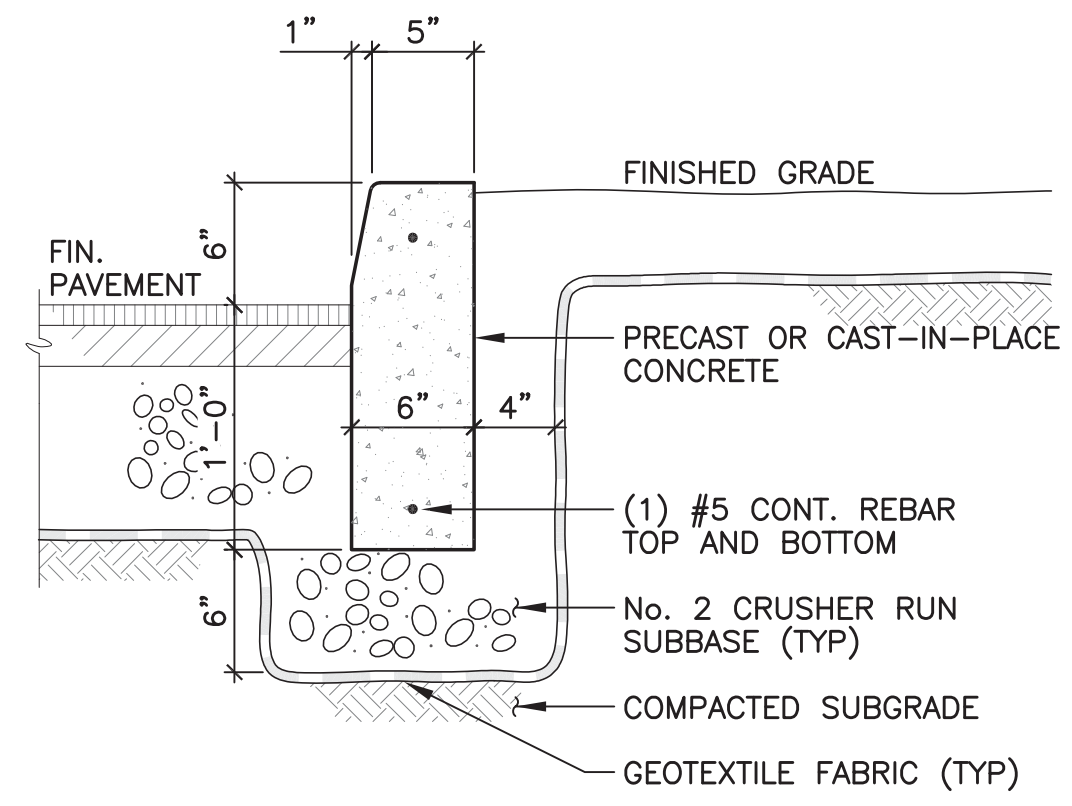
11 HANDICAPPED PARKING SIGNAGE LOCATED IN LAWN AREAS



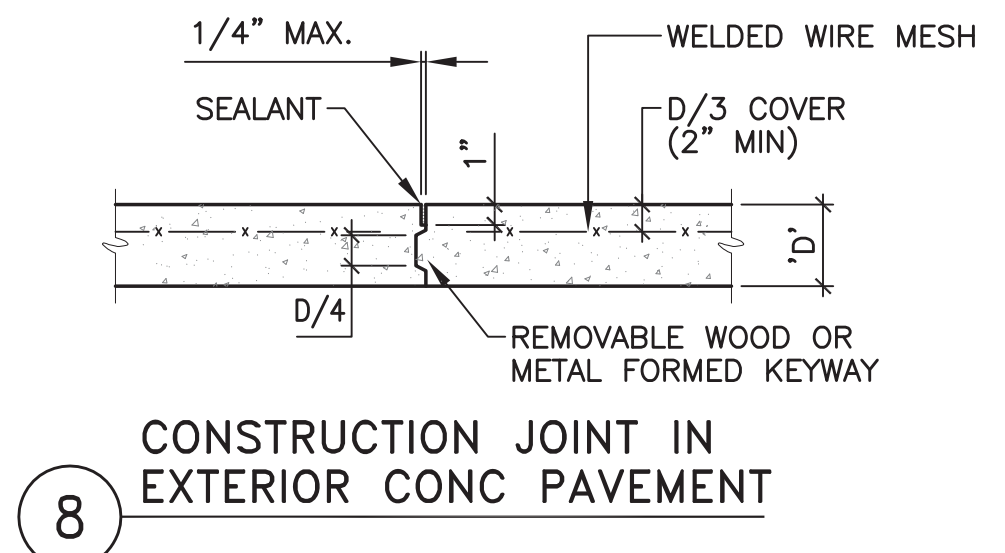
10 HANDICAP ACCESS RAMP



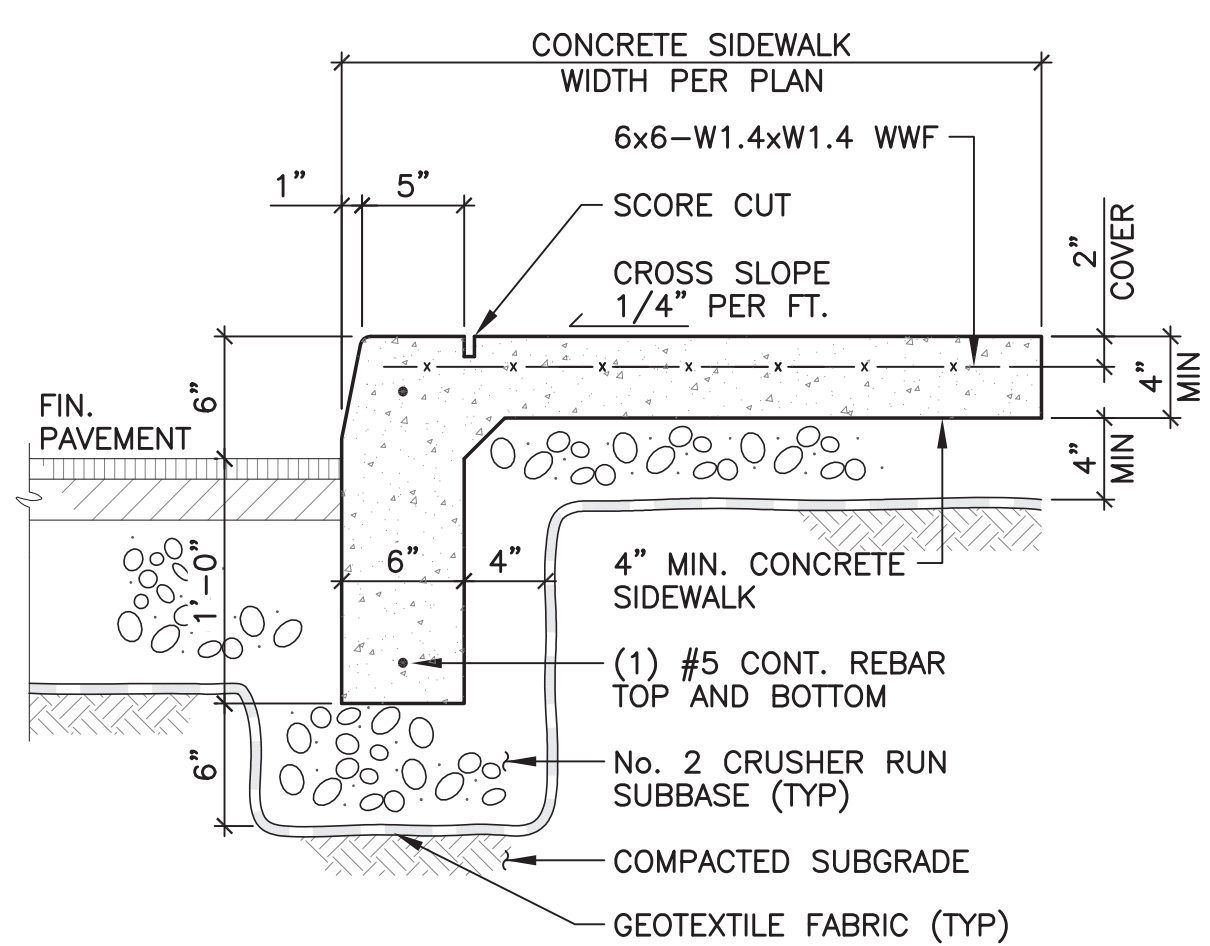
7 CONTROL JOINT IN EXTERIOR CONC PAVEMENT



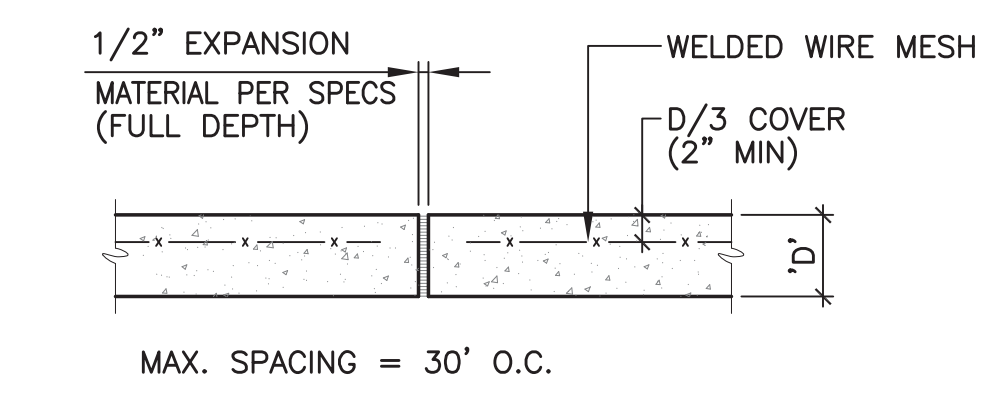
5 TYPICAL CONCRETE CURB



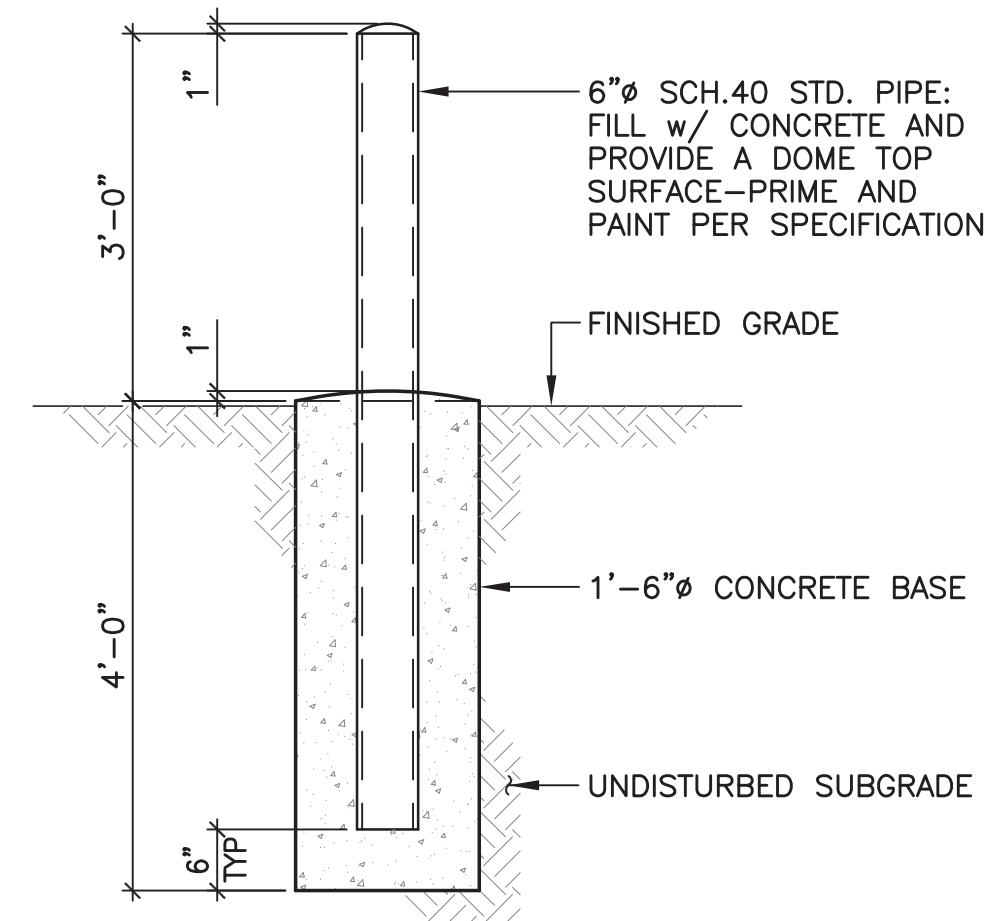
8 CONSTRUCTION JOINT IN EXTERIOR CONC PAVEMENT



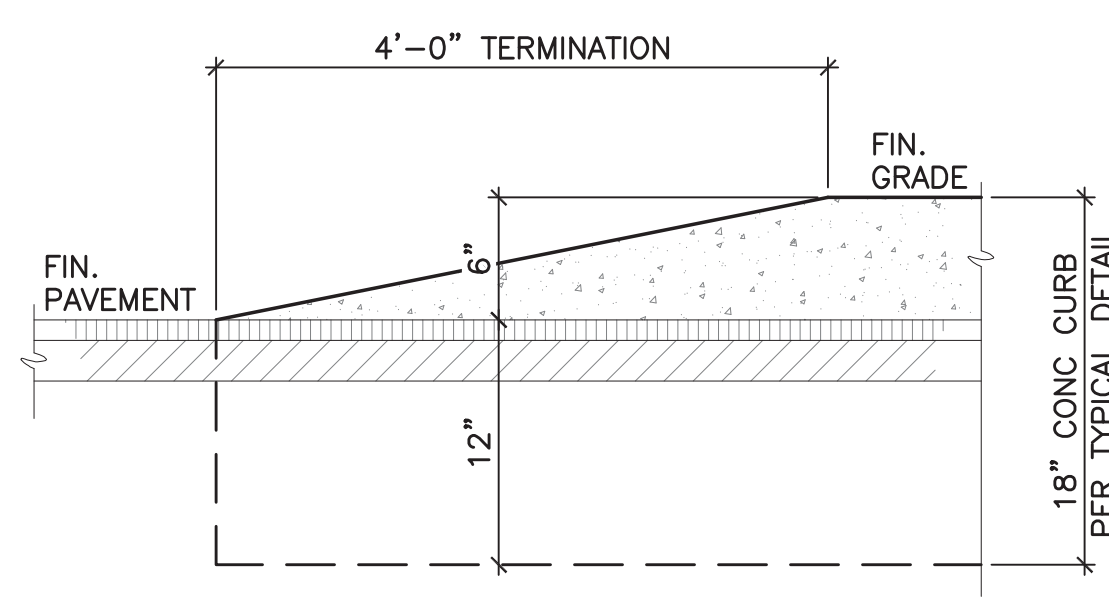
6 CONCRETE SIDEWALK WITH INTEGRAL CURB



9 EXPANSION JOINT IN EXTERIOR CONC PAVEMENT



13 STEEL PIPE BOLLARD



12 CURB TERMINATION DETAIL

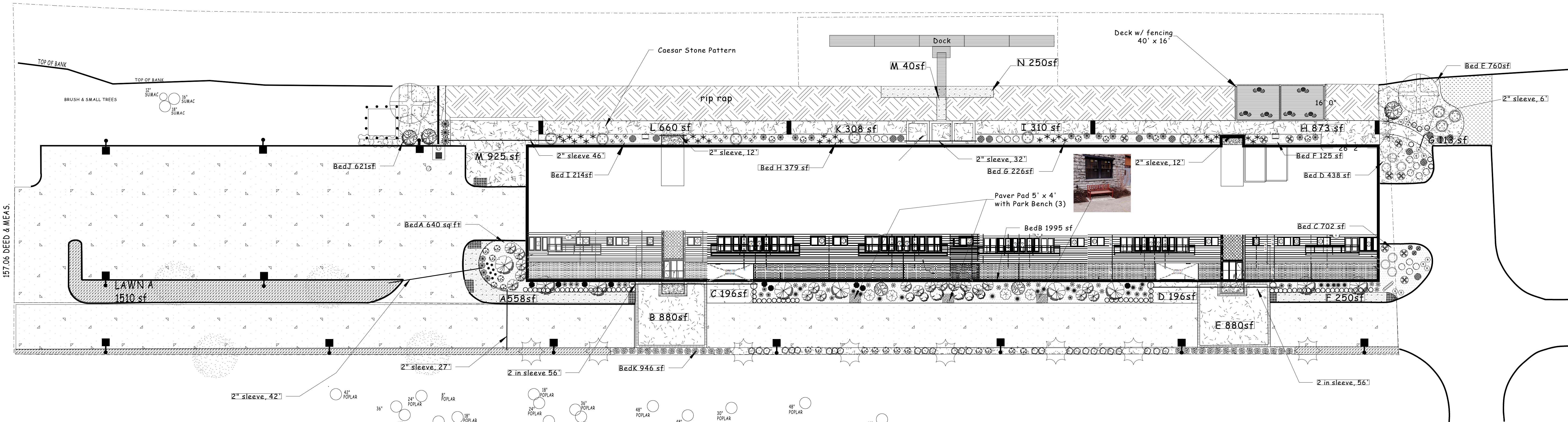
REV. NO.	DESCRIPTION	DATE
JOB NO.		1209
SCALE		AS NOTED
ISSUE DATE		06-08-15
DRAWN BY		AVM
CHECKED BY		MJE

THIS IS A SINGLE SHEET OF A COHESIVE SET OF CONSTRUCTION DOCUMENTS (INCLUDING DRAWINGS AND SPECIFICATIONS). INTERPRETATION OF THE INFORMATION AS PRESENTED SHOULD BE BASED ON THE ENTIRE SET OF DOCUMENTS.

DRAWING TITLE

SITE DETAILS

COPYRIGHT © 2015 TREEDO ENGINEERS ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED OR COPIED IN ANY FORM BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER. REPRODUCTION OF THIS DRAWING FOR USE IN THE PRODUCTION OF SHOP AND/OR FIELD DETAIL DRAWINGS IS EXPRESSLY FORBIDDEN. UNAUTHORIZED ALTERATION AND/OR DUPLICATION OF THIS DRAWING IS A VIOLATION OF SECTION 7209, PROVISION 2, OF THE NEW YORK STATE EDUCATION LAW.



MarksEngineering
Design-It. Build-It.

FOR PLANTING PLAN ONLY.

12/16/16

Walks & Patios (sf)			
A	558	E	880
B	880	F	250
C	196	G	113
D	196	H	873
		I	310
		J	300
		K	308
		L	646
		M	40
		N	250
Total Flatwork(sf)		5800	
Threshold Pads(4)		200	

N.B. Riverside elevations to be recorded to establish proper threshold pad step downs & sidewalk grading.

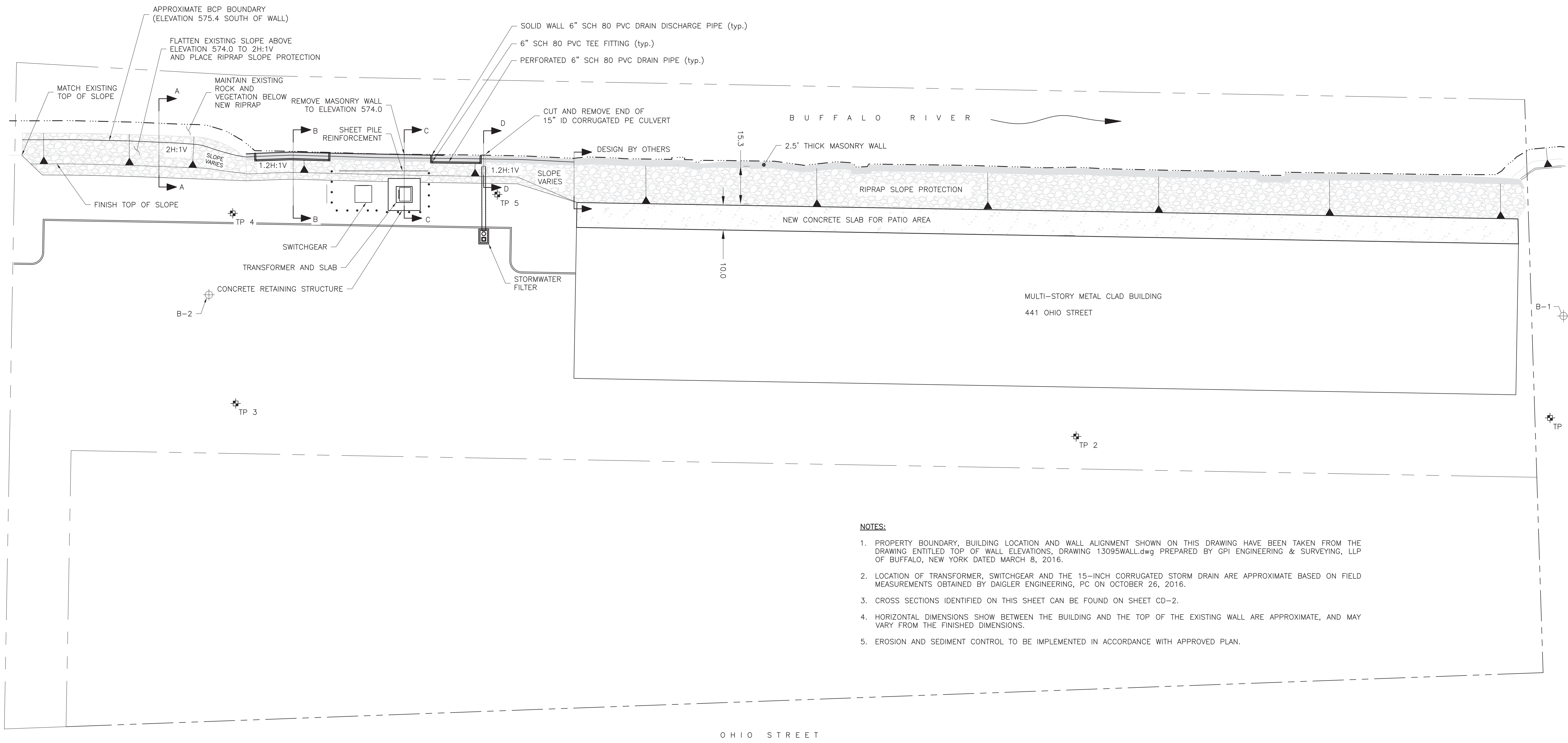
Landscaped Beds (sf)			
A	640	E	760
B	1995	F	125
C	702	G	226
D	438	H	379
		I	214
		J	621
		K	946
Total Bed(sf)		7046	

Lawns (sf)	
A	1510
B	743
C	152
D	542
Total Lawn(sf)	2947

Legend

Qty	Botanical Name	Qty	Botanical Name	Qty	Botanical Name	Qty	Botanical Name
12	Bergenia cordifolia	3	Sambucus canadensis	5	Tree, Deciduous		
13	Echinacea purpurea	3	Viburnum dentatum	5	Amelanchier laevis		
15	Hosta ventricosa	27	Weigela florida 'Fine Wine'	8	Carpinus betulus 'Fastigiata'		
16	Lavandula angustifolia	Shrub, Evergreen Broadleaf		9	Hydrangea paniculata 'Grandiflor'		
7	Liatris	4	Azaleas, p., mixed colors	2	Nyssa sylvatica		
9	Polygonatum odoratum	70	Buxus microphylla 'Green Velvet'	4	Syringa reticulata		
28	Achillea millifolium, mixed colors	4	Buxus x 'Green Mountain'	4	Tree, Evergreen		
15	Perovskia atriplicifolia	2	Hydrangea petiolaris	2	Rhododendron catawbiense 'Boursault'	19	Thuja occidentalis 'Smaragd'
3	Alchemilla mollis	Shrub, Deciduous		30	Taxus media 'hicksii'		
17	Anemone hybrid	9	Cornus alba 'Argenteo-marginata'	Shrub, Evergreen Conifer			
20	Aquilegia, mixed colors	4	Hydrangea macrophylla 'Masja'	6	Juniperus s. 'Wichita Blue'		
6	Aster x frikartii	2	Hydrangea quercifolia	9	Juniperus sabina 'Buffalo'		
		23	Rosa 'Knockout', mixed colors				

Revision #:	Scale:	Landscape Plan: All Landscaping	Landscape Design by: Richard Tedeschi
Date: 11/11/2016	1" = 20'	BUFFALO RIVER LANDING	Jacrist Gardening Svcs., Inc.



NOTES:

1. PROPERTY BOUNDARY, BUILDING LOCATION AND WALL ALIGNMENT SHOWN ON THIS DRAWING HAVE BEEN TAKEN FROM THE DRAWING ENTITLED TOP OF WALL ELEVATIONS, DRAWING 13095WALL.dwg PREPARED BY GPI ENGINEERING & SURVEYING, LLP OF BUFFALO, NEW YORK DATED MARCH 8, 2016.
2. LOCATION OF TRANSFORMER, SWITCHGEAR AND THE 15-INCH CORRUGATED STORM DRAIN ARE APPROXIMATE BASED ON FIELD MEASUREMENTS OBTAINED BY DAIGLER ENGINEERING, PC ON OCTOBER 26, 2016.
3. CROSS SECTIONS IDENTIFIED ON THIS SHEET CAN BE FOUND ON SHEET CD-2.
4. HORIZONTAL DIMENSIONS SHOW BETWEEN THE BUILDING AND THE TOP OF THE EXISTING WALL ARE APPROXIMATE, AND MAY VARY FROM THE FINISHED DIMENSIONS.
5. EROSION AND SEDIMENT CONTROL TO BE IMPLEMENTED IN ACCORDANCE WITH APPROVED PLAN.

ALTERATION OF ANY SURVEY, DRAWING, DESIGN, SPECIFICATION OR REPORT MUST BE COMPLETED IN ACCORDANCE WITH SECTION 7209 PROVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	REVISION	BY	DATE

DAIGLER ENGINEERING, P.C.
 CIVIL & GEO-ENVIRONMENTAL ENGINEERING
 2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072
 (716) 773-6872 (716) 773-6873 FAX

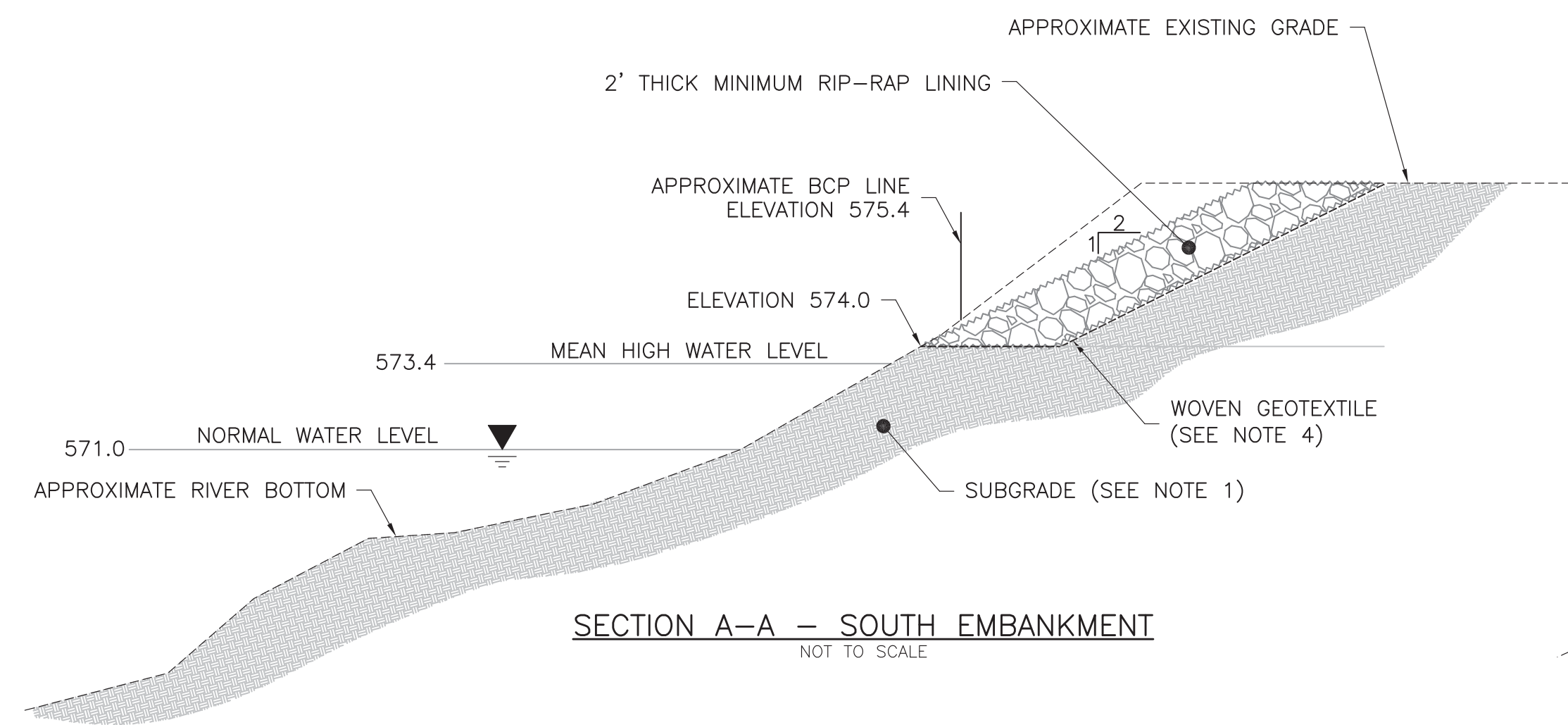
JAMES A. DAIGLER, P.E.
 NYSPE NO. 061689

DATE: October 2016

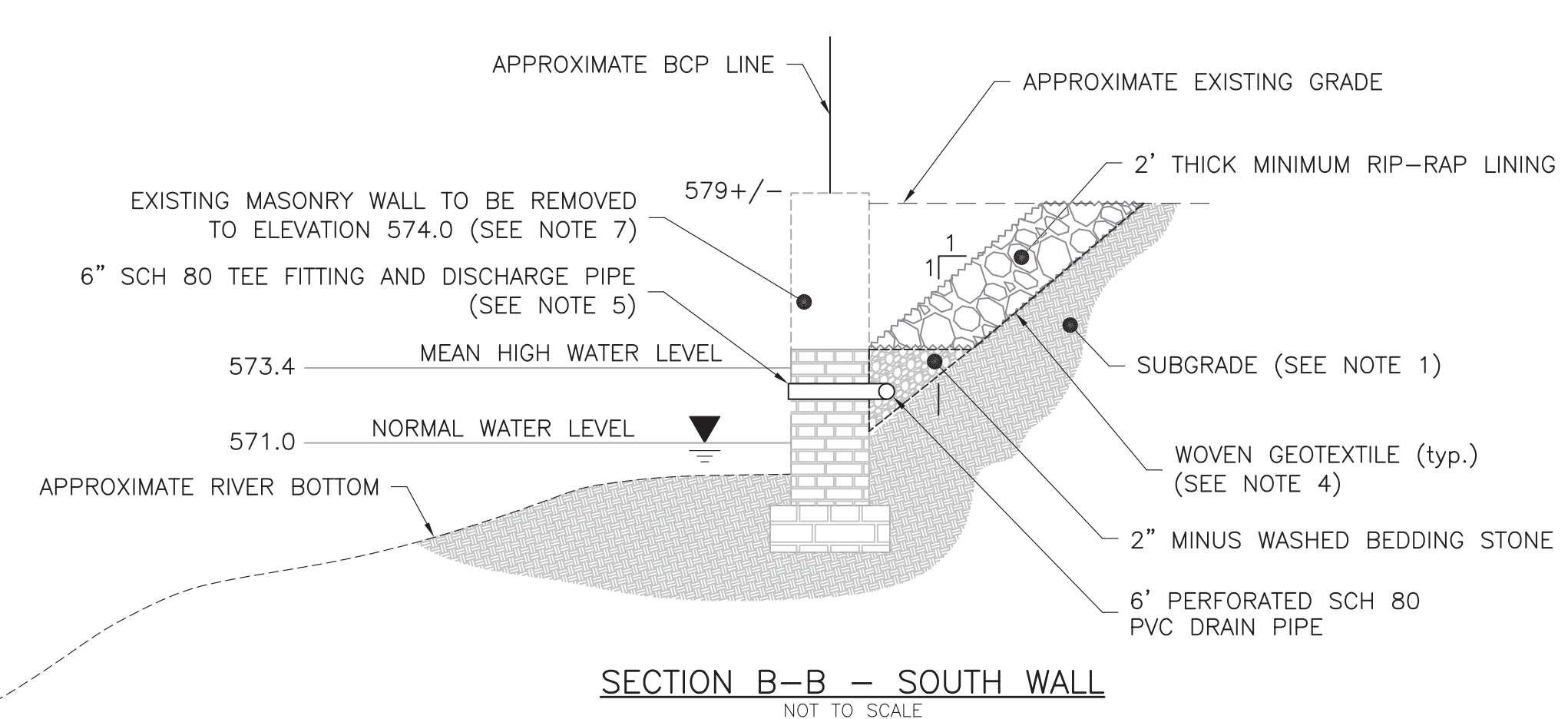
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DWG. 13095 WALL_DE_STYLE.dwg			CITY OF BUFFALO	ERIE COUNTY	STATE OF NEW YORK	

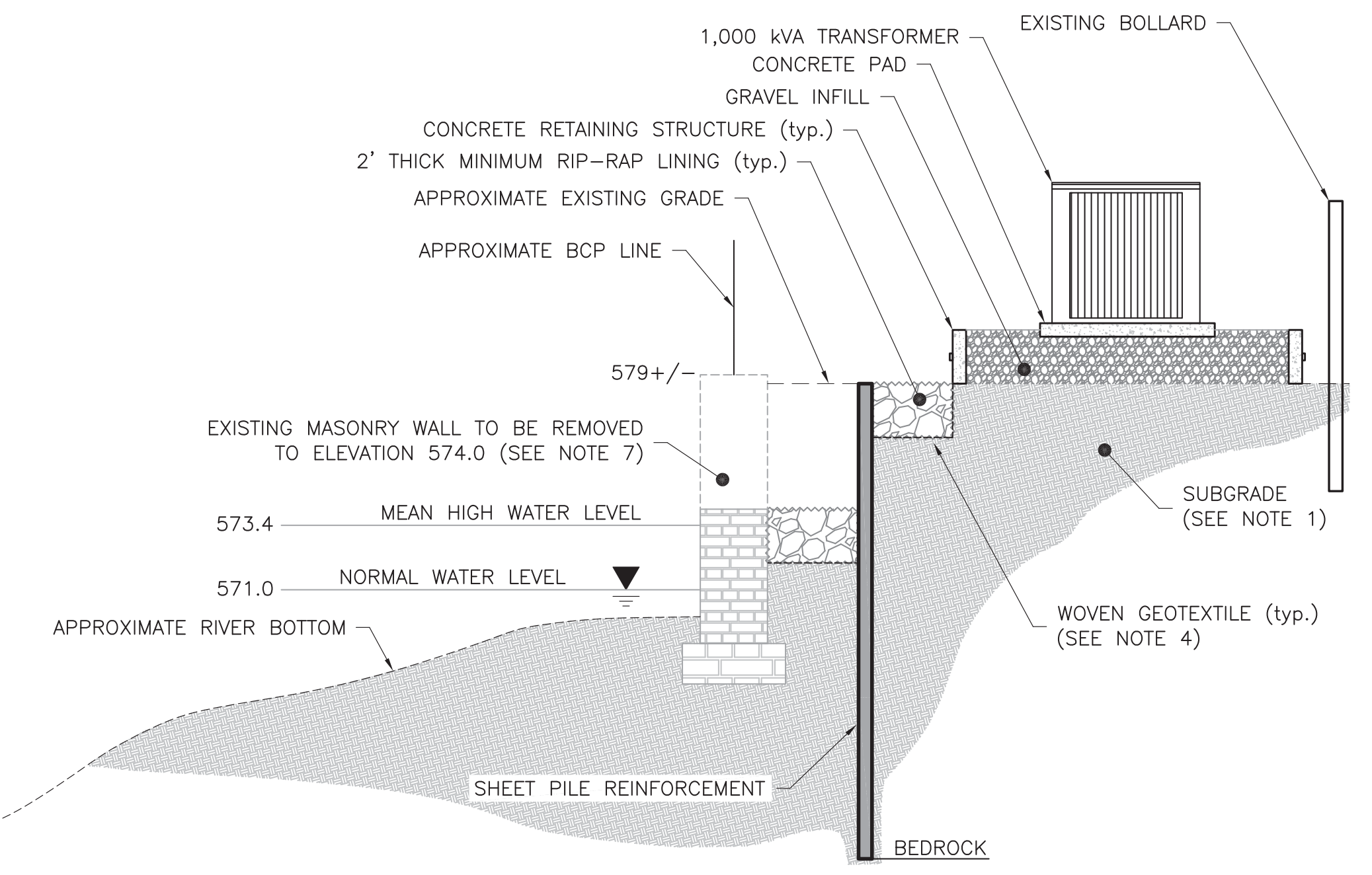
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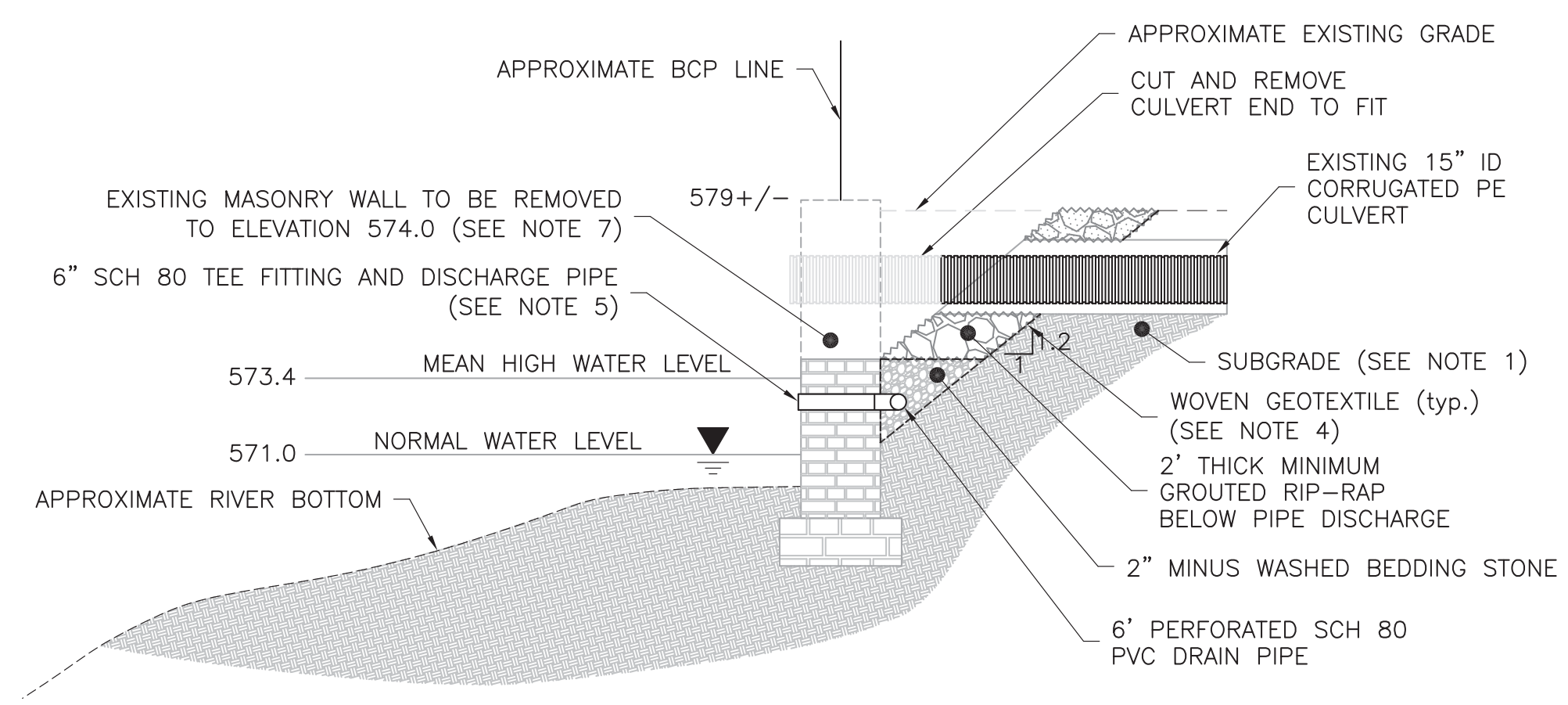
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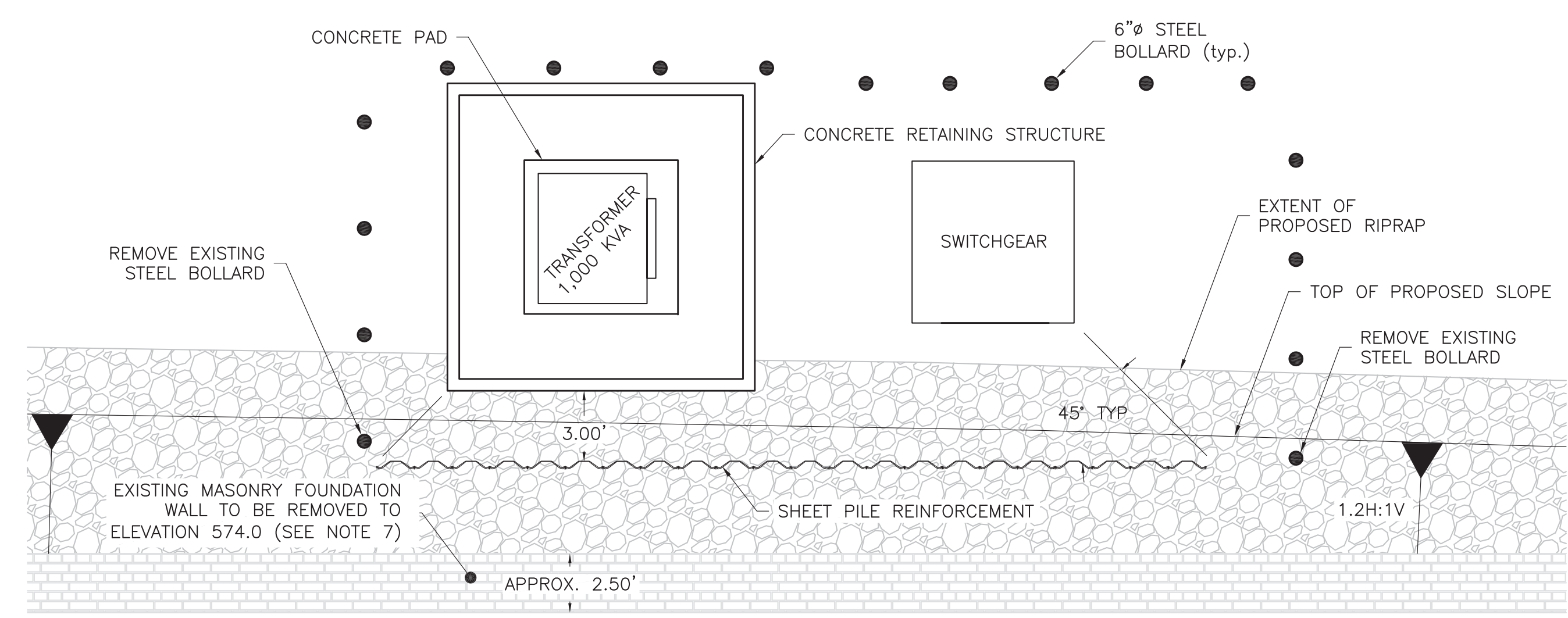
SECTION B-B - SOUTH WALL
NOT TO SCALE



SECTION C-C - TRANSFORMER PAD
NOT TO SCALE



SECTION D-D - STORM DRAIN
NOT TO SCALE



TRANSFORMER AREA PLAN
NOT TO SCALE

- NOTES:**
- SUBSURFACE CONDITIONS ASSUMED FOR THE SLOPE CONFIGURATIONS SHOWN HEREON ARE BASED ON DATA OBTAINED FROM THE TEST PITS AND BOREHOLES SHOWN ON SHEET CD-1. THE IN-PLACE ENGINEERING PROPERTIES OF THE SUBGRADE SOIL, AND THE GROUNDWATER CONDITIONS, MUST BE CONFIRMED DURING EXCAVATION AND PRIOR TO PLACEMENT OF THE OVERLYING RIPRAP.
 - THE THICKNESS AND GRADATION OF THE RIPRAP RIVER BANK PROTECTION IS A FUNCTION OF THE SUBGRADE SOIL PROPERTIES AND GROUNDWATER CONDITIONS. THE ENGINEER SHALL REVIEW THE INFORMATION AVAILABLE FROM THE CONFIRMATORY OBSERVATIONS REFERENCED IN NOTE 1 TO DETERMINE WHETHER THE SLOPE PROTECTION DESIGN SHOWN HEREON REQUIRES MODIFICATION. EAST OF THE BCP LINE, THE THICKNESS OF THE RIPRAP PROTECTION SHALL BE NO LESS THAN TWO FEET.
 - RIPRAP SHALL CONSIST OF SOUND, DURABLE AND HARD MEDIUM STONE FILL PER NYS DOT ITEM 620-2.02, WITH INDIVIDUAL STONES SHAPED AS NEARLY AS PRACTICABLE IN THE FORM OF RIGHT RECTANGULAR PRISMS.
 - MIRAFI 600 OR APPROVED EQUAL SHALL UNDERLAY THE FULL LENGTH AND WIDTH OF INTERFACE BETWEEN:
RIPRAP AND SUBGRADE MATERIAL
RIPRAP AND 2" MINUS WASHED BEDDING STONE
SUBGRADE AND 2" MINUS WASHED BEDDING STONE
 - THE LOCATIONS OF THE DRAIN DISCHARGE PIPE IS ILLUSTRATED ON CD-1. THE DISCHARGE PIPE DETAIL ON SECTION B-B AND C-C IS FOR ILLUSTRATIVE PURPOSES ONLY.
 - RIPRAP SHALL BE PLACED AND CONSOLIDATED IN-PLACE TO ITS FULL COURSE THICKNESS IN ONE OPERATION AND IN A MANNER THAT PRODUCES A REASONABLY WELL-GRADED MASS WITH THE SMALLER STONE FRAGMENTS FILLING THE VOIDS BETWEEN THE LARGER PARTICLES WITH A MINIMUM PRACTICABLE VOID RATIO IN THE COMPLETED LINING. THE MATERIAL SHALL BE PLACED SUCH THAT THERE ARE NO POCKETS OF UNIFORM SIZE MATERIAL. PLACEMENT OF THE LINING SHALL BE COMPLETED IN A MANNER THAT AVOIDS DISRUPTION AND DAMAGE TO THE UNDERLYING BEDDING MATERIAL.
 - THE STONE WALL REMAINING IN PLACE SHALL BE REPAIRED IN KIND IF DAMAGED BELOW ELEVATION 574.

ALTERATION OF ANY SURVEY, DRAWING, DESIGN, SPECIFICATION OR REPORT MUST BE COMPLETED IN ACCORDANCE WITH SECTION 7209 PROVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	REVISION	BY	DATE

DAIGLER ENGINEERING, P.C.
CIVIL & GEO-ENVIRONMENTAL ENGINEERING
2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072
(716) 773-6872 (716) 773-6873 FAX

JAMES A. DAIGLER, P.E.
NYSPE NO. 061689

DATE: November 2016

SCALE: NOTED

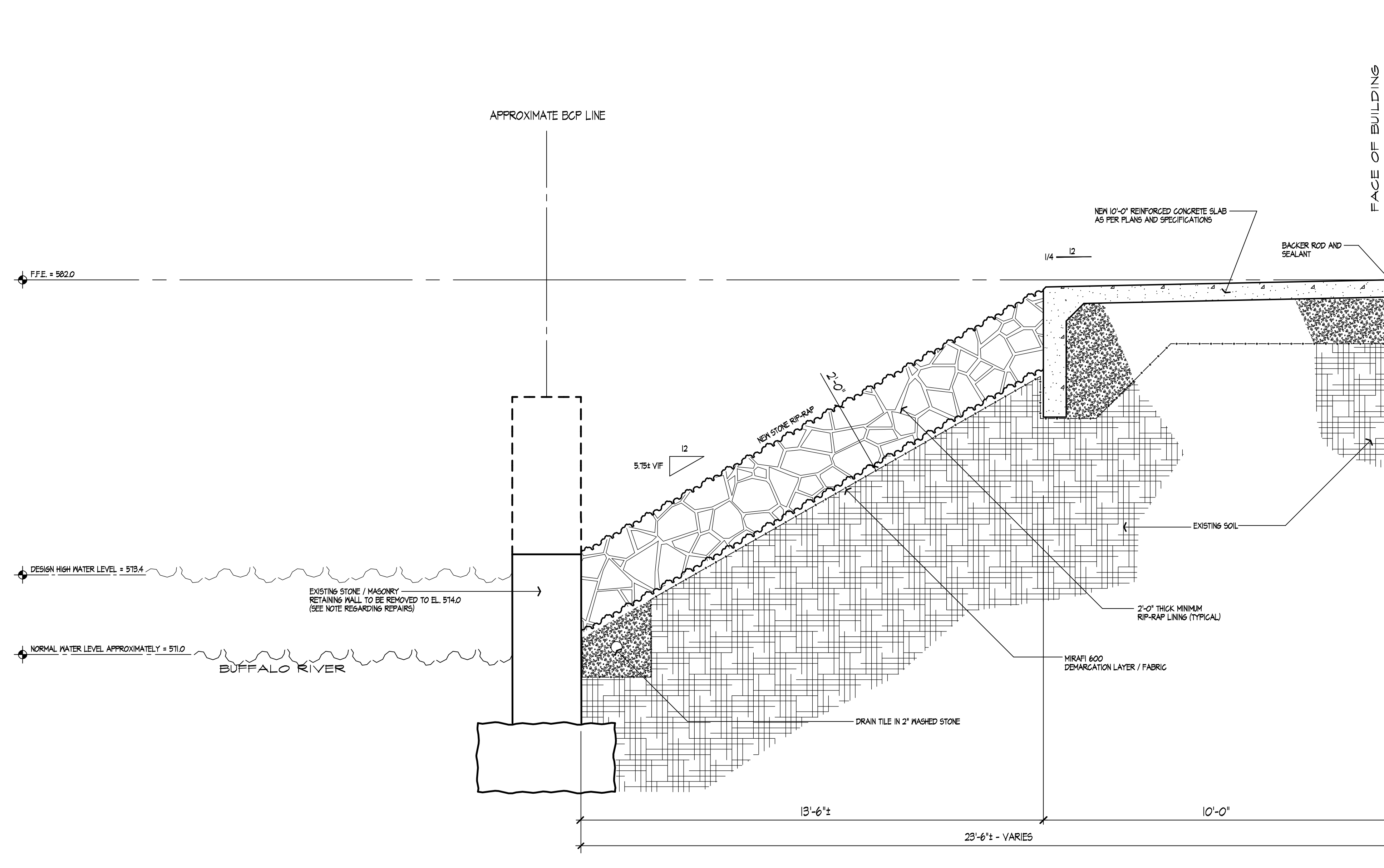
PREPARED FOR:	SAVARINO COMPANIES
DES. BY:	JPR
DRW. BY:	SJD
CHK. BY:	JAD
DWG.	Sheet CD-2_REV1.dwg

SECTION AND AREA PLAN DETAIL
BUFFALO RIVER LANDING - RIVERBANK STABILIZATION

CITY OF BUFFALO	ERIE COUNTY	STATE OF NEW YORK
-----------------	-------------	-------------------

SHEET
CD-2

C:\Savarino Companies\441 - One Street\A\CD\Sheet CD-2_REV1.dwg 11/25/2016 12:50 PM



NOTES

- 1.) RIPRAP SHALL CONSIST OF SOUND, DURABLE AND HARD MEDIUM STONE FILL PER NYSDOT ITEM 620-2.02, WITH INDIVIDUAL STONES SHAPED AS NEARLY PRACTICAL BE IN THE FORM OF RIGHT RECTANGULAR PRISMS.
- 2.) RIPRAP TO BE UNDERLAIN BY MIRAFI 600 OR APPROVED EQUAL
- 3.) RIPRAP SHALL BE PLACED AND CONSOLIDATED IN-PLACE TO ITS FULL COURSE THICKNESS IN ONE OPERATION AND IN A MANNER THAT PRODUCES A REASONABLY WELL-GRADED MASS WITH THE SMALLER STONE FRAGMENTS FILLING THE VOIDES BETWEEN THE LARGER PARTICLES WITH A MINIMUM PRACTICABLE VOID RATIO IN THE COMPLETED LINING. THE MATERIAL SHALL BE PLACED SUCH THAT THERE ARE NO POCKETS OF UNIFORM SIZE MATERIAL. PLACEMENT OF THE LINING SHALL BE COMPLETED IN A MANNER THAT AVOIDS DISRUPTION AND DAMAGE TO THE UNDERLYING FABRIC.
- 4.) IF STONE WALL IS DAMAGED BELOW EL. 514 IT SHALL BE REPAIRED IN KIND OR COVERED WITH OVERSIZE STONE TO SUPPORT A MINIMUM 2 FOOT THICKNESS OF COVER TO B.C.P. LINE.

01 PARTIAL SITE SECTION @ 1/2" = 1'-0"
SP-2

Site Improvements at
Buffalo River Landing
441 Ohio Street
Buffalo, New York



Professional Engineering Solutions
93 Knob Hill Road
Orchard Park, New York 14127
716-238-0483

Consultants

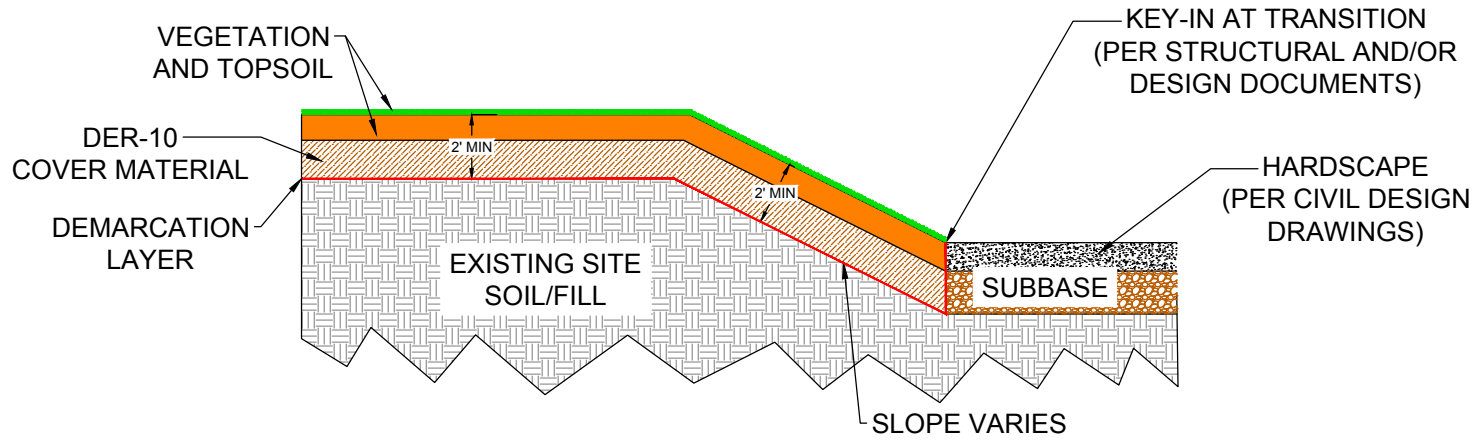
01	11/29/2016	REVISION	Revised Sections
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SHEET TITLE
Partial Site Section

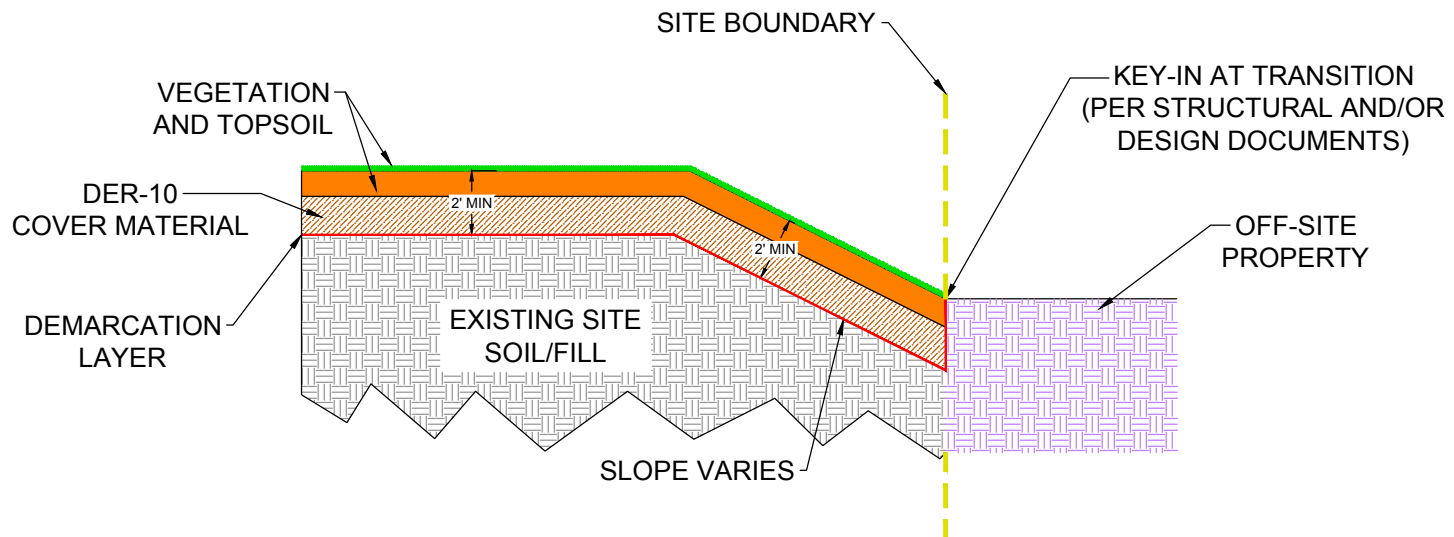
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As Noted
DATE:
09/22/16
Plotted:
11/29/2016

SP-2
SHEET 02 OF 02

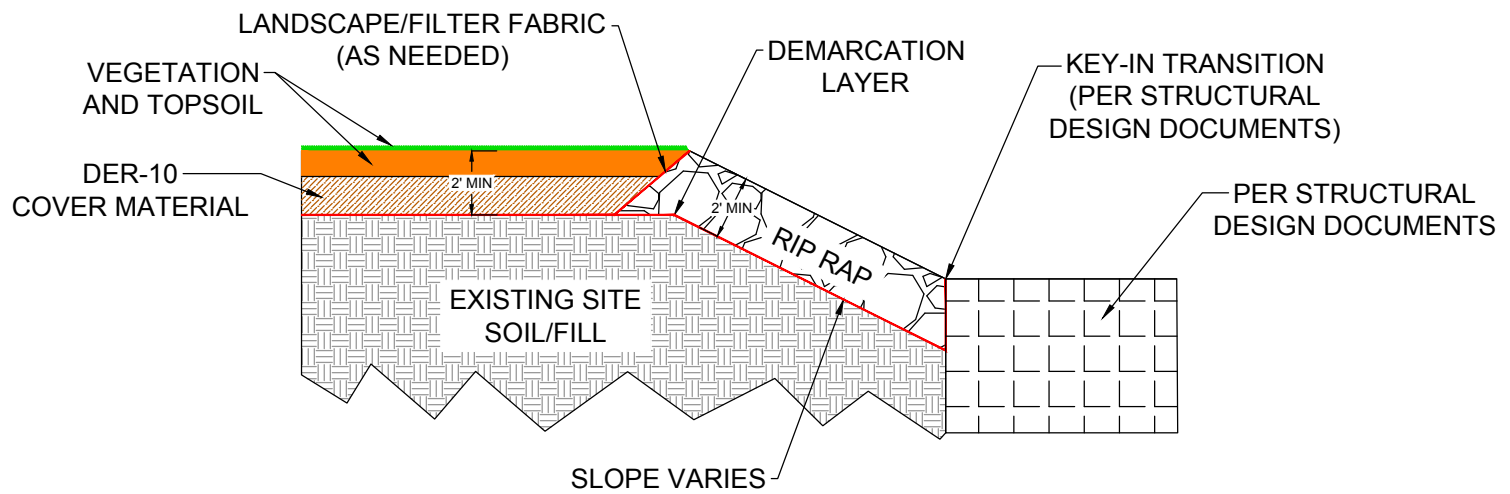
DETAIL 1 - HARDSCAPE TO SOFTSCAPE TRANSITION



DETAIL 2 - COVER SYSTEM TIE-IN TO SITE BOUNDARY



DETAIL 3 - RIP RAP TO SOFTSCAPE TRANSITION



NOTES:

1. TRANSITION FROM SOFTSCAPE TO HARDSCAPE AND/OR BCP BOUNDARY REQUIRES KEYING-IN TO PROVIDE A MINIMUM 2' VERTICAL CLEAN COVER LAYER AT TRANSITION POINT.
2. ALL COVER MATERIAL MUST BE DEMONSTRATED TO MEET IMPORT CRITERIA FOR RESTRICTED RESIDENTIAL USE PER APPENDIX 5 OF THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) DER-10 TECHNICAL GUIDANCE FOR SITE INVESTIGATION AND REMEDIATION, MAY 2010. SOIL SAMPLING TO BE PERFORMED BY QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) PER DER-10 AND ANALYZED BY A NEW YORK STATE DEPARTMENT OF HEALTH ELAP-CERTIFIED ENVIRONMENTAL TESTING LABORATORY. AN IMPORT REQUEST MUST BE PREPARED AND APPROVED BY THE NYSDEC BROWNFIELD CLEAN-UP PROGRAM (BCP) PROJECT MANAGER PRIOR TO IMPORT OF COVER MATERIAL TO THE SITE.
3. DEMARCATION LAYER SHALL BE COMPRISED OF NON-BIODEGRADABLE FABRIC NETTING OR PLASTIC FENCING.

BM DETAILS

BCP COVER SYSTEM TRANSITION DETAILS

REMEDIAL ACTION WORK PLAN
441 OHIO STREET SITE
BCP SITE NO. 915285
BUFFALO, NEW YORK
PREPARED FOR
441 OHIO STREET, LLC



2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 858-0599

JOB NO.: B0292-013-002

APPENDIX E

ELECTRONIC COPY