March 2019
Buffalo Color

ANCHOR QEA

Remedial Action Work Plan for Buffalo Color Corporation Site Areas A and B Off-site: NYSDEC Site No. C915230A

Prepared for

Honeywell
THE POWER OF CONNECTED

Project Number: E70287-04.01
N:\Projects\Buffalo_River (E70287-04.01)\Deliverables\Buffalo Color Offsite Area BCP\RAWP\BCC Off-site Area RAWP_03142019.docx

March 2019
Buffalo Color

Remedial Action Work Plan for Buffalo Color Corporation Site Areas A and B Off-site: NYSDEC Site No. C915230A

I Ram Mohan certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan 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) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Signature and Seal of Engineer

Ram K Mohan March 14, 2019

Signature Date

Prepared for
Honeywell International Inc.
115 Tabor Road
Morris Plains, New Jersey 07950

Prepared by
Anchor QEA Engineering, PLLC
290 Elwood Davis Road, Suite 340
Liverpool, New York 13088

TABLE OF CONTENTS

FIGURES

APPENDICES

ABBREVIATIONS

Anchor QEA	Anchor QEA Engineering, PLLC
AOC	Area of Concern
BMP	best management practice
CCR	Construction Completion Report
CDF	confined disposal facility
COC	contaminant of concern
DMU	Dredge Management Unit
GLLA	Great Lakes Legacy Act
GLNPO	Great Lakes National Program Office
H:V	horizontal to vertical
HASP	Health and Safety Plan
Hg	mercury
Honeywell	Honeywell International Inc.
IC	institutional control
IGLD 85	International Great Lakes Datum of 1985
mg/kg	milligram per kilogram
NYSDEC	New York State Department of Environmental Conservation
Off-site Area	Buffalo Color Corporation Site Areas A and B Off-site Area
Order	Order on Consent
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
RAWP	Remedial Action Work Plan
SEQR	New York State Environmental Quality Review Act
SMP	Site Management Plan
SPT	Standard Penetration Test
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

1 Introduction

This Remedial Action Work Plan (RAWP) describes the evaluation and design process for a remedial action at the Buffalo Color Corporation Site Areas A and B Off-site Area (Off-site Area), New York State Department of Environmental Conservation (NYSDEC[1]) Site No. C915230A. This RAWP has been prepared on behalf of Honeywell International Inc. (Honeywell[2]) by Anchor QEA Engineering, PLLC (Anchor QEA[3]), in accordance with the August 2016 Order on Consent (Order) and Administrative Settlement Index No. CO 9-20151109-133 under the NYSDEC State Superfund Program. This report provides a summary of the remedial design for the removal of contaminated soft sediments and the submerged sheetpile wall (knee wall) required to allow the sediment removal along a portion of the Buffalo River in Buffalo, New York (see Figures 1 and 2). As the remedial activities for the Off-site Area were performed in 2015 to coincide with an active dredging project, this report documents the investigation, analysis, and design work conducted prior to the remedy implementation. The design was based on existing information collected as part of the upland Buffalo Color Area A remediation and restoration, which was performed by South Buffalo Development under the New York State Brownfield Program, as well as in-river data collected for the Great Lakes Legacy Act (GLLA) Buffalo River Area of Concern (AOC) project.

1.1 Site Description and Background

The brownfield cleanup associated with the upland Buffalo Color Corporation Area A site was completed in December 2013.[4] This work included demolition of former dye plant buildings and associated manufacturing structures, installation of a groundwater vertical hydraulic barrier wall, an existing groundwater pump and treatment system, a soil cap and cover, an existing marine mattress, and shoreline restoration. Site location and site overview maps are provided as Figures 1 and 2, respectively.

The groundwater vertical hydraulic barrier wall that was installed as part of the brownfield cleanup parallels the shoreline of the Buffalo River. Between the river and the vertical hydraulic barrier wall, a protective armored shoreline cover was installed along a 200-foot section of the property. The shoreline protection comprises a series of anchored marine mattresses, which provide containment and erosion protection along the shoreline. The marine mattress sections comprise geo-composite grids filled with armor stone anchored at the top of slope and extending into the Buffalo River (MACTEC 2008) . Figure 3 shows the installed marine mattress sections located along the Area A shoreline.

[1] Website: www.dec.ny.gov
[2] Website: www.honeywell.com
[3] Website: www.anchorqea.com
[4] Project details available online at https://www.dec.ny.gov/chemical/52854.html

Figure 3
Completed Marine Armor Mattress System

In 2014, shoreline restoration, including spiny softshell turtle habitat, placement of planting soil, and plantings, was also implemented along the Area A riverbank portion of the site. Details of the Buffalo Color Area A remedial activities, including the shoreline restoration work, are available in the *Design Basis Report, Former Buffalo Color Corporation Site – Area A/B* (MACTEC 2013). Figure 4 shows the Area A shoreline during the additional 2014 restoration work.

Figure 4
Area A 2014 Shoreline Restoration Work

During the remedial design for the GLLA Buffalo River AOC project, soft sediment in Dredge Management Units (DMUs) 9 and 10 (see Figure 2) were identified as areas requiring dredging due to concentrations of lead (Pb), mercury (Hg), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) that were above the cleanup criteria for these indicator chemicals for the Buffalo River AOC project (CH2M Hill 2013). The existing mattress and groundwater vertical hydraulic barrier wall were identified as part of the GLLA design as a "Critical Structure" due to the proximity of the proposed sediment removal that could potentially compromise the stability and integrity of these upland structures.

Due to the presence of a Critical Structure, a focused evaluation of the effects of dredging in front of the shoreline was completed to determine the potential effects from the dredging project. Removal of sediment and debris material from DMUs 9 and 10 along the Area A shoreline was evaluated by several engineering firms, including Anchor QEA, AMEC Foster Wheeler (formerly MACTEC and currently Wood), CH2M Hill Engineers (now Jacobs), McMahon & Mann Consulting Engineers, and Watts Architecture & Engineering. Based on these evaluations, it was determined that there was minimal effect from sediment removal along Area A shoreline areas up- and downstream of the marine mattresses due to the anticipated (and now completed) shoreline restoration, which incorporated removal of the former dye plant water intake and bulkhead structures and flattening of the steeper shoreline slopes. Evaluation of the marine mattress segment indicated the slope was in stable condition, but the removal of sediments from the base of slope indicated the stability of slope would be potentially compromised. The limited area of river sediments (approximately 0.45 acre), located near the toe of the marine mattress slope and within the extent of GLLA Buffalo River AOC DMUs 9 and 10, was identified by NYSDEC as the Off-site Area requiring management separate from the GLLA reporting. The Off-site Area, marine armor mattress, vertical hydraulic barrier wall alignment, and DMUs 9 and 10 are depicted on Figure 2.

1.2 Purpose and Scope

This RAWP details the design and evaluation work for the selected remedial action, including construction details necessary for implementation. Due to the in-river work associated with the GLLA AOC project, including initial DMU dredging operations during 2014 and 2015 completion, the remedial design efforts associated with the Off-site Area occurred through a variety of supplemental investigations and design phases as the remedial approach evolved. Preliminary design details associated with the removal of sediments were extrapolated from the original dredging design outlined in the *Final Basis of Design Report – Final Design for Sediment Remediation: Volume 1* (CH2M Hill 2013). The alternatives analysis performed to evaluate remedial approaches for the Off-site Area are documented in the *Remedial Investigation Alternatives Analysis for Buffalo Color Corporation Site Areas A and B Off-Site* (Anchor QEA 2018). The design was ultimately revised and updated based on supplemental investigations and analysis performed by Anchor QEA and as

formalized in *Buffalo River AOC 2015 Additional Dredging* Construction Drawings (Anchor QEA 2015a; included as Appendix A). Details of the sequence of data collection, slope stability and knee wall evaluations, and final design as coordinated with NYSDEC through the GLLA project process are summarized herein. Key timeframes associated with the design and construction of the Off-site Area Remedy are summarized on Figure 5.

Figure 5
Area A and B Off-site Area Timeline

1.3 Report Organization

Section 2 of the report provides a summary of the pre-design activities associated with the project. Section 3 provides an overview of the remedial design process, including the knee wall, dredging, and backfilling design. Section 4 describes the planned remedial implementation effort. References are provided in Section 5.

2 Pre-Design Activities

During the Buffalo River AOC design and construction phases, technical evaluations and supplemental field investigations of the Off-site Area were performed to identify a remedial approach that was protective of the Area A shoreline and accepted by the Buffalo River project stakeholders, including Buffalo Niagara Waterkeeper, U.S. Environmental Protection Agency (USEPA) Great Lakes National Program Office (GLNPO), U.S. Army Corps of Engineers (USACE), and NYSDEC. Details of these pre-design evaluations and investigations are described within this section.

2.1 GLLA Site Investigations

Sediments within Buffalo River AOC DMUs 9 and 10, where the Off-site Area is located, were sampled in 2005, 2008, and 2010 as part of the remedial investigation and feasibility study of the AOC. This sediment sampling program was conducted, in part, by USEPA GLNPO and NYSDEC. Four primary indicator chemicals for the AOC were determined during this sampling program, including PAHs, PCBs, Pb, and Hg. Exceedances of the AOC cleanup levels for these four contaminants of concern (COCs) were observed in DMUs 9 and 10. All data were provided as part of the *Final Basis of Design Report – Final Design for Sediment Remediation: Volume 1* (CH2M Hill 2013). Consistent with the delineation approach for the AOC, it has been assumed that the COC concentrations are representative of the sediment concentrations within the DMUs.

2.2 Slope Stability Evaluations

A series of slope stability analyses that evaluated best management practices (BMPs) for dredging at the toe of the marine mattress area in DMUs 9 and 10 were performed and submitted to the Buffalo River AOC stakeholders in 2013. These evaluations were presented in a technical memorandum, *Updated Slope Stability Evaluation – Former Buffalo Color Site, Buffalo NY Proposed Remedial Dredging Scenarios Near Area A – Marine Mattress* (Anchor QEA 2013a), and later clarified in an additional technical memorandum, *Clarification of Anchor QEA Slope Stability Evaluation Former Buffalo Color Site* (Anchor QEA 2013b). These initial evaluations used data available at the time, including the following:

- Upland soil boring data collected for the design of the groundwater cut off wall (MACTEC 2012)
- Data from three additional soil borings performed in July 2013 from along the shoreline within DMUs 9 and 10
- Post-dredge surveys performed by USACE following maintenance dredging in April 2013
- Diver-assisted surveys of the marine mattress toe performed in May 2013

Slope stability under dredging scenarios along the marine mattress were evaluated, including varying offsets, vertical cut, slope, and backfill alternatives. Combined, the evaluations concluded that a 5-foot toe offset and 3 horizontal to 1 vertical (3H:1V) dredge prism slope, with close monitoring to

track slope movement, was the BMP most suited for dredging adjacent to the marine mattress area. This BMP concept was carried forward in the *Alternatives Evaluation for DMUs 9 & 10 Marine Mattress* (Anchor QEA 2014) and enacted during GLLA project dredging of DMUs 9 and 10 in 2014. Ultimately, this BMP approach for the final remedy of the sediments in the Off-site Area was not accepted by NYSDEC because it would allow roughly 1,300 cubic yards of sediment in place along the toe of the mattress. Additional pre-design investigations described in Section 2.3 were performed to evaluate additional alternatives for final remedy of the Off-site Area to capture additional targeted sediment and further protect any sediment left in place.

2.3 Additional Investigation

Following the 2014 dredging operations and discussions with project stakeholders, including NYSDEC, regarding the "wedge" of sediments intended to be left in place following this initial dredging, it was concluded that additional remedial activities to address the sediments were needed. Additional pre-design investigations necessary to evaluate solutions to remove the sediments were performed in 2014 and 2015. Those additional investigations are described in this section.

2.3.1 Bathymetric Survey

To further inform the slope stability evaluations described in Section 2.2 and resolve discrepancies between the April 2013 USACE survey and other recent survey data collected in the vicinity of the marine mattresses, updated bathymetry was needed. Confirmation of the limit and elevation of the marine mattress was also needed to evaluate the volume and extent of sediments present at the toe of the slope. In April 2014, a multibeam bathymetric survey was performed along the Area A/DMUs 9 and 10 shoreline by Ocean Surveys, Inc.[5] Additional survey data were collected using an extended survey pole along the toe of the mattress to probe for the edge of the mattress segments that were potentially buried in localized sediment. The survey data were used to refine the as-built limits and elevation of the mattress, which showed that all portions of mattress toe were located within 15 feet of the federal navigation channel and in most areas less than 10 feet. The 2014 survey is depicted on Figure 2.

2.3.2 Geotechnical Investigation

Geotechnical investigation activities at the Off-site Area were performed in 2015 to refine the earlier slope stability evaluations and provide additional data for potential knee wall design, Phase I of the investigation was performed from March 6 to March 9, 2015, and Phase II was performed from May 19 to June 3, 2015. Phase I consisted of sediment probing and field vane shear testing of sediments at the toe of the mattress from the surface of the then frozen river for DMUs 9 and 10.

[5] Website: www.oceansurveys.com

Phase II consisted of advancing two upland soil borings and three offshore soil borings. The two onshore (upland) borings (AQ-SB-01 and AQ-SB-02) were performed at the top of the river bank at the former Buffalo Color Site adjacent to DMUs 9 and 10 (see Figure 6). The three offshore borings were performed from a barge near the toe of slope of the marine armor mattress in DMUs 9 and 10. Both phases were conducted in accordance with the USEPA-approved *Geotechnical Investigation Field Sampling Plan – Buffalo River AOC* (Anchor QEA 2015b).

Figure 6
Upland Soil Borings Along Riverbank

Subsurface conditions in the Off-site Area were characterized through observations of samples obtained during advancement of soil borings performed during this effort. Five principal soil units were identified during the investigation. These soil units are described from the ground surface/mudline downward.

Fill/SAND/Silty SAND and Clayey Gravel (SM/SP/GC): The unit, a variable mixed fill, is described as a loose to medium dense, damp to moist, reddish dark brown, fine to medium silty sand with variable gravel content and occasional brick and concrete debris and glass fragments. The bottom elevation of the unit varied from 545.9 to 555.5 feet International Great Lakes Datum of 1985 (IGLD 85).

SILT (ML/MH): This unit is observed at in-water locations typically above the clay or an alluvium deposit. The silt varied in the investigated areas, but in general, it is described as a very soft, moist to

wet, olive-gray to dark gray, clayey silt with medium to high plasticity and varying organic content. In DMUs 9 and 10, the thickness ranged from 3.0 to 5.0 feet.

Alluvium (SP-SM/SM): The alluvium unit was observed immediately beneath the fill unit in DMUs 9 and 10. The unit is described as a loose to medium dense, olive gray-brown, fine to medium-coarse sand with silt and silty sand and angular rock fragments. The thickness ranged from 4.0 to 6.0 feet in the two borings where the unit was observed. The bottom elevation of the unit varied from 539.9 to 541.9 feet IGLD 85.

CLAY (CL/CH): This unit was observed in all borings and was the principle unit targeted for this investigation. The unit is described as a very soft to soft, moist, reddish gray-brown, silty, and sandy clay with low to medium plasticity. In upland borings, the unit is soft to medium stiff. In DMUs 9 and 10, the observed thickness of the clay at the upland borings ranged from 28 to 30 feet. The unit was typically underlain by a glacial till unit or bedrock.

Till (SC/CL): This unit was observed in all borings immediately beneath the clay unit. The unit is typically soft to stiff, moist, gray to gray-brown, silty sandy clay with low plasticity and varying sand and gravel content. The unit is readily identified by the presence of coarse, granular particles and a change in color from reddish-brown to grayish. The material is observed to be 5.0 to 8.0 feet thick near DMUs 9 and 10.

Bedrock: Bedrock was encountered in all borings. The bedrock was observed to be intact because Standard Penetration Test (SPT) sampling typically met refusal criteria (i.e., 50 blows per 6-inch drive interval) within 1 to 2 inches of driving. Fragments of bedrock recovered from SPT sampling were observed in the field and estimated to be consistent with limestone.

The greater understanding of the subsurface conditions in the Off-site Area, including depth to bedrock and clay layer characterization, allowed for the advancement of the knee wall design as described in the following section.

3 Remedial Design Process

Following the completion of the 2015 geotechnical investigation and characterization of subsurface conditions, alternatives for addressing the Off-site Area were again evaluated. At the time, this evaluation process was discussed with the GLLA stakeholder team, which included NYSDEC, through meetings and presentations. The evaluation process was also later documented in the *Remedial Investigation Alternatives Analysis for Buffalo Color Corporation Site Areas A and B Off-Site* (Anchor QEA 2018). Ultimately, the knee wall approach for addressing sediments in the Off-site Area was presented to the GLLA project stakeholder team and selected to be advanced as a possible remedy for the area. The knee wall would provide support for the removal of sediments in front of the wall and protect against erosion that could potentially undercut the slope from normal river currents. Following installation of the knee wall, dredging would be performed to remove the wedge of sediments at the toe of the slope followed by installation of backfill to cover any remaining gap between the knee wall and the marine mattresses. This remedy would be fully implementable because all stabilization and cover features would be located outside of the immediately adjacent federal navigation channel in the river.

The knee wall would eliminate the need for an offset from the marine mattress structure during dredging and allow for significant additional sediment removal. To conform to previous evaluations of slope stability, overdredge allowance restrictions would still be necessary adjacent to the structure and limited to the original design allowance of 6 inches. This section provides a description of the design for each component associated with the selected remedy.

3.1 Sheeting Design

The sheetpile design was developed by Barton & Loguidice of Liverpool, New York, using Pile Buck sheetpile design software and the 2015 geotechnical data. Design evaluations included post-dredge scenarios where sediments would be removed from along the face of the wall. With the inclusion of the knee wall, slope stability following full sediment removal at the toe of the marine mattress to glacial till met an acceptable factor of safety. General design parameters included the following:

- Assumed embedment to refusal/bedrock at an approximate elevation of 518 IGLD 85
- PZ27 sheetpile with SKP90 corner pieces
- Pile length of 38.5 feet and overall wall length of approximately 240 feet
- 18-foot-long wing walls on up- and downstream sides of wall
- Top of sheeting at an approximate elevation of 556.5 IGLD 85, or 2.5 feet above the existing mudline and approximately 13 feet below average water surface elevations
- All portions of the knee wall located outside of the federal navigation channel in the Buffalo River

Final sheetpile design and details were provided in the *Buffalo River AOC 2015 Additional Dredging* Construction Drawings (Anchor QEA 2015a; Appendix A) and submitted to agencies for permit authorization.

3.2 Dredge Design

A dredge template was developed that included full removal of un-dredged sediments along the face of the wall within DMUs 9 and 10 down to the glacial till layer in accordance with GLLA project design (CH2M Hill 2013). The dredge template also included isolated areas along the knee wall wing walls adjacent to the shoreline where a 3H:1V slope was used. The template was provided in *Buffalo River AOC 2015 Additional Dredging*, Construction Drawings (Anchor QEA 2015a; Appendix A). The design dredge volume was approximately 1,100 cubic yards. A 1-foot operational offset from the sheetpile wall was incorporated into project specifications to limit the possibility of damage to the wall during dredging. It was anticipated that the sediments would be dredged mechanically and disposed of in USACE's confined disposal facility (CDF) No. 4 located on Lake Erie in Buffalo, New York, consistent with other dredging operations for the GLLA project. To dispose of the sediments, the material would be transported by barge to the shoreline of CDF No. 4 and offloaded hydraulically into the CDF. Any generated debris would be separated mechanically and placed into designated debris areas within the CDF. Additional details of the dredging design that are applicable to the Off-site Area work, including material handling and disposal procedures, are provided in *Final Basis of Design Report – Final Design for Sediment Remediation: Volume 1* (CH2M Hill 2013).

3.3 Backfill Design

The knee wall design template placed the wall footprint near the surveyed toe of the existing marine mattress. To minimize the potential for disturbance of the marine mattress during sheeting installation, a 5-foot maximum offset of the sheeting from the mattress was included in the design. A sand backfill was incorporated into the design for the Off-site Area to address this narrow area between the marine mattress cover and the sheeting. The sheeting design included 2.5 feet of free sheeting installed above the mud line, behind which an 18-inch backfill layer would be installed. This configuration provided approximately 1 foot of additional wall clearance above the surface of the proposed backfill layer and was expected to provide protection over the adjacent sand. Backfilling activities at DMUs 9 and 10 would be performed following completion of the knee wall installation and dredging along the face of the knee wall. Before backfilling was initiated, a review of post-dredging bathymetric surveys was completed to confirm dredging had been satisfactorily completed to design requirements. The *Feasibility Study for the Buffalo River, New York* (ENVIRON et al. 2011) prepared as part of the GLLA project indicated that this location is not within identified potential scour zones in the river. Thus, scour of the backfill layer was not considered a concern following the sheeting installation. The backfill design was provided in *Buffalo River AOC 2015 Additional Dredging*, Construction Drawings (Anchor QEA 2015a; Appendix A).

4 Remedy Implementation

4.1 Permitting

The Off-site Area project was conducted as part of the Buffalo River AOC remedy and therefore fell under the permits required for that project.

A Joint Application for Permit was submitted to the USACE and NYSDEC by Honeywell on behalf of the GLLA project team prior to AOC construction activities. Honeywell applied to the USACE for Nationwide Permit 27 for Aquatic Habitat Restoration and Nationwide Permit 38 for Cleanup of Hazardous and Toxic Waste. These Nationwide Permits were issued by USACE-Buffalo District. Honeywell also applied for a project-specific Water Quality Certification under Section 401 of the Clean Water Act and an Article 15 Protection of Waters Permit, which were issued by NYSDEC. A modification to the NYSDEC Water Quality Certification was issued to reflect the *Buffalo River AOC 2015 Additional Dredging*, Construction Drawings (Anchor QEA 2015a; Appendix A), as well as to modify the turbidity monitoring process.

The project was also subject to the New York State Environmental Quality Review Act (SEQR), which requires the identification and mitigation of significant environmental impacts of the activity to land, air, plants and animals, water quality, historic or archeological resources, noise, and odor. NYSDEC ultimately determined that the project was a Type 1 action and would not have a significant effect on the environment. The permit application and SEQR review for the Buffalo River Sediment Remediation and Habitat Restoration project included consultation with U.S. Fish and Wildlife Service, NYSDEC's Division of Fish and Wildlife, and the New York State Historic Preservation Office.

4.2 Health and Safety

The Health and Safety requirements developed for the work were established using Anchor QEA, Honeywell, and Occupational Safety and Health Administration (OSHA) regulations. During construction, the Contractor was designated to be responsible for the following:

- Preparing a site-specific Health and Safety Plan (HASP) and safety procedures
- Conforming to Honeywell's Remediation and Evaluation Services Contractor Safety Workbook
- Ensuring each employee was properly trained in hazardous waste operations and emergency response, as well as all other appropriate construction safety regulations
- Ensuring each employee was included in a medical surveillance program consisting of pre-assignment, annual, and exit physicals
- Providing daily "toolbox talk" safety instruction
- Conducting personal air sampling of employees to monitor exposure to airborne hazards as needed
- Providing personal protective equipment as needed

- Ensuring employee compliance with site and contractor safety rules
- Conducting an incident investigation and providing an incident report to site health and safety representatives in the event of an employee injury, property damage, or near miss incident

During construction, the Construction Manager (Anchor QEA) was designated to be responsible for the following:

- Providing health and safety oversight of the on-site construction management team personnel
- Reviewing contractor HASPs and safety procedures
- Conducting inspections of site activities to ensure contractor compliance with the HASP and applicable OSHA regulations
- Receiving and reviewing contractor incident reports
- Reviewing employee training and medical surveillance records
- Developing the Final Construction Completion Report (CCR)

The submittal of the RAWP follows the submittal of the following:

- **Project Work Plan:** A document to convey the previous implementation of the remedy associated with the Off-site Area and discuss the various communications and summary documents to be submitted to complete the Order
- **Citizen Participation Plan:** A document that summarizes necessary details associated with the Off-site Area for the public
- **Remedial Investigation Alternatives Analysis:** Provides a summary of investigation results and evaluations of remedial alternatives for the location and proposes a remedy for implementation

The CCR has been submitted along with this RAWP. The CCR documents the implementation of the remedy and includes information on permitting, contractors and oversight, means and methods of implementation, schedule, and any deviations from original designs. The CCR also summarizes as-built information as a baseline for later monitoring efforts.

The Site Management Plan (SMP) will be submitted in early 2019 following submittal of this RAWP and CCR. The SMP outlines performance monitoring for the applied remedy at the Off-site Area.

4.3 Site Management Plan

A SMP will be prepared in accordance with DER-10 after the acceptance of preceding Brownfield Cleanup Program documents. The SMP will include the following activities, which are necessary for

the proper and effective management of the institutional controls (ICs) and monitoring the effectiveness of the implemented remedy:

- **Inspection:** Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment
- **Survey Monitoring:** Bathymetric surveying every 5 years for 20 years following completion of the work, coinciding with the Riverbank Restoration Monitoring of the Former Buffalo Color Corporation Site – Area D Sediment Containment Monitoring
- **ICs:** Restrictions on site access and use will be described in detail in the SMP, along with the steps necessary for its implementation and periodic certification
- **Corrective Measures:** Procedures for corrective measures such as repairs to any failure of an institutional or engineering control
- **Reporting:** The results of all inspections, corrective actions, and monitoring will be reported in the Periodic Review Report for the Off-site Area

5 References

Anchor QEA (Anchor QEA Engineering, PLLC), 2013a. *Updated Slope Stability Evaluation – Former Buffalo Color Site, Buffalo NY Proposed Remedial Dredging Scenarios Near Area A – Marine Mattress*. September 2013.

Anchor QEA, 2013b. *Clarification of Anchor QEA Slope Stability Evaluation Former Buffalo Color Site*. October 2013.

Anchor QEA, 2014. *Alternatives Evaluation for DMUs 9 & 10 Marine Mattress. Buffalo River Area of Concern*. July 2014.

Anchor QEA, 2015a. *Buffalo River AOC 2015 Additional Dredging, Construction Drawings*. November 2015.

Anchor QEA, 2015b. *Geotechnical Investigation Field Sampling Plan – Buffalo River AOC*. March 2015.

Anchor QEA, 2018. *Remedial Investigation Alternatives Analysis for Buffalo Color Corporation Site Areas A and B Off-Site: NYSDEC Site No. C915230A*. June 2018.

CH2M Hill, 2013. *Final Basis of Design Report – Final Design for Sediment Remediation: Volume 1, Buffalo, New York*. March 2013.

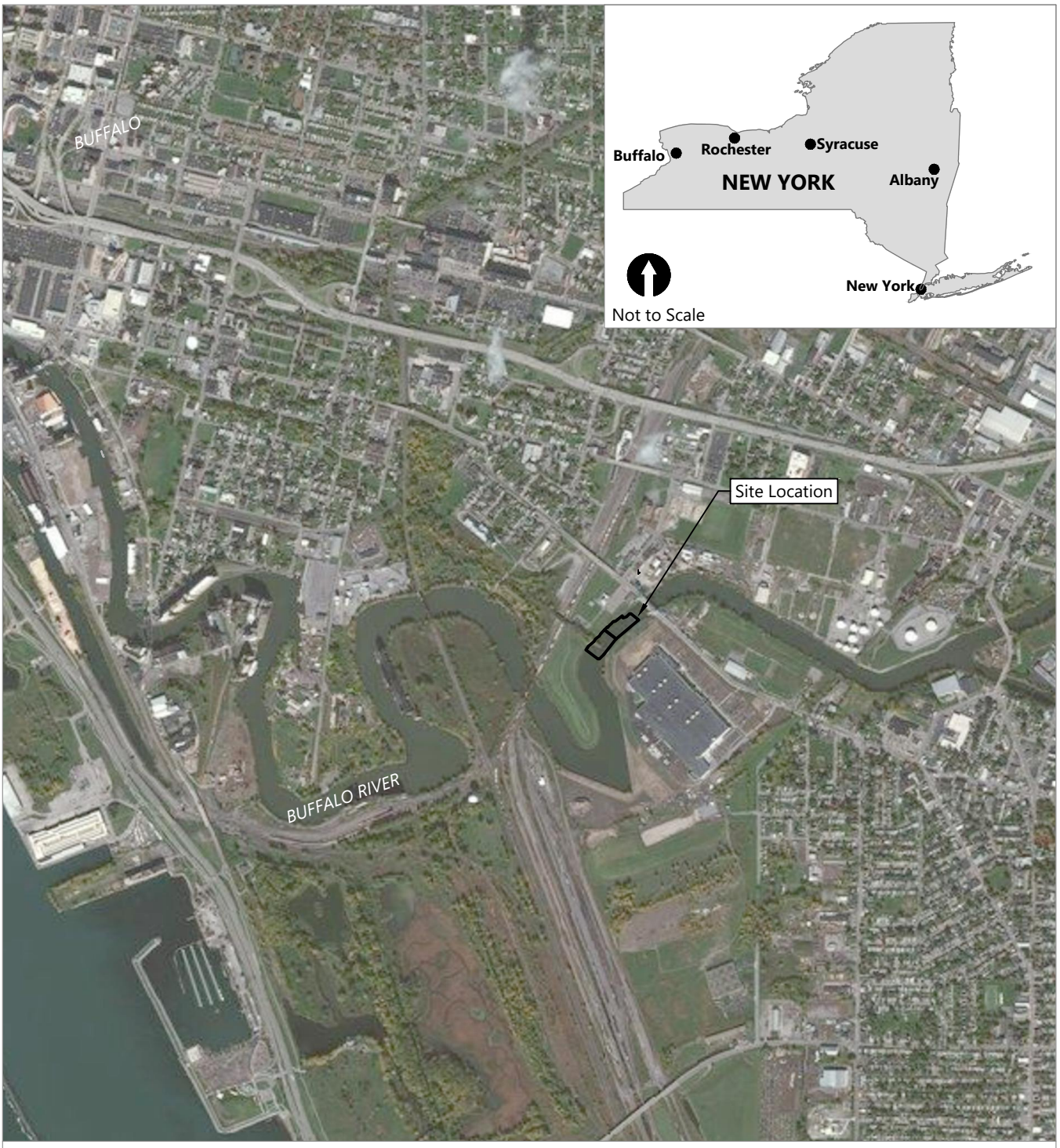
ENVIRON, MACTEC, and LimnoTech, 2011. *Final Feasibility Study for the Buffalo River, New York*. October 2011.

MACTEC, 2008. *Final Engineering Report – Buffalo Color Site Area ABCE Interim Corrective Measure*. October 2008.

MACTEC, 2012. *Basis of Design Report*. Area A Vertical Hydraulic Barrier, NYSDEC Site No. C915230, Buffalo Color Corporation, Buffalo, New York. June 2012.

MACTEC, 2013. *Design Basis Report, Former Buffalo Color Corporation Site – Area A/B*. May 2013

Figures



SOURCE: Aerial Imagery from Bing Maps.
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: International Great Lake Datum of 1985

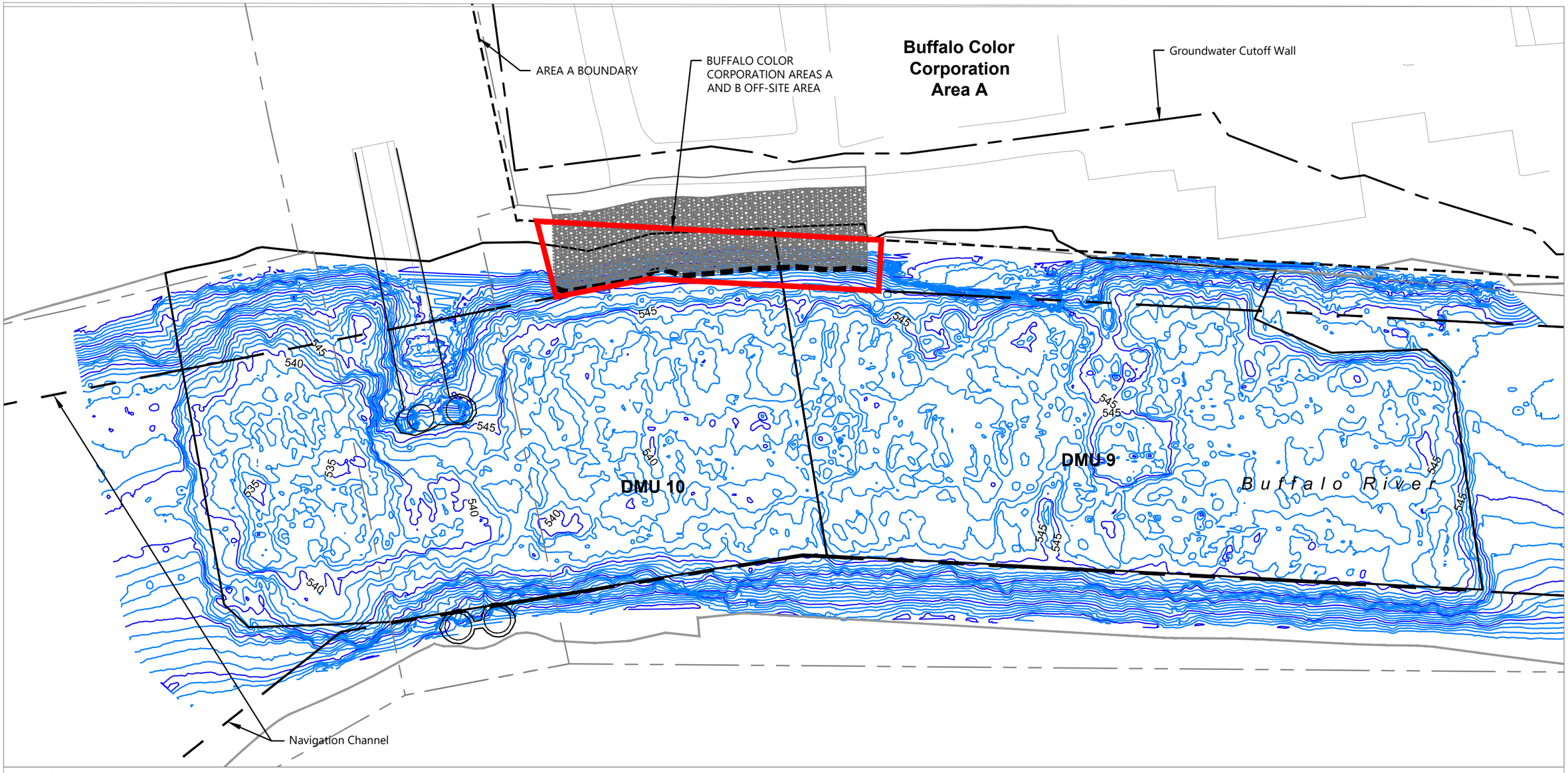
0 2000
Feet

Publish Date: 2018/11/14 12:40 PM | User: cyard
Filepath: K:\Projects\0287-Honeywell International Inc\Buffalo River Site Strategy & Eng Sup\0287-RP-073 (Site Location Map).dwg Site Location

ANCHOR QEA

Figure 1
Site Location

Buffalo Color Corporation Areas A and B Off-Site Area
Buffalo, New York



SOURCE: Basemap prepared from CH2MHILL drawings, titled 'Existing Conditions' and 'Dredging Operations'. Bathymetry from AECOM, dated October 2014.
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum of 1985 (IGLD85)
NOTES:

1. Base map information including navigation channel, in-water structure and 90% Design toe of marine mattress is shown as indicated in the Basis of Design Report prepared by CH2MHill/Ecology and Environment (March, 2013)
2. Actual toe of marine mattress is based on May 28, 2013 diver survey and probing conducted by OSI (April 2014).

LEGEND:

- 550 — Existing Contours (October 2014, 1' and 5' Interval)
- Toe of Marine Mattress (May 2013 and April 2014)
- DMU Boundary
- Marine Mattress Design Footprint (Mactec)
- Parcels
- Groundwater Cutoff Wall

0 100 Feet

Publish Date: 2018/10/24 10:43 AM | User: rpetrie
Filepath: K:\Projects\0287-Honeywell International Inc\Buffalo River Site Strategy & Eng Sup\0287-RP-019 (Surface XS_20140604).dwg F3

ANCHOR QEA

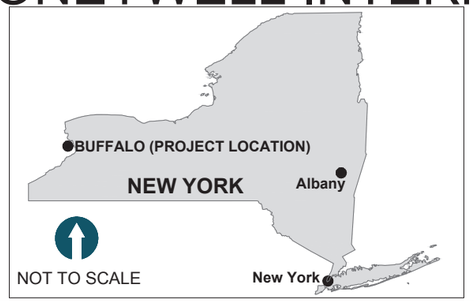
Figure 2
Site Overview Map
Buffalo Color Corporation Areas A and B Off-Site Area
Buffalo, New York

Appendix A
Buffalo River AOC 2015 Additional Dredging, Construction Drawings

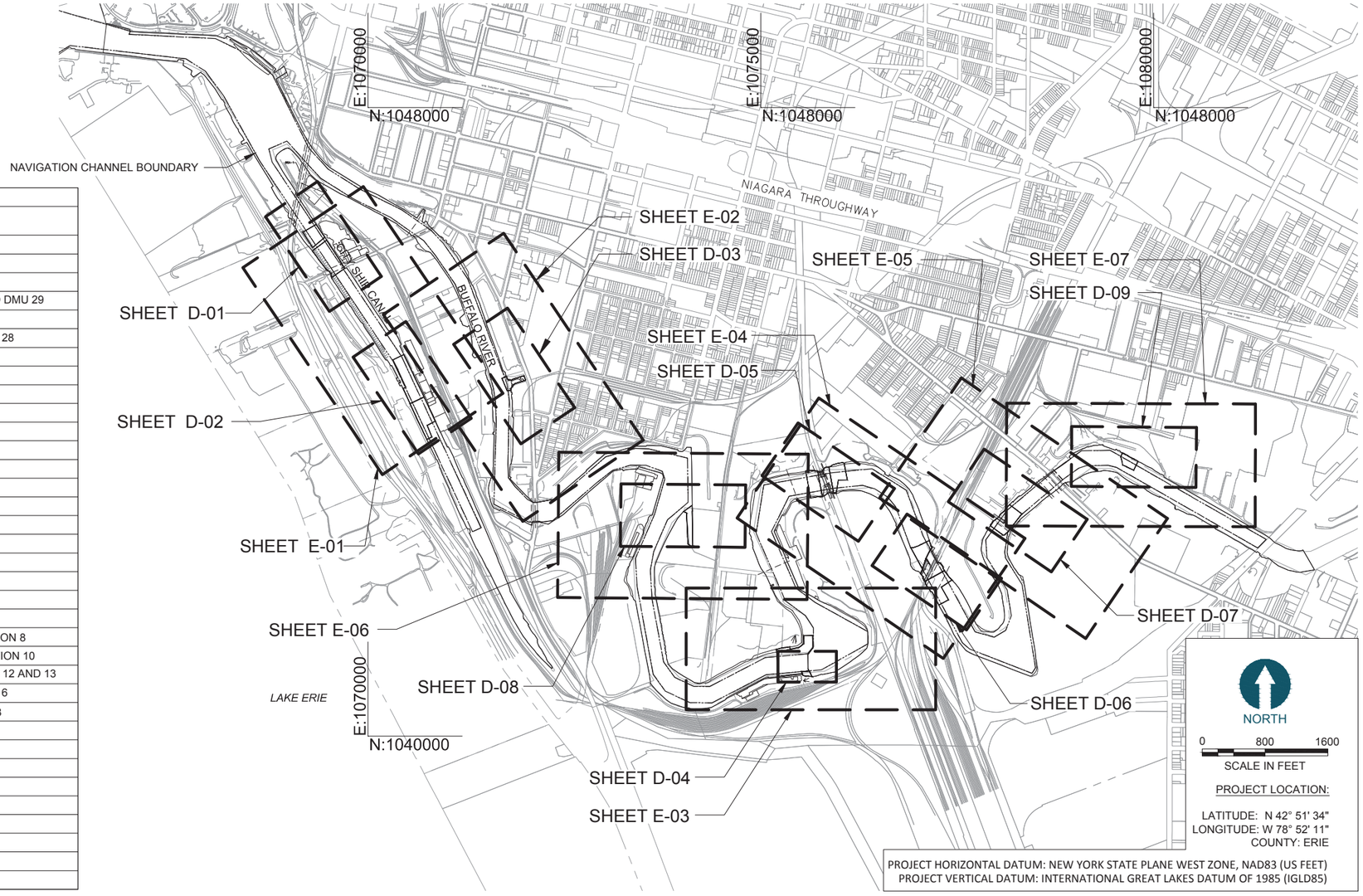
CONSTRUCTION DRAWINGS

BUFFALO RIVER AOC 2015 ADDITIONAL DREDGING

HONEYWELL INTERNATIONAL INC.



Sheet List		
Sheet Number	Sheet Name	Sheet Title
1	T-01	COVER SHEET
2	G-01	GENERAL NOTES AND LEGEND
3	E-01	EXISTING CONDITIONS - DMU 1, DMU 2, DMU 5 AND DMU 6a
4	E-02	EXISTING CONDITIONS DMU 17, DMU 18, DMU 19, DMU 27, DMU 28 AND DMU 29
5	E-03	EXISTING CONDITIONS - DMU 38a
6	E-04	EXISTING CONDITIONS - DMU 17, DMU 18, DMU 19, DMU 27, DMU 28
7	E-05	EXISTING CONDITIONS - DMU 9 AND DMU 10
8	E-06	EXISTING CONDITIONS - DMU 101
9	E-07	EXISTING CONDITIONS - DMU 8b, DMU 9 AND DMU 10
10	D-01	PROPOSED CONDITIONS - DMU 5 AND DMU 6a
11	D-02	PROPOSED CONDITIONS - DMU 1 AND DMU 2
12	D-03	PROPOSED CONDITIONS - DMU 44e
13	D-04	PROPOSED CONDITIONS - DMU 38a
14	D-05	PROPOSED CONDITIONS - DMU 27, DMU 28 AND DMU 29
15	D-06	PROPOSED CONDITIONS - DMU 17, DMU 18 AND DMU 19
16	D-07	PROPOSED CONDITIONS - DMU 9 AND DMU 10
17	D-08	PROPOSED CONDITIONS - DMU 101
18	D-09	PROPOSED CONDITIONS - DMU 8b
19	D-10	SECTIONS - DMU 6a CROSS SECTIONS 1 AND 2
20	D-11	SECTIONS - DMU 5 CROSS SECTIONS 3 AND 4
21	D-12	SECTIONS - DMU 2 CROSS SECTIONS 5 AND 6
22	D-13	SECTIONS - DMU 1 CROSS SECTION 7 AND DMU 44e CROSS SECTION 8
23	D-14	SECTIONS - DMU 44e CROSS SECTION 9 AND DMU 101 CROSS SECTION 10
24	D-15	SECTIONS - DMU 101 CROSS SECTION 11 AND DMU 38a CROSS SECTIONS 12 AND 13
25	D-16	SECTIONS - DMU 9 AND DMU 10 CROSS SECTIONS 14, 15 AND 16
26	D-17	SECTIONS - DMU 27 AND DMU 28 CROSS SECTIONS 17 AND 18
27	D-18	SECTIONS - DMU 27 AND DMU 28 CROSS SECTION 19
28	D-19	SECTIONS - DMU 18 AND DMU 19 CROSS SECTION 20
29	D-20	SECTIONS - DMU 17 AND DMU 19 CROSS SECTION 21
30	D-21	SECTIONS - DMU 18 CROSS SECTION 22
31	D-22	SECTION - DMU 19 CROSS SECTION 23
32	D-23	SECTIONS - DMU 8b CROSS SECTIONS 24 AND 25
33	D-24	TYPICAL COVER SECTIONS
34	S-01	SHEET PILE DESIGN DETAILS PLAN
35	S-02	SHEET PILE DESIGN DETAILS



ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: S. BAGNULL
DRAWN BY: B. HURRY
CHECKED BY: M. REEMTS
APPROVED BY: R. MOHAN
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

BUFFALO RIVER AOC 2015 ADDITIONAL DREDGING

COVER SHEET

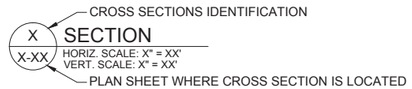
T-01

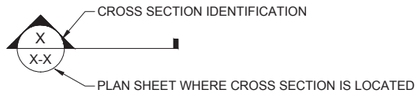
SHEET NO. 1 OF 35

Nov 06, 2015 4:40pm bhurry H:\Syracuse1\CAD Projects\130287 - Buffalo River\Construction Plans\0287-T-01.dwg 0287 - T01

LEGEND

- EXISTING CONTOUR MAJOR (5 FT)
- EXISTING CONTOUR MINOR (1 FT)
- PROPOSED CONTOUR MAJOR (5 FT)
- PROPOSED CONTOUR MINOR (1 FT)
- EXISTING PROPERTY LINE
- EXISTING SHORELINE
- EXISTING MUDLINE
- REQUIRED DREDGE LINE
- NAVIGATION CHANNEL
- ROAD
- DREDGE MANAGEMENT UNIT BOUNDARY
- PROPOSED REMAINING GLLA PROJECT DREDGING LIMITS





- GLLA DMU DREDGING AREA COMPLETED BY OTHERS
- HABITAT SUBGRADE RESTORATION COMPLETED BY OTHERS
- NO DREDGE AREA - 25 FT OFFSET FROM UTILITIES
- NO DREDGE AREA - 25 FT OFFSET FROM IN -WATER STRUCTURES AND OPERATIONALLY LIMITED DREDGE AREAS
- BACKFILL
- SAND COVER MATERIAL
- ARMOR STONE

GENERAL NOTES:

1. THIS PROJECT INCLUDES ENVIRONMENTAL DREDGING IN SELECTED AREAS OF THE BUFFALO RIVER AND CITY SHIP CANAL.
2. DRAWINGS E-01 THROUGH E-06 SHOW EXISTING BATHYMETRIC CONTOURS AND DRAWINGS D-01 THROUGH D-08 SHOW DREDGE CUT LINE CONTOURS.
3. DREDGE CUT LINE CONTOURS ARE BASED ON EVALUATION OF TILL ELEVATION OBSERVATIONS MADE AT TEST BORING LOCATIONS AND SEDIMENT THICKNESS POLING LOCATIONS.
4. LOCATIONS OF NAVIGATION CHANNEL AND STATIONING IN PROJECT AREA PROVIDED BY USACE.
5. DREDGE MANAGEMENT UNITS (DMUs) WERE DELINEATED BASED ON THE 2010 FEASIBILITY STUDY (ENVIRON INTERNATIONAL CORPORATION, MACTEC ENGINEERING AND CONSULTING INC., LINMOTECH. 2010 DRAFT FINAL FEASIBILITY STUDY FOR THE BUFFALO RIVER, NEW YORK, PREPARED ON BEHALF OF BUFFALO RIVER GREAT LAKES LEGACY ACT PROJECT COORDINATION TEAM, NOVEMBER 2010), AND FURTHER DEFINED DURING DISCUSSIONS WITHIN THE PROJECT COORDINATION TEAM.
6. LOCATIONS DISPLAYED FOR EXISTING CONDITIONS SUCH AS SHORELINES, STRUCTURES AND UTILITIES ARE APPROXIMATE.
7. IF AN UNDERWATER SHORELINE STRUCTURE (E.G., RIPRAP, CONCRETE BOAT RAMPS, ECT.) IS ENCOUNTERED IN ANY AREA WHERE NONE IS INDICATED, CONTRACTOR SHALL NOTIFY ENGINEER FOR A DECISION ON HOW TO PROCEED.
8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A NEAT AND ORDERLY SITE, YARD AND GROUNDS. REMOVE AND DISPOSE OFF SITE ALL RUBBISH, WASTE MATERIALS, LITTER, AND ALL FOREIGN SUBSTANCES, REMOVE PETRO-CHEMICAL SPILLS, STAINS AND OTHER FOREIGN DEPOSITS IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
9. THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE DRAWINGS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE DRAWINGS WITHOUT THE EXPRESSED APPROVAL OF THE OWNER OR OWNER'S REPRESENTATIVE.
10. THE CONTRACTOR SHALL RESTORE ALL PUBLIC OR PRIVATE PROPERTY INCLUDING MARINE STRUCTURES DAMAGED OR REMOVED TO AT LEAST AS GOOD OF CONDITION AS BEFORE DISTURBED AS DETERMINED BY THE OWNER OR OWNER'S REPRESENTATIVE.
11. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIRED PERMITS.
12. MAINTAIN OPEN ACCESS FOR SHIPPING AND OTHER OPERATIONS.
13. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
14. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
15. NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CLIENT PRIOR TO CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE APPROVAL.
16. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
17. TO THE EXTENT UTILITIES OR OVERHEAD LINES ARE PRESENT AT THE SITE, THEY ARE NOT SHOWN ON THESE DRAWINGS. CONTRACTOR SHALL DETERMINE THE PRESENCE OF ALL UTILITIES IN THE FIELD.
18. CONTRACTOR SHALL FIELD VERIFY SEDIMENT PHYSICAL PROPERTIES, LOCATIONS OF SITE STRUCTURES, LOCATION OF IDENTIFIED DEBRIS, SHORELINE AND OTHER SITE FEATURES.
19. CONTRACTOR SHALL PERFORM A PRE-CONSTRUCTION SURVEY WHICH WILL SERVE AS THE BASELINE SURVEY FOR PAYMENT. THE PRE-CONSTRUCTION SURVEY IS SUBJECT TO REVIEW AND APPROVAL BY THE OWNER.

PROJECT INFORMATION:

PROJECT LOCATION:	BUFFALO RIVER BUFFALO, ERIE COUNTY, NEW YORK
CLIENT:	HONEYWELL INTERNATIONAL
ENGINEER OF RECORD:	ANCHOR QEA ENGINEERING, PLLC 290 ELWOOD DAVIS ROAD LIVERPOOL, NY 13088 CONTACT: RAM MOHAN, P.E.

SURVEY NOTES:

1. TOPOGRAPHIC DATA, BATHYMETRIC DATA, UTILITY LOCATION INFORMATION, AND BASE MAP DATA FROM CH2MHILL AND ECOLOGY AND ENVIRONMENT ENGINEERING FINAL DESIGN DRAWING SET TITLED "SEDIMENT REMEDIATION DESIGN BUFFALO RIVER AREA OF CONCERN". THE BATHYMETRIC CONTOURS SHOWN ON THE EXISTING CONDITIONS SHEETS ARE BASED ON BATHYMETRIC SURVEY DATA PROVIDED BY CH2MHILL (2012), USACE (2013) AND AQUATIC SCIENCES (2013, 2014). EXISTING CONDITIONS DRAWINGS ARE NOT POST DREDGE DRAWINGS AND ACTUAL SITE TOPOGRAPHY AND BATHYMETRY MAY VARY. THE LOCATIONS OF PIERS, OUTFALLS, RAMPS AND OTHER IN-WATER STRUCTURES ARE AS NOTED IN CH2MHILL AND ECOLOGY AND ENVIRONMENT ENGINEERING FINAL DESIGN DRAWING SET. CONTRACTOR SHALL FIELD VERIFY THESE LOCATIONS FOR ACCURACY, AS APPLICABLE.
2. CONTRACTOR SHALL CONFIRM ACTUAL BATHYMETRY PRIOR TO CONSTRUCTION.
3. HORIZONTAL DATUM IS NEW YORK STATE PLANE WEST, NAD83, US FEET.
4. VERTICAL DATUM IS INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGLD85).

ABBREVIATIONS

ABB.	TERM
ABB.	ABBREVIATION
AC.	ACRES
ADM	ARCHER DANIELS MIDLAND
CY	CUBIC YARD
DIA.	DIAMETER
DMU	DREDGE MANAGEMENT UNIT
EA.	EACH
EL.	ELEVATION
EX	EXISTING
FT.	FOOT OR FEET
GLLA	GREAT LAKES LEGACY ACT
IN.	INCH OR INCHES
LOC.	LOCATION
LWD	LOW WATER DATUM
MAX.	MAXIMUM
MIN.	MINIMUM
N/A	NOT APPLICABLE
NTS	NOT TO SCALE
O.C.	ON CENTER
P.E.	PROFESSIONAL ENGINEER
QTY.	QUANTITY
SF	SQUARE FOOT OR FEET
SPEC.	SPECIFICATION(S)
SY	SQUARE YARD
TYP.	TYPICAL
WSEL	WATER SURFACE ELEVATION

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

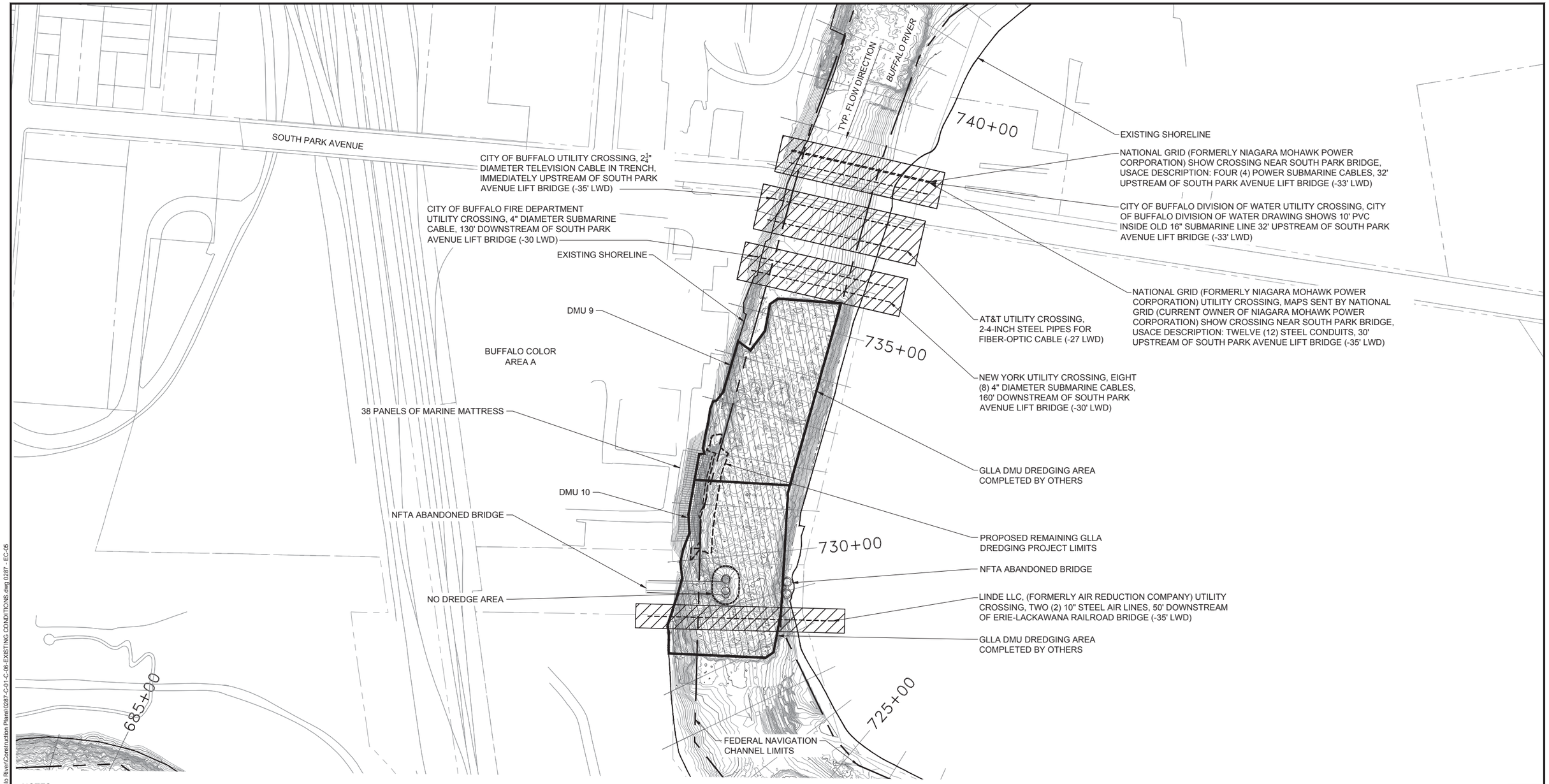
DESIGNED BY: S. BAGNULL
DRAWN BY: B. HURRY
CHECKED BY: M. REEMTS
APPROVED BY: R. MOHAN
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

BUFFALO RIVER AOC 2015 ADDITIONAL DREDGING

GENERAL NOTES AND LEGEND

G-01

SHEET NO. 2 OF 35



NOTES:

1. CONTRACTOR SHALL CONFIRM ACTUAL BATHYMETRY AND UTILITIES IN OR AFFECTED BY THE WORK PRIOR TO CONSTRUCTION.

SOURCE: Basemap from CH2MHill. Bathymetry from CH2MHill (2012), USACE (2013), Ocean Surveys, Inc. (2014) and Aquatic Sciences (2013, 2014)
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum of 1985 (IGLD85).

NORTH

0 100 200
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: S. BAGNULL
DRAWN BY: B. HURRY
CHECKED BY: M. REEMTS
APPROVED BY: R. MOHAN
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

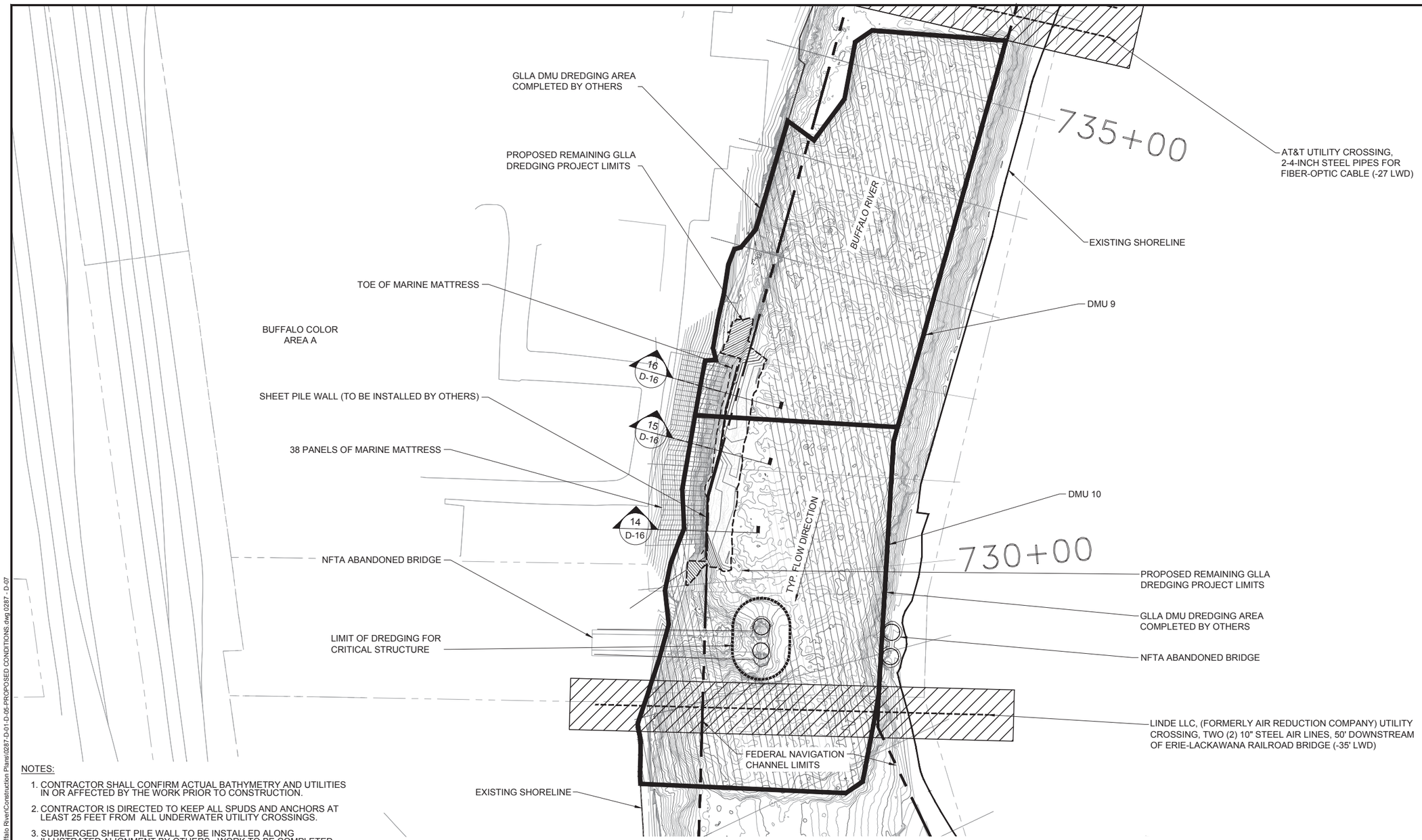
BUFFALO RIVER AOC 2015 ADDITIONAL DREDGING

EXISTING CONDITIONS - DMU 9 AND DMU 10

E-05

SHEET NO. 7 OF 35

Nov 06, 2015 4:42pm bhurry H:\Syracuse1\CAD Projects\130287 - Buffalo River\Construction Plans\0287-C-01-C-06-EXISTING CONDITIONS.dwg 0287 - EC-05



NOTES:

1. CONTRACTOR SHALL CONFIRM ACTUAL BATHYMETRY AND UTILITIES IN OR AFFECTED BY THE WORK PRIOR TO CONSTRUCTION.
2. CONTRACTOR IS DIRECTED TO KEEP ALL SPUDS AND ANCHORS AT LEAST 25 FEET FROM ALL UNDERWATER UTILITY CROSSINGS.
3. SUBMERGED SHEET PILE WALL TO BE INSTALLED ALONG ILLUSTRATED ALIGNMENT BY OTHERS. WORK TO BE COMPLETED PRIOR TO START OF DREDGING. TOP OF SHEETING ANTICIPATED TO RANGE FROM 550.0 TO 555.0 FT, ACTUAL ALIGNMENT AND ELEVATION TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO DREDGING.

SOURCE: Basemap from CH2MHill. Bathymetry from CH2MHill (2012), USACE (2013), Ocean Surveys, Inc. (2014) and Aquatic Sciences (2013, 2014)
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum of 1985 (IGLD85).

NORTH

0 50 100
SCALE IN FEET

ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: S. BAGNULL
DRAWN BY: B. HURRY
CHECKED BY: M. REEMTS
APPROVED BY: R. MOHAN
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

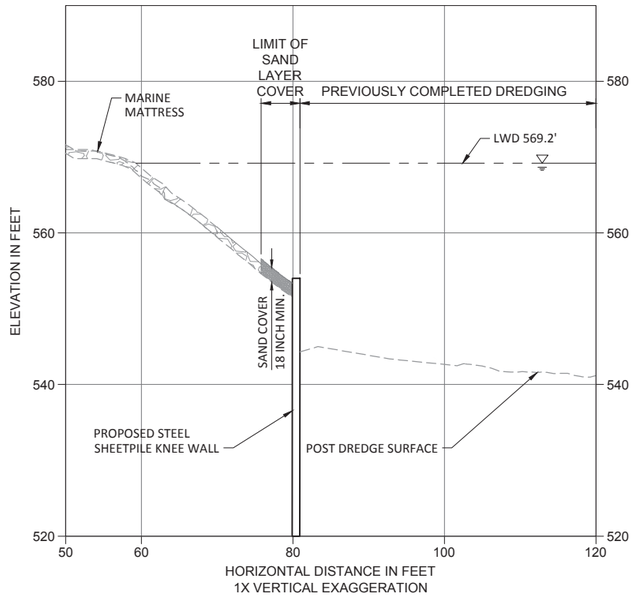
BUFFALO RIVER AOC 2015 ADDITIONAL DREDGING

PROPOSED CONDITIONS - DMU 9 AND DMU 10

D-07

SHEET NO. 16 OF 35

H:\Syracuse\1CAD Projects\130287 - Buffalo River\Construction Plans\0287-D-01-D-05-PROPOSED CONDITIONS.dwg 0287 - D-07
Nov 06, 2015 4:45pm bhurry



14a / D-16 DETAIL - DMU 9 AND 10 COVER

HORIZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'

DMU 9 AND 10 COVER DETAIL NOTES:

1. SAND COVER LAYER SHALL BE INSTALLED TO MINIMUM 18 INCH LAYER BETWEEN PROPOSED SHEET PILE WALL (INSTALLED BY OTHERS) AND EXISTING MARINE MATTRESS.
2. INSTALLATION OF SAND COVER LAYER TO OCCUR FOLLOWING DREDGING ACTIVITIES IN DMUs 9 AND 10.
3. MATERIAL SHALL BE PLACED IN THIN, CONTROLLED LIFTS TO REDUCE DISTURBANCE OF UNDERLYING SEDIMENTS.
4. NO MATERIAL SHALL BE PLACE OUTSIDE SHEETPILE WALL OR WITHIN NAVIGATION CHANNEL EXTENTS.

NOTES:

1. CONTRACTOR SHALL CONFIRM ACTUAL BATHYMETRY AND UTILITIES IN OR AFFECTED BY THE WORK PRIOR TO CONSTRUCTION.

LEGEND

- EXISTING MUDLINE
- REQUIRED DREDGE LINE
- FEDERAL NAVIGATION CHANNEL
- DMU BOUNDARY
- PREVIOUS BOUNDARY OF NO DREDGE AREA
- ALLOWABLE OVERDREDGE LINE

SOURCE: Basemap from CH2MHill. Bathymetry from CH2MHill (2012), USACE (2013), Ocean Surveys, Inc. (2014) and Aquatic Sciences (2013, 2014)
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum of 1985 (IGLD85).

0 10 20
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: S. BAGNULL
DRAWN BY: B. HURRY
CHECKED BY: M. REEMTS
APPROVED BY: R. MOHAN
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

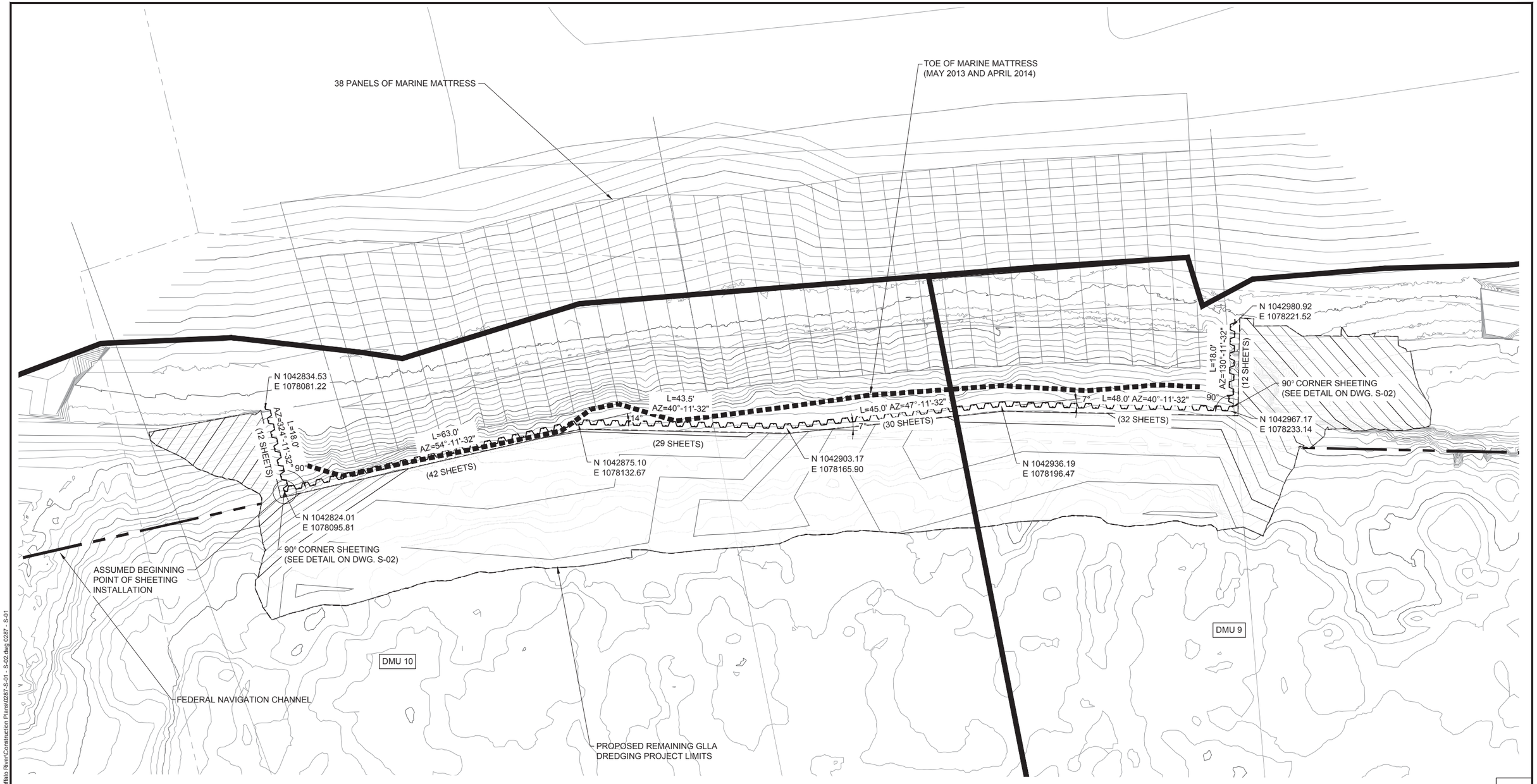
BUFFALO RIVER AOC 2015 ADDITIONAL DREDGING

TYPICAL COVER SECTIONS

D-24

SHEET NO. 33 OF 35

Nov 06, 2015 4:49pm bhurry H:\Syracuse1\CAD Projects\130287 - Buffalo River\Construction Plans\0287-D-01-D-05-PROPOSED CONDITIONS.dwg 0287 - D-24



SOURCE: Basemap from CH2MHill. Bathymetry from CH2MHill (2012), USACE (2013), Ocean Surveys, Inc. (2014) and Aquatic Sciences (2013, 2014)
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum of 1985 (IGLD85).

NORTH

0 10 20
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

Barton & Loguidice, D.P.C.
BARTON & LOGUIDICE, D.P.C.
290 ELWOOD DAVIS ROAD
LIVERPOOL, NY 13088

ANCHOR QEA
ANCHOR QEA ENGINEERING, PLLC
290 ELWOOD DAVIS ROAD
LIVERPOOL, NY 13088

CLIENT: HONEYWELL INTERNATIONAL

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: M. PATTERSON
DRAWN BY: J.CLARK
CHECKED BY: M. SCHOOLEY
APPROVED BY: M. SCHOOLEY
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

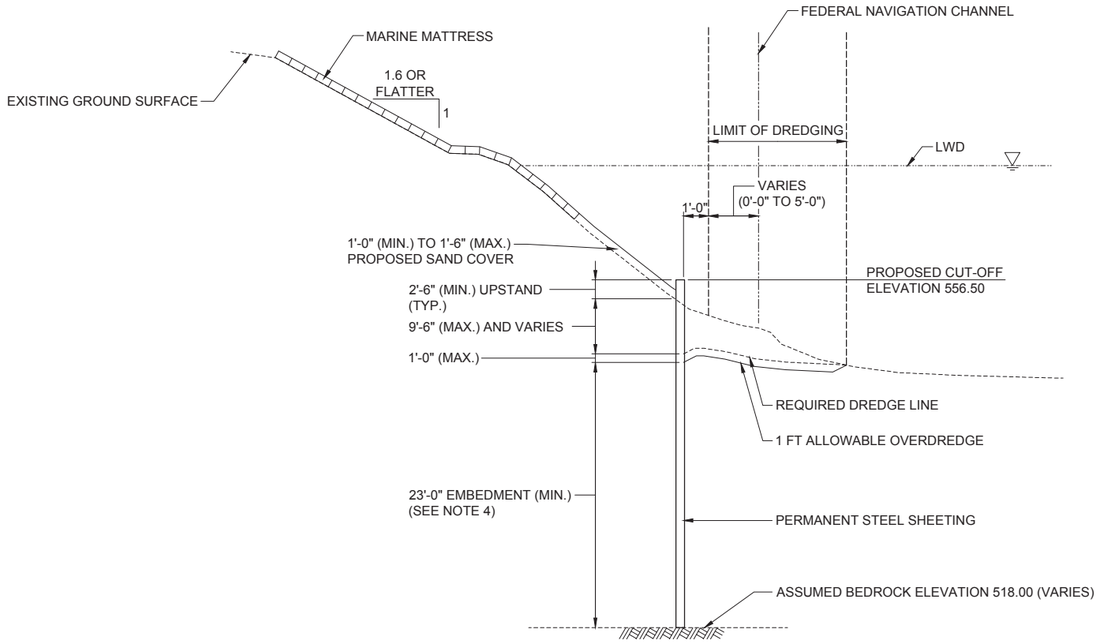
BUFFALO RIVER AOC 2015
ADDITIONAL DREDGING

SHEET PILE DESIGN
DETAILS PLAN

S-01

SHEET NO. 34 OF 35

Nov 06, 2015 4:51pm bhurry H:\Syracuse1\CAD Projects\130287 - Buffalo River\Construction Plans\0287-S-01 - S-02.dwg 0287 - S-01

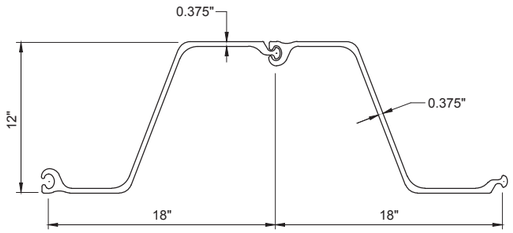


PERMANENT STEEL SHEETING SECTION

NOT TO SCALE

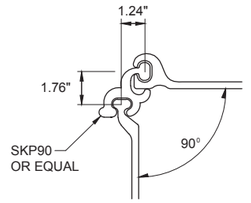
NOTES:

1. PERMANENT STEEL SHEETING SHALL CONFORM TO NYSDOT STANDARD SPECIFICATION ITEM 552.11.
2. PERMANENT STEEL SHEETING SHALL BE PZ27 OR EQUAL (MINIMUM Sx = 30.2 in³ /ft.).
3. PERMANENT STEEL SHEETING SHALL HAVE A MINIMUM YIELD STRENGTH OF 36 ksi.
4. PERMANENT STEEL SHEETING SHALL HAVE A MINIMUM EMBEDMENT OF 23'-0" BEYOND THE ANTICIPATED DREDGE LINE (INCLUDING OVERDREDGE). HOWEVER, ALL SHEETING SHALL BE DRIVEN TO REFUSAL / BEDROCK.
5. DREDGING EQUIPMENT SHALL NOT BE OPERATED WITHIN 1'-0" OF THE FRONT FACE OF THE PERMANENT STEEL SHEETING.
6. ALL COST ASSOCIATED WITH THE METHOD AND MEANS OF THE CONTRACTOR'S OPERATION TO INSTALL SHEETPILING BELOW WATER SURFACE (I.E. TORCH CUTTING VS. SHEET PILING TEMPLATE, ACCESS BARGES, ETC.) AS SHOWN SHALL BE INCLUDED UNDER STEEL INSTALLATION BID ITEM.
7. SHEETPILING INSTALLATION AS SHOWN ON PLAN, DWG. S-01 MUST BE MAINTAINED WITH NO MORE THAN A 6" TOLERANCE OR DEVIATION FROM POINT OF BEGINNING TO END. THE CONTRACTOR SHALL USE METHOD AND MEANS APPROVED BY E.I.C. TO MAINTAIN THE TOLERANCE. ALL COST ASSOCIATED WITH THE CONTRACTOR'S METHOD AND MEANS (I.E. TEMPLATE MATERIAL) TO MAINTAIN THE SHEETPILING LAYOUT AS SHOWN ON THE PLAN, DWG. S-01 SHALL BE INCLUDED IN STEEL INSTALLATION BID ITEM.
8. CONTRACTOR SHALL VERIFY TOE OF MARINE MATTRESS PRIOR TO INSTALLATION TO PREVENT DAMAGE. ANY DAMAGE TO MARINE MATTRESS SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.



PZ27 SHEETING DETAIL

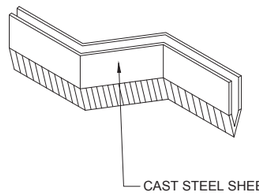
NOT TO SCALE



90° CORNER SHEETING DETAIL

NOT TO SCALE

NOTE:
CONTRACTOR MAY USE AN EQUIVALENT SYSTEM.



SHEET PILE SHOES

NOT TO SCALE

NOTE:
CONTRACTOR MAY USE AN EQUIVALENT SYSTEM.

ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

BARTON & LOGUIDICE, D.P.C.
290 ELWOOD DAVIS ROAD
LIVERPOOL, NY 13088

ANCHOR QEA ENGINEERING, PLLC
290 ELWOOD DAVIS ROAD
LIVERPOOL, NY 13088

CLIENT: HONEYWELL INTERNATIONAL

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: M. PATTERSON
DRAWN BY: J. CLARK
CHECKED BY: M. SCHOOLEY
APPROVED BY: M. SCHOOLEY
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

BUFFALO RIVER AOC 2015 ADDITIONAL DREDGING

SHEET PILE DESIGN DETAILS

S-02

SHEET NO. 35 OF 35