June 2021
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

Honeywell International Inc.

Project Number: E70287-04.01
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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 June 30, 2021

Signature Date

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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). Both memorandums are provided in Appendix B. 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. A soil boring map, soil boring logs and geotechnical laboratory data for soil samples collected are provided in Appendix C. 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. Supporting sheetpile design calculations that informed the design are provided in Appendix D.

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. Project permits specifically relevant to the Off-site Area work are provided in Appendix E.

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.

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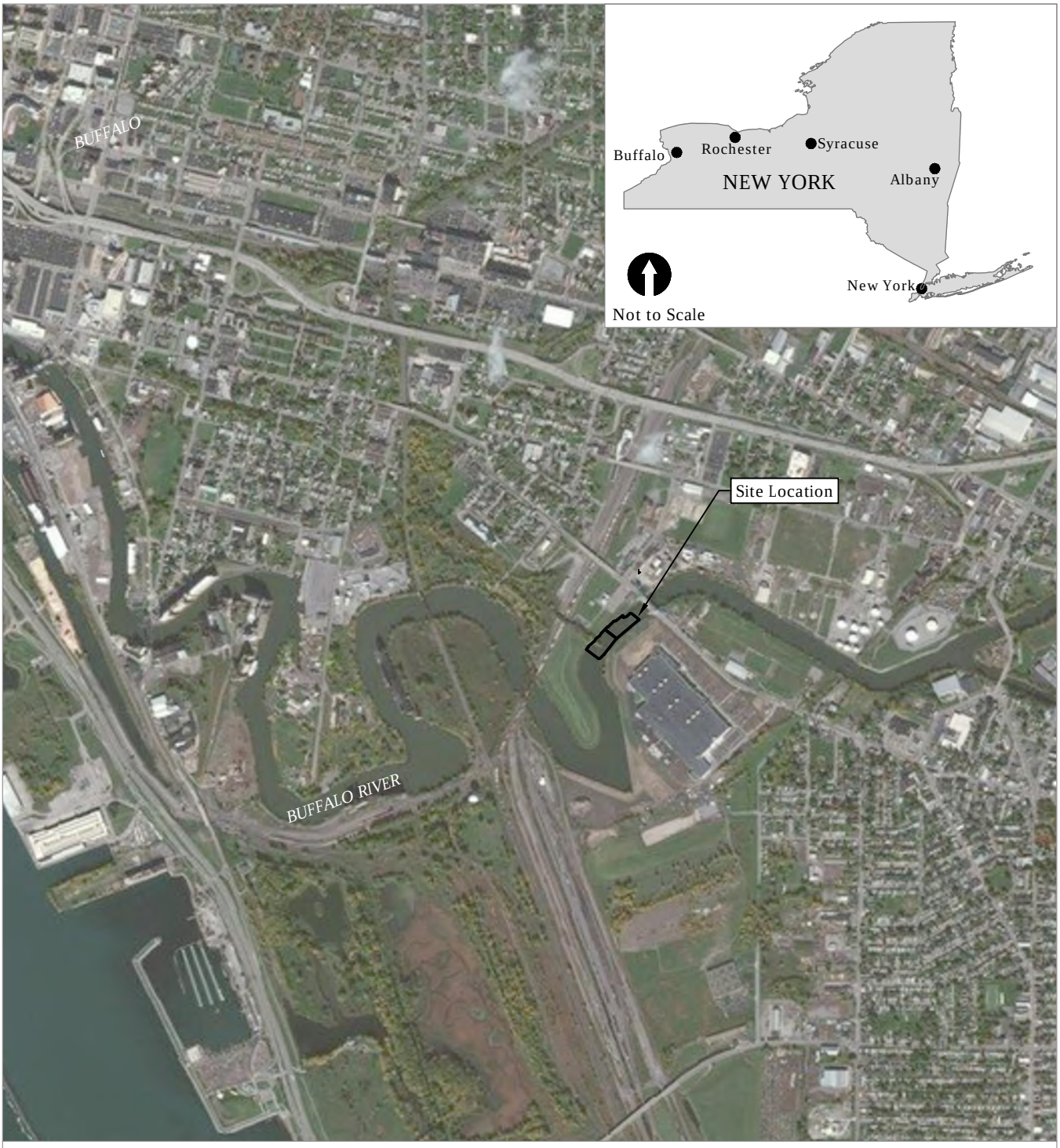
Figures



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

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Feet

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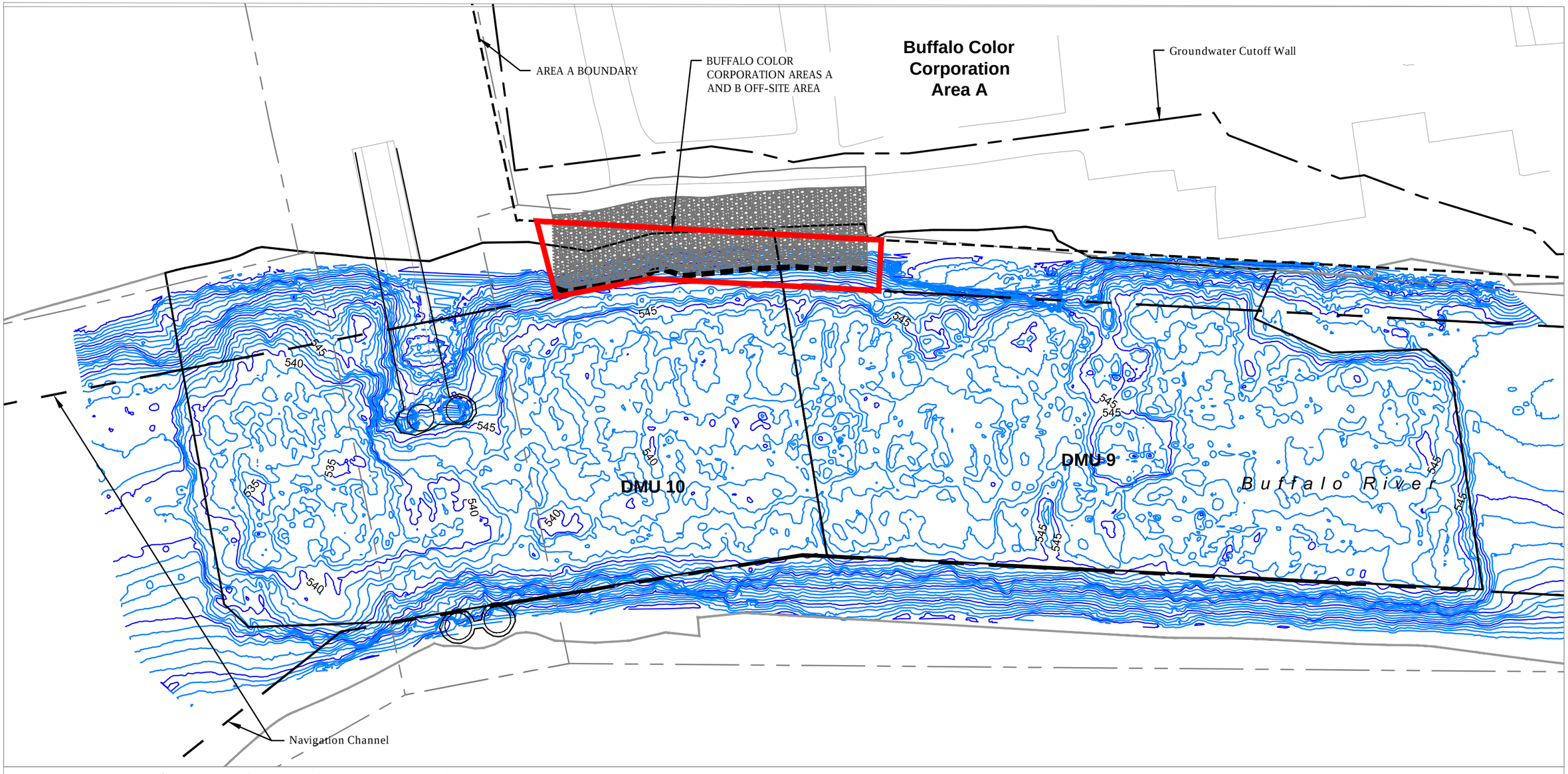
Filepath: K:\Projects\0287-Honeywell International Inc\Buffalo River Site Strategy & Eng Sup\0287-RP-073 (Site Location Map).dwg Site Location

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

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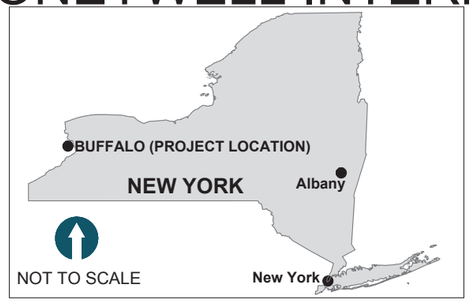
Figure **2**
Site **Overview** Map
Buffalo Color Corporation Areas A and B Off-Site Area
Buffalo, New York

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
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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
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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
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19	D-10	SECTIONS - DMU 6a CROSS SECTIONS 1 AND 2
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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
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29	D-20	SECTIONS - DMU 17 AND DMU 19 CROSS SECTION 21
30	D-21	SECTIONS - DMU 18 CROSS SECTION 22
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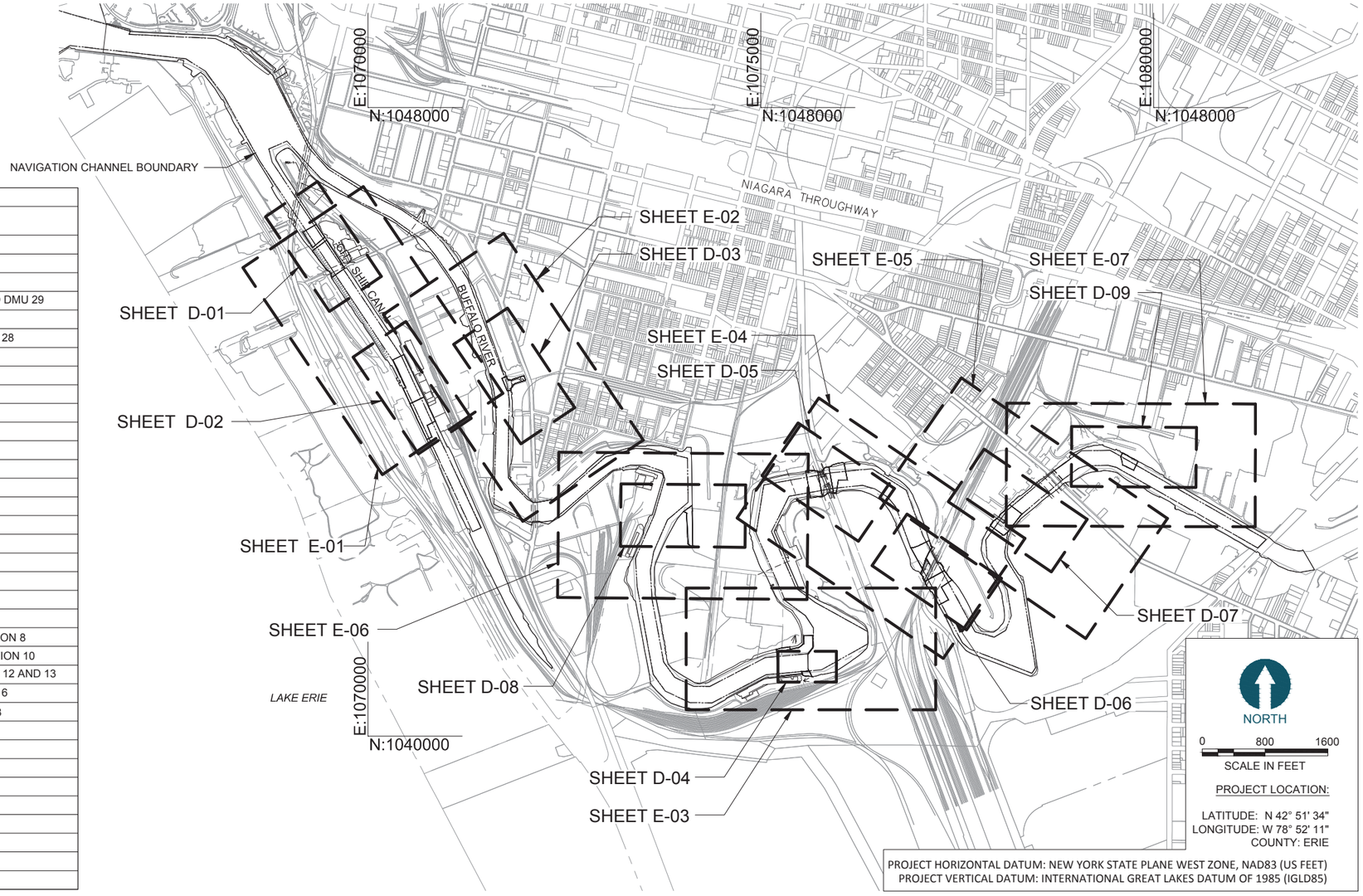
32	D-23	SECTIONS - DMU 8b CROSS SECTIONS 24 AND 25
33	D-24	TYPICAL COVER SECTIONS
34	S-01	SHEET PILE DESIGN DETAILS PLAN
35	S-02	SHEET PILE DESIGN DETAILS



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

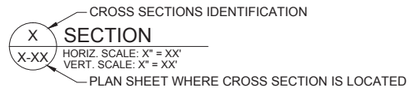
T-01

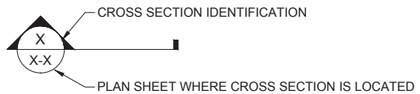
SHEET NO. 1 OF 35

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

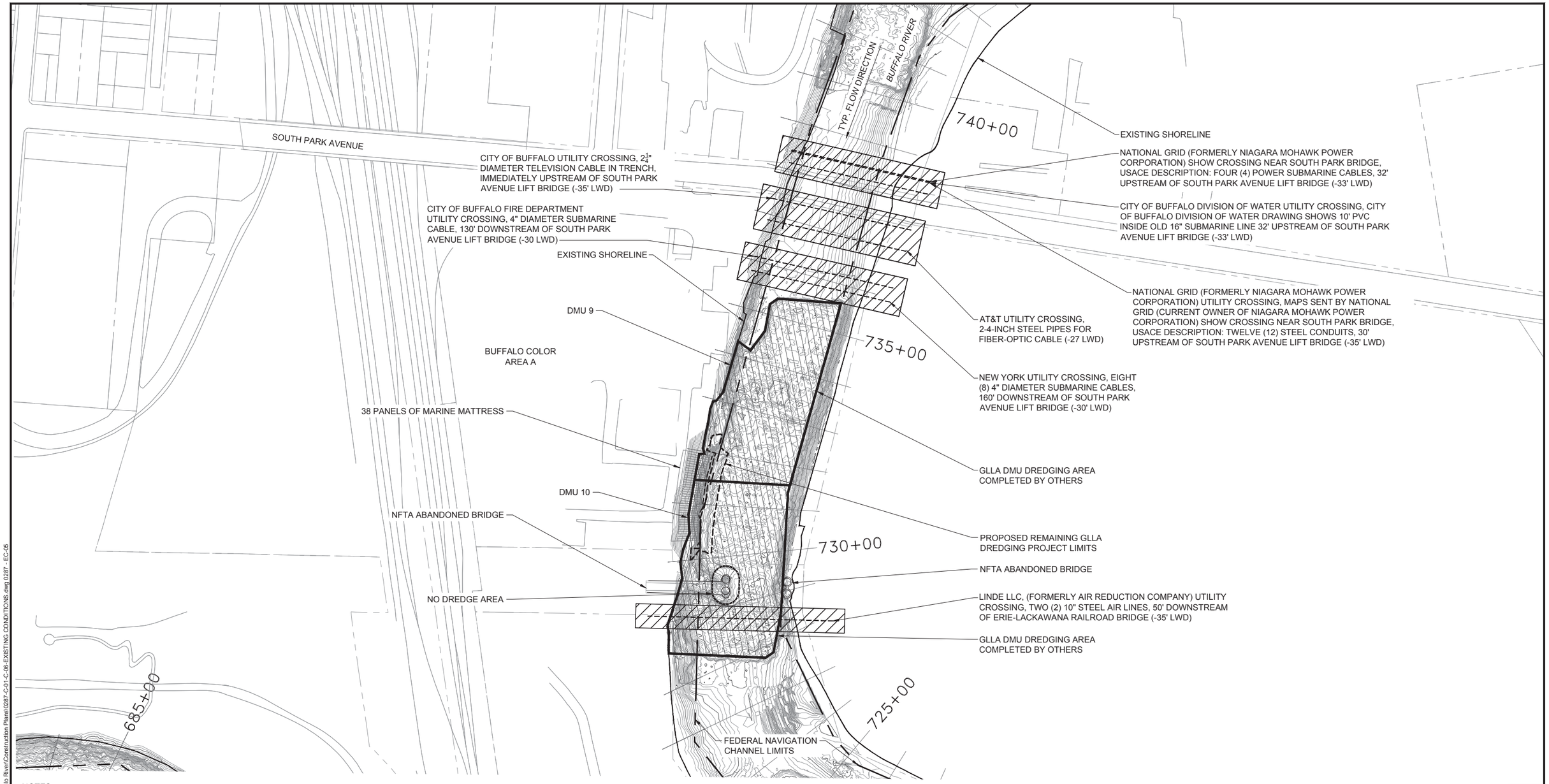
DESIGNED BY: S. BAGNULL
DRAWN BY: B. HURRY
CHECKED BY: M. REEMTS
APPROVED BY: R. MOHAN
SCALE: AS NOTED
DATE: NOVEMBER 6, 2015

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

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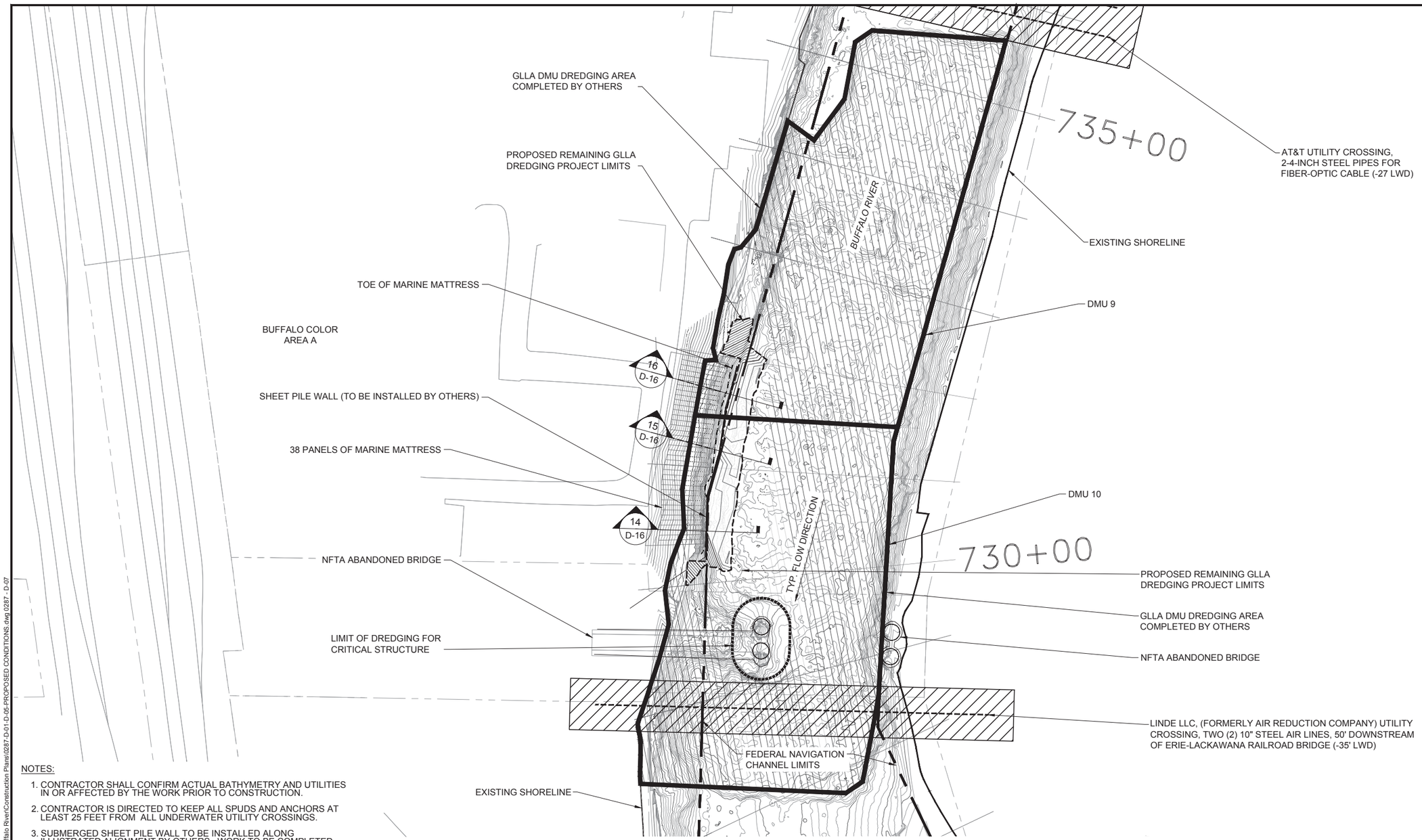

NOTES:

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

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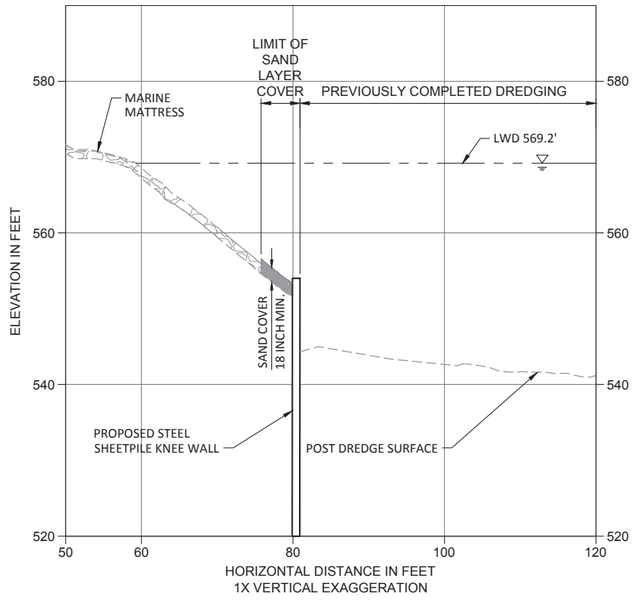

14a / D-16 DETAIL - DMU 9 AND 10 COVER

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

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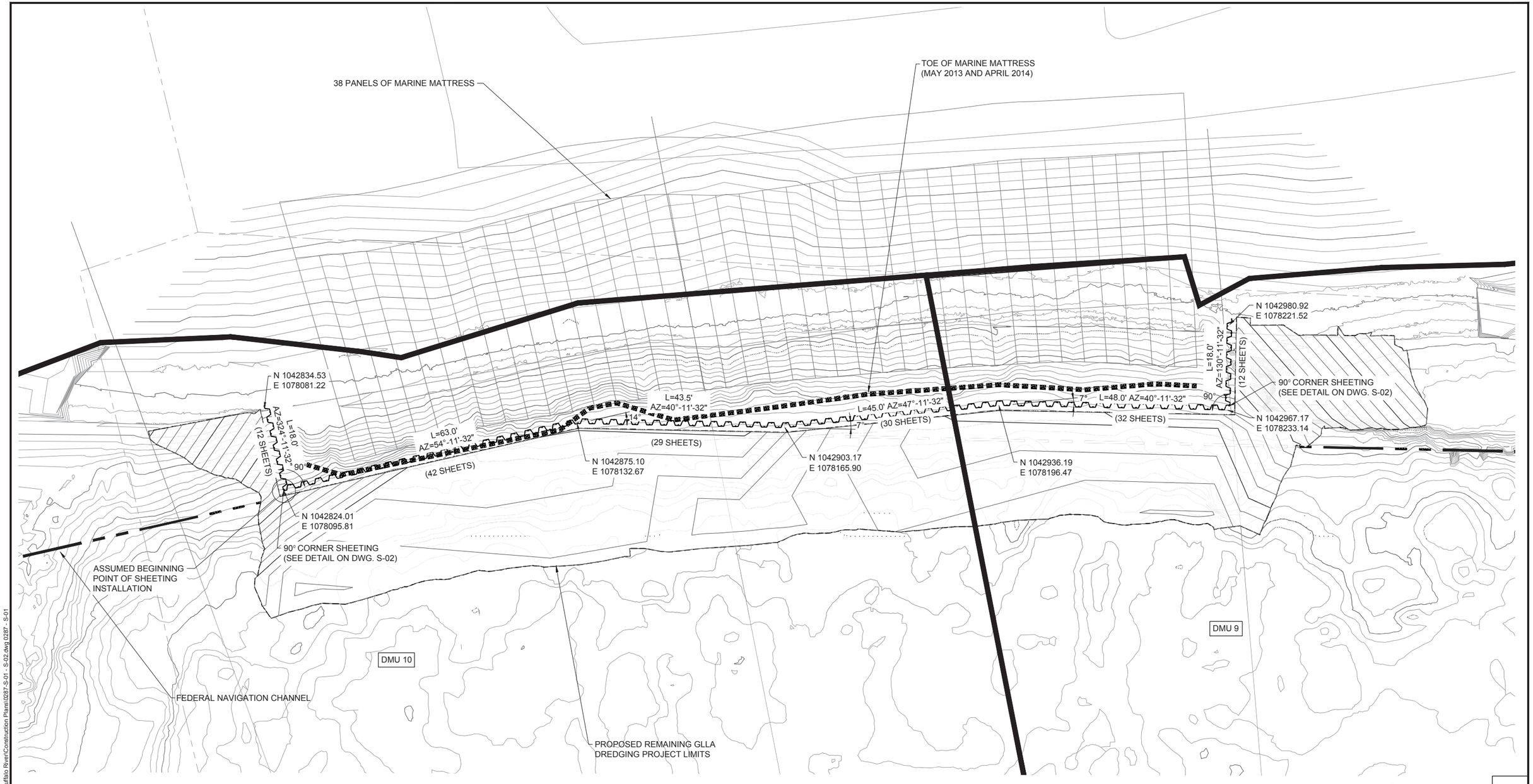

SOURCE: Basemap from CH2MHill. Bathymetry from CH2MHill (2012), USACE (2013), Ocean Surveys, Inc. (2014) and Aquatic Sciences (2013, 2014)
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum of 1985 (IGLD85).

NORTH

0 10 20
SCALE IN FEET

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

BARTON & LOGUIDICE, D.P.C.
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 PLAN

S-01

SHEET NO. 34 OF 35

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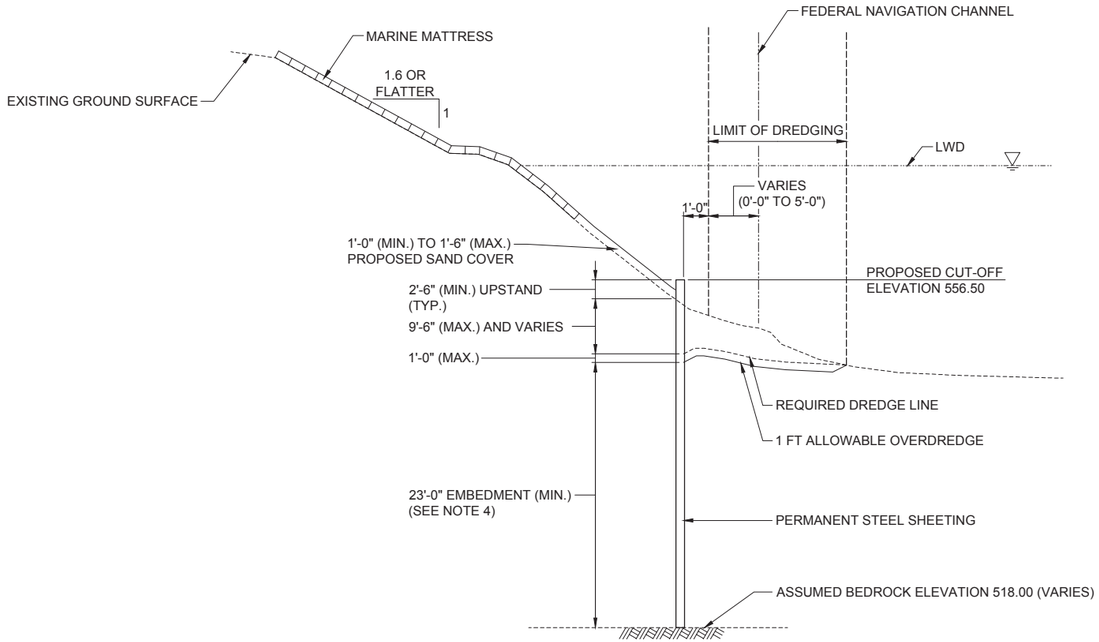
Nov 06, 2015 4:51pm bhurry

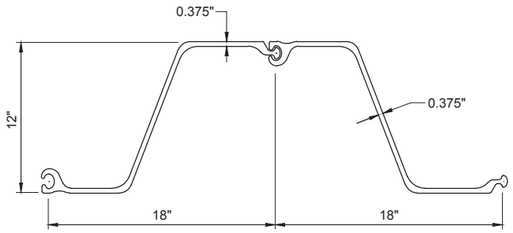


PERMANENT STEEL SHEETING SECTION

NOT TO SCALE

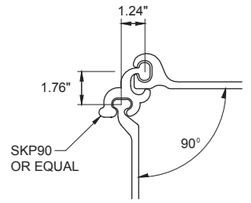
NOTES:

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

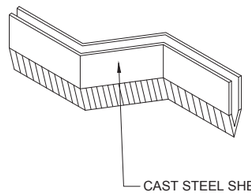
NOT TO SCALE



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

Appendix B
Slope Stability Analysis

ANCHOR QEA

720 Olive Way, Suite 1900
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131
www.anchorqea.com

MEMORANDUM

To:	William Hague, John Morris, and Richard Galloway, Honeywell International	**Date:**	September 30, 2013
From:	John Laplante, Mark Reemts, and Ram Mohan, Anchor QEA, LLC	**Project:**	110287-11.01
Re:	Updated Slope Stability Evaluation – Former Buffalo Color Site, Buffalo, NY Proposed Remedial Dredging Scenarios Near Area A – Marine Mattress		

INTRODUCTION

This memorandum presents updated results of slope stability evaluations and recommendations in support of proposed remedial dredge designs adjacent to the former Buffalo Color Site. The area in question is located within the Buffalo River Area A at Dredge Management Units (DMUs) 9 and 10, adjacent to the shoreline slope and marine mattress. The objective of this memorandum is to evaluate various best management practices (BMPs) near the toe of the marine mattress area so that BMPs can be implemented in the field by the contractor to try to minimize potential slope stability issues during and after dredging.

Slope stability was previously evaluated at DMUs 9 and 10 to assess the draft remedial dredge design for this area. The results of the analyses and recommendations were provided in a memorandum on March 20, 2012 (Anchor QEA 2012). Since performing the initial evaluations in 2012, additional data have been provided to Anchor QEA for purposes of refining the slope stability model. The additional data included the following:

- Post-dredge surveys performed by the United States Army Corps of Engineers (USACE) following maintenance dredging in April 2013
- Data from three soil borings performed in July, 2013 by Nothnagle Drilling, Inc., along the shoreline within DMU 9 and DMU 10
- Diver-assisted surveys of the marine mattress toe performed in May 2013

Previous analysis indicated that the existing slope in this area has a factor of safety that is lower than target factors of safety provided in engineering design guidance documents. The previously proposed dredge design resulted in a lower factor of safety (near 1.0), indicating

potential slope movement that could compromise the upland soil-bentonite slurry wall and/or result in loss of material into the river during or following dredging. Methods of backfill or shoring to reduce the impacts of the removal of dredged material are limited in the area due to the close proximity of the federal navigation channel, which ranges in distance from 2 to 3 feet to at most 15 feet away from the toe of the marine mattress. Efforts to stabilize the slope through added material would result in material placement within the navigation channel footprint and in some cases within the authorized depth; therefore, mitigation measures were considered by Anchor QEA, and several options were evaluated and presented as possible solutions.

Although the recently provided additional data have allowed for a more refined slope stability analyses, our conclusions regarding the shoreline stability during and after remedial dredging have not fundamentally changed, for the most part. Updates to the slope stability model, analytical results, and conclusions are discussed in the following sections.

UPDATES TO THE SLOPE STABILITY MODEL

Recent topographic and bathymetric surveys performed by Niagara Boundary and Mapping Services in April 2013 in support of shoreline restoration work planned along Area A were used to update the existing mudline adjacent to the marine mattress. Using available data, a cross section was developed through the marine mattress and shoreline slope at the steepest point along the shoreline, and where the proposed dredge limits have the closest approach to the marine mattress. The geology of this cross section was then modeled, and the stability at this location was evaluated using Rocscience SLIDE version 6.024 software. The location and extent of the cross section considered is shown on Figure 1.

A series of recent borings were performed by Nothnagle Drilling, Inc., for BIDCO Marine Group, Inc., to support the Buffalo Color shoreline restoration. Three of these borings adjacent and waterward of the marine mattress (i.e., BH-09, BH-10, and BH-11) were utilized, which allowed for a more accurate model of the clay thickness and depth to bedrock to be used in the updated stability analysis. Based on this new information, the clay layer is demonstrated to be thicker than was anticipated from previously available data.

Additionally, mapping of the marine mattress toe was performed in May 2013, which revealed that the overall footprint of the marine mattress extends much further into the river

than previously documented. The geologic model, therefore, was updated to include this recently provided as-built information from the diver-assisted survey of the marine mattress. The location of the borings and survey results of the marine mattress toe are shown on Figure 1.

Previous analyses assumed an extreme low-water event of 565 feet (IGLD 85). The river surface water elevation has been reassessed and assumed to be consistent with the Lake Erie low-water datum of 569.2 feet (IGLD 85).

ANALYSES AND RESULTS

The existing shoreline adjacent to DMUs 9 and 10 has a lower factor of safety than values recommended in engineering design guidance documents, regardless of whether future dredging is performed or not; however, the marine mattress slopes appear to be stable under existing conditions based on visual observations, as well as reports from on-site personnel. Removal action with dredging initiating at the marine mattress toe and extending vertically downward to the proposed dredge elevation is modeled to have a factor of safety of approximately 1.0. Although theoretically stable, the results do not guarantee that that the slope is safe from some deformations or distortion. The potential for slope movements are most prevalent and are theoretically most likely to occur if a vertical cut were to be made at the toe of the slope. Because of this low factor of safety, alternative dredge offsets and slopes adjacent to the marine mattress were evaluated using the updated slope stability model.

Note that offsets and slopes were selected based on similar approaches elsewhere in the remedial dredge prism design and typical stable slopes for soft sediments. Offsets included both 5-foot and 15-foot offsets from the toe of the mattress, and slopes included vertical cuts 1 horizontal to 1 vertical [1H:1V], 2H:1V, and 3H:1V. Current dredge prism design for the rest of the remedial project incorporates offsets of 5 feet from existing structures and natural shorelines. Existing design also incorporates 1H:1V slopes adjacent to natural shorelines as well as 2H:1V slopes adjacent to city-owned critical structures. In addition, 3H:1V slopes were incorporated as typical soft sediment stable slopes for evaluation during design. Evaluated scenarios for alternative dredge prisms and associated factor of safety are presented in Table 1.

Table 1
Slope Stability Modeling Results

Scenario	Removal Action	Estimated Factor of Safety
Existing	Existing Condition (Post-USACE Maintenance Dredging)	1.15
Baseline	Vertical Slope Cut at Marine Mattress Toe to Proposed Dredge Prism	1.06
Alternative 1	Vertical Slope Cut with 5-foot Offset from Marine Mattress Toe	1.07
Alternative 2	Vertical Slope Cut with 15-foot Offset from Marine Mattress Toe	1.09
Alternative 3	1H:1V Slope with 5-foot Offset from Marine Mattress Toe	1.09
Alternative 4	2H:1V Slope with 5-foot Offset from Marine Mattress Toe	1.10
Alternative 5	3H:1V Slope with 5-foot Offset from Marine Mattress Toe	1.13

Note:
H:V = ratio of horizontal distance (H) to vertical distance (V) along a slope

The results presented above demonstrate that all of the dredge scenarios considered result in a factor of safety that is less than a typical design target value of 1.3 to 1.5. The potential failure planes modeled represent deep-seated, global slope movement. In addition to these deep-seated surfaces, shallower failures that daylight below the marine mattress toe but above the initiation of remedial dredging are also possible.

The factor of safety is slightly higher when horizontal offsets and flatter cut slopes are used. For a 5-foot horizontal offset from the toe of the marine mattress, and using a dredge cut slope of 3H:1V, the resulting factor of safety is similar to that of the existing slope, indicating that the dredging action for this alternative only has a minor influence on the overall slope stability when compared to existing conditions.

CONCLUSIONS

Stability of the shoreline for a post-dredge scenario utilizing a vertical cut is predicted to be at risk of slope movements along the marine mattress area, and to potentially affect the soil-bentonite slurry wall. Slightly higher factors of safety of the slope are predicted when 2H:1V and 3H:1V sloped cuts are utilized with a 5-foot offset; however, these factors of safety are still well below engineering design guidance targets. None of the modeled scenarios achieve a factor of safety of 1.3 or higher, which is normally recommended by engineering design guidance documents. Analyses indicate that a dredge prism utilizing a vertical slope cut initiating at the marine mattress toe has the highest potential for slope movement. An alternate dredge design using a 5-foot offset and a 3H:1V slope would result in a factor of

safety that is similar to that of the existing slope, indicating that the dredging action for this alternative has only a minor influence on the overall slope stability when compared to existing conditions.

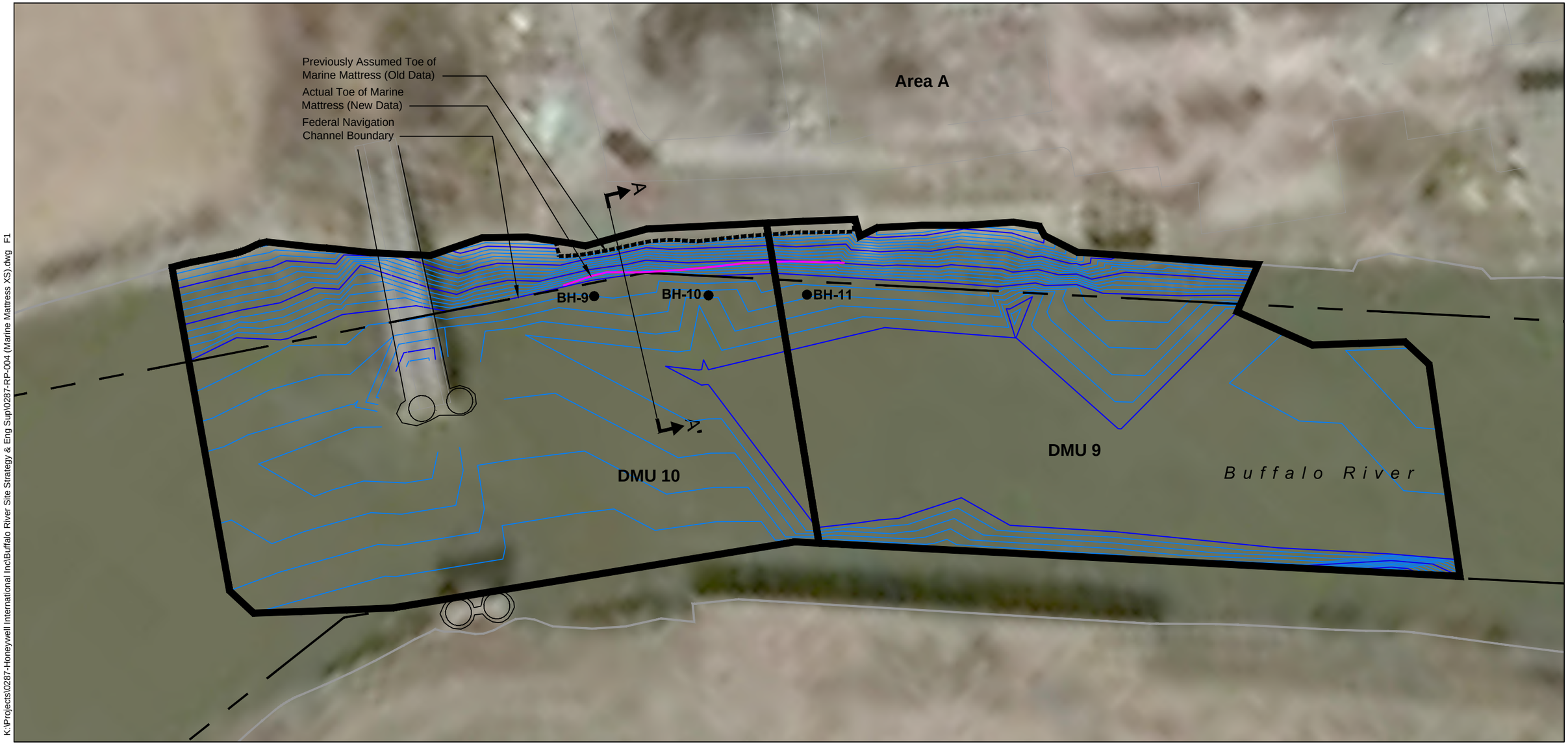
One BMP for marginally stable conditions is to conduct dredging in small areas at the toe of the slope, sequentially cutting "slots" along the toe and backfilling before cutting an adjacent slot. Sequencing the dredging in such a manner (the slot-cut approach) would allow for a more controlled dredging process and would provide the opportunity for adaptive management during construction whereby the length of the slot could be decreased if unstable conditions occurred. The tradeoff of the slot-cut approach is that when cutting the adjacent slot, equipment tolerance would dictate that some of the clean backfill material would also need to be removed so that full excavation of the target material could be ensured. In addition, placement of backfill to improve slope stability in this area would necessitate receiving USACE approval to add fill adjacent to, and in some cases, within the federal navigation channel footprint. Although the slot-cut approach could potentially reduce the risk of slope movements, the post-dredge factor of safety under that approach would also be similar to that of the existing condition.

Note that as part of the design phase evaluation of critical structures, the property owner, South Buffalo Development, LLC, has signed a liability waiver releasing Honeywell, U.S. Environmental Protection Agency, USACE, and their agents/consultants from future liability related to slope stability issues that could potentially result from dredging activities. Based on the limited options available, it appears that the 5-foot toe offset and 3H:1V dredge prism slope, with close monitoring to track slope movement, is the BMP most suited to this area of the river.

REFERENCES

Anchor QEA. "Slope Stability Evaluation: Proposed Dredge Scenarios for Area A and Area D." Technical Memorandum, December, 2011.

Anchor QEA. "Updated Slope Stability Evaluation: Proposed Dredging Scenario Area A – Marine Mattress." Technical Memorandum, March, 2012.



K:\Projects\0287-Honeywell International Inc\Buffalo River Site Strategy & Eng Sup\0287-RP-004 (Marine Mattress XS).dwg F1

Sep 30, 2013 9:15am chewett

SOURCE: Basemap and bathymetry prepared from CH2MHILL drawings, titled 'Existing Conditions' and 'Dredging Operations'.
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: North American Vertical Datum 1988 (NAVD88).

LEGEND:

- Proposed Dredging Contours (1' and 5')
- Actual Toe of Marine Mattress (New Data)
- Previously Assumed Toe of Marine Mattress (Old Data)
- Navigation Channel
- DMU Boundary
- Naturally-sloped Shoreline
- Borehole Location
- A A' Slope Stability Cross Section

0 100
Scale in Feet

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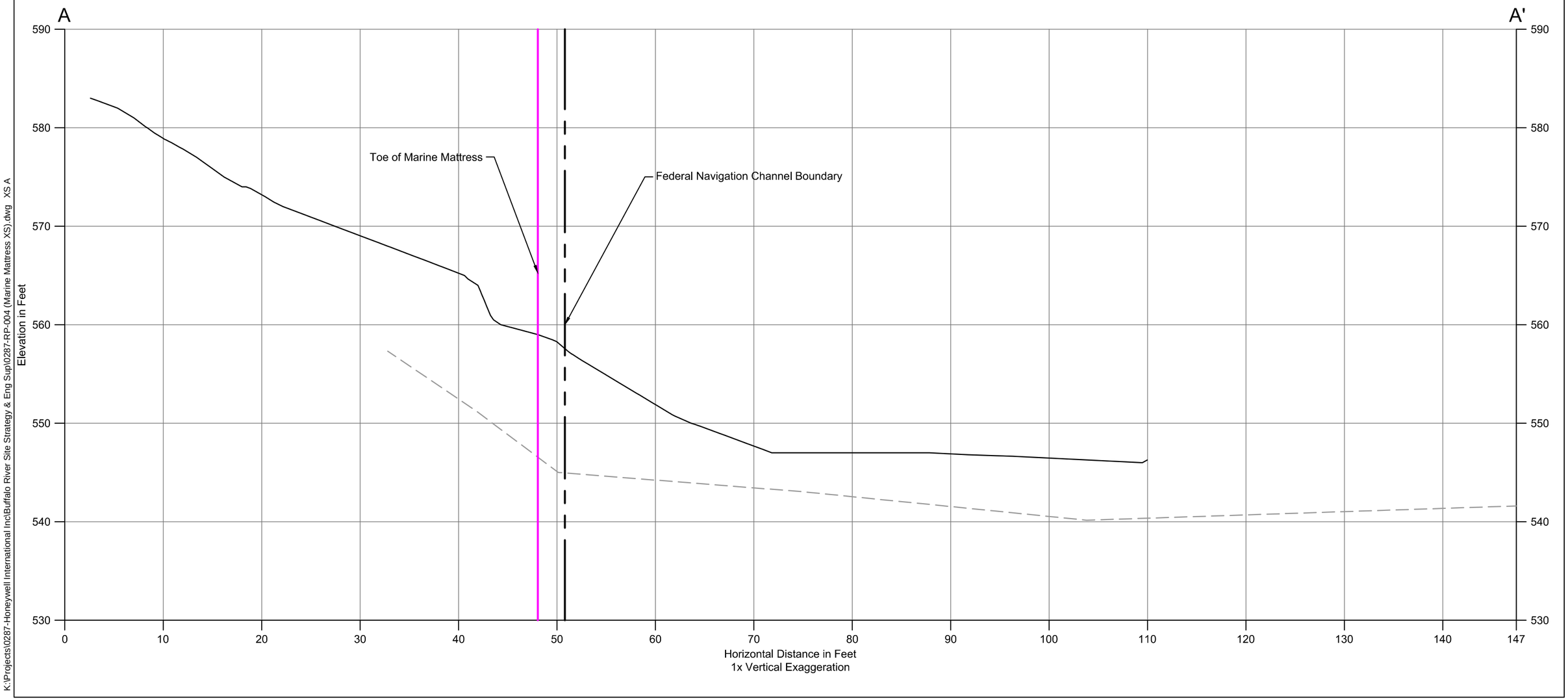
Figure 1
Marine Mattress Overview
Updated Slope Stability Evaluation
Former Buffalo Color Site



K:\Projects\0287-Honeywell International Inc\Buffalo River Site Strategy & Eng Sup\0287-RP-004 (Marine Mattress XS).dwg XS A

Sep 30, 2013 9:15am chewett

SOURCE: Basemap and bathymetry prepared from CH2MHILL drawings, titled 'Existing Conditions' and 'Dredging Operations'.
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.
VERTICAL DATUM: North American Vertical Datum 1988 (NAVD88).

LEGEND:

- Proposed Dredge Prism
- Existing Mudline (April 2013)
- Navigation Channel
- Toe of Marine Mattress

0 10
Scale in Feet

ANCHOR QEA

Figure 2
Marine Mattress Cross Section A-A'
Updated Slope Stability Evaluation
Former Buffalo Color Site

ANCHOR QEA

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MEMORANDUM

To:	William Hague, John Morris, and Richard Galloway, Honeywell	**Date:**	October 30, 2013
From:	John Laplante and Zac Koehn, Anchor QEA	**Project:**	110287-11.01
Cc:	Ram Mohan and Mark Reemts, Anchor QEA		
Re:	Clarification of Anchor QEA Slope Stability Evaluation Former Buffalo Color Site Buffalo River Dredging Project		

This memorandum was prepared to clarify the conclusions presented in our September 30, 2013 memoranda regarding slope stability evaluations performed to evaluate effects of dredging adjacent to the Former Buffalo Color Site as part of the Buffalo River Remediation project. Through a recent Buffalo River Management call, Anchor QEA became aware that on October 18, 2013, NYSDEC contacted the property owner along DMU's 9 and 10, South Buffalo Development (SBD). We understand that NYSDEC expressed concern to SBD over the long term stability of the existing marine mattress on a portion of SBD's shoreline based on NYSDEC's interpretation of Anchor QEA's September 30th Buffalo River Dredging analysis.

INTERPRETATION OF OUR PREVIOUS EVALUATIONS

Anchor QEA's work was, and continues to be, in support of the Buffalo River Cleanup and Restoration project, and it should be noted that the soil strength data used in the September 30, 2013 analysis was conservative in its approach with regard to calculating a Factor of Safety. It seems like the misinterpretation of our work has resulted in incorrect conclusions about the site by NYSDEC. Specifically, our work *has not* shown the existing slopes to be unstable in the area of DMU 9 and DMU 10 at the former Buffalo Color site. As discussed in our previous memoranda, there have been no observations or visual indications of slope instability in the marine mattress adjacent to DMU 9 or DMU 10. Furthermore, our work was conducted solely to evaluate the short- and long-term effects of potential dredging at the toe of the slope. Specifically, we did not conduct slope stability evaluations for upland development scenarios at the former Buffalo Color site. It is a mischaracterization to use our previous slope stability evaluations beyond the specific intent for which they were conducted.

Our memoranda included references to target factors of safety. Anchor QEA's reference to the target factor of safety guideline of 1.3 to 1.5 should have noted that these values are a frame of reference that is typically associated with *new construction,* and not to existing slopes. In our experience, it is common for shoreline slopes to have existing factors of safety that are below the target factors of safety that we provided in our memoranda, and still be stable.

GLOBAL STABILITY SENSITIVITY EVALUATION

Based on our previous stability evaluations, the global stability of the slope is controlled by the subsurface native clay unit that was encountered in borings around the site. The in situ shear strength of the native clay unit was measured using the vane shear test (VST) at 16 locations, including 3 tests conducted within explorations near the mattress. Our slope stability model assumed that the shear strength of the clay could be conservatively assumed as the average of the 3 VST measurements made in the borings near the marine mattress, and corrected for clay plasticity in accordance with standard geotechnical engineering practices.

There are many ways to evaluate the shear strength of a geologic unit, particularly when multiple in situ measurements have been made in that unit. The shear strength of soil is dependent on many factors, including the "stress history" of the soil, the current (i.e. in situ) stresses acting on the soil, and the rate of shearing if the soil were to be loaded beyond its peak strength. Because soil can behave both elastically (soil will rebound after loading) and plastically (soil deformations are permanent after loading), there can be many interpretations of the appropriate strength to use when modeling a soil unit. Common methods of evaluating soil test data are to consider mean values, median values, lower-bound values and upper-bound values. Other factors such as data density, variability in test results, and the potential consequence of failure are also important to consider. In all cases, engineering judgment is required to select an appropriate soil strength assumption for a given situation.

To evaluate the sensitivity of our model for a variety of strength assumptions, we considered a subset of test results for soils located near the marine mattress, as well as the full suite of test results from the clay unit across the former Buffalo Color site. Table 1 summarizes our original assumptions and factor of safety (i.e. the "baseline" case), which relied on the subset of data closest to the marine mattress, as well as the alternate methods of modeling the native

clay strength considering the full suite of test results, and the resulting factors of safety for these cases.

Table 1
Sensitivity Evaluation of Native Clay Strength

Case	Basis of Strength Assumption	Assumed Native Clay Undrained Shear Strength (psf)	Existing Slope Factor of Safety
Baseline	Average of 3 VST tests conducted along the shoreline near DMU 9 and DMU 10, corrected for plasticity[1]	680	1.15
Lower 1-third Strength All Data	Strength modeled using the 33rd percentile of all VST results	750	1.26
Mean Strength Shoreline Data	Strength modeled using average of all shoreline boring VST results	850	1.41
Median Strength All Data	Strength modeled using the mid-point of all VST results	875	1.44
Mean Strength All Data	Strength modeled using average of all VST results	950	1.55
Upper 1-third Strength All Data	Strength modeled using the 67th percentile of all VST results	1025	1.66

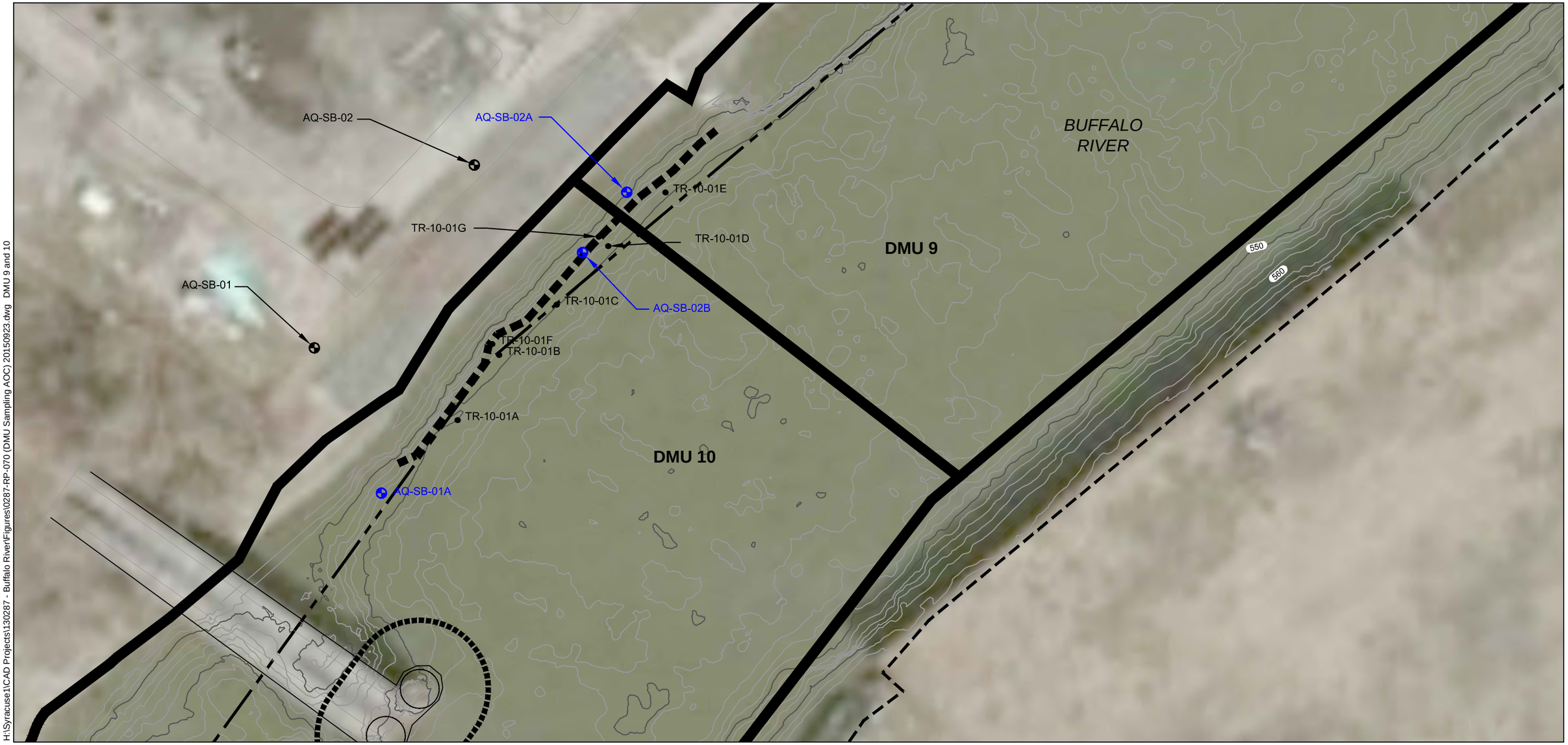
Notes

1. VST correction factor for plasticity = 0.95, based on Bjerrum (1973), "*Problems of Soil Mechanics and Construction on Soft Clays and Structurally Unstable Soils*", Proceedings, 8th International Conference on Soil Mechanics and Foundation Engineering, Springer, New York.

As presented in the above table, depending on the specific strength assumption employed, higher factors of safety are obtained. These factors of safety range confirm the physical observations along the Marine Mattress areas of the former Buffalo Color site, which does indicate a stable slope. However, for the purposes of evaluation of effects of any future activities that might influence the riverside toe of the slope, it is characteristic to use a conservative, lower end strength assumption, to account for construction variations that might occur during implementation of an in-water project. Therefore, for the purposes of evaluating the effects of dredging near the toe of the structure, the more conservative strength assumptions should be employed.

We appreciate the opportunity to provide this clarification to our earlier memorandum. Please contact us if you have any questions or require further clarification.

Appendix C
Soil Boring Logs and Geotechnical Laboratory Data



H:\Syracuse1\CAD Projects\130287 - Buffalo River\Figures\0287-RP-070 (DMU Sampling AOC) 20150923.dwg DMU 9 and 10

Sep 24, 2015 8:48am bhurry

SOURCE: Aerial from ESRI. Basemap from CH2MHill. Bathymetry from USACE, dated September-December 2014.
HORIZONTAL DATUM: New York State Plane West, NAD83, U.S. Feet.

LEGEND:

- Navigation Channel
- DMU Limits
- Shoreline
- Existing Contours, 2' and 10'
- Boundary of No Dredge Area
- Toe of Marine Mattress (May 2013 and April 2014)
- Actual Sediment Probing Location
- Actual Upland Boring Location
- Actual Over-water Boring Location

0 90
Scale in Feet

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Figure 1
Subsurface Exploration Locations - DMUs 9 and 10
Buffalo River AOC

Soil Boring Log

AQ-SB-01

Project: **Buffalo River AOC**	Location: **Buffalo, NY**	Method: **Wash Rotary**
Project #: **E50287-03.01**	N/LAT: **1078061.599** E/LONG: **1042878.313**	Total Depth (ft): **67.0**
Client: **Honeywell International**	Horiz. Datum: **New York State Plane West, NAD1983, US Survey Feet**	Observed GW (bgs): **N/A**
Collection Date: **5/19/15-5/20/15**	Vert. Datum: **IGLD 85**	Ground Surface Elevation (ft): **584.5**
Contractor: **Atlantic Testing Laboratories**	Sampler(s): **2 inch O.D. Split - Spoon** **3 inch O.D. Shelby Tube (Piston Sampler)**	Hammer: **Auto Hammer - 140lbs w/ 30-inch drop**
Logged By: **Chad Robinson**		Hammer Efficiency: **NA**

Depth (ft)	Samples	Uncorrected Standard Penetration Resistance (blows per foot) and Water Content (%) 0 10 20 30 40 50	Values Greater than 50	Soil Description Samples and descriptions are in recovered depths. Classification scheme: USCS	Lab Test	Elevation (ft)
0	S-1	▲		TOPSOIL: Very stiff, dry, light brown, sandy clayey TOPSOIL (approx. 2 - inches).		580
	S-2	▲		FILL (SM): Loose, damp, reddish dark brown to black, silty, fine to medium SAND (FILL), some gravel, occasional brick, concrete, and glass fragments, no odor.		
5	S-3	▲				
	S-4	▲				
	S-5	▲				575
10	S-6	▲				
	S-7	▲		Becomes medium dense, moist, with very slight hydrocarbon odor @12.0ft.		570
15						
	S-8	▲		Becomes wet.		565
20						
	S-9	▲				560
25						
	S-10	▲				
30	ST-11	●		Silty CLAY (CL): Very soft to medium stiff, moist, brownish gray, silty CLAY, trace fine sand, medium plasticity, no odor.	MC, SG, AL, UUTX	555
35	S-12	▲ ●	W.O.H.	Vane Shear Test @35ft. Peak - 1328 psf, Remold - 516 psf.	MC	550
	S-13	▲ ●	W.O.R.		MC	
40						545
	S-14	▲ ●			MC	
45	ST-15	●			MC, SG, AL, CUTX	540
	S-16	▲ ●	W.O.H.	Vane Shear Test @47ft. Peak - 1224 psf, Remold - 664 psf.	MC	
50						535

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▲ SPT N-Value
● Water Content (%)

Notes:
1. Soil descriptions and stratum lines are interpretive and actual conditions may vary.
2. Groundwater level was observed at the time and date specified.
3. W.O.H. = Weight of Hammer; W.O.R. = Weight of Rods; GS = Grain Size Analysis; AL = Atterberg Limits; SG = Specific Gravity; CUTX = Consolidated-Undrained Tri-Axial.

Soil Boring Log

AQ-SB-01

Project: **Buffalo River AOC**	Location: **Buffalo, NY**	Method: **Wash Rotary**
Project #: **E50287-03.01**	N/LAT: **1078061.599** E/LONG: **1042878.313**	Total Depth (ft): **67.0**
Client: **Honeywell International**	Horiz. Datum: **New York State Plane West, NAD1983, US Survey Feet**	Observed GW (bgs): **N/A**
Collection Date: **5/19/15-5/20/15**	Vert. Datum: **IGLD 85**	Ground Surface Elevation (ft): **584.5**
Contractor: **Atlantic Testing Laboratories**	Sampler(s): **2 inch O.D. Split - Spoon** **3 inch O.D. Shelby Tube (Piston Sampler)**	Hammer: **Auto Hammer - 140lbs w/ 30-inch drop**
Logged By: **Chad Robinson**		Hammer Efficiency: **NA**

Depth (ft)	Samples	Uncorrected Standard Penetration Resistance (blows per foot) and Water Content (%) 0 10 20 30 40 50	Values Greater than 50	Soil Description Samples and descriptions are in recovered depths. Classification scheme: USCS	Lab Test	Elevation (ft)
50						530
55	S-17	▲ ●	W.O.R.	trace fine sand; transition to light gray. Driller noted possible cobble or boulder @56.5 to 57.0ft.	MC	525
60	S-18	▲ ●		trace well-rounded gravel; increasing sand content.	MC	520
65	S-19	● ▲		Silty SAND (SM): Medium dense, moist, gray, gravelly silty fine SAND to sandy SILT.	MC	515
70	S-20	▲	100/0.5"	Driller noted change in drilling (bedrock) @65.5ft., advance with roller bit to 67.0ft. BEDROCK: Poor recovery, broken rock fragments, possible limestone.		510
75				Bottom of Boring at 67.0ft below ground surface. Completed on 5/20/15.		505
80						500
85						495
90						490
95						485
100						

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△ SPT N-Value
● Water Content (%)

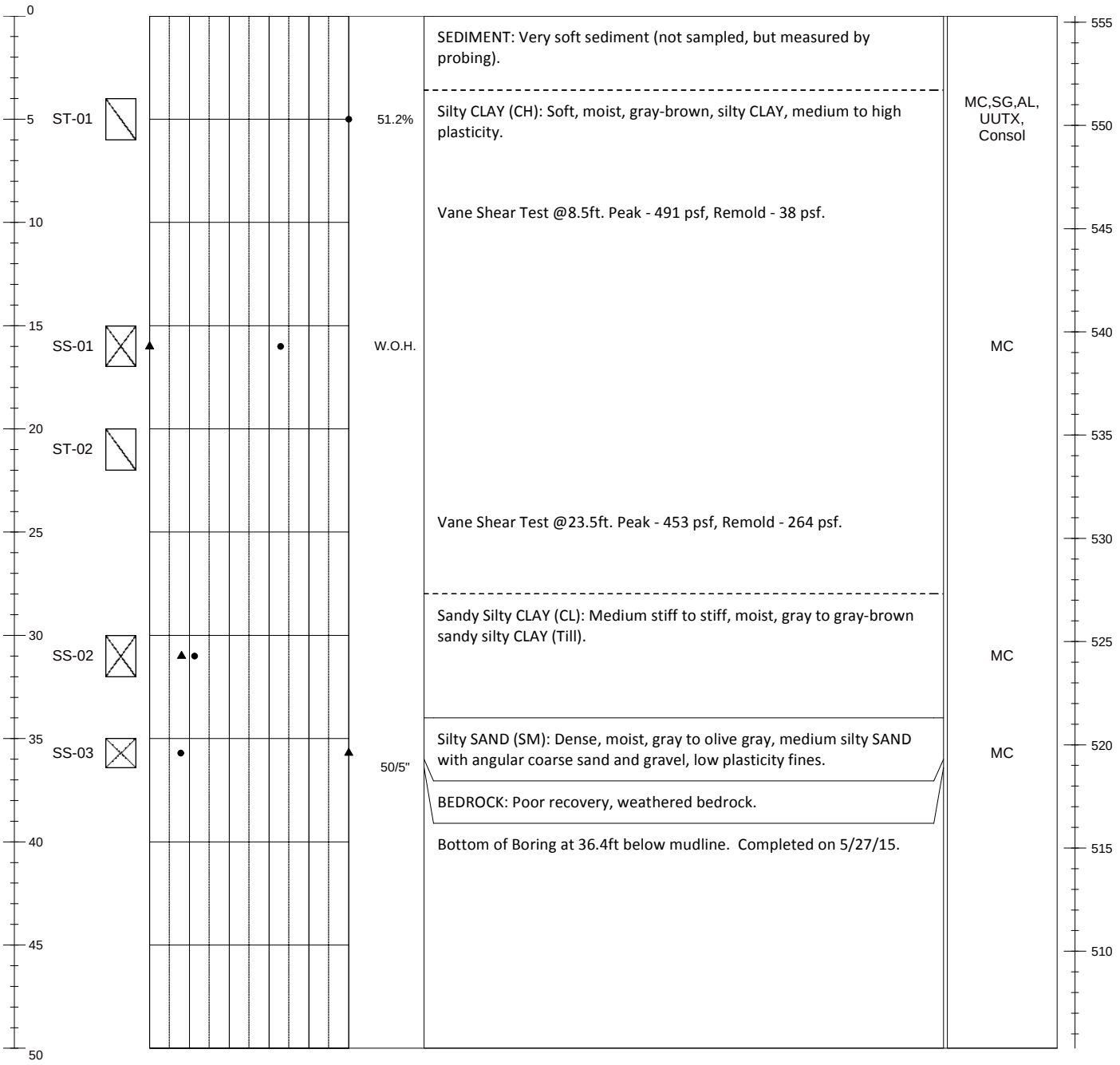
Notes:
1. Soil descriptions and stratum lines are interpretive and actual conditions may vary.
2. Groundwater level was observed at the time and date specified.
3. W.O.H. = Weight of Hammer; W.O.R. = Weight of Rods; GS = Grain Size Analysis; AL = Atterberg Limits; SG = Specific Gravity; CUTX = Consolidated-Undrained Tri-Axial.

Soil Boring Log

AQ-SB-01A

Sheet 1 of 1

Project: **Buffalo River AOC**	Location: **Buffalo, NY**	Method: **Wash Rotary**
Project #: **E50287-03.01**	N/LAT: **1078088.876** E/LONG: **1042819.286**	Total Depth (ft): **36.4**
Client: **Honeywell International**	Horiz. Datum: **New York State Plane West, NAD1983, US Survey Feet**	Water Depth (ATD): **16.3ft.**
Collection Date: **5/27/15**	Vert. Datum: **IGLD 85**	Ground Surface Elevation (ft): **555.3**
Contractor: **Atlantic Testing Laboratories**	Sampler(s): **2 inch O.D. Split - Spoon** **3 inch O.D. Shelby Tube (Piston Sampler)**	Hammer: **Auto Hammer - 140lbs w/30-inch drop**
Logged By: **Zac Koehn**		Hammer Efficiency: **NA**



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▲ SPT N-Value

● Water Content (%)

Notes:
1. Soil descriptions and stratum lines are interpretive and actual conditions may vary.
2. Groundwater level was observed at the time and date specified.
3. W.O.H. = Weight of Hammer; W.O.R. = Weight of Rods; GS = Grain Size Analysis; AL = Atterberg Limits; SG = Specific Gravity; CUTX = Consolidated-Undrained Tri-Axial.

Soil Boring Log

AQ-SB-02

Project: **Buffalo River AOC**	Location: **Buffalo, NY**	Method: **Wash Rotary**
Project #: **E50287-03.01**	N/LAT: **1078126.613** E/LONG: **1042952.62**	Total Depth (ft): **66.0**
Client: **Honeywell International**	Horiz. Datum: **New York State Plane West, NAD1983, US Survey Feet**	Observed GW (bgs): **N/A**
Collection Date: **5/20/15 - 5/21/15**	Vert. Datum: **IGLD 85**	Ground Surface Elevation (ft): **584.9**
Contractor: **Atlantic Testing Laboratories**	Sampler(s): **2 inch O.D. Split - Spoon** **3 inch O.D. Shelby Tube (Piston Sampler)**	Hammer: **Auto Hammer - 140lbs w/ 30-inch drop**
Logged By: **Chad Robinson**		Hammer Efficiency: **NA**

Depth (ft)	Samples	Uncorrected Standard Penetration Resistance (blows per foot) and Water Content (%) 0 10 20 30 40 50	Values Greater than 50	Soil Description Samples and descriptions are in recovered depths. Classification scheme: USCS	Lab Test	Elevation (ft)
0	S-1			TOPSOIL: Stiff, dry, light brown, silty clayey TOPSOIL (approx. 2-inches).		580
	S-2			Silty Sand (SM): Loose to medium dense, dry, dark brown to reddish brown, silty fine to medium SAND, occasional brick, concrete, and glass fragments, no odor (FILL).		
5	S-3					
	S-4					
	S-5			SAND/GRAVEL (SP/GC): Loose, dry to moist, reddish brown, interbedded medium SAND and clayey GRAVEL (FILL).		575
10						
	S-6					
15						570
	S-7			Silty SAND (SM): Medium dense, wet, black, silty gravelly, fine to medium SAND, cemented black pieces, no odor (FILL).		
20						565
	S-8					
25						560
	S-9					
30				Driller notes wash water return turns to dark gray @31.0ft.		555
	S-10		W.O.R.	Silty CLAY (CL): Very soft, moist, brownish gray, silty CLAY, medium plasticity.	MC	
35						550
	S-11		W.O.H.		MC	
40	ST-12			Mottled gray and brown from 39.0 to 40.0ft.	MC, SG, AL, UUTX	545
	S-13		W.O.R.	Vane Shear Test @43.0ft. Peak - 604 psf, Remold - 302 psf.	MC	
45						540
	S-14		W.O.H.		MC	
50						535

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△ SPT N-Value
● Water Content (%)

Notes:
1. Soil descriptions and stratum lines are interpretive and actual conditions may vary.
2. Groundwater level was observed at the time and date specified.
3. W.O.H. = Weight of Hammer; W.O.R. = Weight of Rods; GS = Grain Size Analysis; AL = Atterberg Limits; SG = Specific Gravity; CUTX = Consolidated-Undrained Tri-Axial.

Soil Boring Log

AQ-SB-02

Project: **Buffalo River AOC**	Location: **Buffalo, NY**	Method: **Wash Rotary**
Project #: **E50287-03.01**	N/LAT: **1078126.613** E/LONG: **1042952.62**	Total Depth (ft): **66.0**
Client: **Honeywell International**	Horiz. Datum: **New York State Plane West, NAD1983, US Survey Feet**	Observed GW (bgs): **N/A**
Collection Date: **5/20/15 - 5/21/15**	Vert. Datum: **IGLD 85**	Ground Surface Elevation (ft): **584.9**
Contractor: **Atlantic Testing Laboratories**	Sampler(s): **2 inch O.D. Split - Spoon** **3 inch O.D. Shelby Tube (Piston Sampler)**	Hammer: **Auto Hammer - 140lbs w/ 30-inch drop**
Logged By: **Chad Robinson**		Hammer Efficiency: **NA**

Depth (ft)	Samples	Uncorrected Standard Penetration Resistance (blows per foot) and Water Content (%) 0 10 20 30 40 50	Values Greater than 50	Soil Description Samples and descriptions are in recovered depths. Classification scheme: USCS	Lab Test	Elevation (ft)
50	ST-15			Silty CLAY (CL): Very soft, moist, brownish gray, silty CLAY, medium plasticity.		535
55	S-16	▲ ●	W.O.R.	Vane Shear Test @53.0ft. Peak - 944 psf, Remold - 310 psf. transitions to brown, silty CLAY with occasional gray silt lens and silt partings.	MC	530
60	S-17	▲ ●	W.O.R.		MC	525
65	S-18	● ▲		Silty Sandy CLAY (CL): Stiff, moist, gray, silty sandy CLAY, some fine semi angular gravel (Till).	MC	520
	S-19	▲	100/6"	Driller noted change in drilling (bedrock), advance with roller bit to 66.0ft. BEDROCK: Poor recovery, broken rock fragments, possible limestone.		
70				Bottom of Boring at 66.0ft below ground surface. Completed on 5/21/15.		515
75						510
80						505
85						500
90						495
95						490
100						485

ANCHOR QEA
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Seattle, WA 98101
206-287-9130

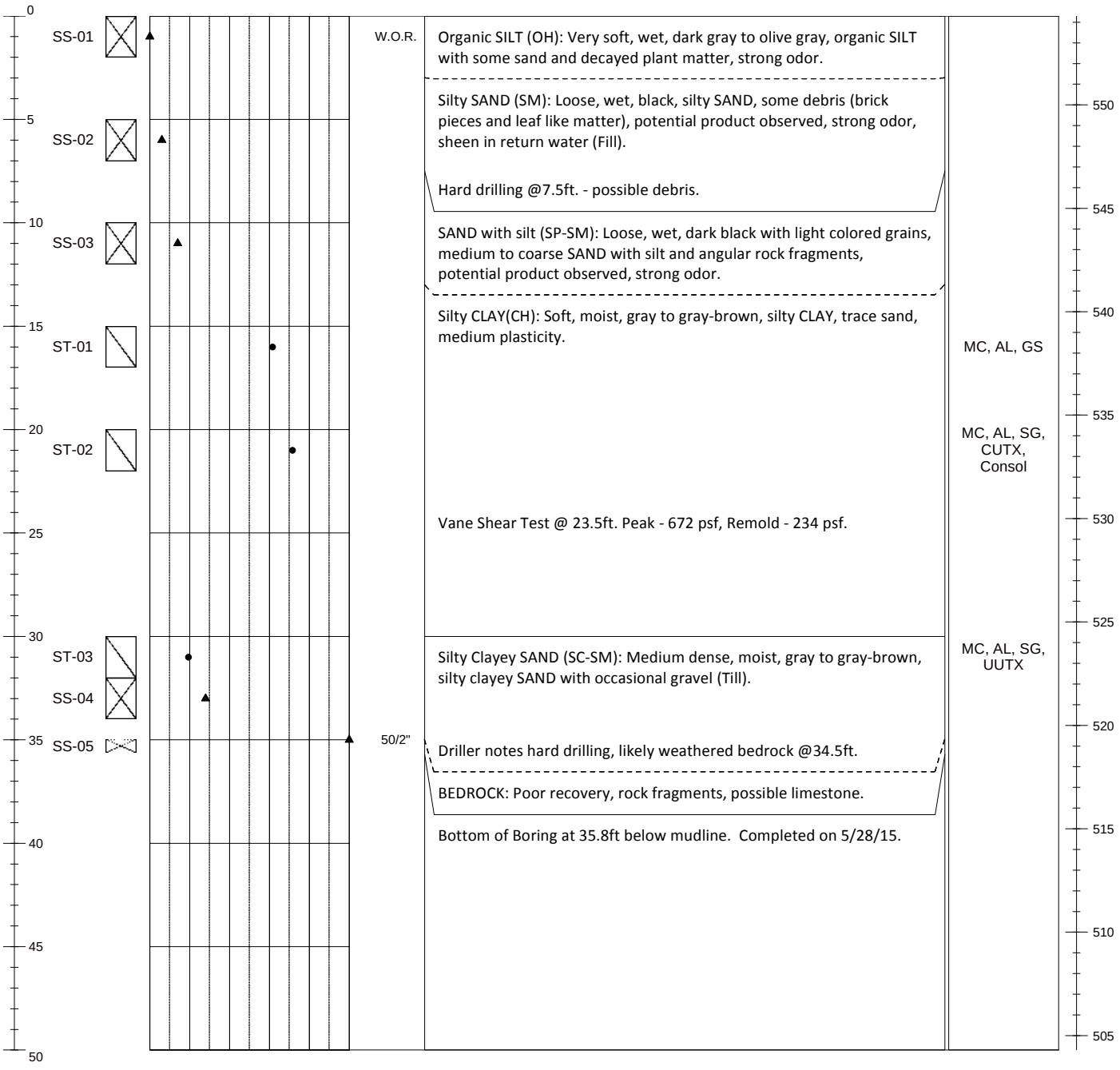
△ SPT N-Value
● Water Content (%)

Notes:
1. Soil descriptions and stratum lines are interpretive and actual conditions may vary.
2. Groundwater level was observed at the time and date specified.
3. W.O.H. = Weight of Hammer; W.O.R. = Weight of Rods; GS = Grain Size Analysis; AL = Atterberg Limits; SG = Specific Gravity; CUTX = Consolidated-Undrained Tri-Axial.

Soil Boring Log

AQ-SB-02A

Project: **Buffalo River AOC**	Location: **Buffalo, NY**	Method: **Wash Rotary**
Project #: **E50287-03.01**	N/LAT: **1078179.056** E/LONG: **1042939.751**	Total Depth (ft): **35.7**
Client: **Honeywell International**	Horiz. Datum: **New York State Plane West, NAD1983, US Survey Feet**	Water Depth (ATD): **17.5ft.**
Collection Date: **5/28/15**	Vert. Datum: **IGLD 85**	Ground Surface Elevation (ft): **554.3**
Contractor: **Atlantic Testing Laboratories**	Sampler(s): **2 inch O.D. Split - Spoon** **3 inch O.D. Shelby Tube (Piston Sampler)**	Hammer: **Auto Hammer - 140lbs w/30-inch drop**
Logged By: **Zac Koehn**		Hammer Efficiency: **NA**



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△ SPT N-Value

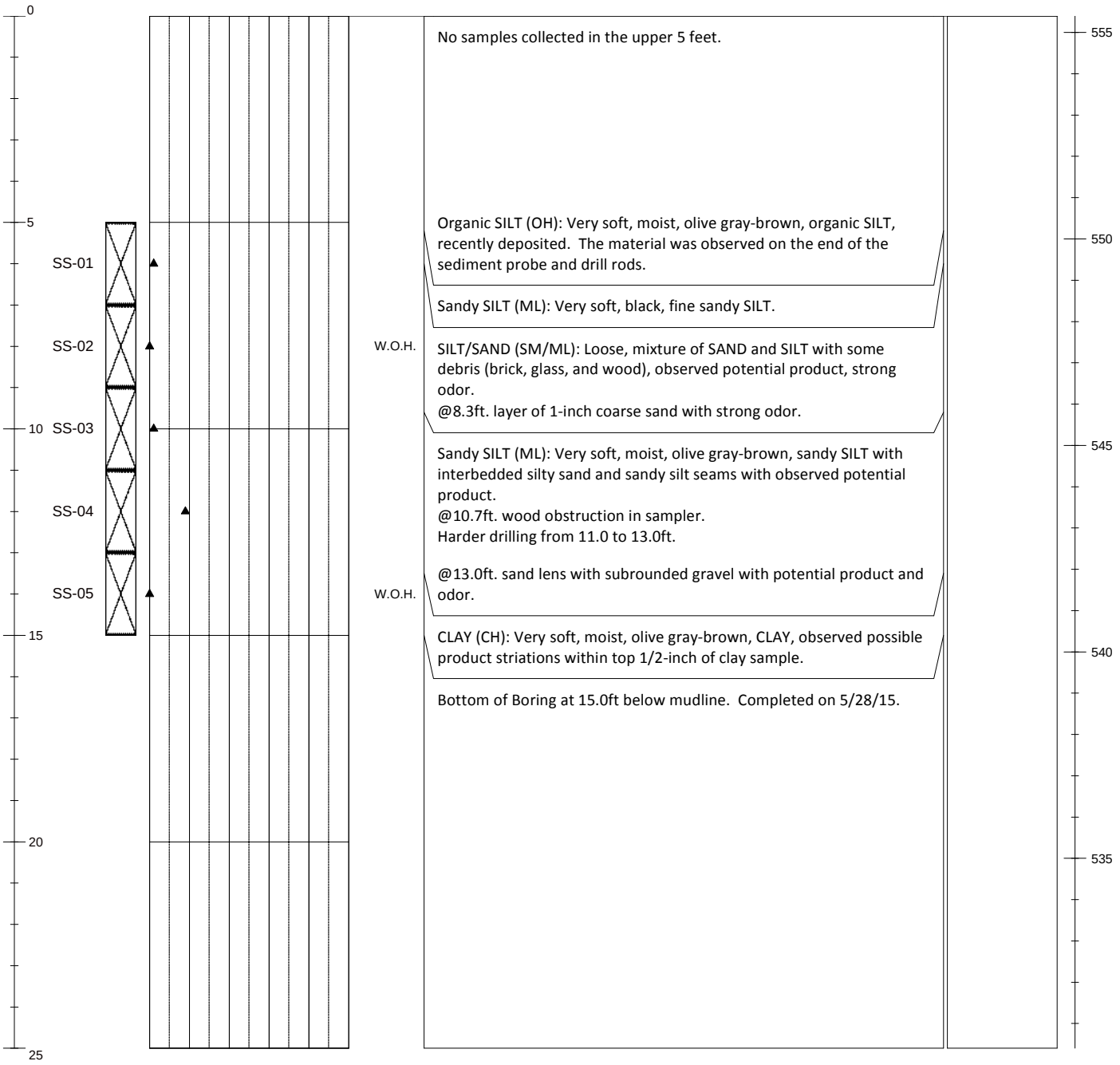
● Water Content (%)

Notes:
1. Soil descriptions and stratum lines are interpretive and actual conditions may vary.
2. Groundwater level was observed at the time and date specified.
3. W.O.H. = Weight of Hammer; W.O.R. = Weight of Rods; GS = Grain Size Analysis; AL = Atterberg Limits; SG = Specific Gravity; CUTX = Consolidated-Undrained Tri-Axial.

Soil Boring Log

AQ-SB-02B

Project: **Buffalo River AOC**	Location: **Buffalo, NY**	Method: **Wash Rotary**
Project #: **E50287-03.01**	N/LAT: **1078191.537** E/LONG: **1042937.594**	Total Depth (ft): **15.0**
Client: **Honeywell International**	Horiz. Datum: **New York State Plane West, NAD1983, US Survey Feet**	Water Depth (ATD): **16.4ft.**
Collection Date: **5/28/15**	Vert. Datum: **IGLD 85**	Ground Surface Elevation (ft): **555.4**
Contractor: **Atlantic Testing Laboratories**	Sampler(s): **2 inch O.D. Split - Spoon** **3 inch O.D. Shelby Tube (Piston Sampler)**	Hammer: **Auto Hammer - 140lbs w/30-inch drop**
Logged By: **Zac Koehn**		Hammer Efficiency: **NA**



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△ SPT N-Value
● Water Content (%)

Notes:
1. Soil descriptions and stratum lines are interpretive and actual conditions may vary.
2. Groundwater level was observed at the time and date specified.
3. W.O.H. = Weight of Hammer; W.O.R. = Weight of Rods; GS = Grain Size Analysis; AL = Atterberg Limits; SG = Specific Gravity; CUTX = Consolidated-Undrained Tri-Axial.

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	---	Sample Type:	---	Tested By:	jbr
Sample ID:	---	Test Date:	07/22/15	Checked By:	emm
Depth :	---	Test Id:	338338		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
AQ-SB-01	ST- 11	---	Moist, grayish brown clay	43.8
AQ-SB-01	S- 12	---	Moist, brown clay	42.2
AQ-SB-01	S- 13	---	Moist, brown clay	41.3
AQ-SB-01	S- 14	---	Moist, brown clay	32.9
AQ-SB-01	ST- 15	---	Moist, dark reddish gray clay	31.2
AQ-SB-01	S- 16	---	Moist, brown clay	24.5
AQ-SB-01	S- 17	---	Moist, brown clay	27.3
AQ-SB-01	S- 18	---	Moist, brown clayey sand	10.7
AQ-SB-01	S- 19	---	Moist, reddish yellow clayey gravel	5.3

Notes: Temperature of Drying : 110° Celsius

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	---	Sample Type:	---	Tested By:	jbr
Sample ID:	---	Test Date:	07/13/15	Checked By:	emm
Depth :	---	Test Id:	338128		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
AQ-SB-01A	ST- 01	---	Moist, reddish brown clay	51.2
AQ-SB-01A	SS- 01	---	Moist, brown clay	32.9
AQ-SB-01A	SS- 02	---	Moist, grayish brown sandy silt	11.3
AQ-SB-01A	SS- 03	---	Moist, grayish brown silt with gravel	7.8

Notes: Temperature of Drying : 110º Celsius

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	---	Sample Type:	---	Tested By:	jbr
Sample ID:	---	Test Date:	07/15/15	Checked By:	emm
Depth :	---	Test Id:	338346		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
AQ-SB-02	S- 10	---	Moist, brown silt	40.0
AQ-SB-02	S- 11	---	Moist, brown clay	34.4
AQ-SB-02	ST- 12	---	Moist, brown clay	29.6
AQ-SB-02	S- 13	---	Moist, brown silt	36.8
AQ-SB-02	S- 14	---	Moist, brown clay	32.6
AQ-SB-02	S- 16	---	Moist, brown silty clay	35.3
AQ-SB-02	S- 17	---	Moist, brown clay	20.6
AQ-SB-02	S- 18	---	Moist, grayish brown clay with sand	8.1

Notes: Temperature of Drying : 110° Celsius

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	---	Sample Type:	---	Tested By:	jbr
Sample ID:	---	Test Date:	07/15/15	Checked By:	emm
Depth :	---	Test Id:	338282		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
AQ-SB-02A	ST- 01	---	Moist, brown clay	30.8
AQ-SB-02A	ST- 02	---	Moist, brown clay	35.8
AQ-SB-02A	ST- 03	---	Moist, grayish brown silty, clayey sand with gravel	9.7
AQ-SB-04	SS- 02	---	Moist, brown clay	32.0
AQ-SB-04	SS- 03	---	Moist, light olive brown silty clay	11.5
AQ-SB-04	SS- 04	---	Moist, brown silt	12.1

Notes: Temperature of Drying : 110° Celsius

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	---	Sample Type:	---	Tested By:	jbr
Sample ID:	---	Test Date:	07/16/15	Checked By:	emm
Depth :	---	Test Id:	338300		

Amount of Material Passing #200 Sieve - ASTM D1140

Boring ID	Sample ID	Depth	Visual Description	Fines, %
AQ-SB-01A	SS-02	---	Moist, grayish brown sandy silt	56.0
AQ-SB-02A	ST-03	---	Moist, grayish brown silty, clayey sand with gravel	49.2
AQ-SB-07	ST-02	---	Moist, reddish gray clay	99.0
AQ-SB-07	SS-04	---	Moist, brown sandy clay	50.6
AQ-SB-10	SS-05	---	Moist, brown sandy silt	58.9

Notes: Tests performed using Method B - washing using a wetting agent
Dry mass of test specimen was determined directly

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	---	Sample Type:	---	Tested By:	jbr
Sample ID:	---	Test Date:	07/16/15	Checked By:	emm
Depth :	---	Test Id:	338142		

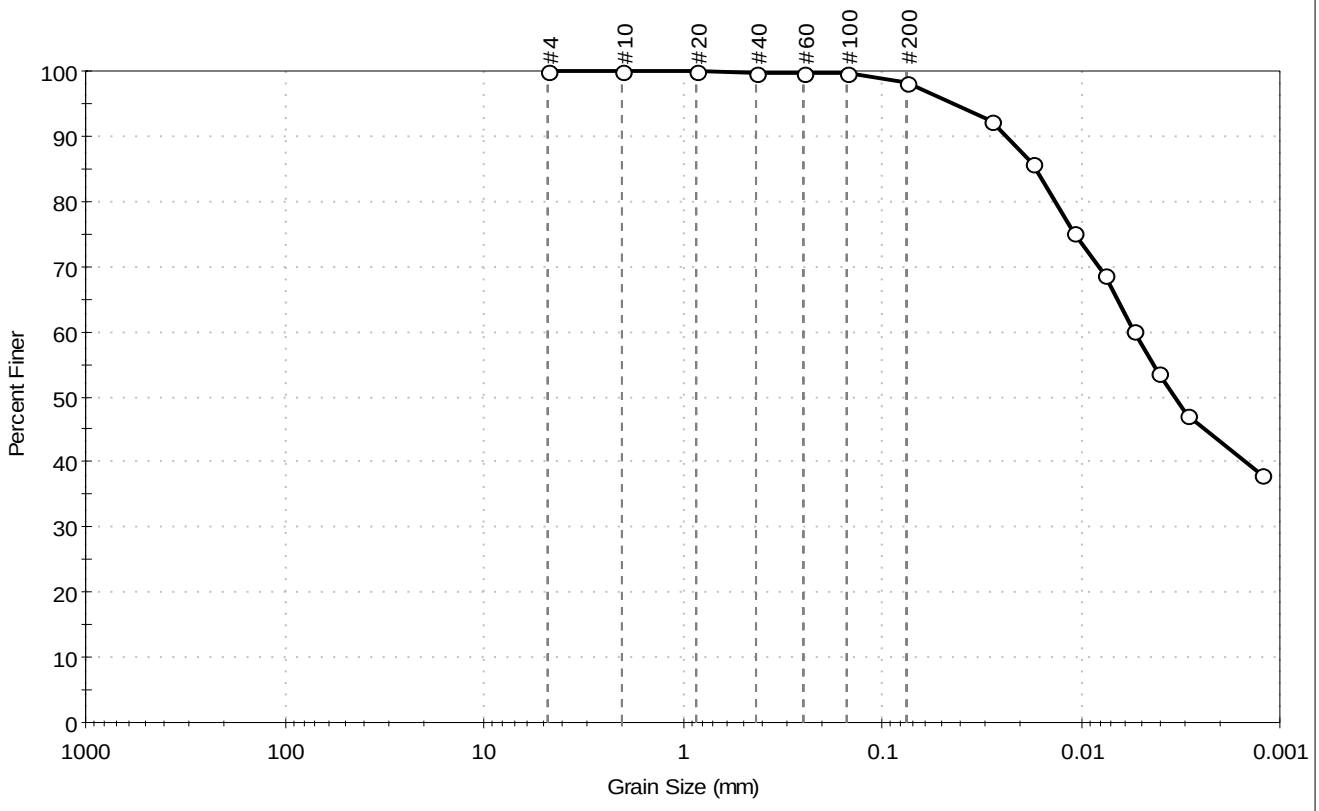
Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
AQ-SB-01	ST-11	---	Moist, grayish brown clay	2.72	
AQ-SB-01	ST-15	---	Moist, dark reddish gray clay	2.72	
AQ-SB-01A	ST-01	---	Moist, reddish brown clay	2.73	
AQ-SB-02	ST-12	---	Moist, brown clay	2.69	
AQ-SB-02A	ST-02	---	Moist, brown clay	2.72	
AQ-SB-02A	ST-03	---	Moist, grayish brown silty, clayey sand with gravel	2.73	
AQ-SB-07	ST-01	---	Moist, dark olive gray clay	2.75	
AQ-SB-07	ST-02	---	Moist, reddish gray clay	2.75	
AQ-SB-08	SS-03	---	Moist, very dark gray silt	2.59	
AQ-SB-08A	ST-02	---	Wet, dark gray clay	2.61	

Notes: Specific Gravity performed by using method A (moist specimens) of ASTM D854
Moisture Content determined by ASTM D2216.

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 02A	Sample Type:	tube	Tested By:	jbr
Sample ID:	ST-01	Test Date:	07/13/15	Checked By:	emm
Depth :	---	Test Id:	338136		
Test Comment:	---				
Visual Description:	Moist, brown clay				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



%Cobble	%Gravel	%Sand	%Silt & Clay Size
---	0.0	1.7	98.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	98		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0281	92		
---	0.0176	86		
---	0.0108	75		
---	0.0077	69		
---	0.0054	60		
---	0.0041	54		
---	0.0029	47		
---	0.0012	38		

Coefficients

D_{85} = 0.0169 mm D_{30} = N/A
D_{60} = 0.0054 mm D_{15} = N/A
D_{50} = 0.0034 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM Lean clay (CL)

AASHTO Clayey Soils (A-6 (17))

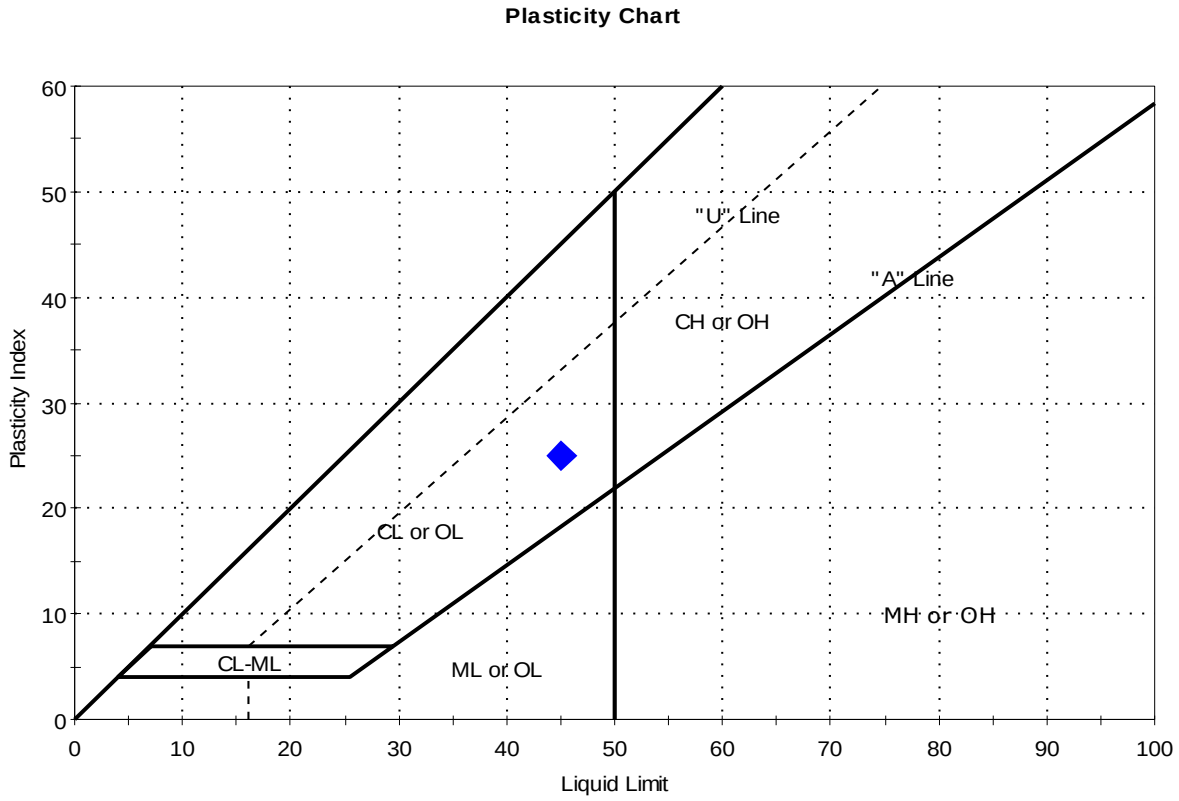
Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 01	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-11	Test Date:	07/22/15	Checked By:	emm
Depth :	---	Test Id:	338327		
Test Comment:	---				
Visual Description:	Moist, grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	ST-11	AQ-SB-01	---	44	45	20	25	1	

Sample Prepared using the WET method

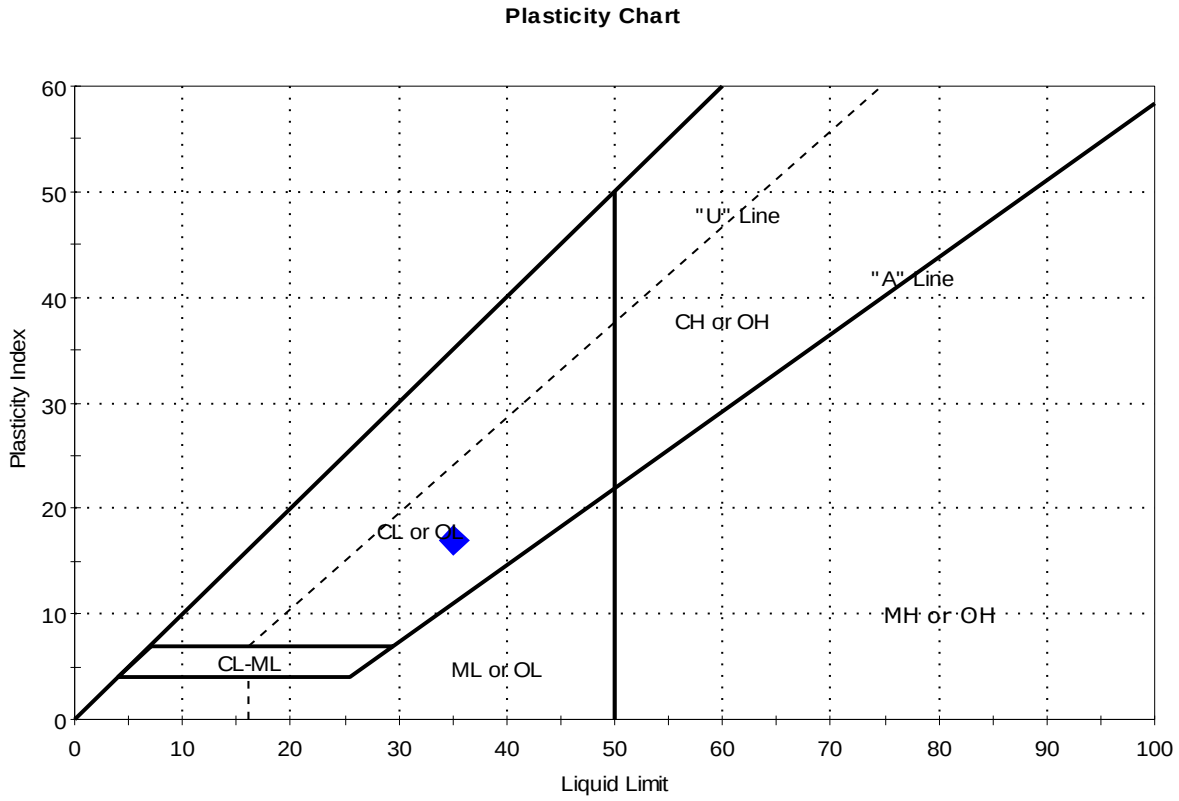
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 01	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-15	Test Date:	07/22/15	Checked By:	emm
Depth :	---	Test Id:	338328		
Test Comment:	---				
Visual Description:	Moist, dark reddish gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	ST-15	AQ-SB-01	---	31	35	18	17	0.8	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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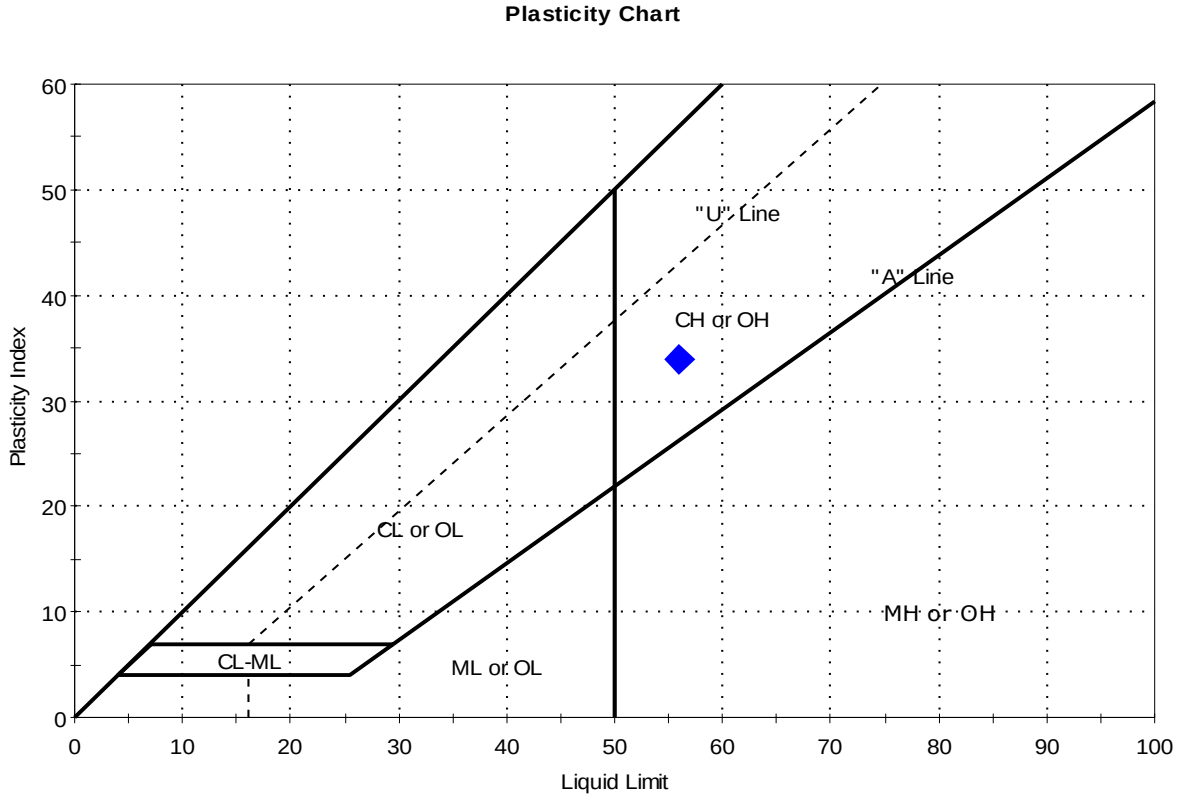
Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 01A	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-01	Test Date:	07/13/15	Checked By:	emm
Depth :	---	Test Id:	338119		
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	ST-01	AQ-SB-01A	---	51	56	22	34	0.9	

Sample Prepared using the WET method

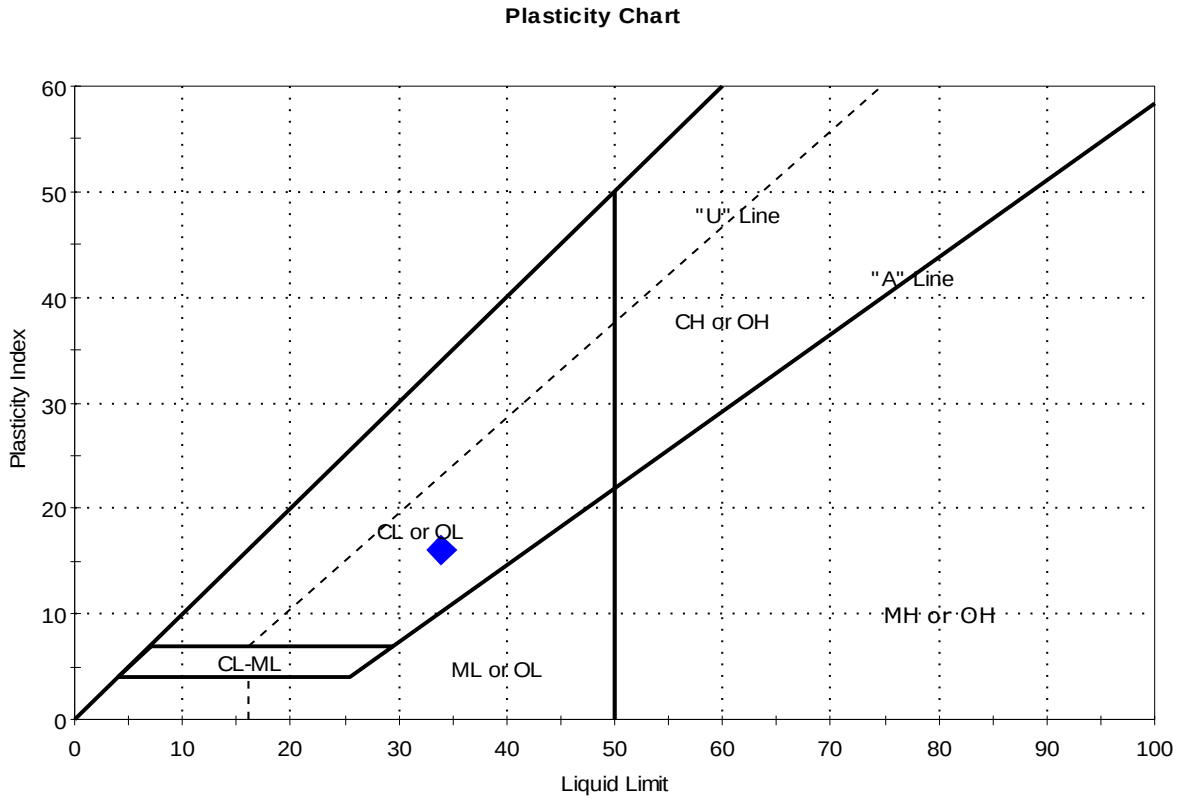
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 02	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-12	Test Date:	07/22/15	Checked By:	emm
Depth :	---	Test Id:	338329		
Test Comment:	---				
Visual Description:	Moist, brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	ST-12	AQ-SB-02	---	30	34	18	16	0.7	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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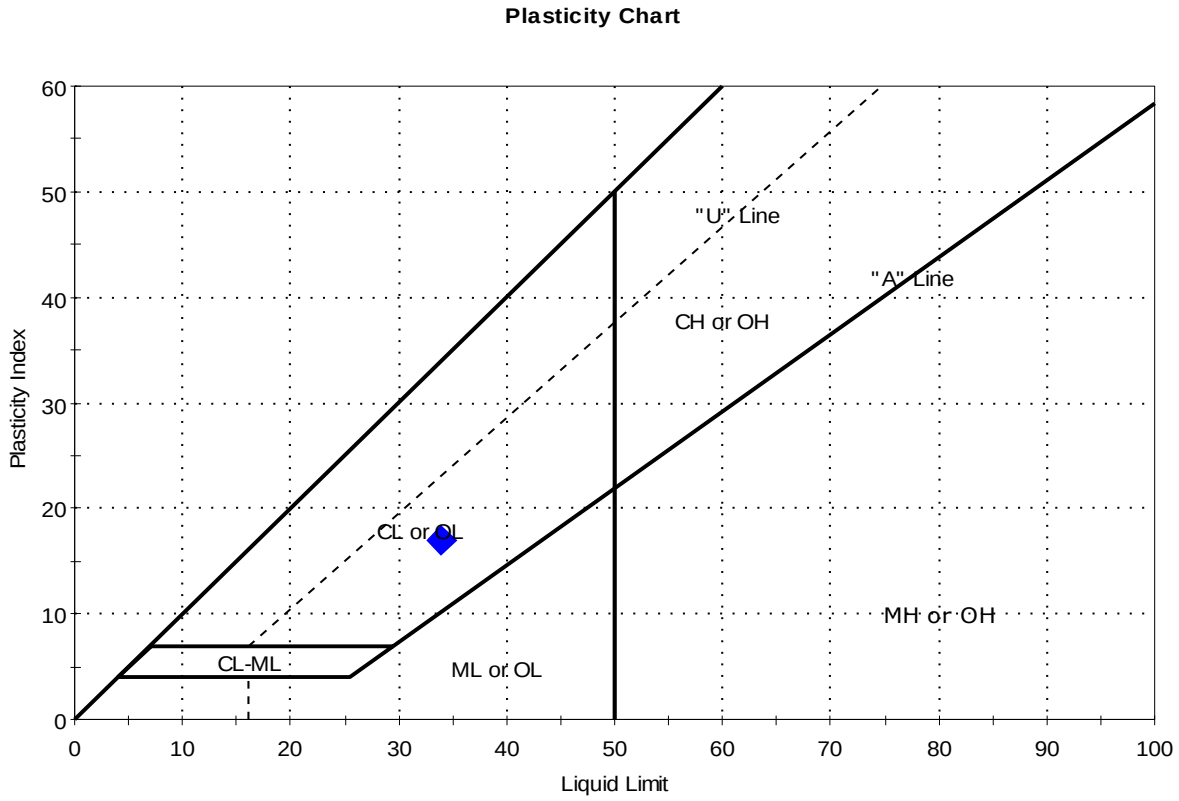
Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 02A	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-01	Test Date:	07/14/15	Checked By:	emm
Depth :	---	Test Id:	338120		
Test Comment:	---				
Visual Description:	Moist, brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	ST-01	AQ-SB-02A	---	31	34	17	17	0.8	Lean clay (CL)

Sample Prepared using the WET method
0% Retained on #40 Sieve
Dry Strength: MEDIUM
Dilatancy: SLOW
Toughness: LOW

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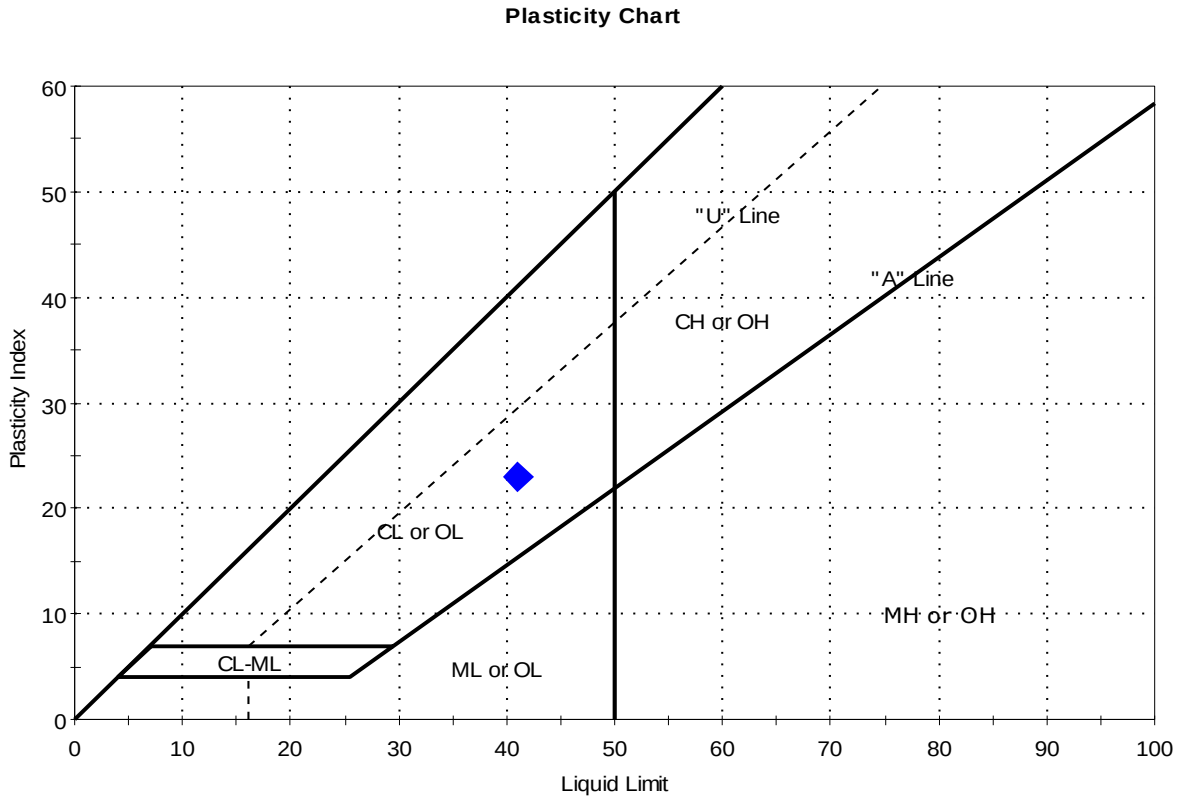
Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 02A	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-02	Test Date:	07/10/15	Checked By:	emm
Depth :	---	Test Id:	338121		
Test Comment:	---				
Visual Description:	Moist, brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	ST-02	AQ-SB-02A	---	36	41	18	23	0.8	

Sample Prepared using the WET method

Dry Strength: LOW

Dilatancy: SLOW

Toughness: LOW

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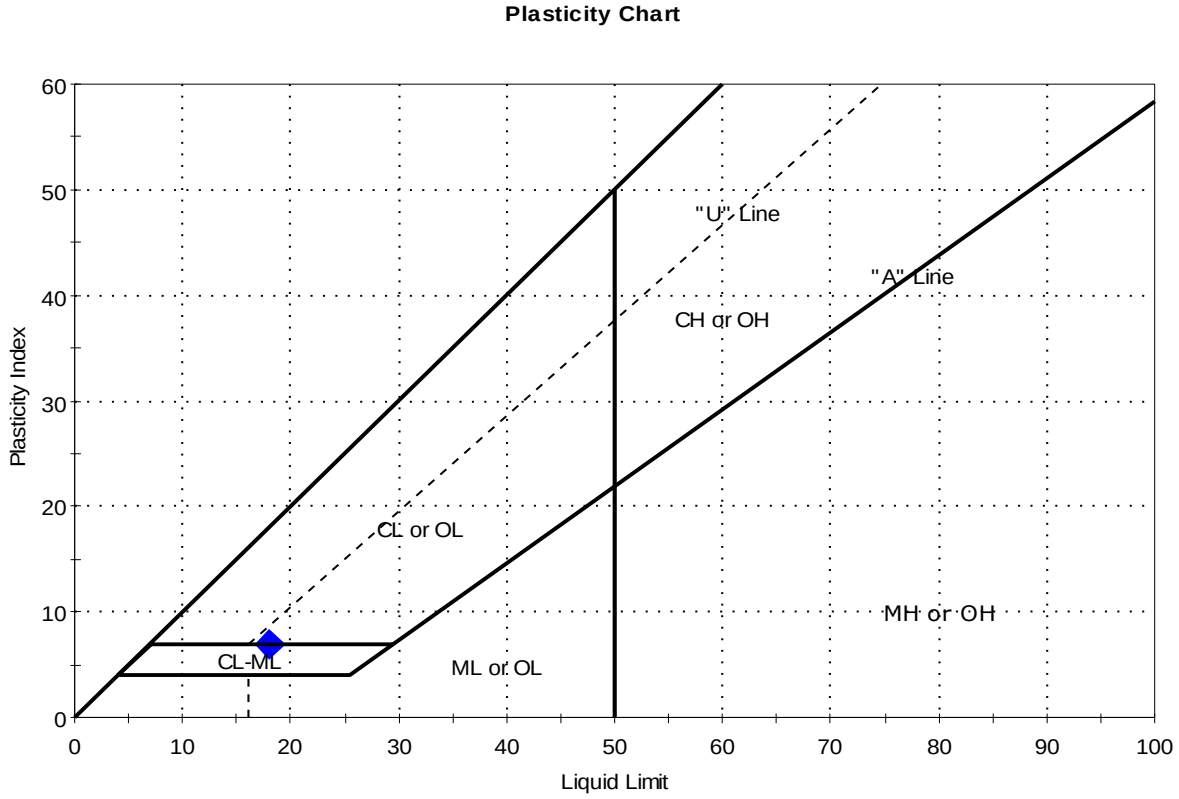
Client:	Anchor QEA, LLC				
Project:	Buffalo River				
Location:	Buffalo, NY			Project No:	GTX-303367
Boring ID:	AQ-SB- 02A	Sample Type:	tube	Tested By:	cam
Sample ID:	ST-03	Test Date:	07/13/15	Checked By:	emm
Depth :	---	Test Id:	338122		
Test Comment:	---				
Visual Description:	Moist, grayish brown silty, clayey sand with gravel				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	ST-03	AQ-SB-02A	---	10	18	11	7	-0.2	

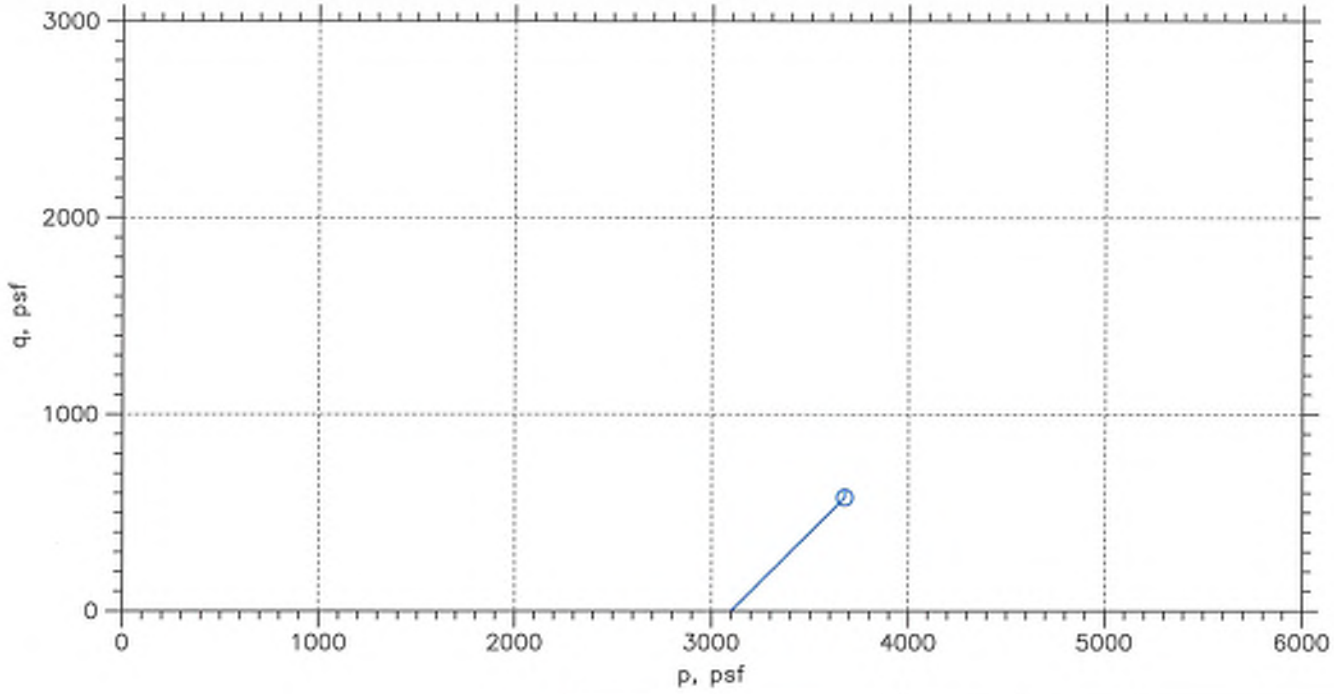
Sample Prepared using the WET method

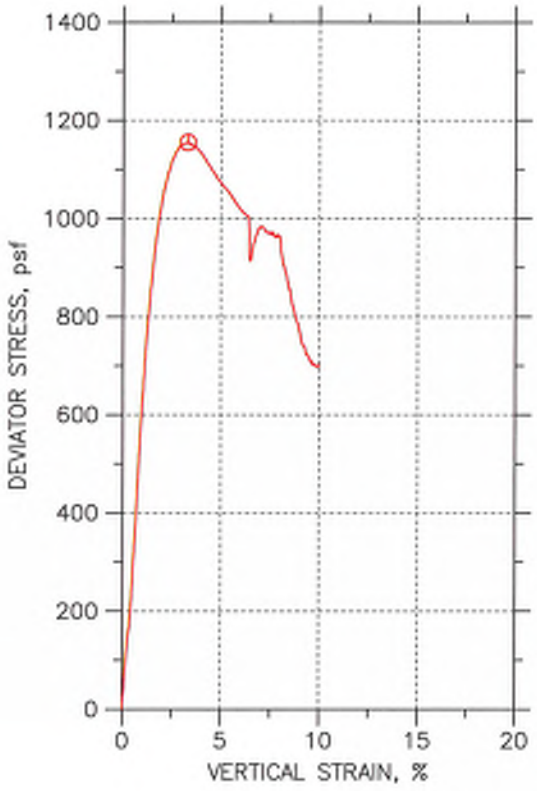
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⏲			
Sample No.	ST-11			
Test No.	UU-5			
Depth	---			
Tested by	md			
Test Date	7/14/15			
Checked by	njh			
Check Date	07/22/15			
Diameter, in	2.02			
Height, in	4.6			
Water Content, %	40.7			
Dry Density, pcf	78.55			
Saturation, %	95.4			
Void Ratio	1.16			
Confining Stress, psf	3100			
Undrained Strength, psf	577.9			
Max. Dev. Stress, psf	1156			
Strain at Failure, %	3.3			
Strain Rate, %/min	1			
Measured Specific Gravity	2.72			
Liquid Limit	45			
Plastic Limit	20			
Plasticity Index	25			

GeoTesting EXPRESS

Project: Buffalo River

Location: Buffalo, NY

Project No.: GTX-303367

Boring No.: AQ-SB-01

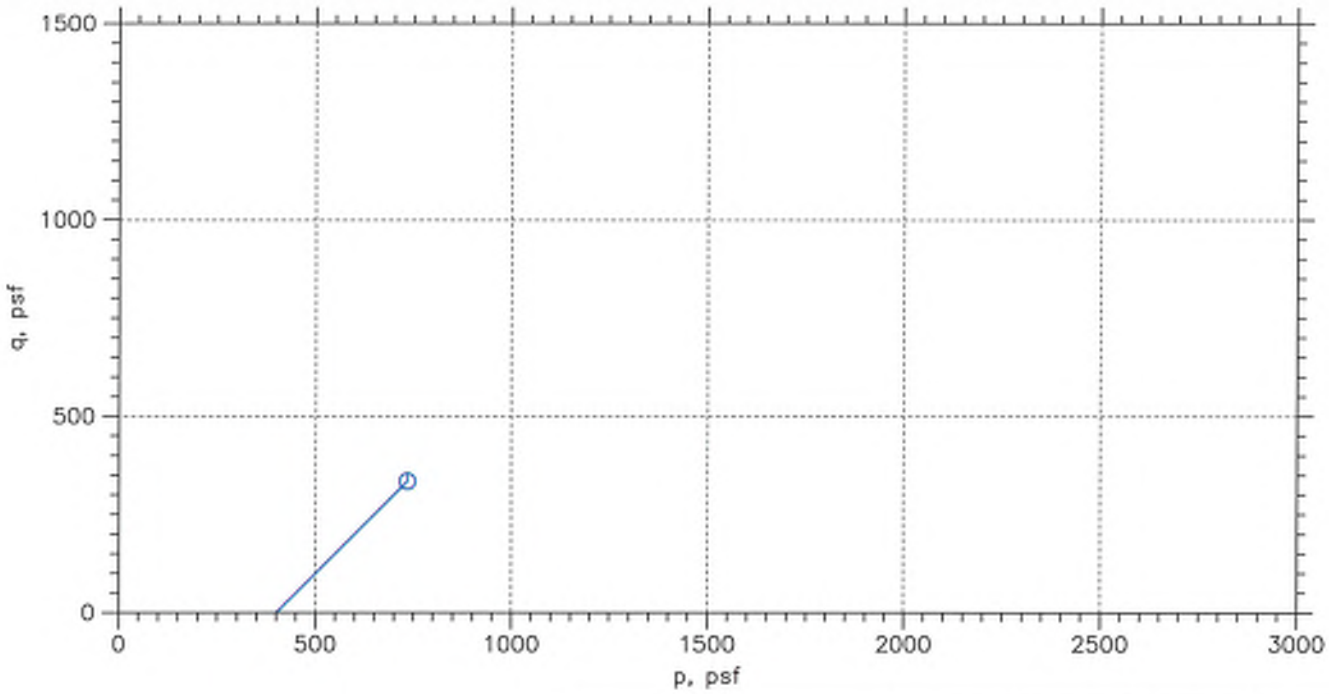
Sample Type: intact

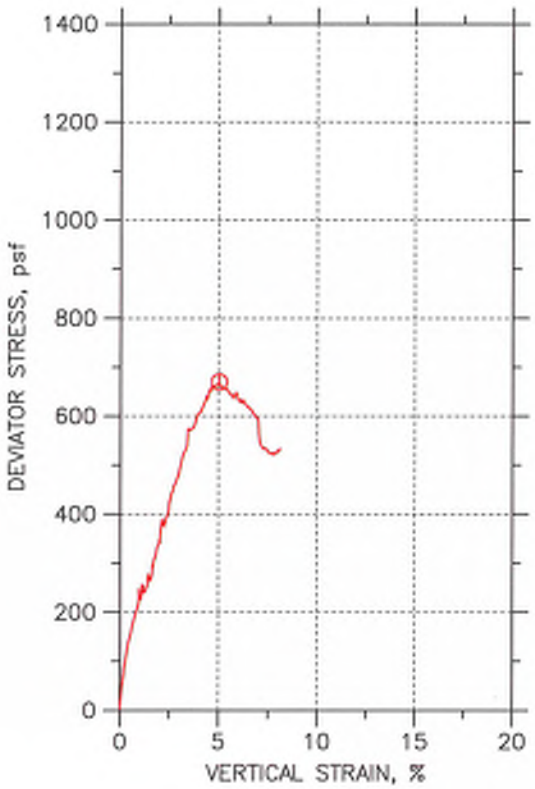
Description: Moist, grayish brown clay

Remarks: System R

Phase calculations based on start and end of test.

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⊙			
Sample No.	ST-01			
Test No.	UU-2			
Depth	---			
Tested by	md			
Test Date	7/8/15			
Checked by	mcm			
Check Date	07/28/15			
Diameter, in	2.87			
Height, in	6.1			
Water Content, %	40.6			
Dry Density, pcf	78.42			
Saturation, %	94.4			
Void Ratio	1.17			
Confining Stress, psf	400			
Undrained Strength, psf	334.8			
Max. Dev. Stress, psf	669.5			
Strain at Failure, %	5.03			
Strain Rate, %/min	1			
Measured Specific Gravity	2.73			
Liquid Limit	56			
Plastic Limit	22			
Plasticity Index	34			

GeoTesting EXPRESS

Project: Buffalo River

Location: Buffalo, NY

Project No.: GTX-303367

Boring No.: AQ-SB-01A

Sample Type: intact

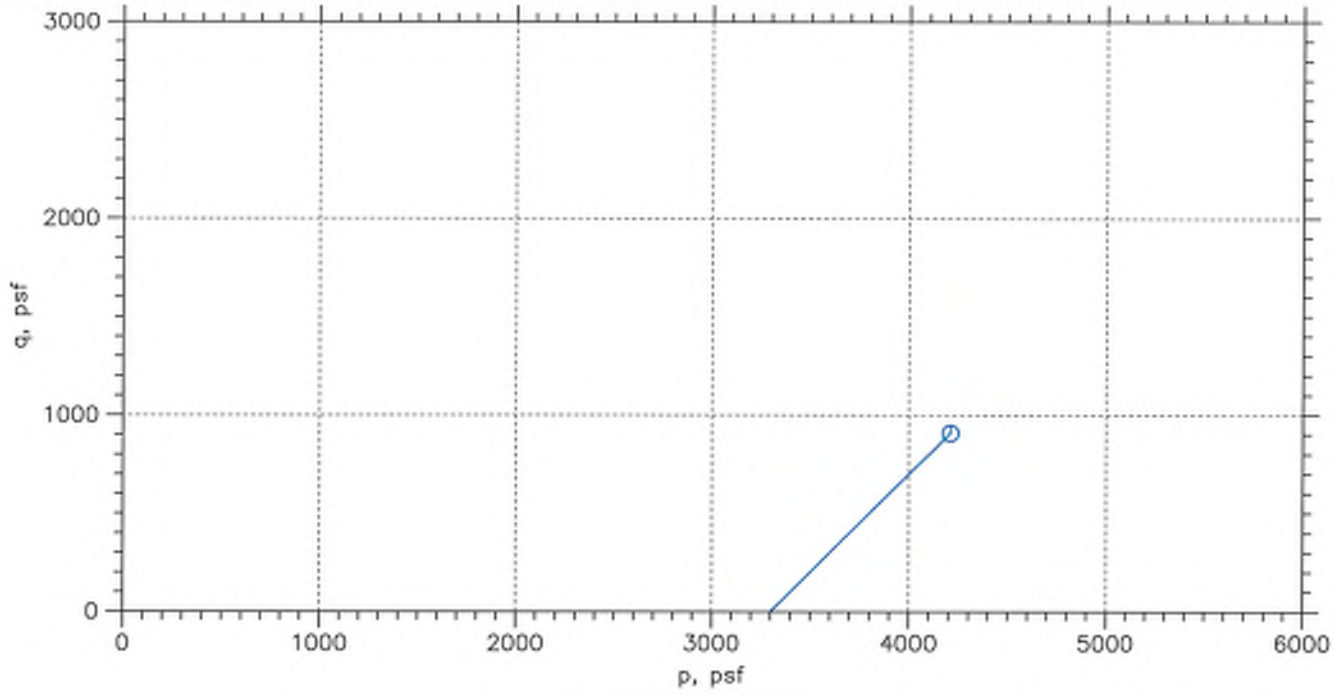
Description: Moist, reddish brown clay

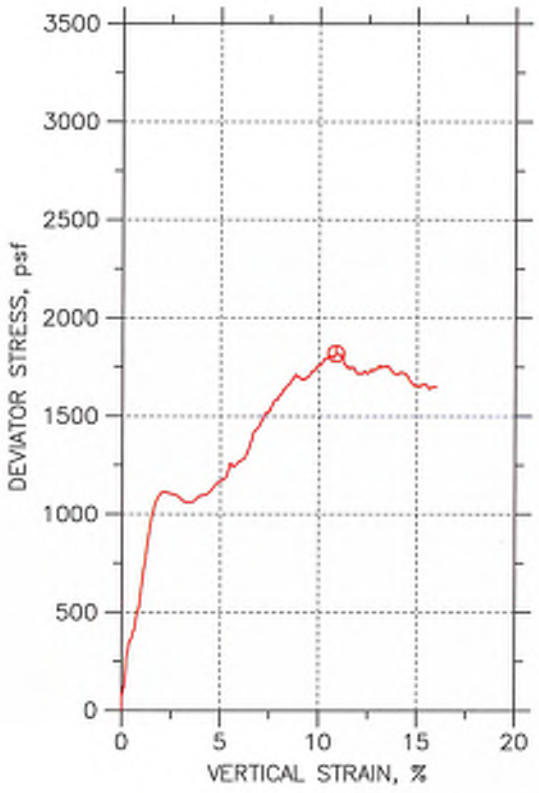
Remarks: System R

Phase calculations based on start and end of test.

Wed, 29-JUL-2015 10:26:14

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⊙			
Sample No.	ST-12			
Test No.	UU-6			
Depth	---			
Tested by	md			
Test Date	7/14/15			
Checked by	njh			
Check Date	07/22/15			
Diameter, in	2.02			
Height, in	4.6			
Water Content, %	33.7			
Dry Density, pcf	87.94			
Saturation, %	99.6			
Void Ratio	0.91			
Confining Stress, psf	3300			
Undrained Strength, psf	909.6			
Max. Dev. Stress, psf	1819			
Strain at Failure, %	10.9			
Strain Rate, %/min	1			
Measured Specific Gravity	2.69			
Liquid Limit	34			
Plastic Limit	18			
Plasticity Index	16			

GeoTesting EXPRESS

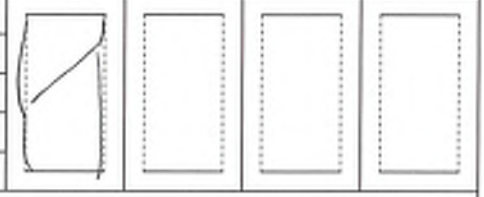
Project: Buffalo River

Location: Buffalo, NY

Project No.: GTX-303367

Boring No.: AQ-SB-02

Sample Type: intact



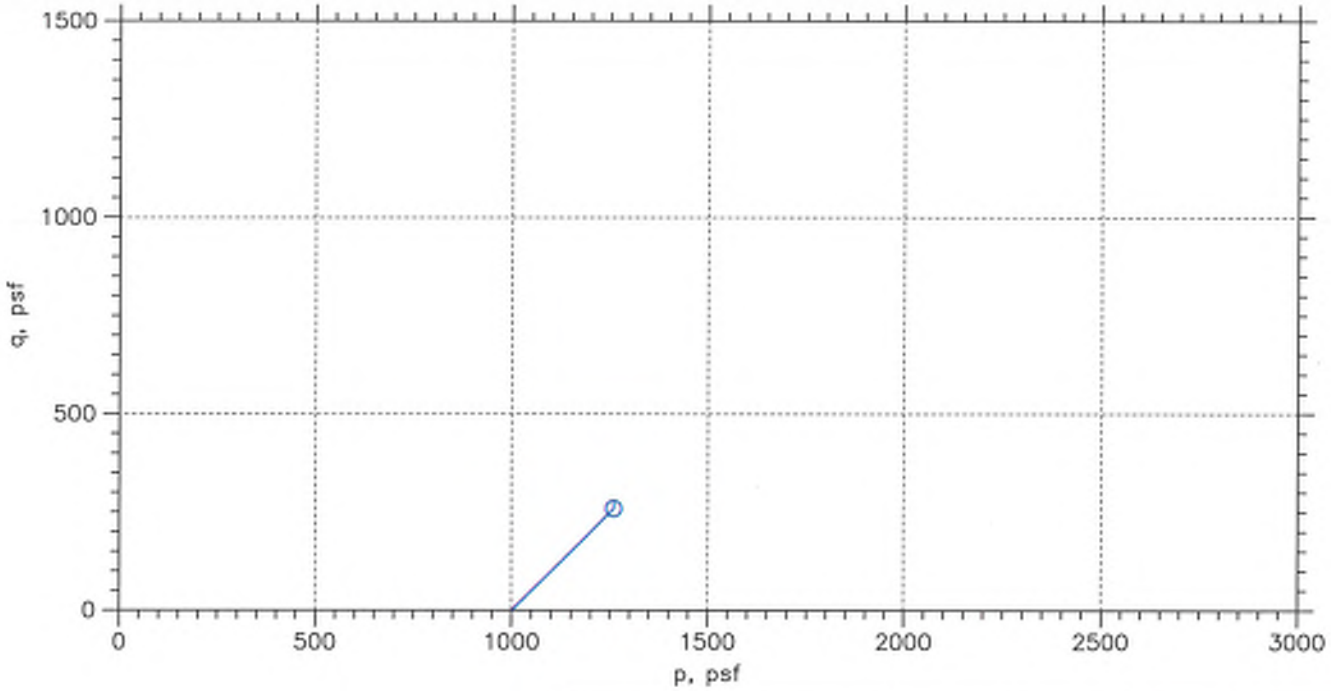
Description: Moist, brown clay

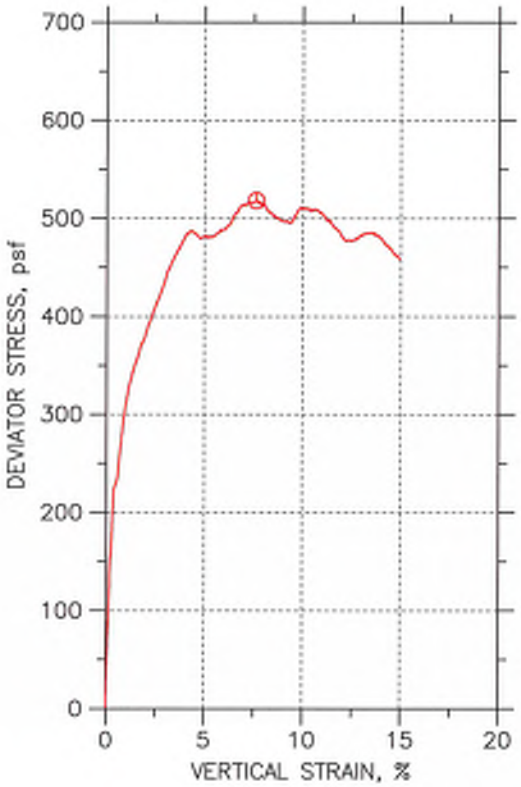
Remarks: System R

Phase calculations based on start and end of test.

Wed, 22-JUL-2015 14:34:20

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850





Symbol	⏲			
Sample No.	ST-03			
Test No.	UU-1			
Depth	---			
Tested by	md			
Test Date	7/8/15			
Checked by	mcm			
Check Date	07/28/15			
Diameter, in	2.89			
Height, in	6.05			
Water Content, %	9.6			
Dry Density, pcf	134.8			
Saturation, %	99.2			
Void Ratio	0.265			
Confining Stress, psf	1000			
Undrained Strength, psf	259.1			
Max. Dev. Stress, psf	518.2			
Strain at Failure, %	7.63			
Strain Rate, %/min	1			
Measured Specific Gravity	2.73			
Liquid Limit	18			
Plastic Limit	11			
Plasticity Index	7			

GeoTesting EXPRESS

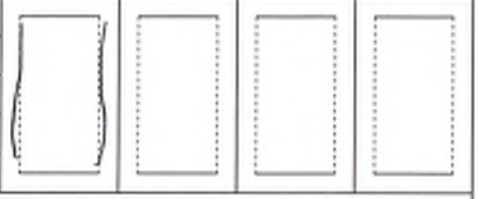
Project: Buffalo River

Location: Buffalo, NY

Project No.: GTX-303367

Boring No.: AQ-SB-02A

Sample Type: intact



Description: Moist, grayish brown silty, clayey sand with gravel

Remarks: System R

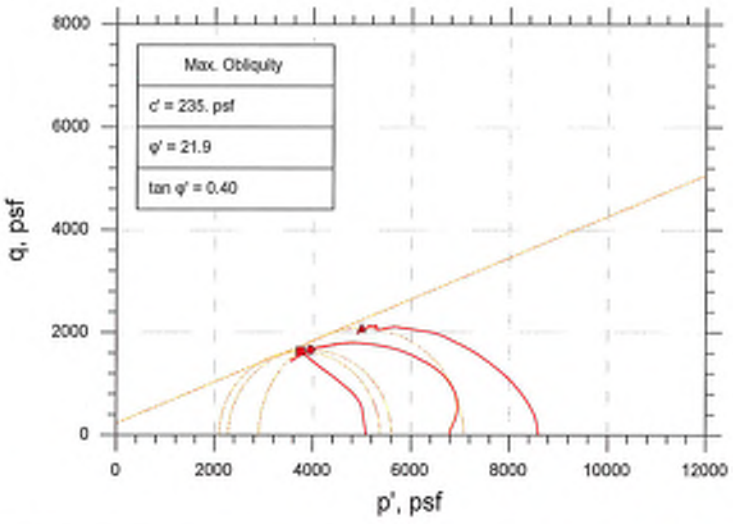
Phase calculations based on start and end of test.

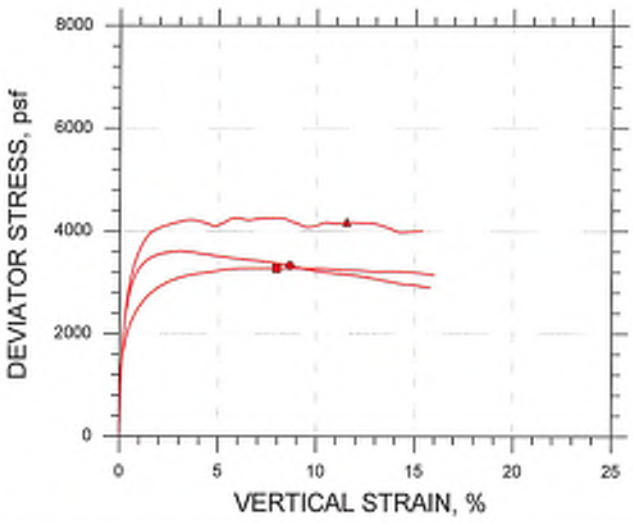
Wed, 29-JUL-2015 10:41:30

GeoTesting EXPRESS

Client: Anchor QEA, LLC	
Project Name: Buffalo River	
Project Location: Buffalo, NY	
Project Number: GTX-303367	
Tested By: md	Checked By: njh
Boring ID: AQ-SB-O1	
Preparation: intact	
Description: Moist, dark reddish gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 35	Plastic Limit: 18
Plasticity Index: 17	Measured Specific Gravity: 2.72

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





		■	●	▲	
Symbol					
Sample ID		ST-15	ST-15	ST-15	
Depth, ft		---	---	---	
Test Number		CU-4-1	CU-4-2	CU-4-3	
Initial	Height, in	4.620	4.710	4.540	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	31.5	30.8	32.0	
	Dry Density, pcf	91.2	91.4	90.8	
	Saturation (Wet Method), %	99.5	97.5	99.9	
	Void Ratio	0.861	0.858	0.871	
Before Shear	Moisture Content, %	26.7	25.7	24.3	
	Dry Density, pcf	98.4	99.9	102.	
	Cross-sectional Area (Method A), in²	3.036	3.003	2.933	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.725	0.699	0.660	
	Back Pressure, psf	1.739e+004	1.886e+004	1.913e+004	
Vertical Effective Consolidation Stress, psf		5073.	6778.	8581.	
Horizontal Effective Consolidation Stress, psf		5094.	6800.	8597.	
Vertical Strain after Consolidation, %		1.834	2.259	2.158	
Volumetric Strain after Consolidation, %		6.370	8.076	8.817	
Time to 50% Consolidation, min		30.25	72.25	64.00	
Shear Strength, psf		1638.	1664.	2088.	
Strain at Failure, %		7.95	8.64	11.5	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psf		3276.	3329.	4177.	
Effective Minor Principal Stress at Failure, psf		2101.	2284.	2906.	
Effective Major Principal Stress at Failure, psf		5377.	5613.	7083.	
B-Value		0.95	0.96	0.95	

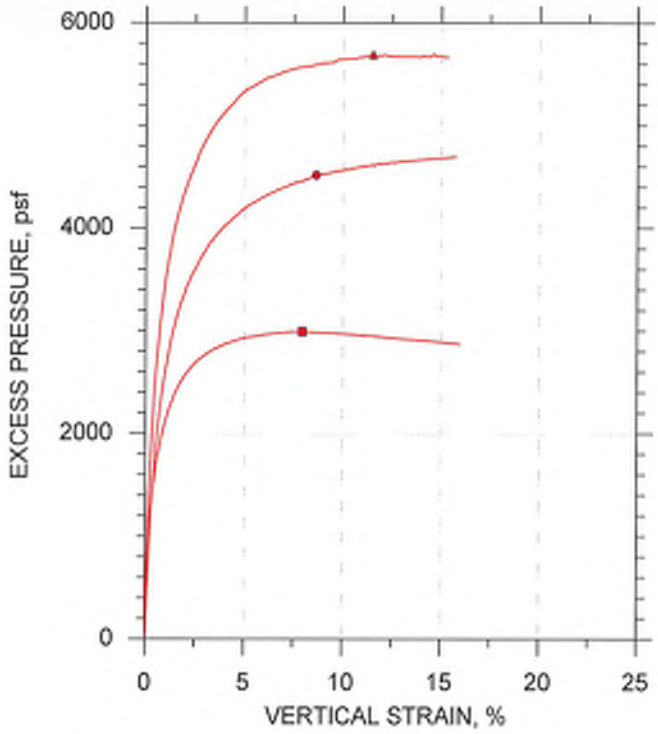
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Specific Gravity determined by ASTM D854.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

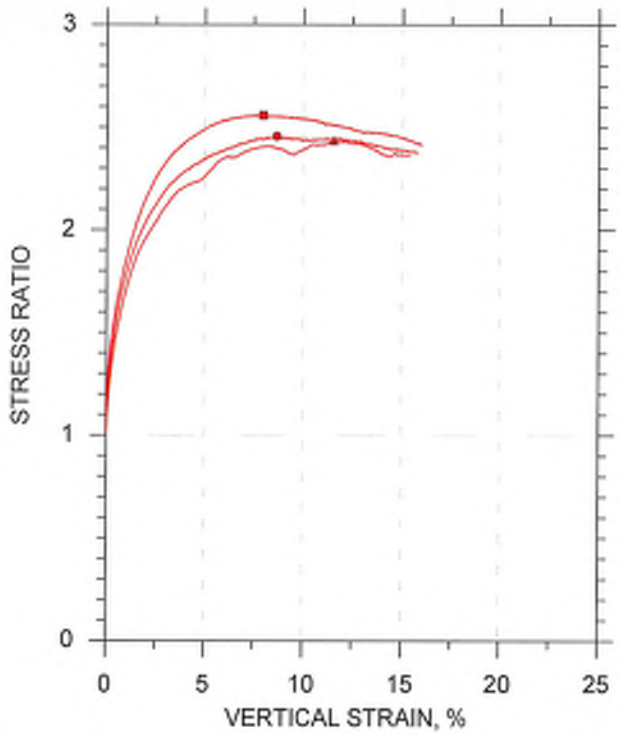
Remarks:

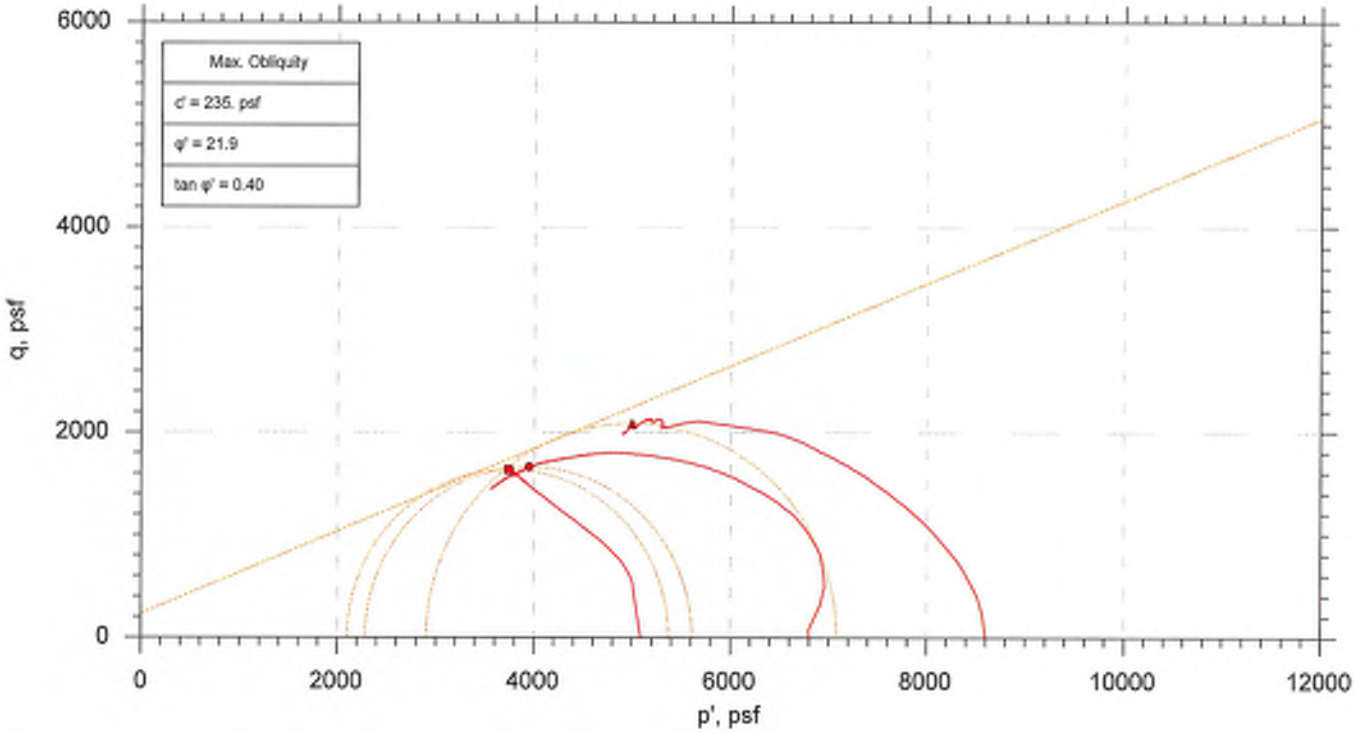


System Y

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	ST-15	CU-4-1	---	md	7/16/15	njh	7/22/15	303367-CU-4-1n.dat
●	ST-15	CU-4-2	---	md	7/15/15	njh	7/22/15	303367-CU-4-2n.dat
▲	ST-15	CU-4-3	---	md	7/15/15	njh	7/22/15	303367-CU-4-3n.dat

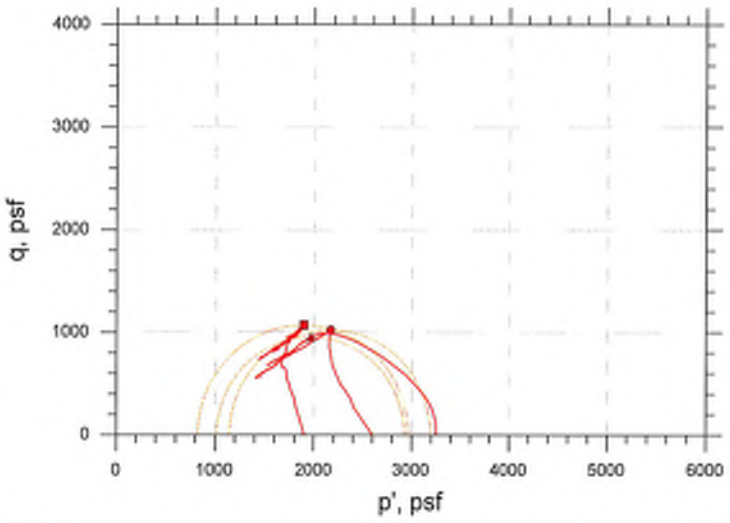
GeoTesting EXPRESS

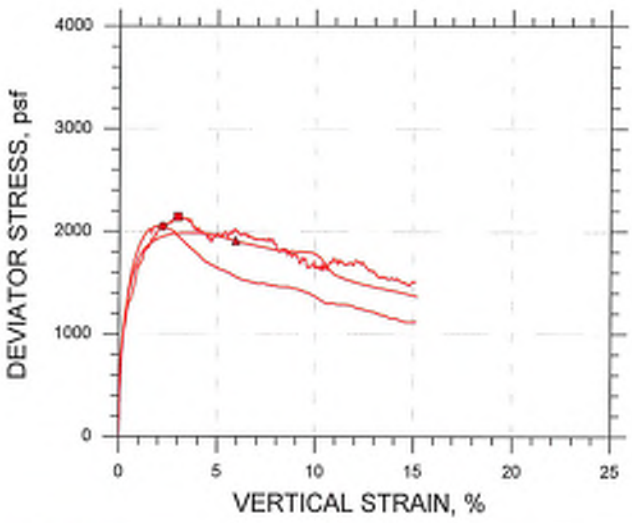
Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
Boring No.: AQ-SB-01	Sample Type: intact	
Description: Moist, dark reddish gray clay		
Remarks: System Y		

GeoTesting EXPRESS

Client: Anchor QEA, LLC	
Project Name: Buffalo River	
Project Location: Buffalo, NY	
Project Number: GTX-303367	
Tested By: md	Checked By: mcm
Boring ID: AQ-SB-02A	
Preparation: Intact	
Description: Moist, brown clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 41	Plastic Limit: 18
Plasticity Index: 23	Estimated Specific Gravity: 2.75

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		ST-02	ST-02	ST-02	
Depth, ft		---	---	---	
Test Number		CU-1-1	CU-1-2	CU-1-3	
Initial	Height, in	4.460	4.550	4.620	
	Diameter, in	2.020	2.020	2.030	
	Moisture Content (from Cuttings), %	33.7	32.9	34.4	
	Dry Density, pcf	87.5	87.5	88.2	
	Saturation (Wet Method), %	96.2	93.9	99.9	
	Void Ratio	0.962	0.962	0.946	
Before Shear	Moisture Content, %	32.5	38.2	29.9	
	Dry Density, pcf	90.7	83.7	94.2	
	Cross-sectional Area (Method A), in²	3.138	3.413	3.105	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.893	1.05	0.822	
	Back Pressure, psf	2.028e+004	2.027e+004	1.995e+004	
Vertical Effective Consolidation Stress, psf		1890.	2553.	3236.	
Horizontal Effective Consolidation Stress, psf		1902.	2603.	3253.	
Vertical Strain after Consolidation, %		1.016	4.132	1.525	
Volumetric Strain after Consolidation, %		2.258	2.317	3.832	
Time to 50% Consolidation, min		14.06	12.96	103.0	
Shear Strength, psf		1071.	1024.	954.4	
Strain at Failure, %		3.01	2.22	5.93	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psf		2143.	2048.	1909.	
Effective Minor Principal Stress at Failure, psf		825.0	1146.	1017.	
Effective Major Principal Stress at Failure, psf		2968.	3194.	2926.	
B-Value		0.95	0.94	0.95	

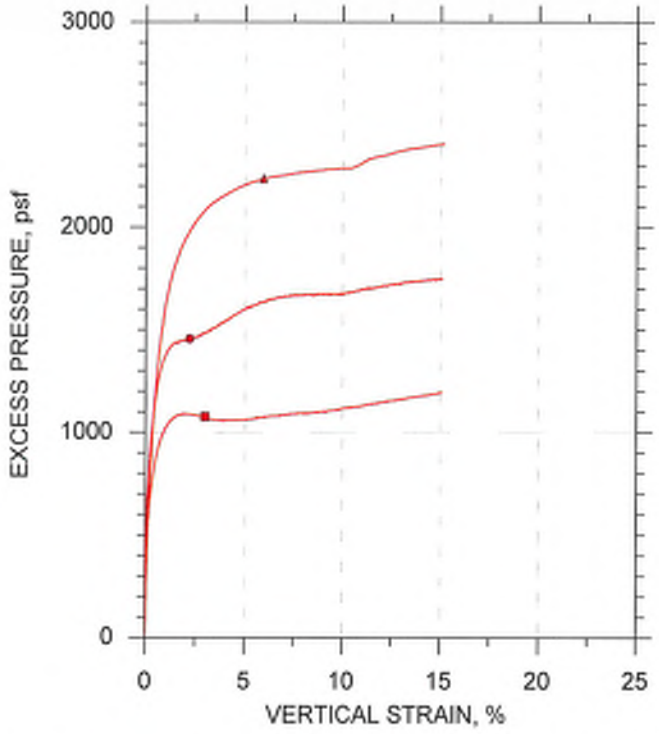
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

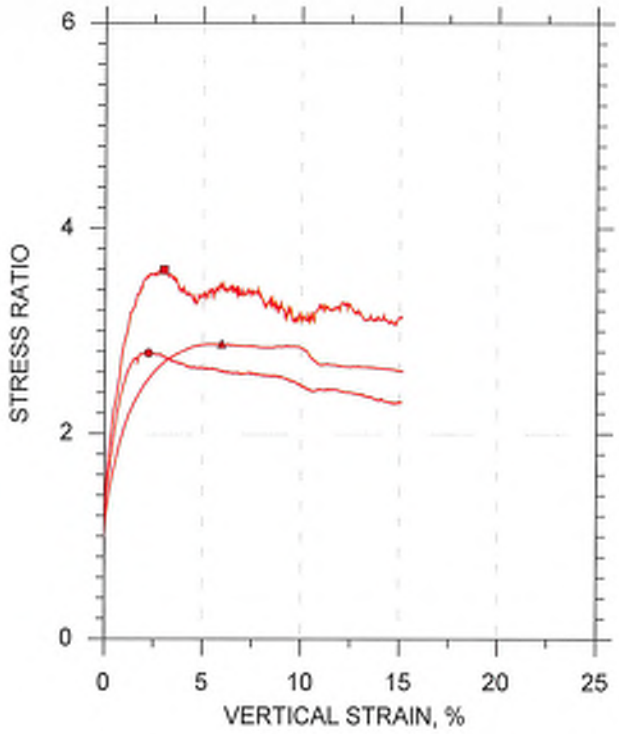
Remarks:

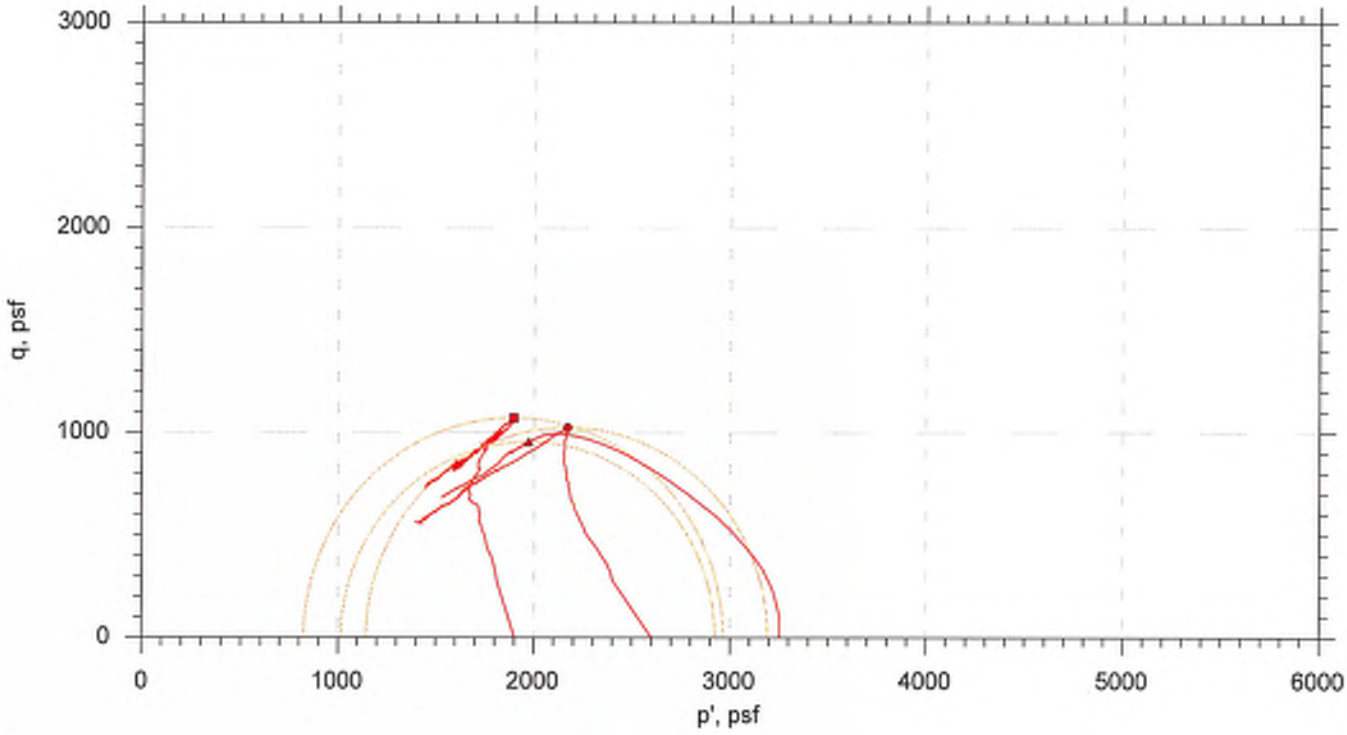


System T

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







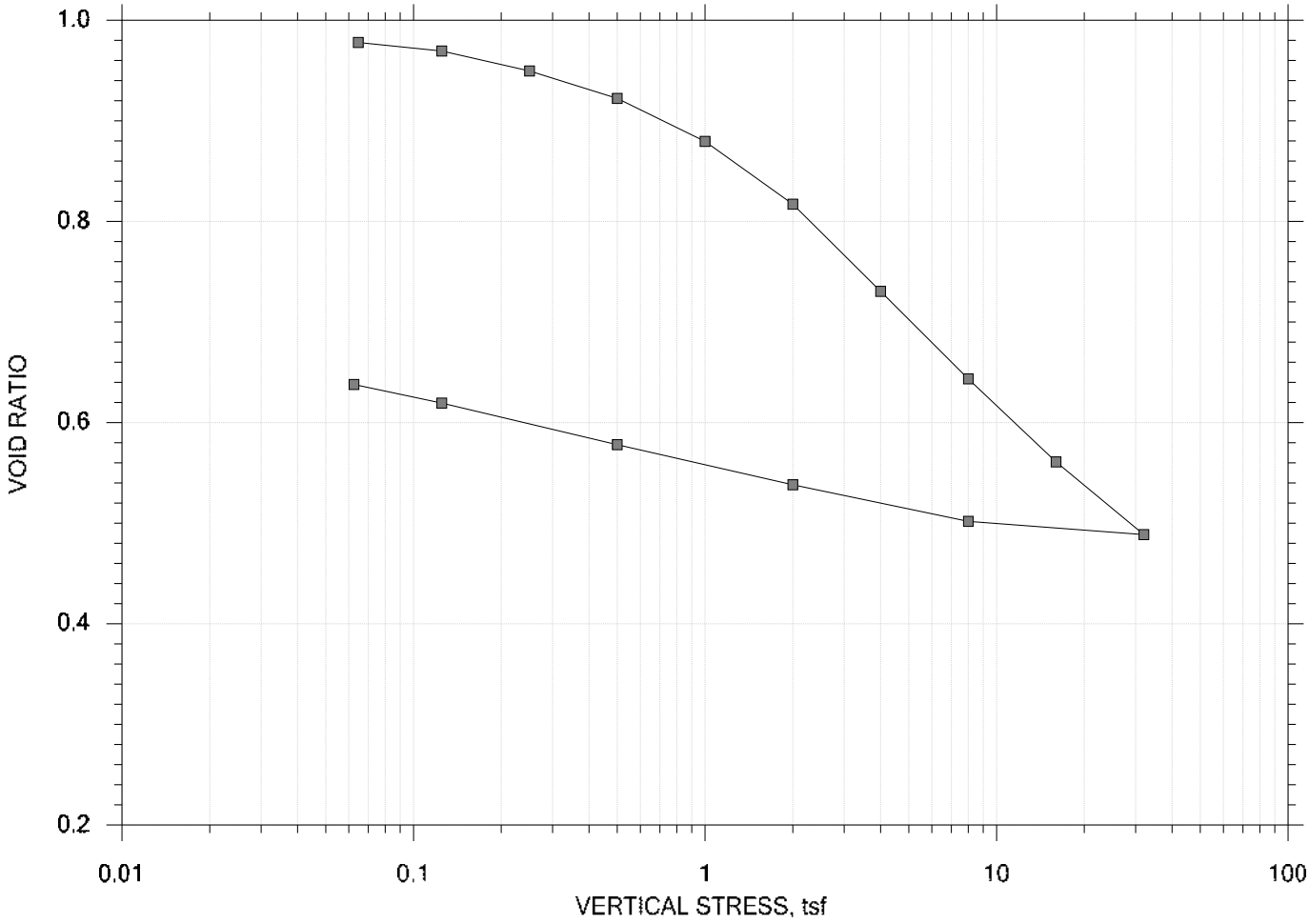
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	ST-02	CU-1-1	---	md	7/9/15	mcm	7/15/15	303367-CU-1-1m.dat
●	ST-02	CU-1-2	---	md	7/9/15	mcm	7/15/15	303367-CU-1-2m.dat
▲	ST-02	CU-1-3	---	md	7/8/15	mcm	7/15/15	303367-CU-1-3m.dat

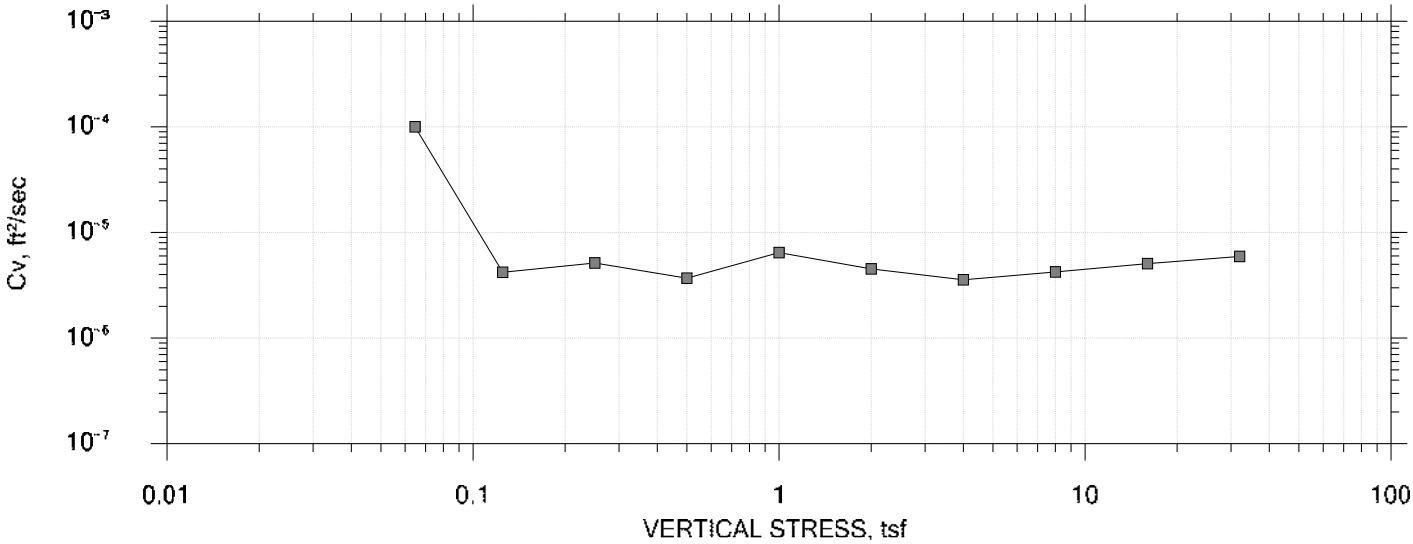
GeoTesting EXPRESS

Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
Boring No.: AQ-SB-02A	Sample Type: Intact	
Description: Moist, brown clay		
Remarks: System T		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT

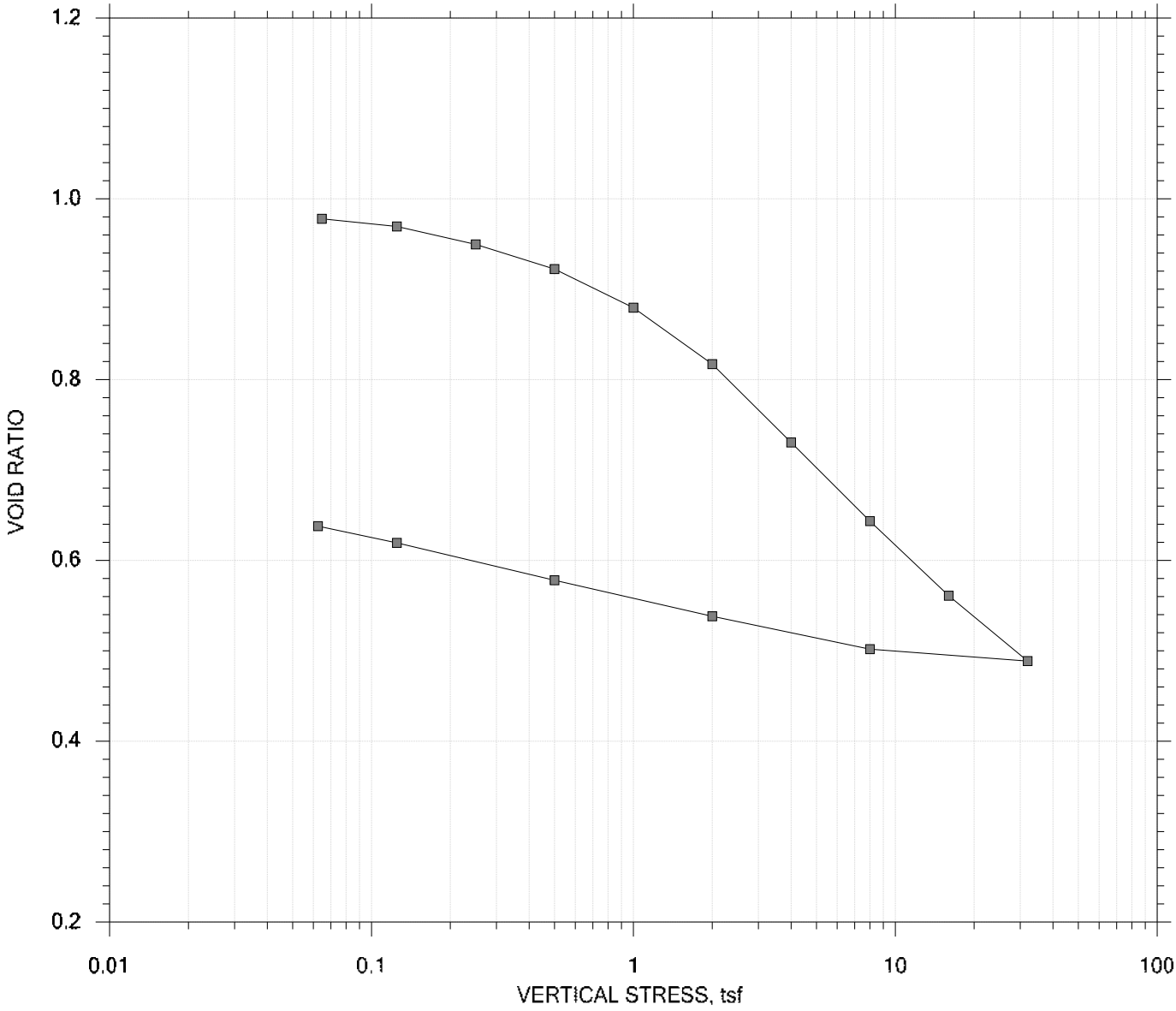




GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT



					Before Test	After Test
Current Vertical Effective Stress: ---				Water Content, %	35.56	23.56
Preconsolidation Stress: ---				Dry Unit Weight, pcf	86.145	103.79
Compression Ratio: ---				Saturation, %	99.11	100.00
Diameter: 2.5 in		Height: 1 in		Void Ratio	0.98	0.64
LL: 56	PL: 22	PI: 34	GS: 2.73			

GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: ---	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
Sample No.: ST-01	Test Date: 07/07/15	Depth: ---
Test No.: IP-2	Sample Type: intact	Elevation: ---

Soil Description: Moist, reddish brown clay
Remarks: System V, Swell Pressure = 0.0646 tsf

Measured Specific Gravity: 2.73	Liquid Limit: 56	Specimen Diameter: 2.50 in
Initial Void Ratio: 0.981	Plastic Limit: 22	Initial Height: 1.00 in
Final Void Ratio: 0.644	Plasticity Index: 34	Final Height: 0.83 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	16779	RING		A141
Wt. Container + Wet Soil, gm	228.70	261.74	248.42	136.91
Wt. Container + Dry Soil, gm	157.33	222.27	222.27	112.42
Wt. Container, gm	8.3200	111.27	111.27	8.4700
Wt. Dry Soil, gm	149.01	111.00	111.00	103.95
Water Content, %	47.90	35.56	23.56	23.56
Void Ratio	---	0.981	0.644	---
Degree of Saturation, %	---	99.11	100.00	---
Dry Unit Weight, pcf	---	86.145	103.79	---

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Buffalo River | Location: Buffalo, NY | Project No.: GTX-303367
Boring No.: AQ-SB-01A | Tested By: md | Checked By: jdt
Sample No.: ST-01 | Test Date: 07/07/15 | Depth: ---
Test No.: IP-2 | Sample Type: intact | Elevation: ---

Soil Description: Moist, reddish brown clay
Remarks: System V, Swell Pressure = 0.0646 tsf

Displacement at End of Increment

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt T90 min	Cv ft²/sec	Mv 1/tsf	k ft/day
1	0.0646	0.001340	0.978	0.134	0.380	6.46e-005	2.07e-002	3.61e-003
2	0.125	0.005622	0.969	0.562	6.983	3.49e-006	7.09e-002	6.67e-004
3	0.250	0.01560	0.950	1.56	5.557	4.32e-006	7.98e-002	9.31e-004
4	0.500	0.02939	0.922	2.94	7.212	3.25e-006	5.52e-002	4.84e-004
5	1.00	0.05099	0.880	5.10	4.302	5.25e-006	4.32e-002	6.12e-004
6	2.00	0.08252	0.817	8.25	4.002	5.34e-006	3.15e-002	4.54e-004
7	4.00	0.1263	0.730	12.6	5.257	3.74e-006	2.19e-002	2.21e-004
8	8.00	0.1702	0.643	17.0	3.740	4.76e-006	1.10e-002	1.41e-004
9	16.0	0.2119	0.561	21.2	2.684	5.98e-006	5.21e-003	8.41e-005
10	32.0	0.2484	0.489	24.8	3.294	4.42e-006	2.28e-003	2.72e-005
11	8.00	0.2417	0.502	24.2	0.772	1.81e-005	2.79e-004	1.37e-005
12	2.00	0.2233	0.538	22.3	5.263	2.75e-006	3.06e-003	2.26e-005
13	0.500	0.2032	0.578	20.3	29.290	5.18e-007	1.34e-002	1.87e-005
14	0.125	0.1823	0.620	18.2	72.789	2.20e-007	5.58e-002	3.31e-005
15	0.0625	0.1730	0.638	17.3	87.320	1.90e-007	1.49e-001	7.65e-005

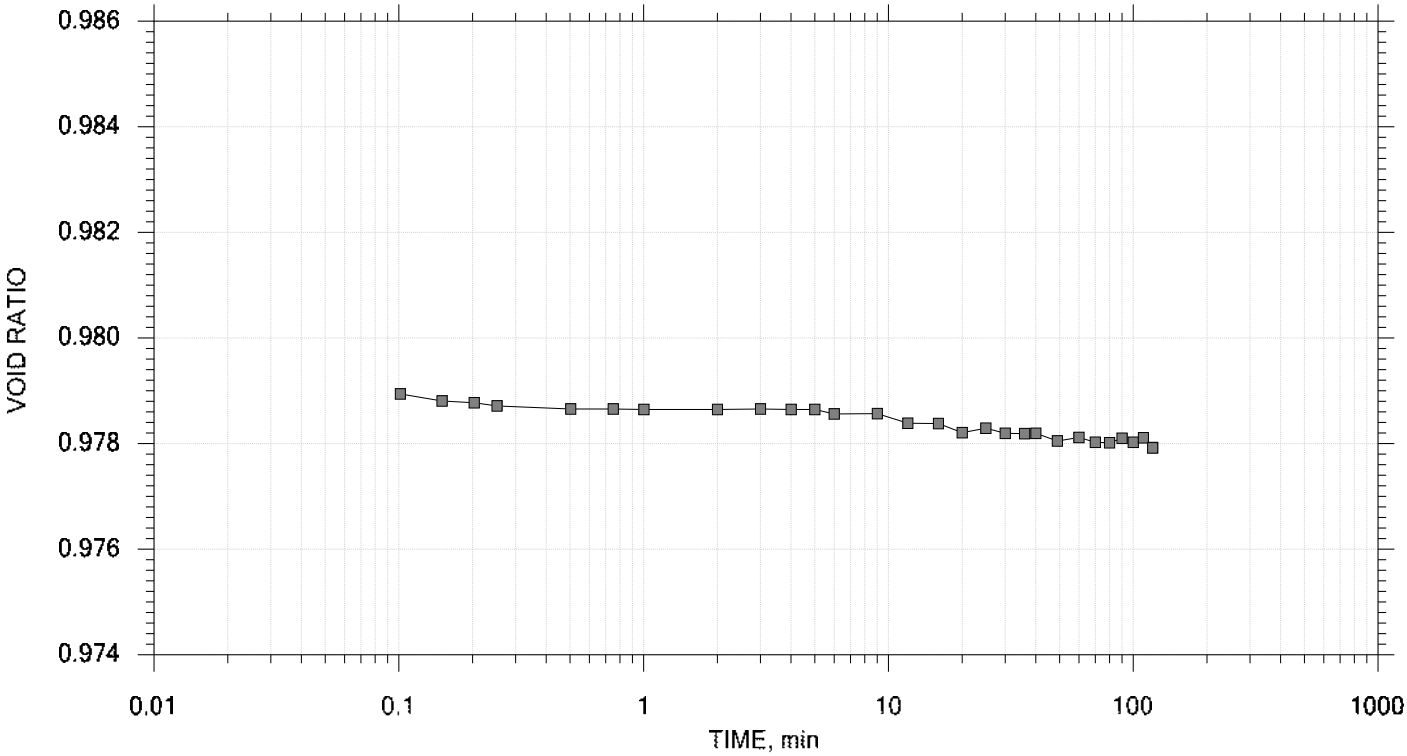
	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/sec	Mv 1/tsf	k ft/day	Ca %
1	0.0646	0.001340	0.978	0.134	0.000	0.00e+000	2.07e-002	0.00e+000	0.00e+000
2	0.125	0.005622	0.969	0.562	0.000	0.00e+000	7.09e-002	0.00e+000	0.00e+000
3	0.250	0.01560	0.950	1.56	0.000	0.00e+000	7.98e-002	0.00e+000	0.00e+000
4	0.500	0.02939	0.922	2.94	1.457	3.74e-006	5.52e-002	5.56e-004	0.00e+000
5	1.00	0.05099	0.880	5.10	0.755	6.95e-006	4.32e-002	8.10e-004	0.00e+000
6	2.00	0.08252	0.817	8.25	1.195	4.15e-006	3.15e-002	3.53e-004	0.00e+000
7	4.00	0.1263	0.730	12.6	1.370	3.34e-006	2.19e-002	1.97e-004	0.00e+000
8	8.00	0.1702	0.643	17.0	1.125	3.68e-006	1.10e-002	1.09e-004	0.00e+000
9	16.0	0.2119	0.561	21.2	0.845	4.41e-006	5.21e-003	6.20e-005	0.00e+000
10	32.0	0.2484	0.489	24.8	0.450	7.50e-006	2.28e-003	4.61e-005	0.00e+000
11	8.00	0.2417	0.502	24.2	0.193	1.68e-005	2.79e-004	1.27e-005	0.00e+000
12	2.00	0.2233	0.538	22.3	0.000	0.00e+000	3.06e-003	0.00e+000	0.00e+000
13	0.500	0.2032	0.578	20.3	0.000	0.00e+000	1.34e-002	0.00e+000	0.00e+000
14	0.125	0.1823	0.620	18.2	0.000	0.00e+000	5.58e-002	0.00e+000	0.00e+000
15	0.0625	0.1730	0.638	17.3	0.000	0.00e+000	1.49e-001	0.00e+000	0.00e+000

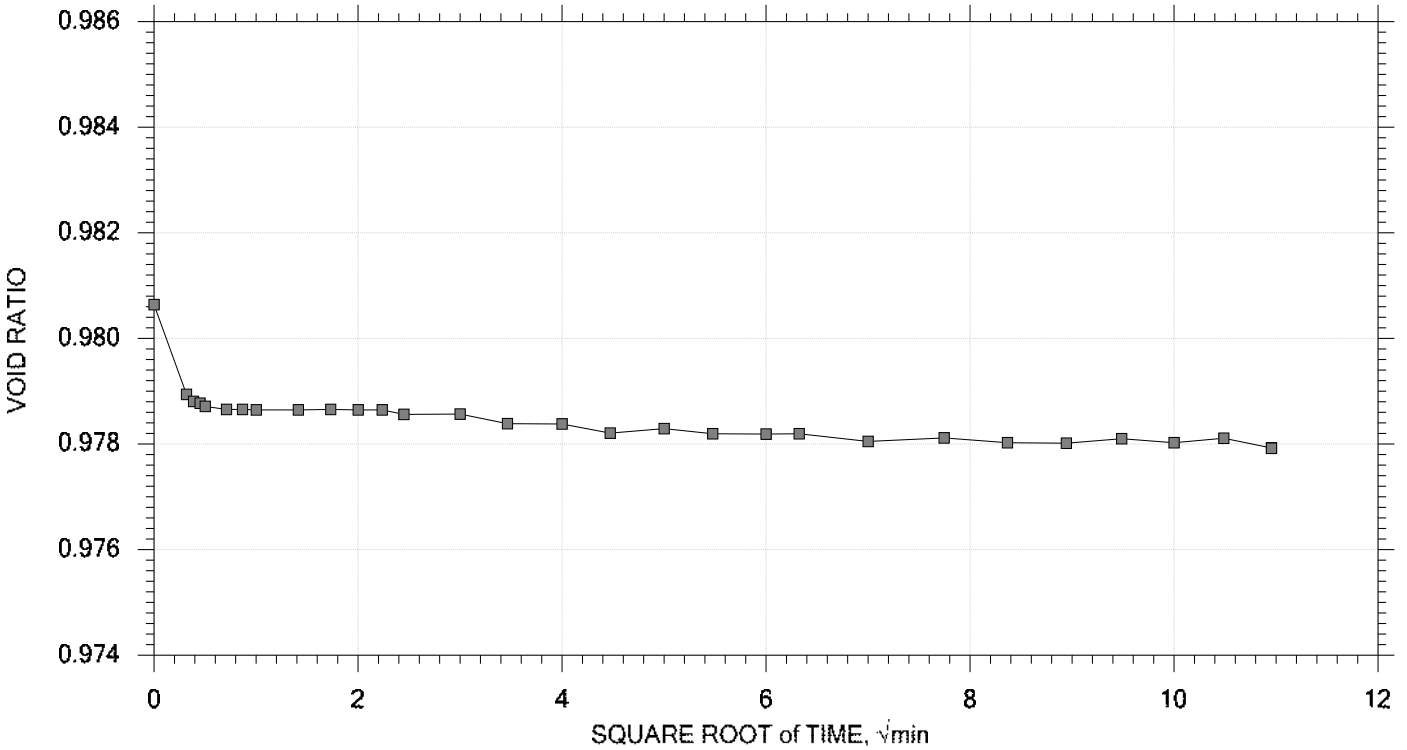
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Volume Step 1 of 15

Stress: 0.064613 tsf





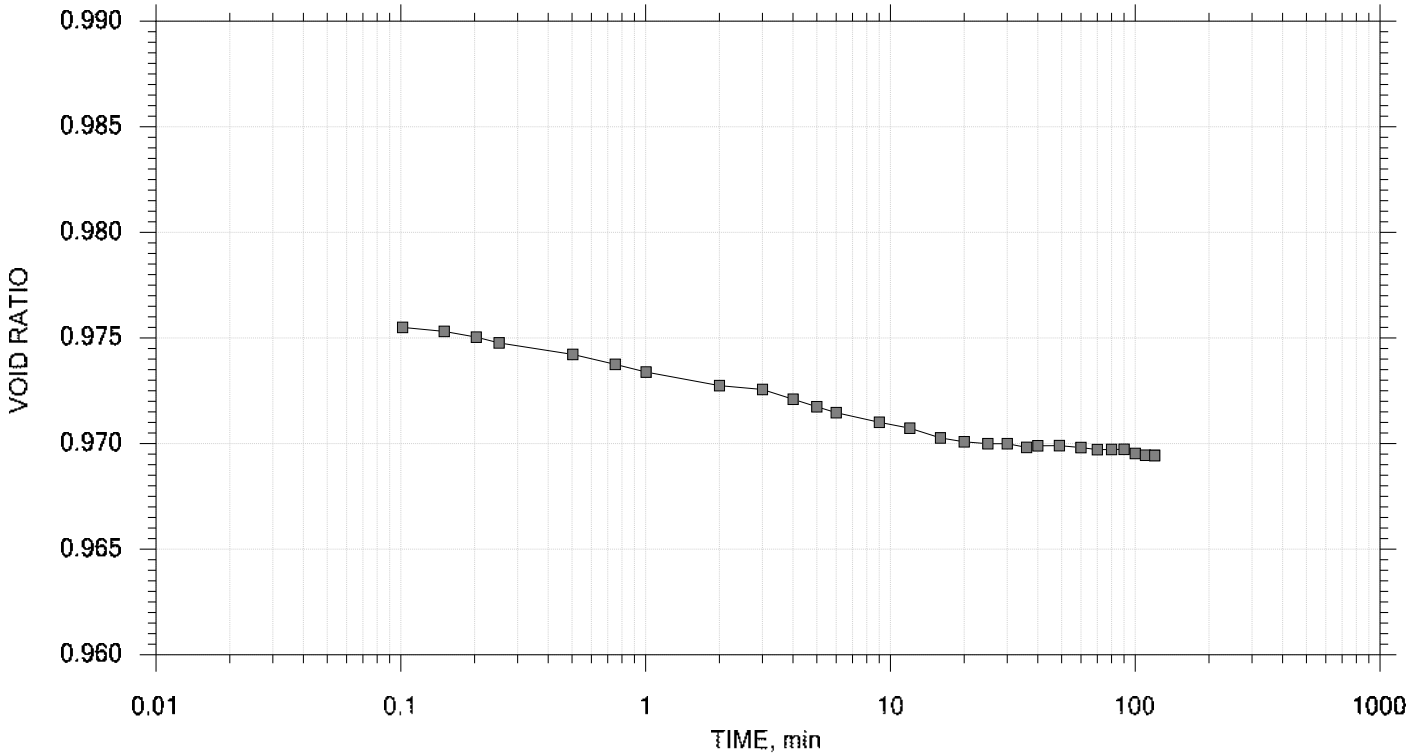
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

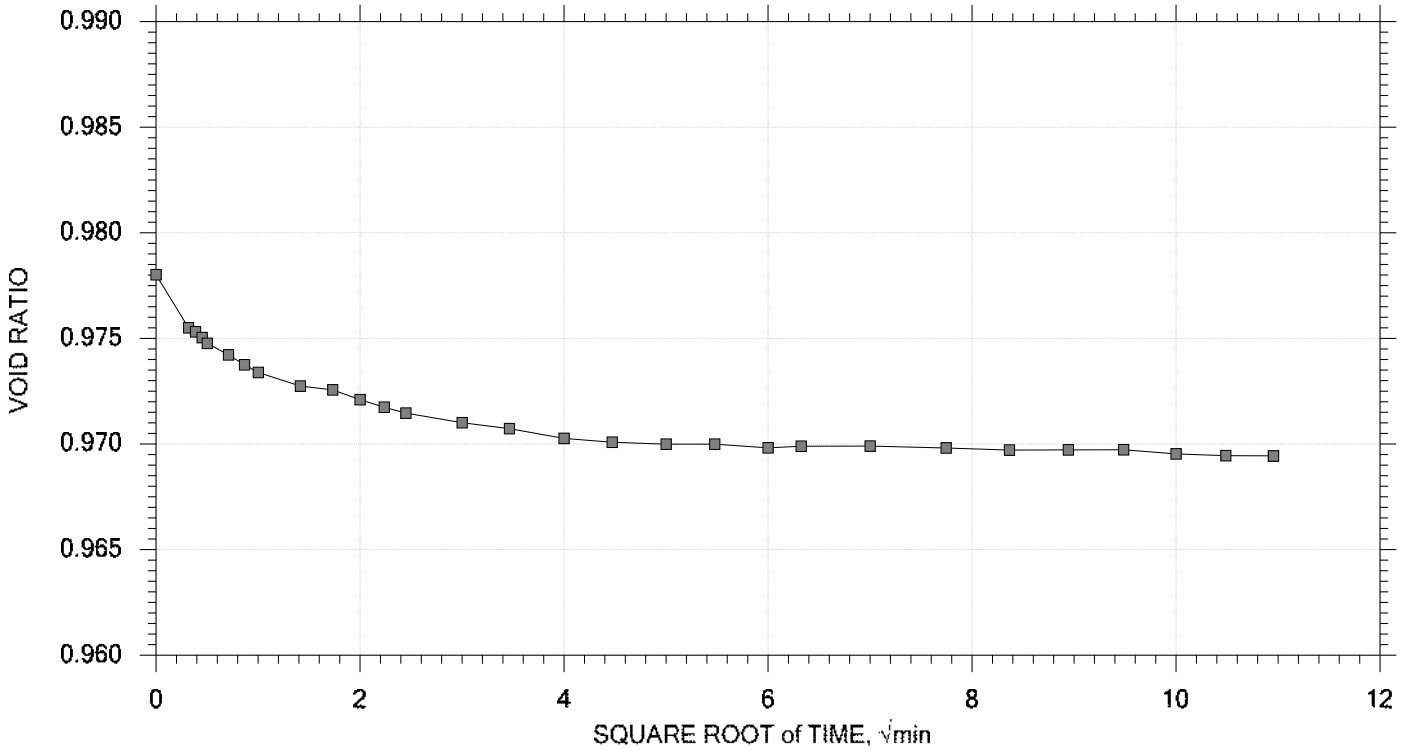
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 2 of 15

Stress: 0.125 tsf





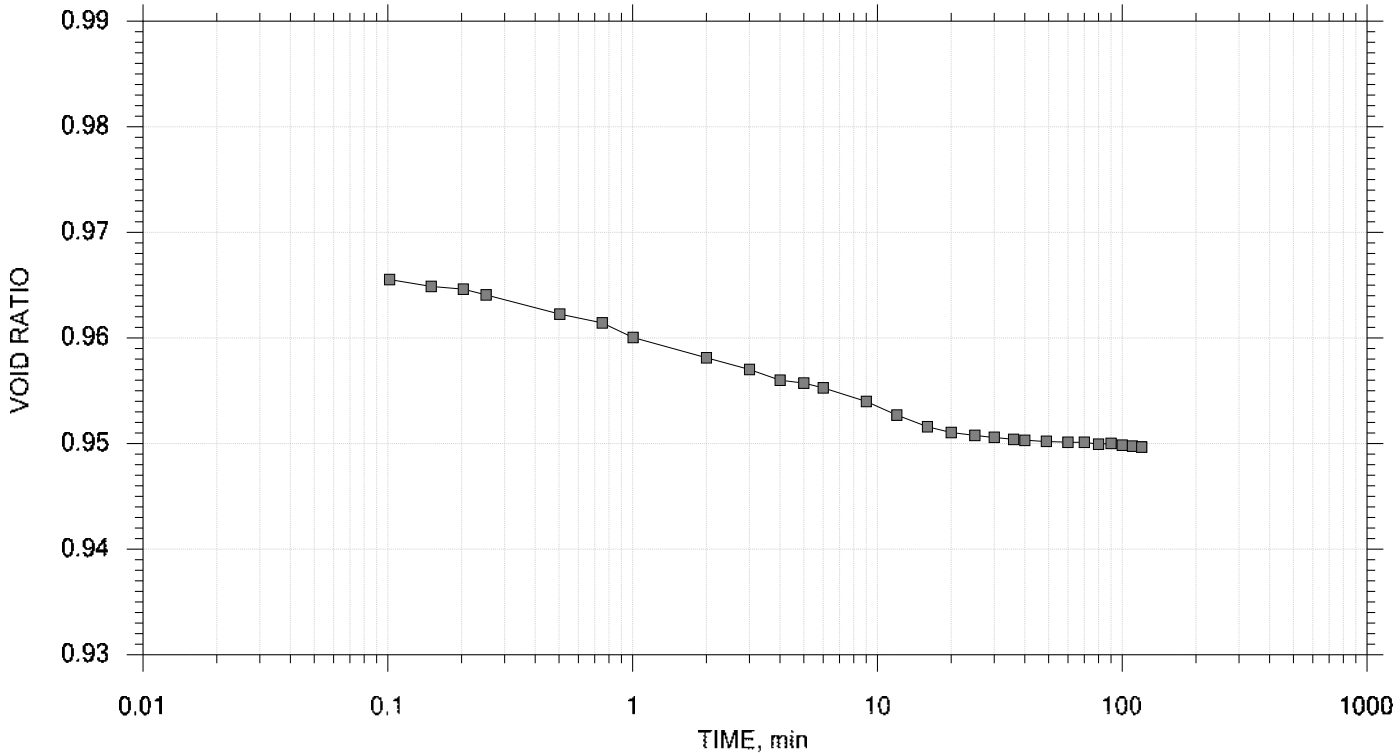
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

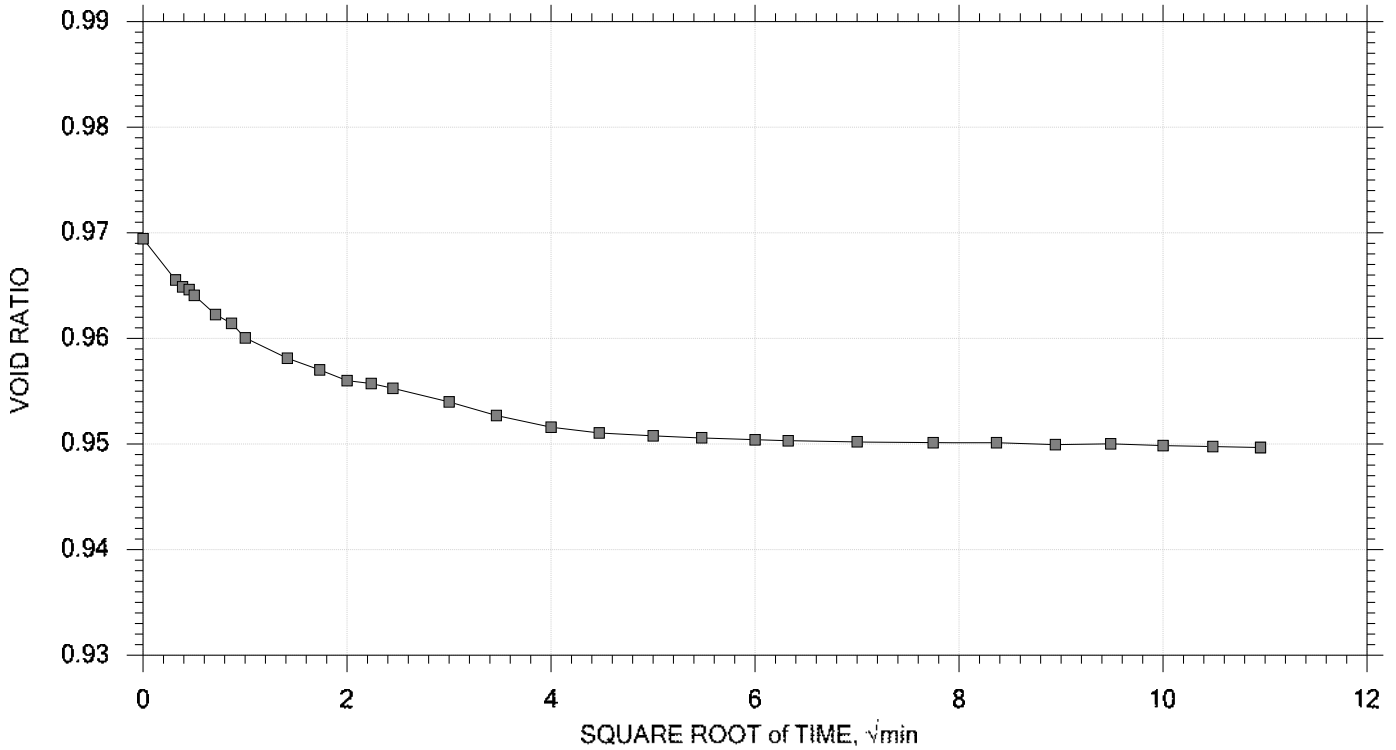
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 3 of 15

Stress: 0.25 tsf





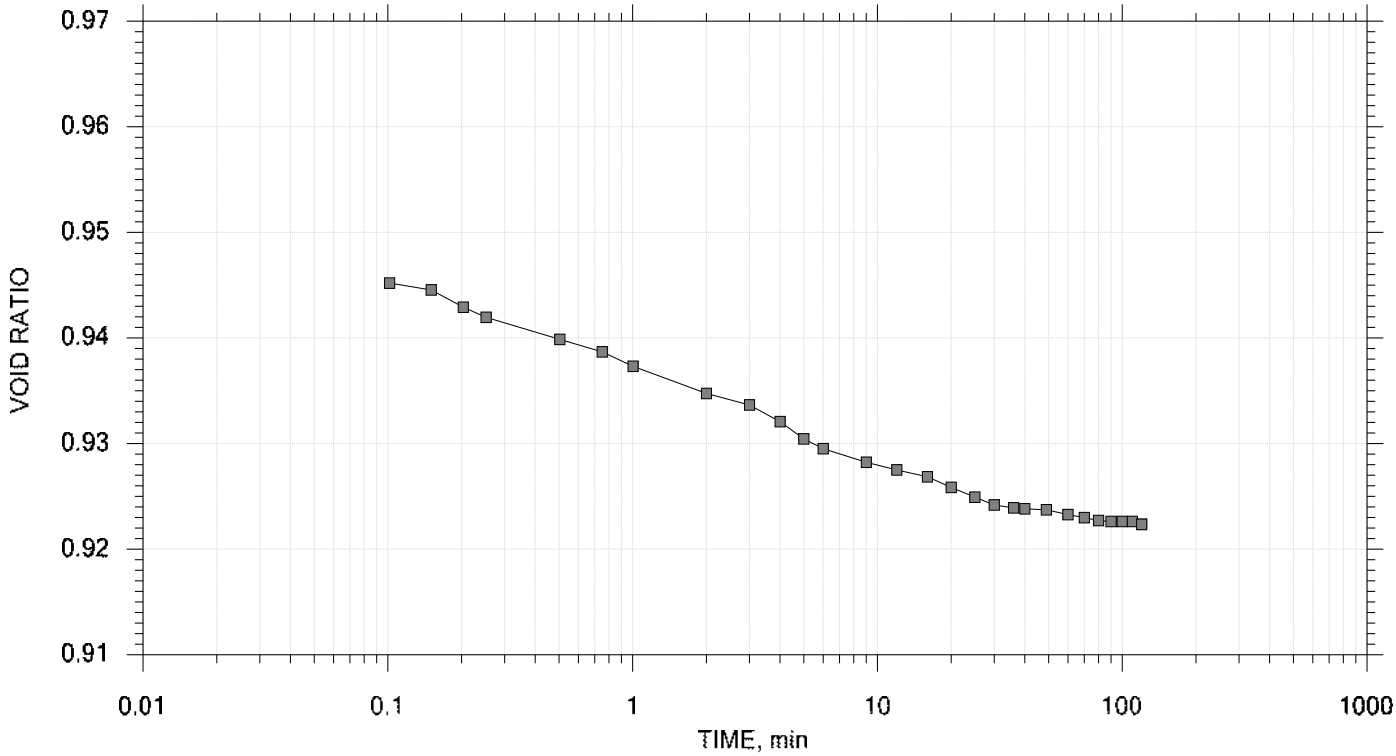
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

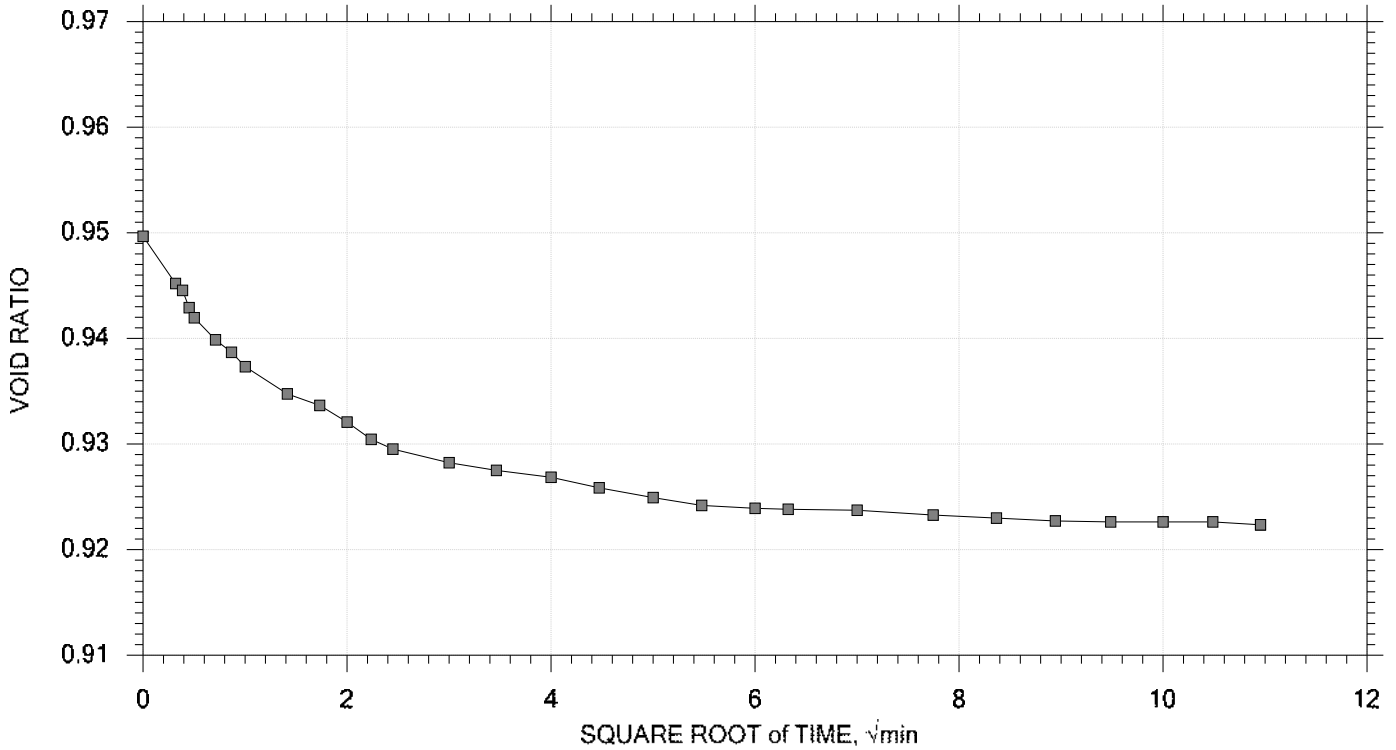
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 4 of 15

Stress: 0.5 tsf





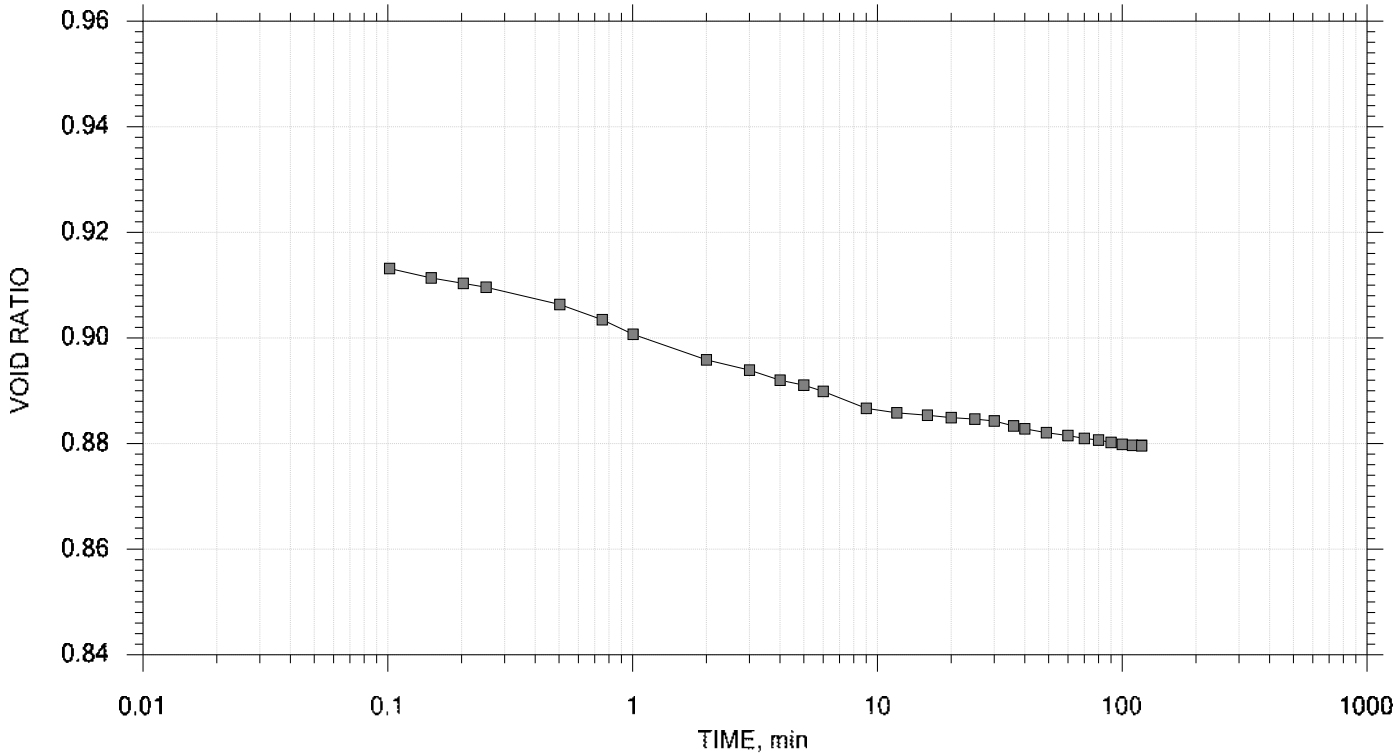
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

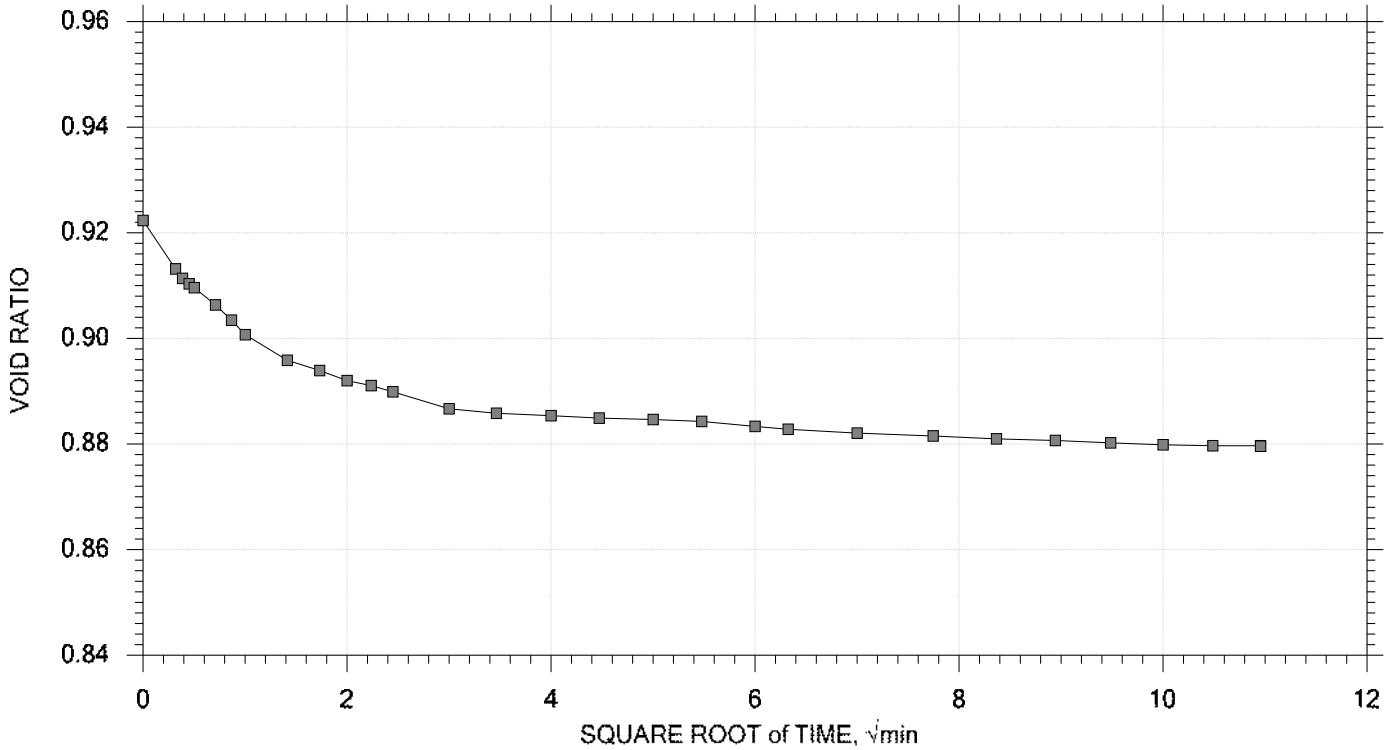
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 5 of 15

Stress: 1 tsf





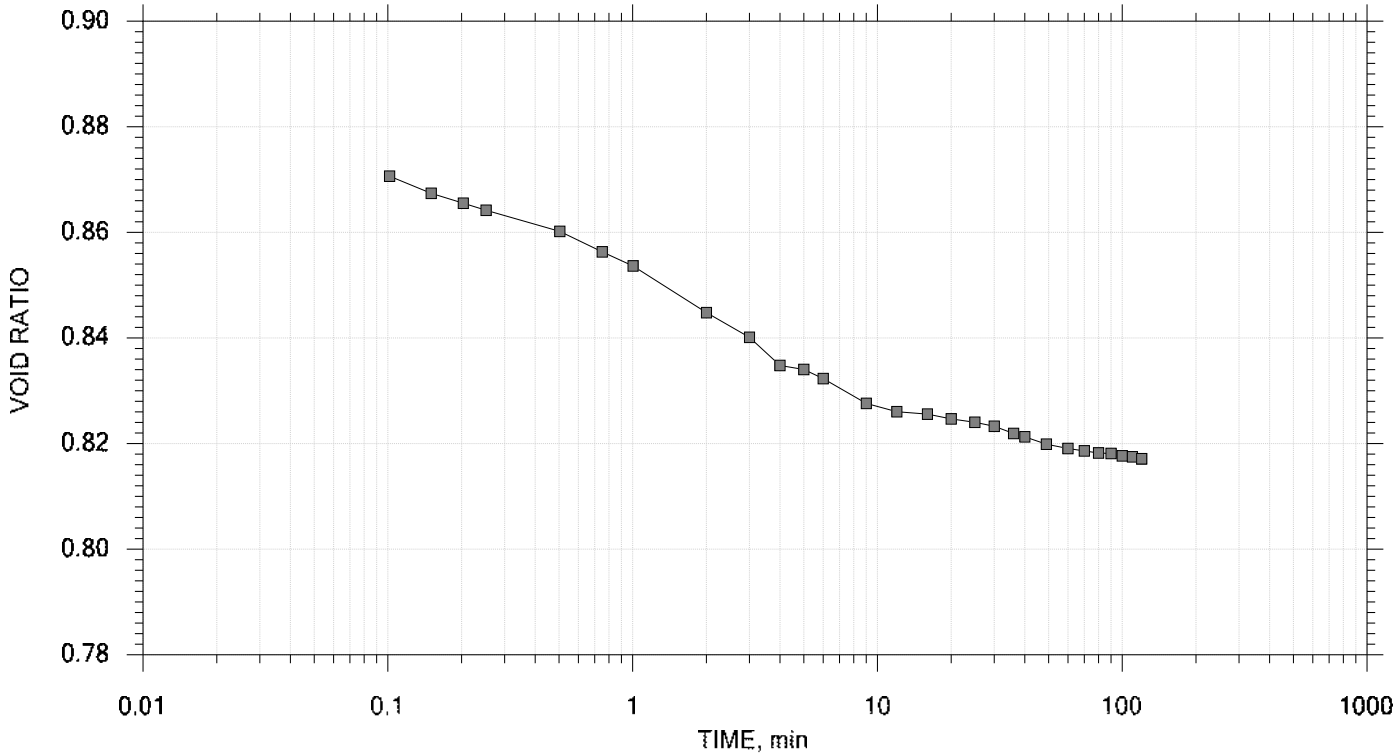
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

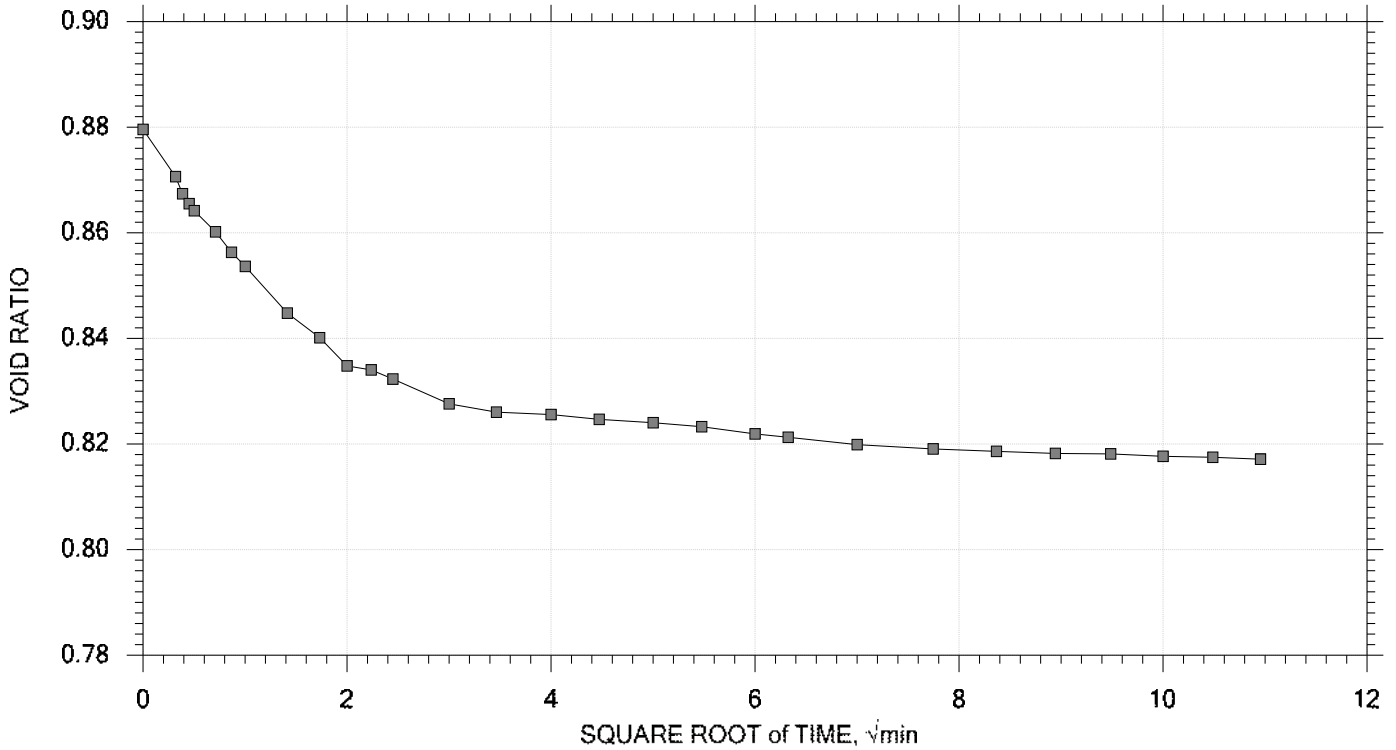
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 6 of 15

Stress: 2 tsf





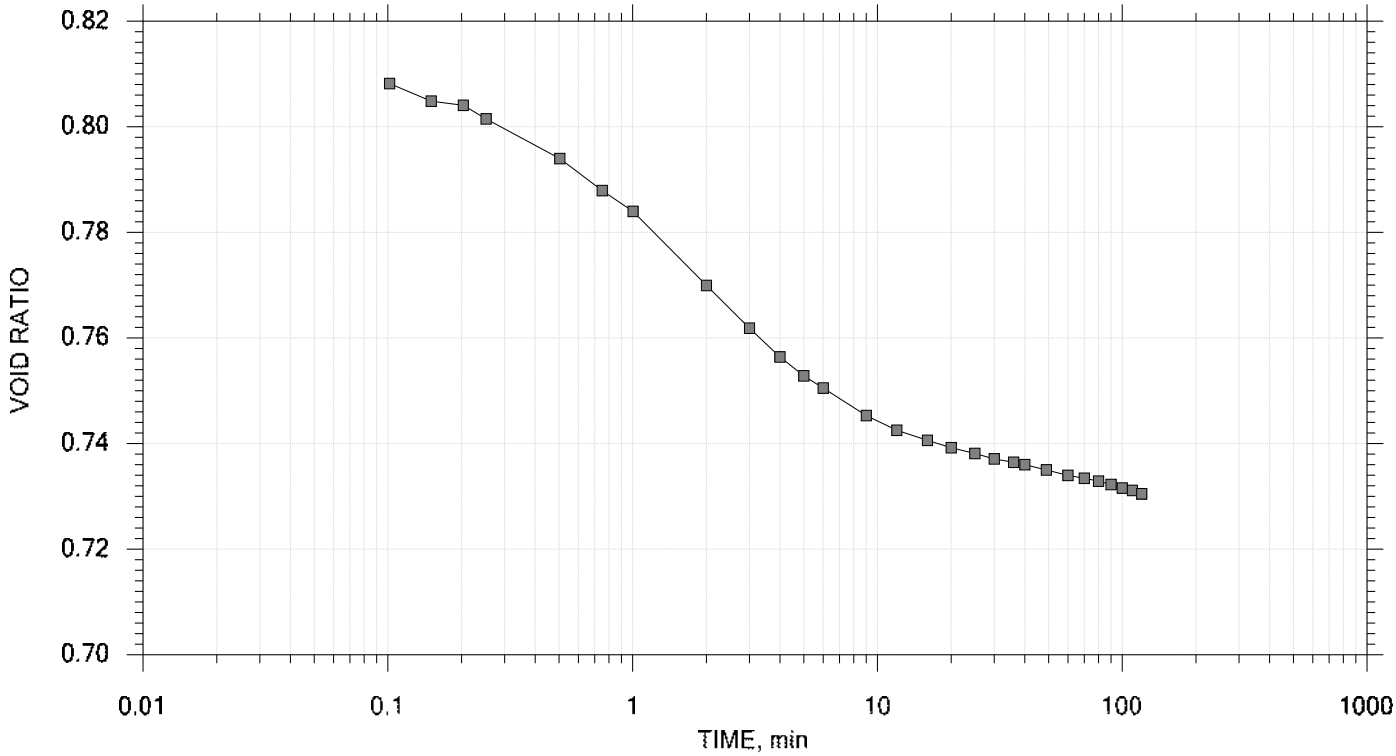
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

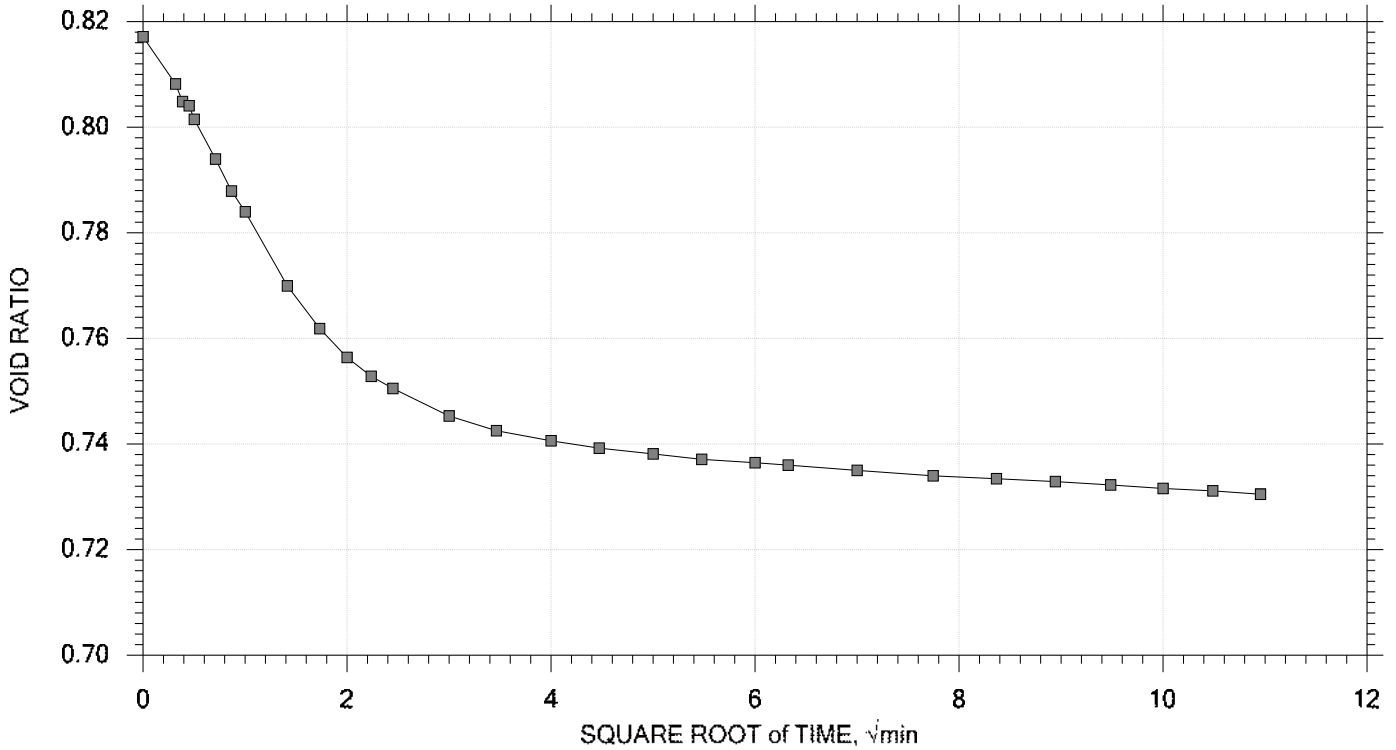
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 7 of 15

Stress: 4 tsf





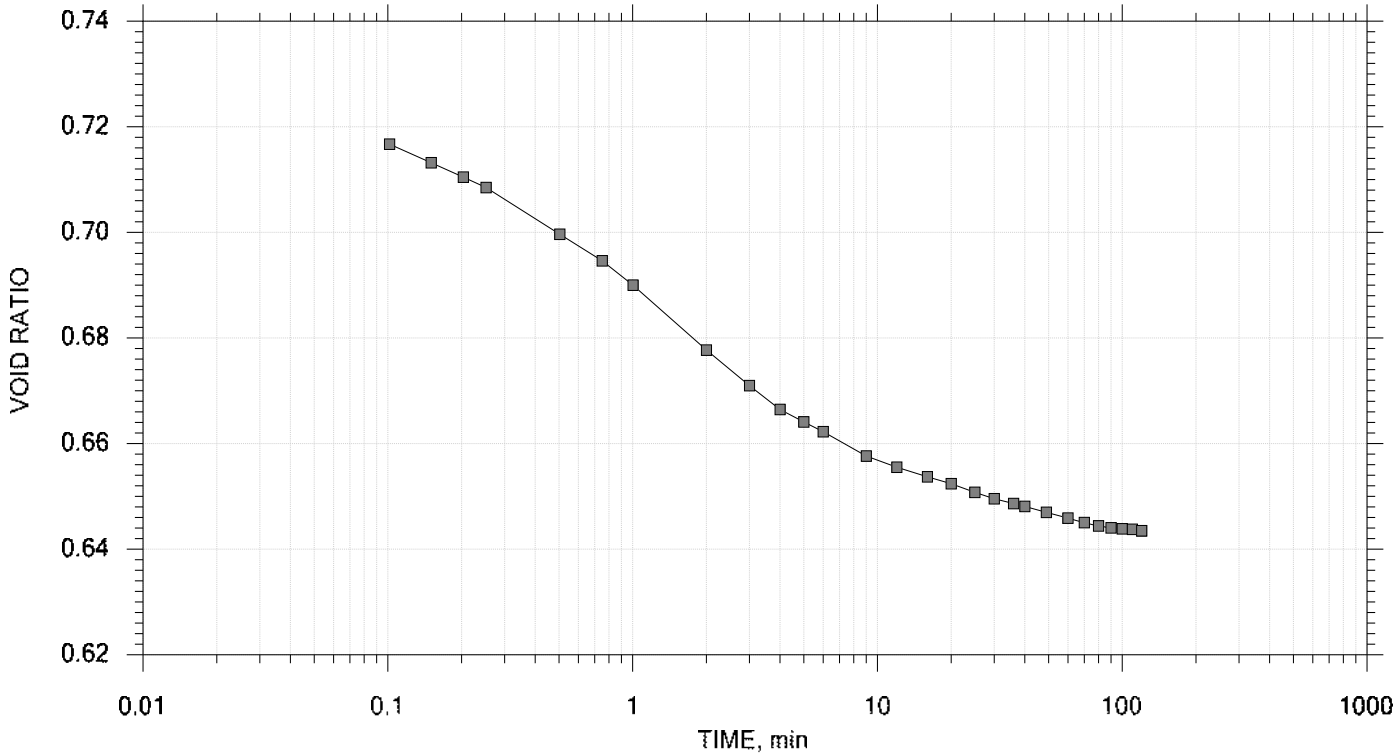
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

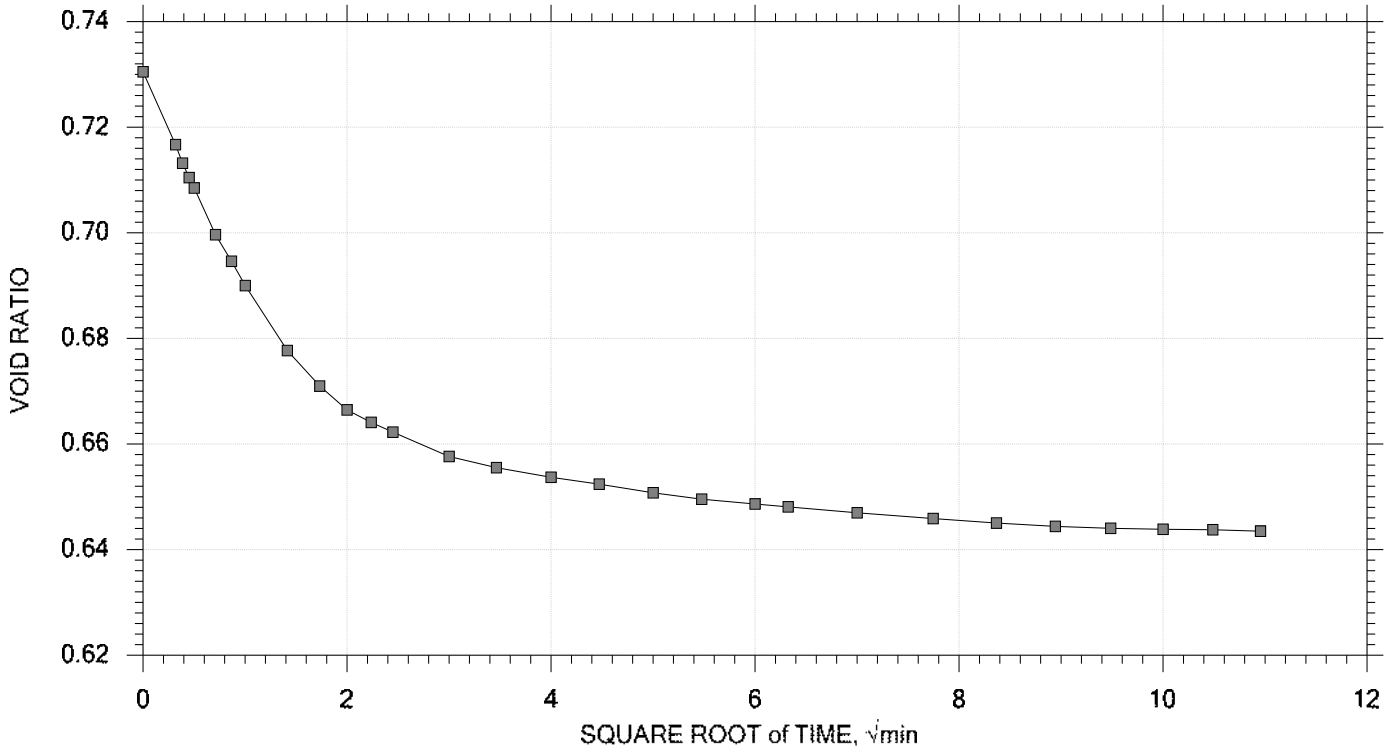
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 8 of 15

Stress: 8 tsf





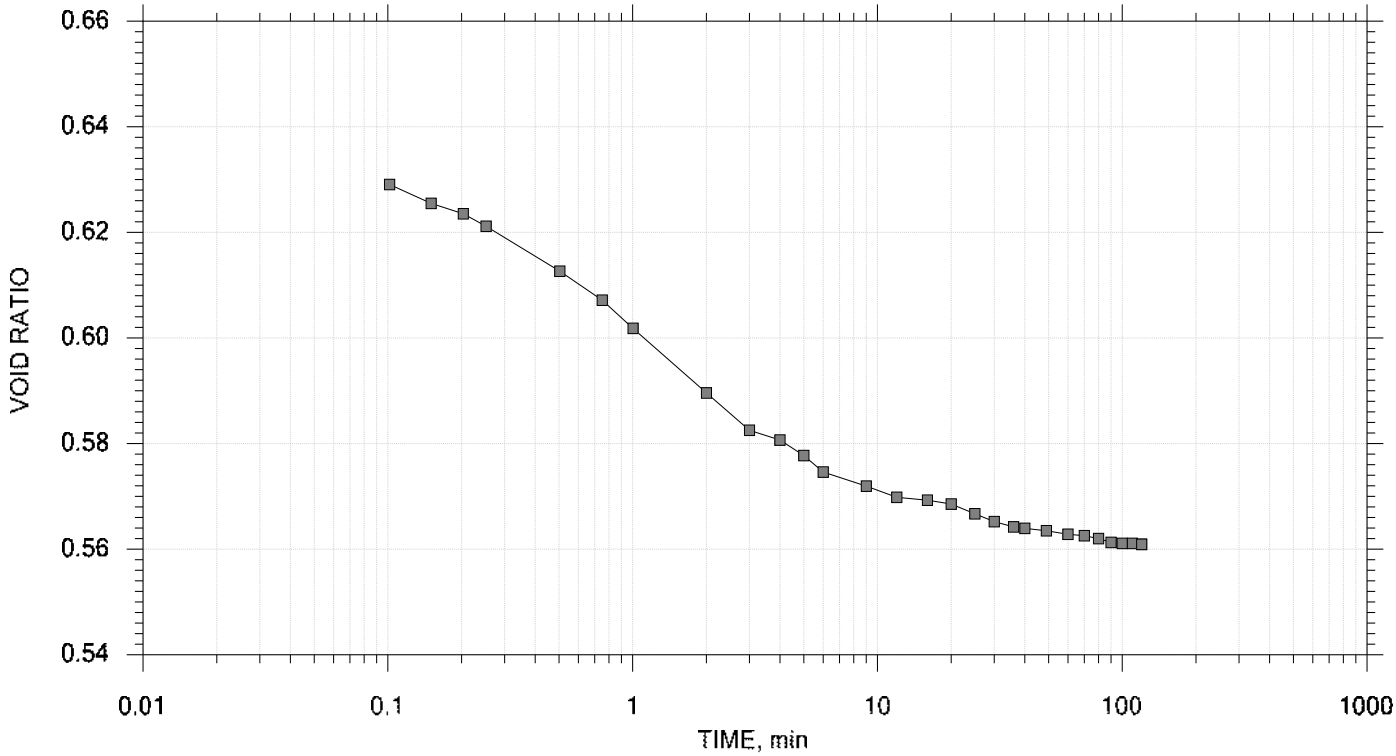
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

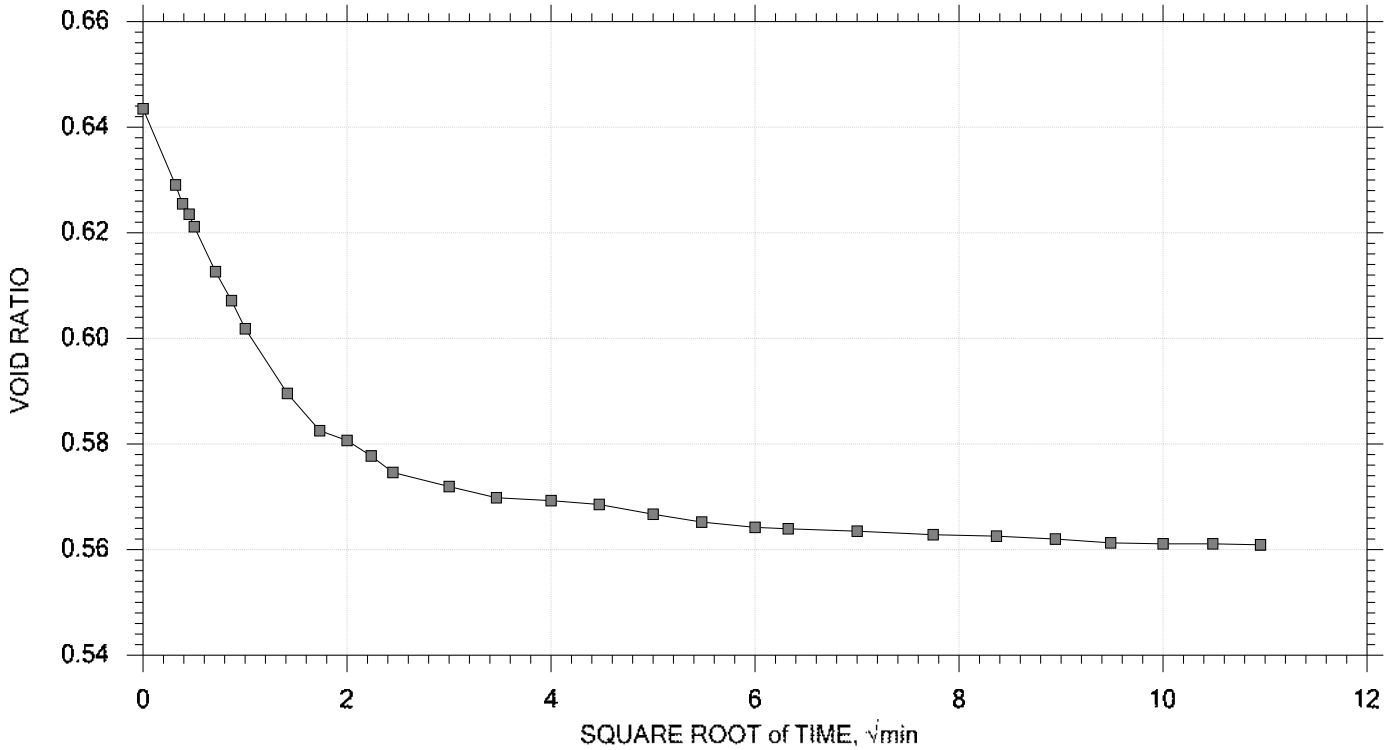
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 9 of 15

Stress: 16 tsf





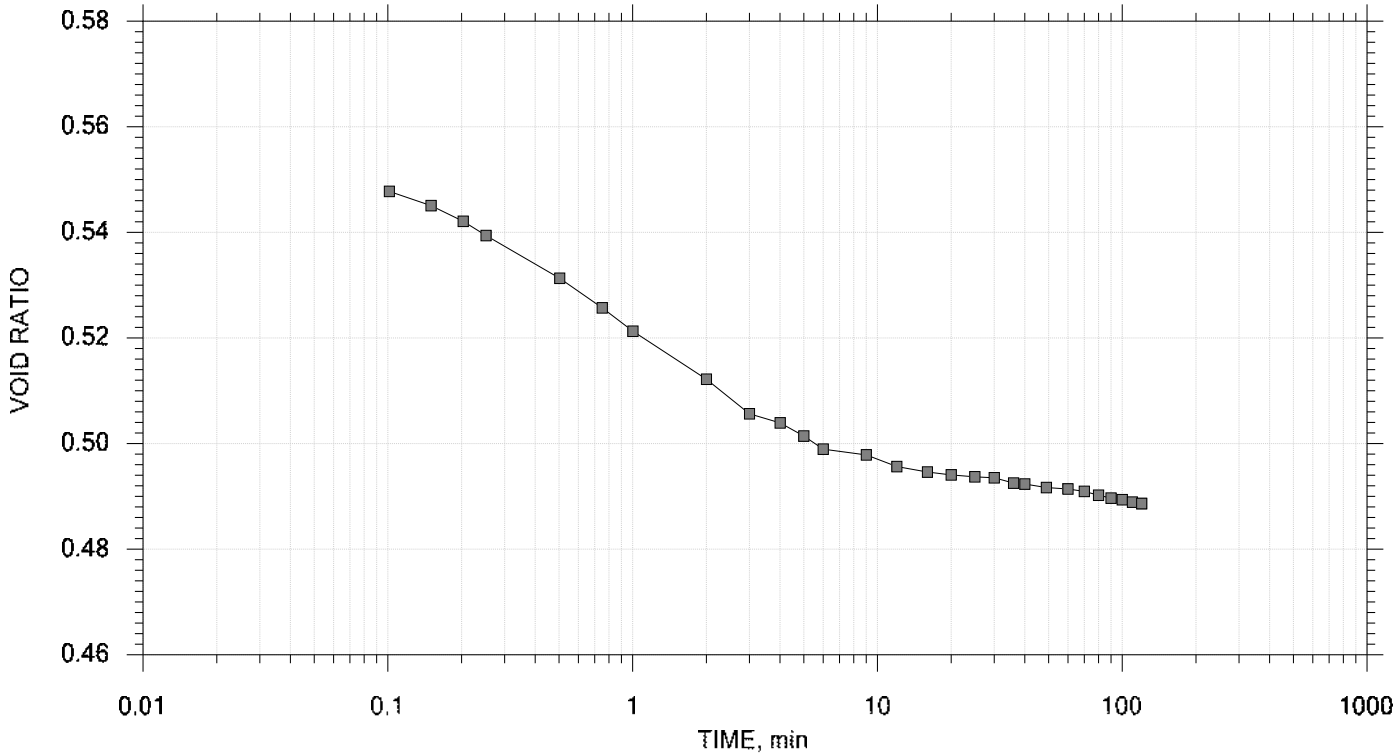
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

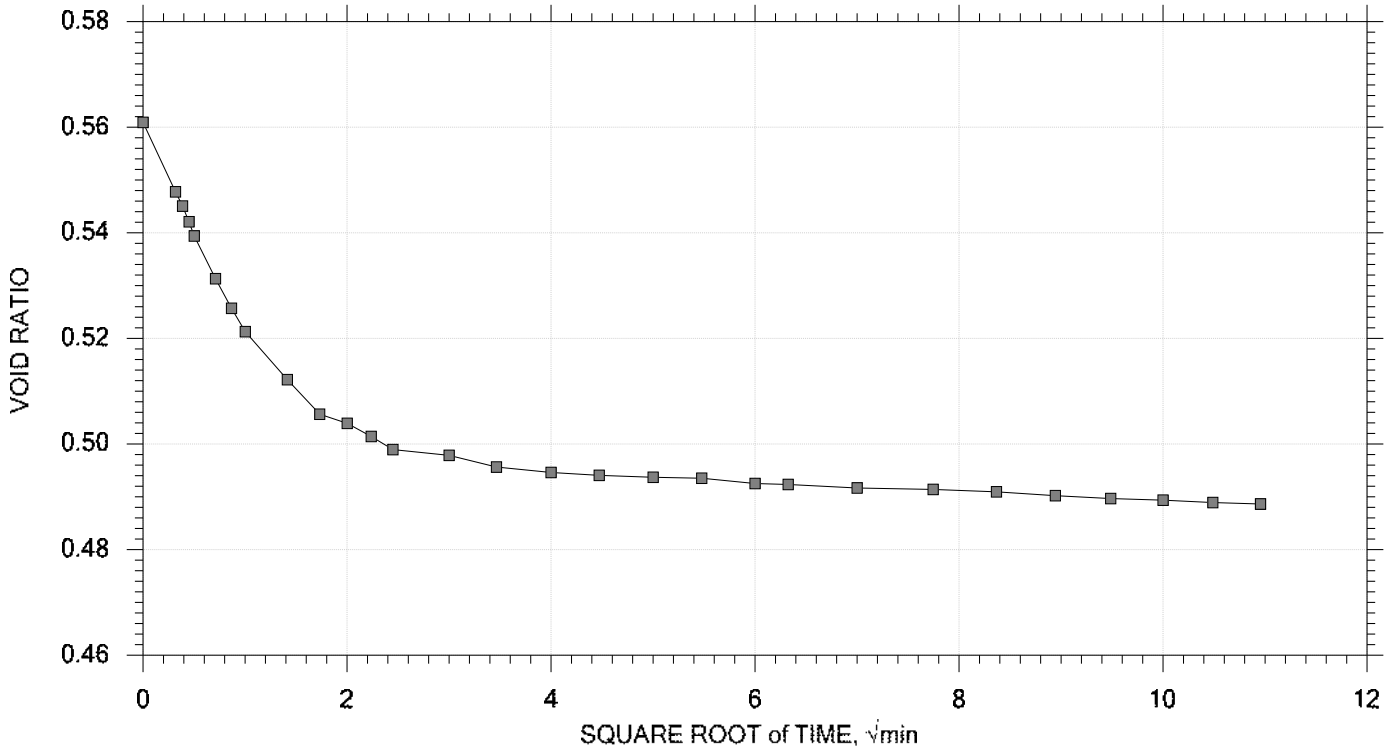
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 10 of 15

Stress: 32 tsf





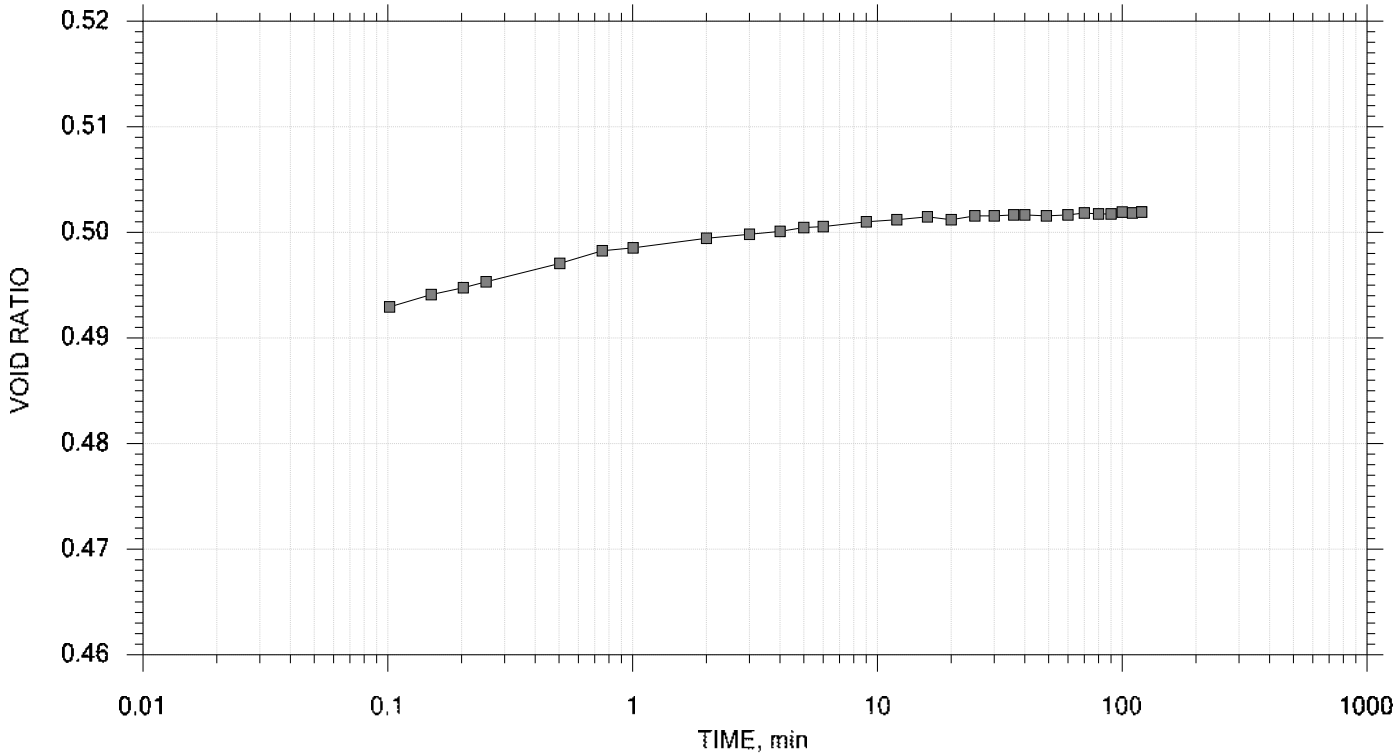
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

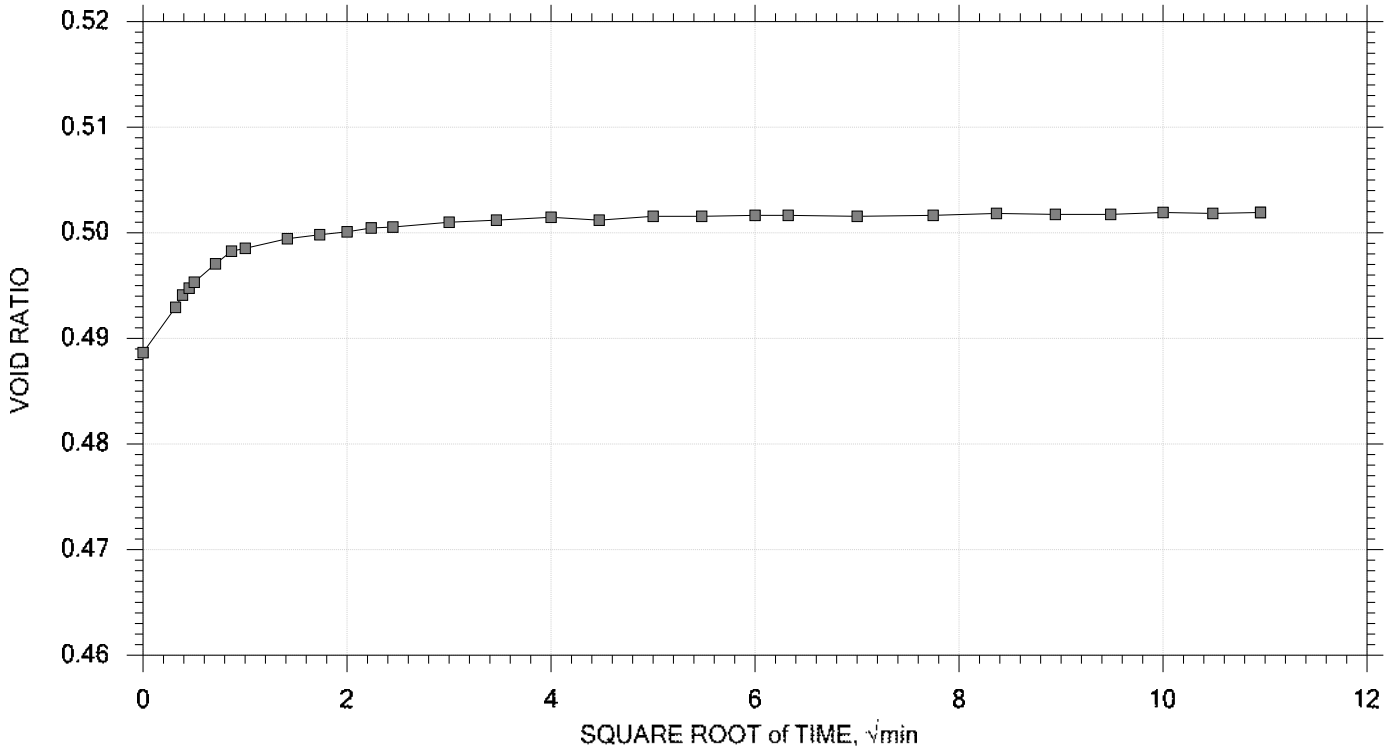
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 11 of 15

Stress: 8 tsf





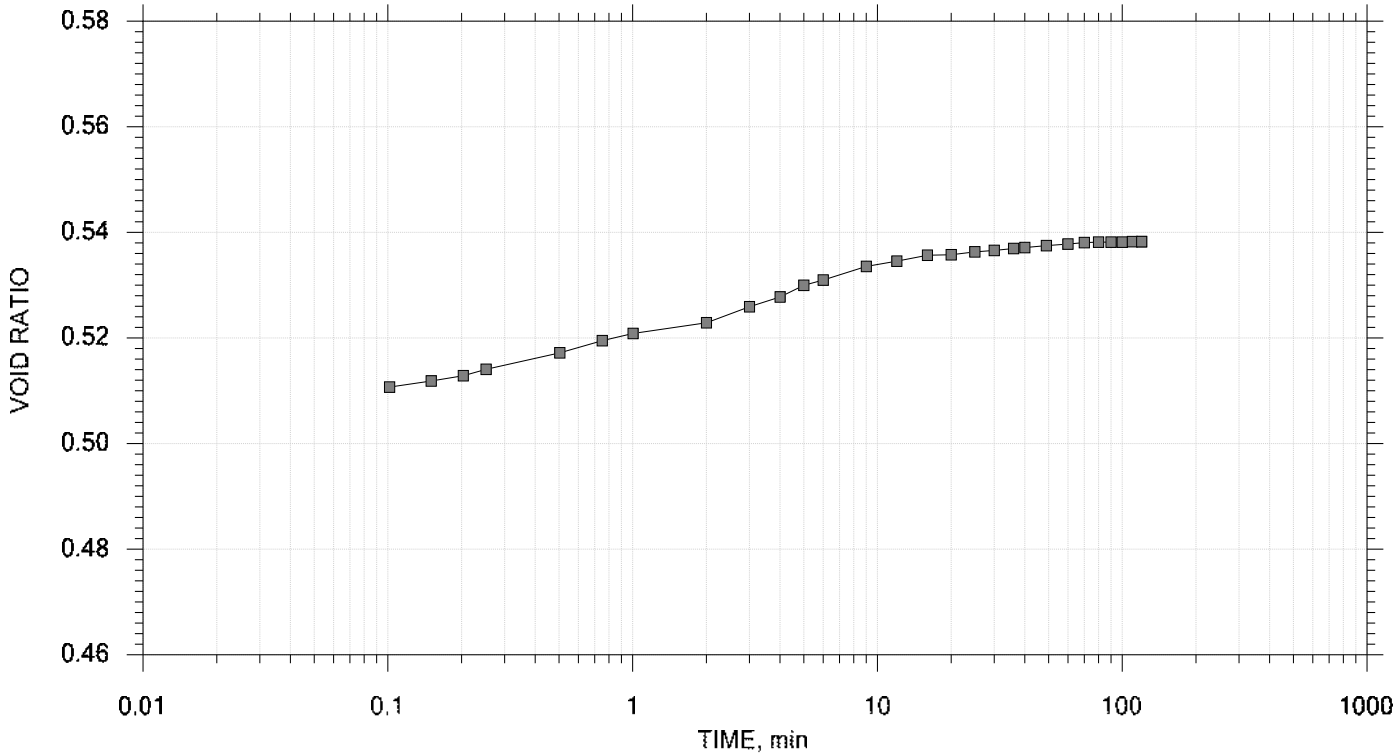
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

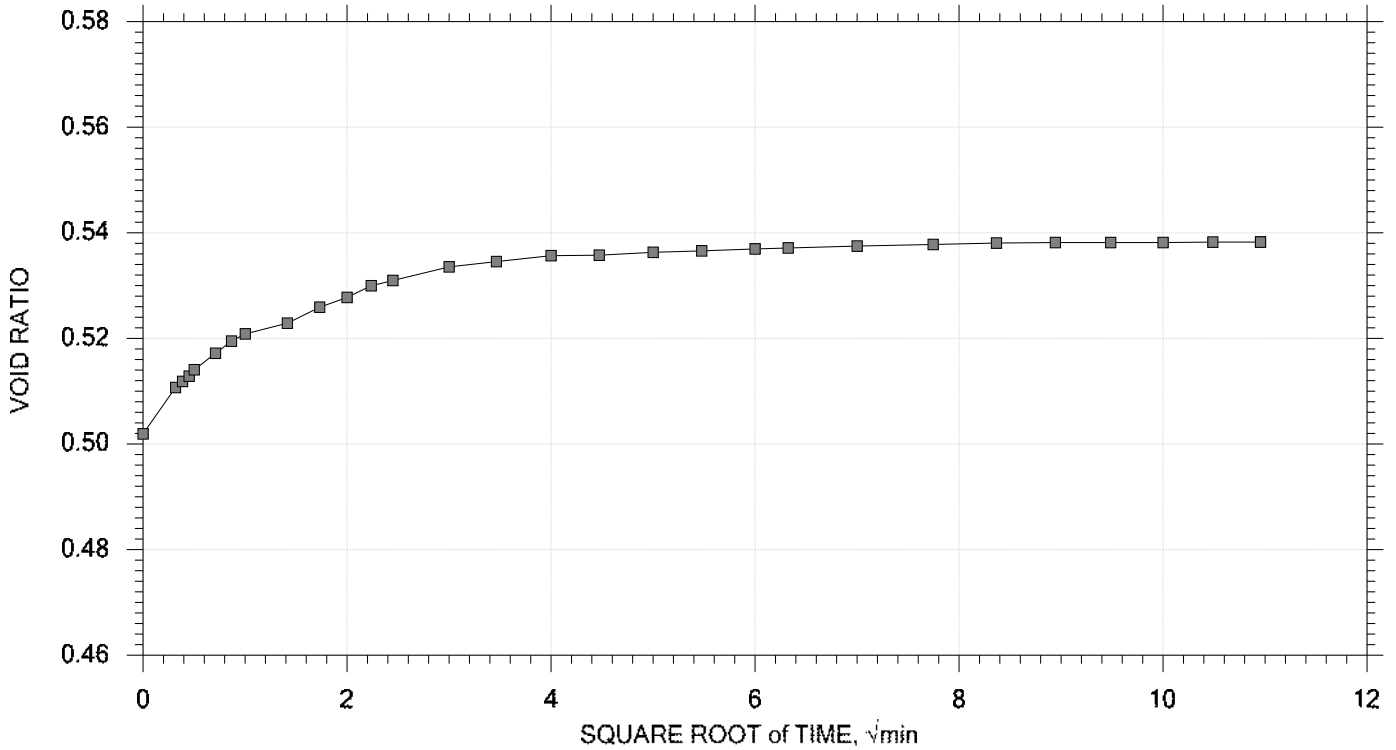
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 12 of 15

Stress: 2 tsf





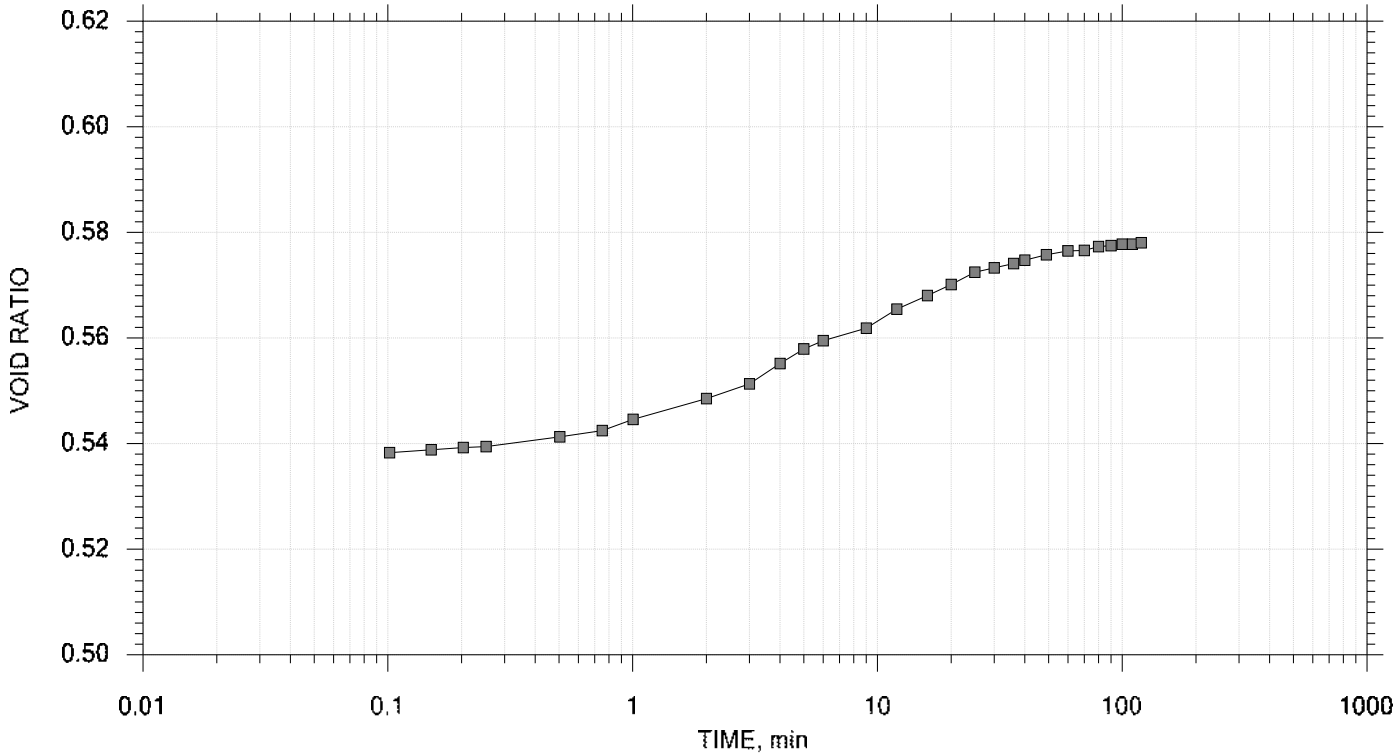
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

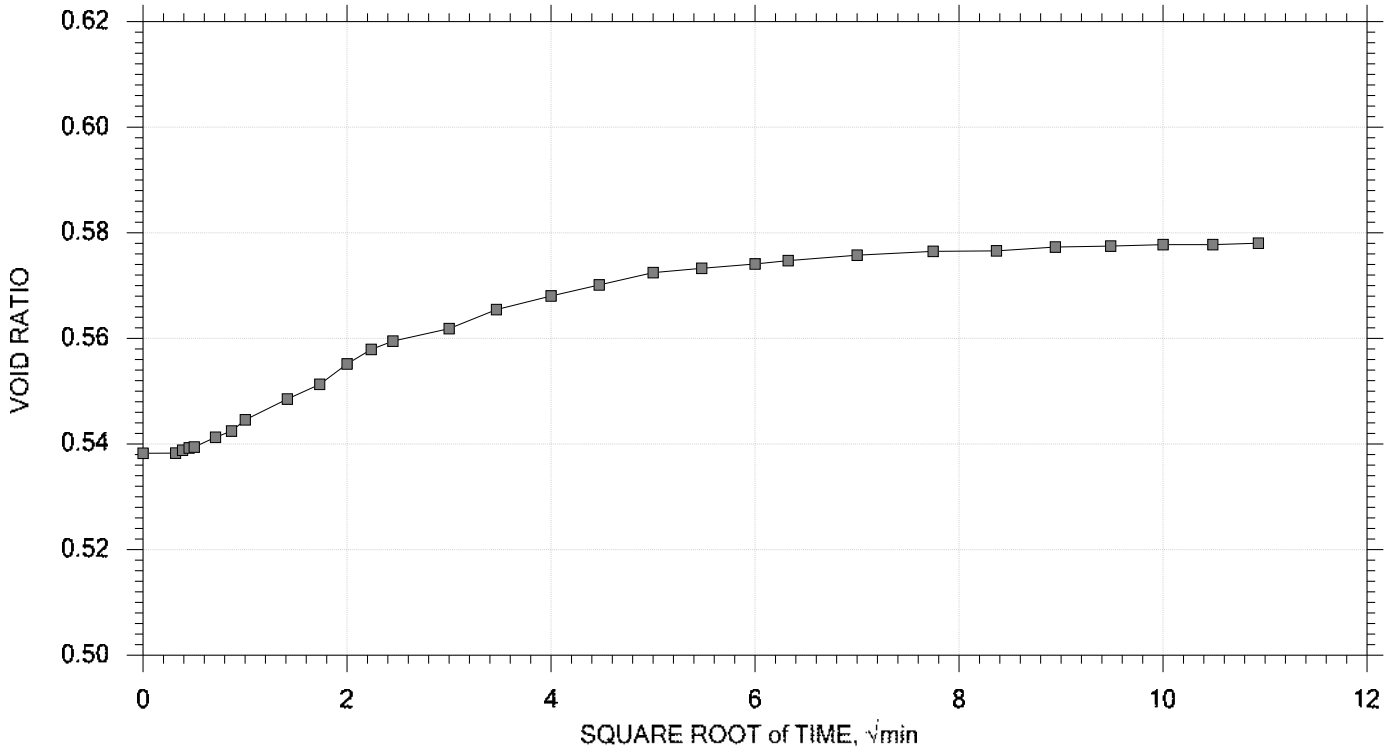
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 13 of 15

Stress: 0.5 tsf





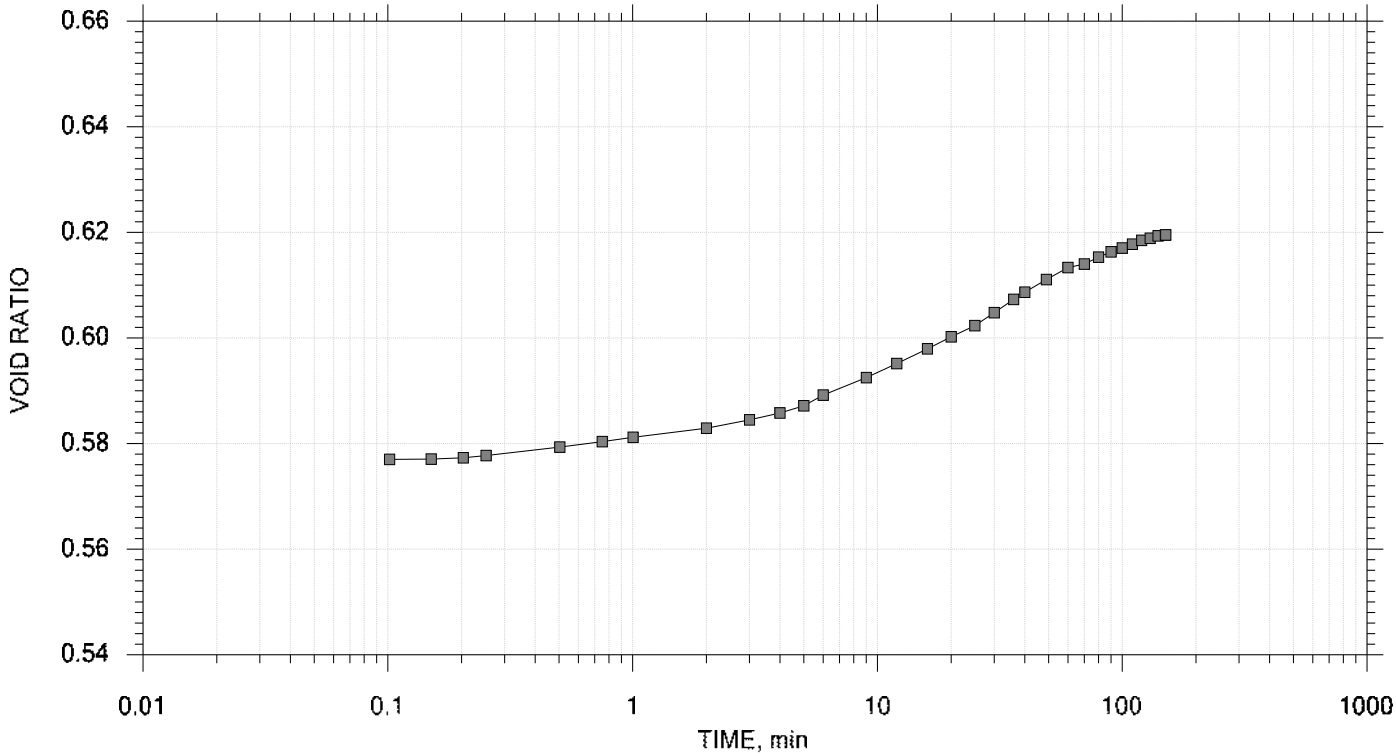
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

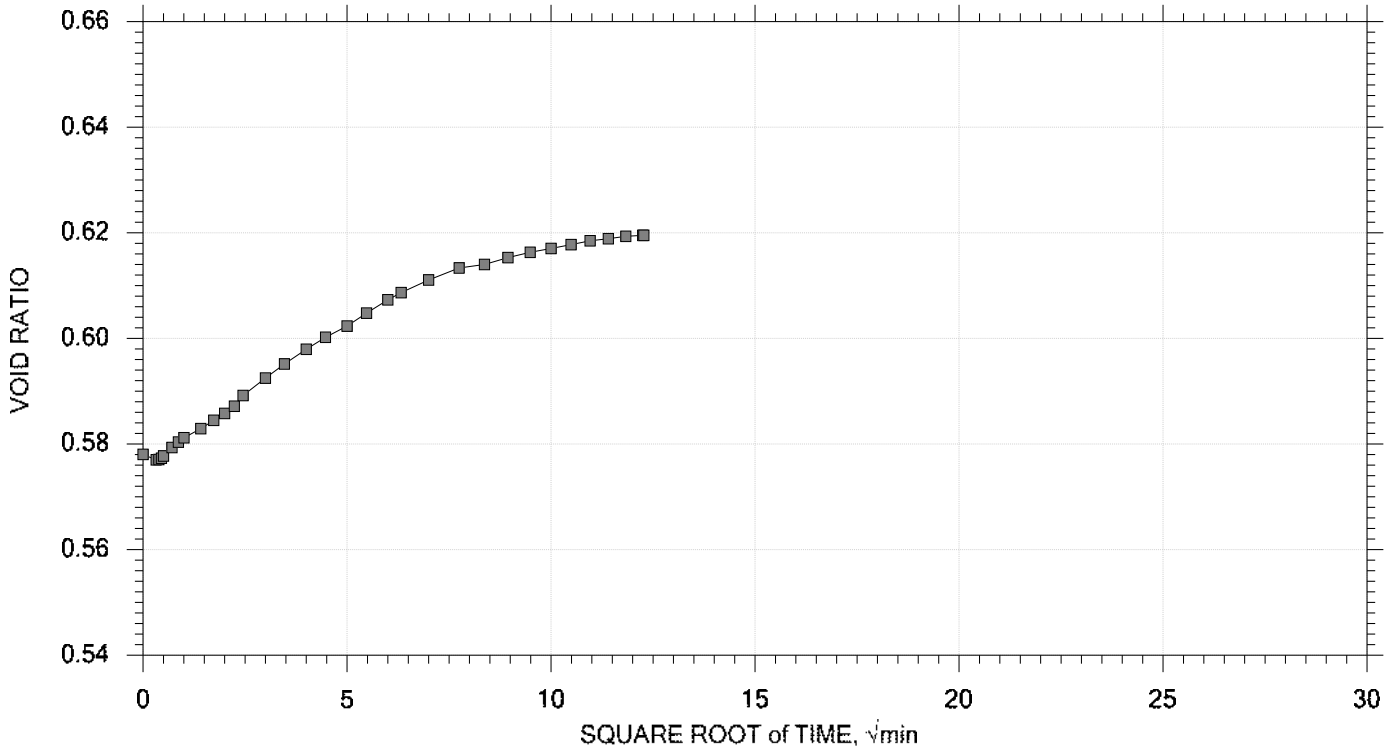
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 14 of 15

Stress: 0.125 tsf





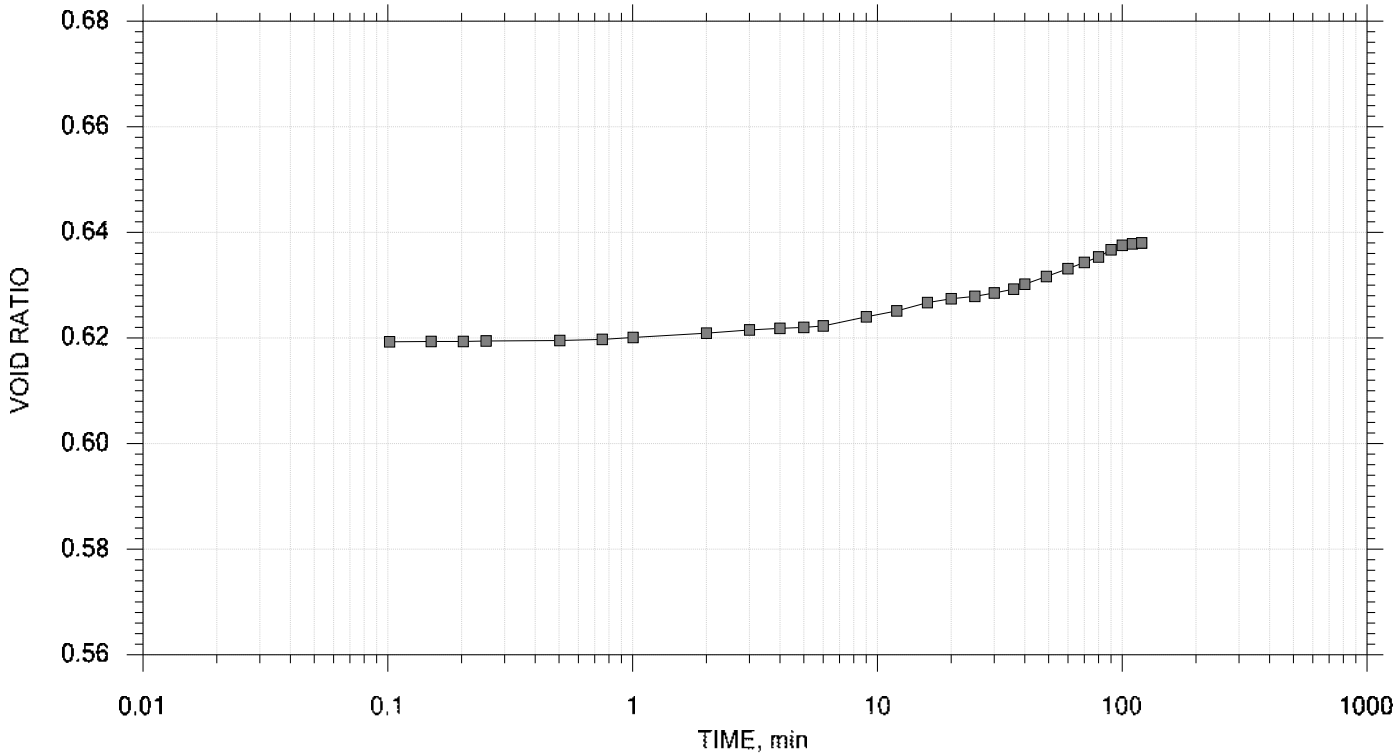
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

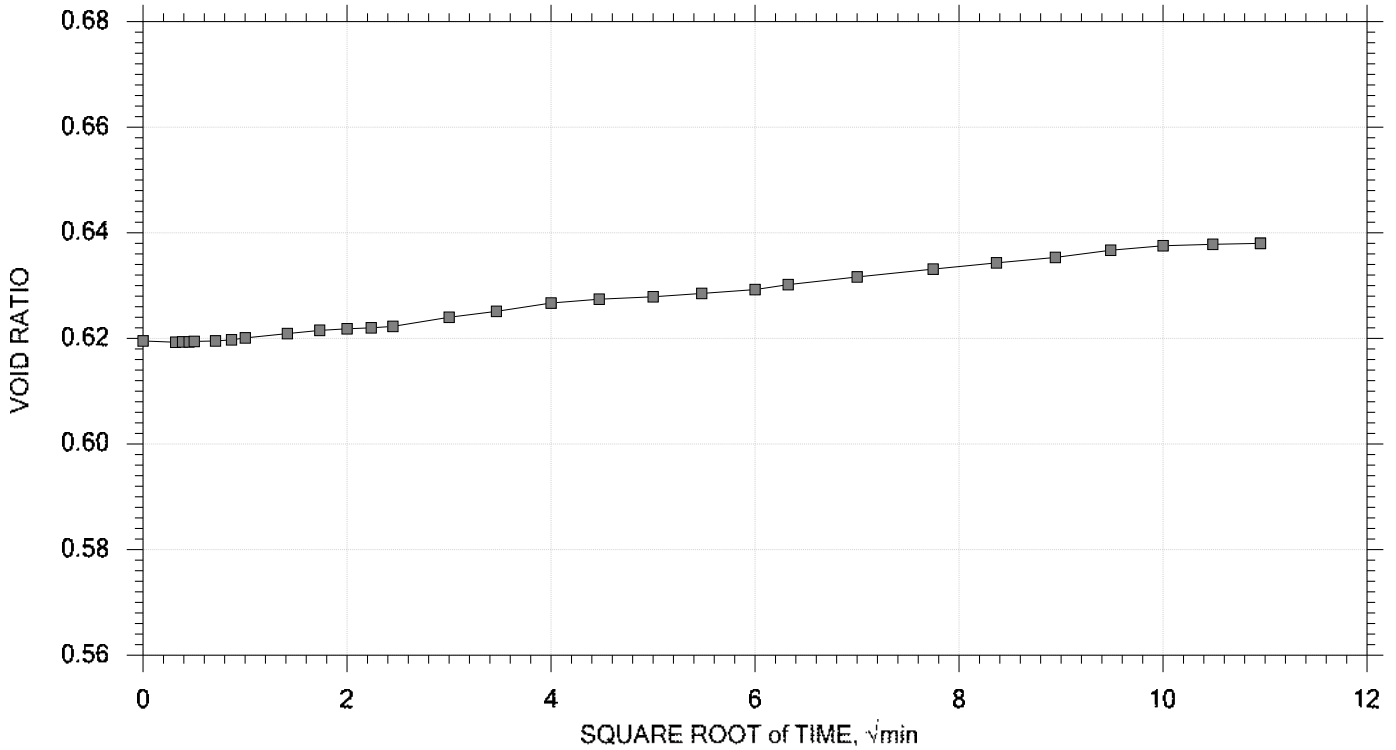
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 15 of 15

Stress: 0.0625 tsf

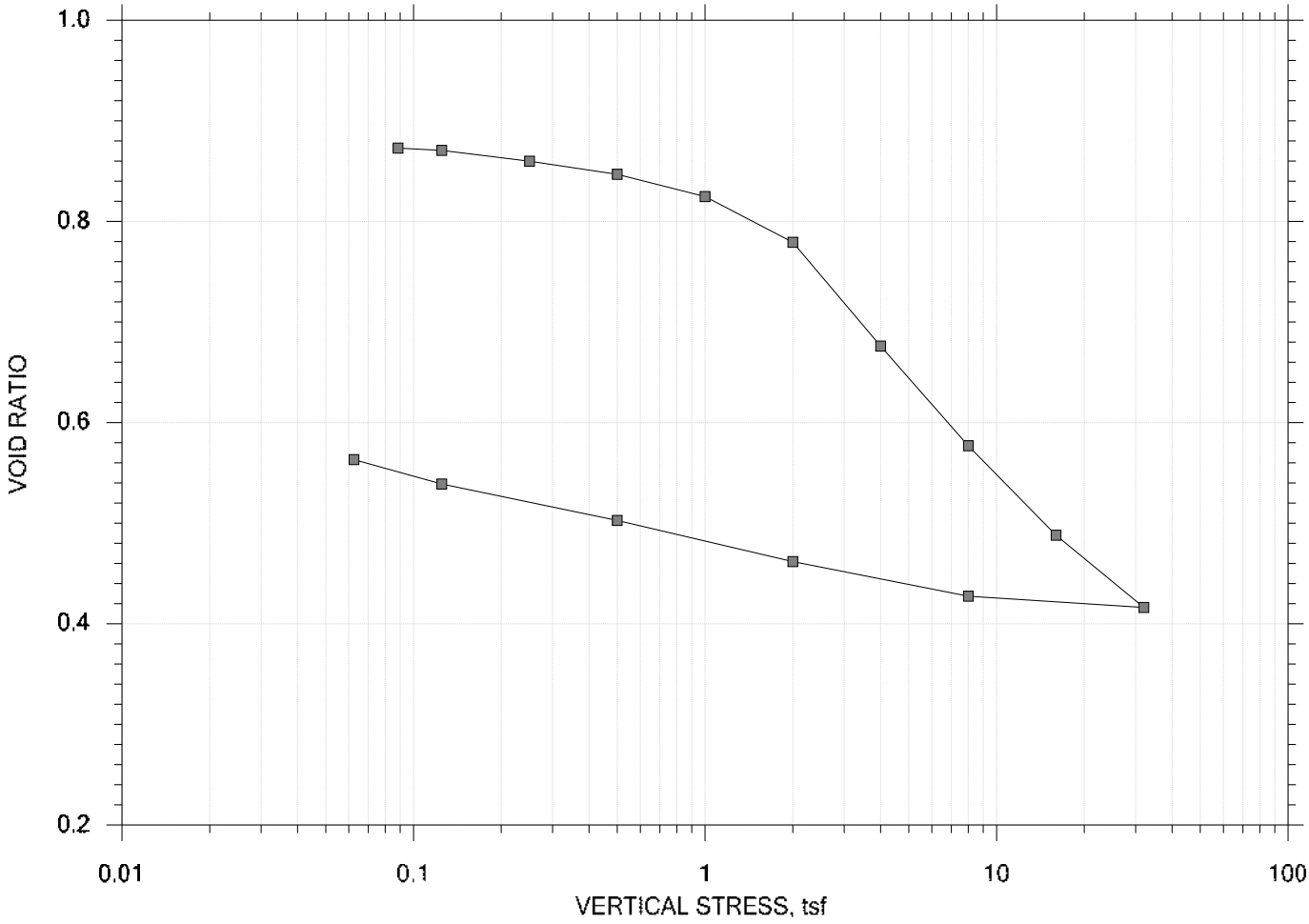


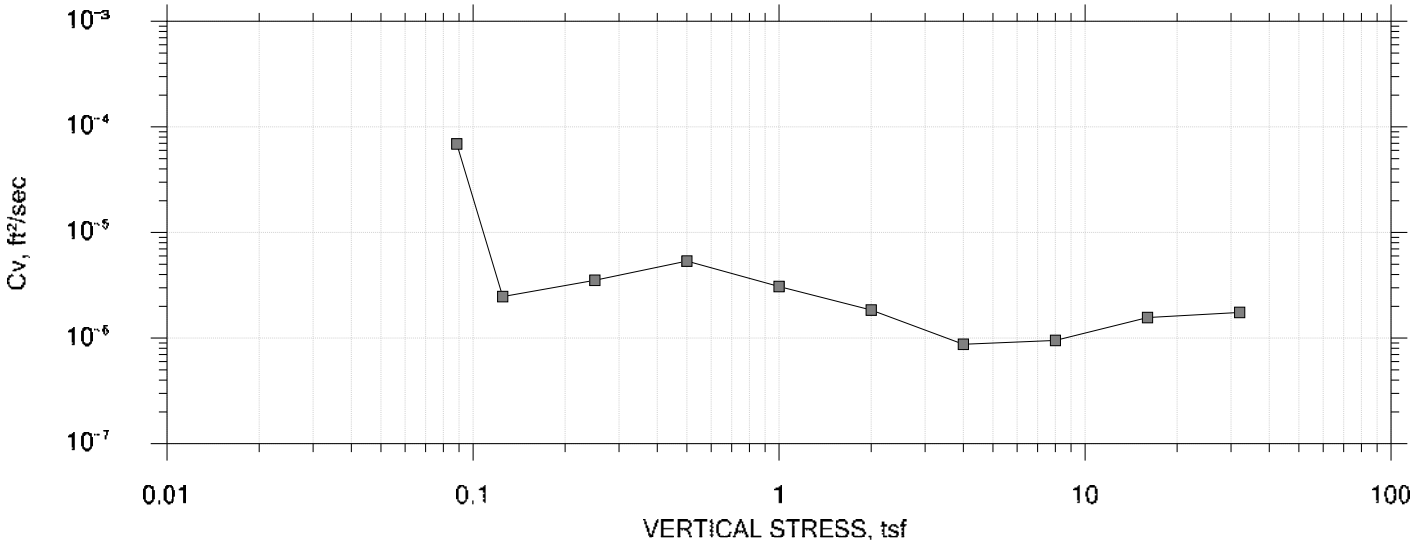


GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-01A	Tested By: md	Checked By: jdt
	Sample No.: ST-01	Test Date: 07/07/15	Test No.: IP-2
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, reddish brown clay		
	Remarks: System V. Swell Pressure = 0.0646 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT

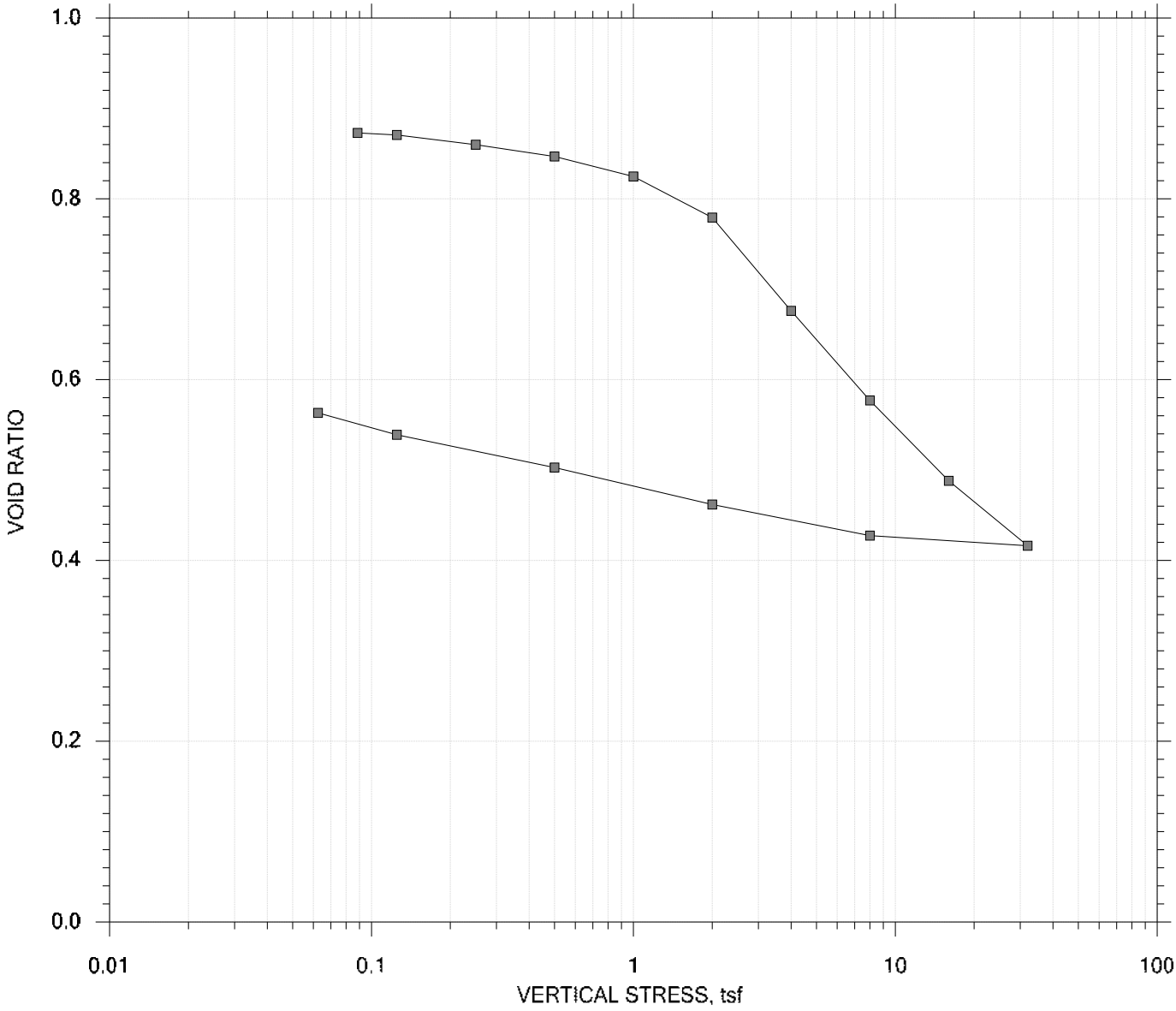




GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT



				Before Test	After Test
Current Vertical Effective Stress: ---			Water Content, %	31.96	22.59
Preconsolidation Stress: ---			Dry Unit Weight, pcf	90.372	105.08
Compression Ratio: ---			Saturation, %	99.06	100.00
Diameter: 2.5 in		Height: 1 in	Void Ratio	0.88	0.61
LL: 41	PL: 18	PI: 23	GS: 2.72		

GeoTesting EXPRESS

Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
Depth: ---	Sample Type: Intact	Elevation: ---
Description: Moist, brown clay		
Remarks: System V. Swell Pressure = 0.0885 tsf		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
Sample No.: ST-02	Test Date: 07/09/15	Depth: ---
Test No.: IP-3	Sample Type: intact	Elevation: ---

Soil Description: Moist, brown clay
Remarks: System V, Swell Pressure = 0.0885 tsf

Measured Specific Gravity: 2.72	Liquid Limit: 41	Specimen Diameter: 2.50 in
Initial Void Ratio: 0.876	Plastic Limit: 18	Initial Height: 1.00 in
Final Void Ratio: 0.614	Plasticity Index: 23	Final Height: 0.86 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A359	RING		A519
Wt. Container + Wet Soil, gm	139.87	262.70	251.79	144.56
Wt. Container + Dry Soil, gm	104.46	225.49	225.49	119.48
Wt. Container, gm	8.4900	109.04	109.04	8.4500
Wt. Dry Soil, gm	95.970	116.45	116.45	111.03
Water Content, %	36.90	31.96	22.59	22.59
Void Ratio	---	0.876	0.614	---
Degree of Saturation, %	---	99.06	100.00	---
Dry Unit Weight, pcf	---	90.372	105.08	---

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Buffalo River
Location: Buffalo, NY
Project No.: GTX-303367
Boring No.: AQ-SB-02A
Tested By: md
Checked By: jdt
Sample No.: ST-02
Test Date: 07/09/15
Depth: ---
Test No.: IP-3
Sample Type: intact
Elevation: ---

Soil Description: Moist, brown clay
Remarks: System V, Swell Pressure = 0.0885 tsf

Displacement at End of Increment

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt T90 min	Cv ft²/sec	Mv 1/tsf	k ft/day
1	0.0885	0.001687	0.873	0.169	0.486	5.04e-005	1.91e-002	2.59e-003
2	0.125	0.002972	0.871	0.297	9.973	2.45e-006	3.52e-002	2.32e-004
3	0.250	0.008637	0.860	0.864	7.649	3.17e-006	4.53e-002	3.88e-004
4	0.500	0.01560	0.847	1.56	4.439	5.39e-006	2.79e-002	4.05e-004
5	1.00	0.02744	0.825	2.74	7.936	2.96e-006	2.37e-002	1.89e-004
6	2.00	0.05163	0.779	5.16	13.710	1.65e-006	2.42e-002	1.08e-004
7	4.00	0.1066	0.676	10.7	23.166	8.98e-007	2.75e-002	6.66e-005
8	8.00	0.1595	0.577	15.9	20.236	9.11e-007	1.32e-002	3.25e-005
9	16.0	0.2068	0.488	20.7	8.036	2.04e-006	5.92e-003	3.25e-005
10	32.0	0.2451	0.416	24.5	6.855	2.14e-006	2.39e-003	1.38e-005
11	8.00	0.2392	0.427	23.9	8.976	1.57e-006	2.48e-004	1.05e-006
12	2.00	0.2208	0.462	22.1	17.675	8.23e-007	3.06e-003	6.78e-006
13	0.500	0.1990	0.503	19.9	91.286	1.68e-007	1.45e-002	6.58e-006
14	0.125	0.1797	0.539	18.0	89.640	1.80e-007	5.14e-002	2.49e-005
15	0.0625	0.1668	0.563	16.7	0.000	0.00e+000	2.07e-001	0.00e+000

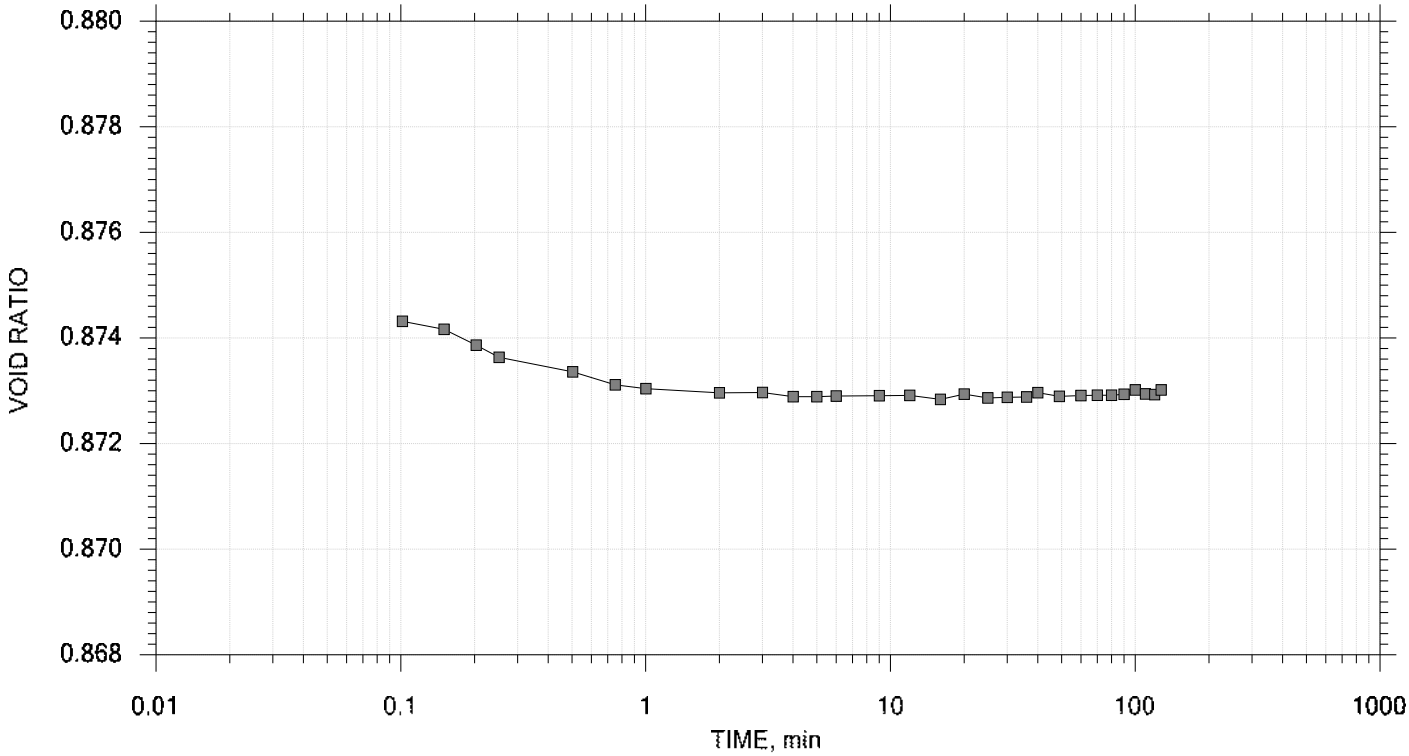
	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/sec	Mv 1/tsf	k ft/day	Ca %
1	0.0885	0.001687	0.873	0.169	0.000	0.00e+000	1.91e-002	0.00e+000	0.00e+000
2	0.125	0.002972	0.871	0.297	0.000	0.00e+000	3.52e-002	0.00e+000	0.00e+000
3	0.250	0.008637	0.860	0.864	0.000	0.00e+000	4.53e-002	0.00e+000	0.00e+000
4	0.500	0.01560	0.847	1.56	0.000	0.00e+000	2.79e-002	0.00e+000	0.00e+000
5	1.00	0.02744	0.825	2.74	1.688	3.23e-006	2.37e-002	2.06e-004	0.00e+000
6	2.00	0.05163	0.779	5.16	0.000	0.00e+000	2.42e-002	0.00e+000	0.00e+000
7	4.00	0.1066	0.676	10.7	5.684	8.50e-007	2.75e-002	6.30e-005	0.00e+000
8	8.00	0.1595	0.577	15.9	4.329	9.90e-007	1.32e-002	3.53e-005	0.00e+000
9	16.0	0.2068	0.488	20.7	2.828	1.34e-006	5.92e-003	2.15e-005	0.00e+000
10	32.0	0.2451	0.416	24.5	2.288	1.49e-006	2.39e-003	9.63e-006	0.00e+000
11	8.00	0.2392	0.427	23.9	0.000	0.00e+000	2.48e-004	0.00e+000	0.00e+000
12	2.00	0.2208	0.462	22.1	4.557	7.42e-007	3.06e-003	6.11e-006	0.00e+000
13	0.500	0.1990	0.503	19.9	18.778	1.89e-007	1.45e-002	7.43e-006	0.00e+000
14	0.125	0.1797	0.539	18.0	0.000	0.00e+000	5.14e-002	0.00e+000	0.00e+000
15	0.0625	0.1668	0.563	16.7	0.000	0.00e+000	2.07e-001	0.00e+000	0.00e+000

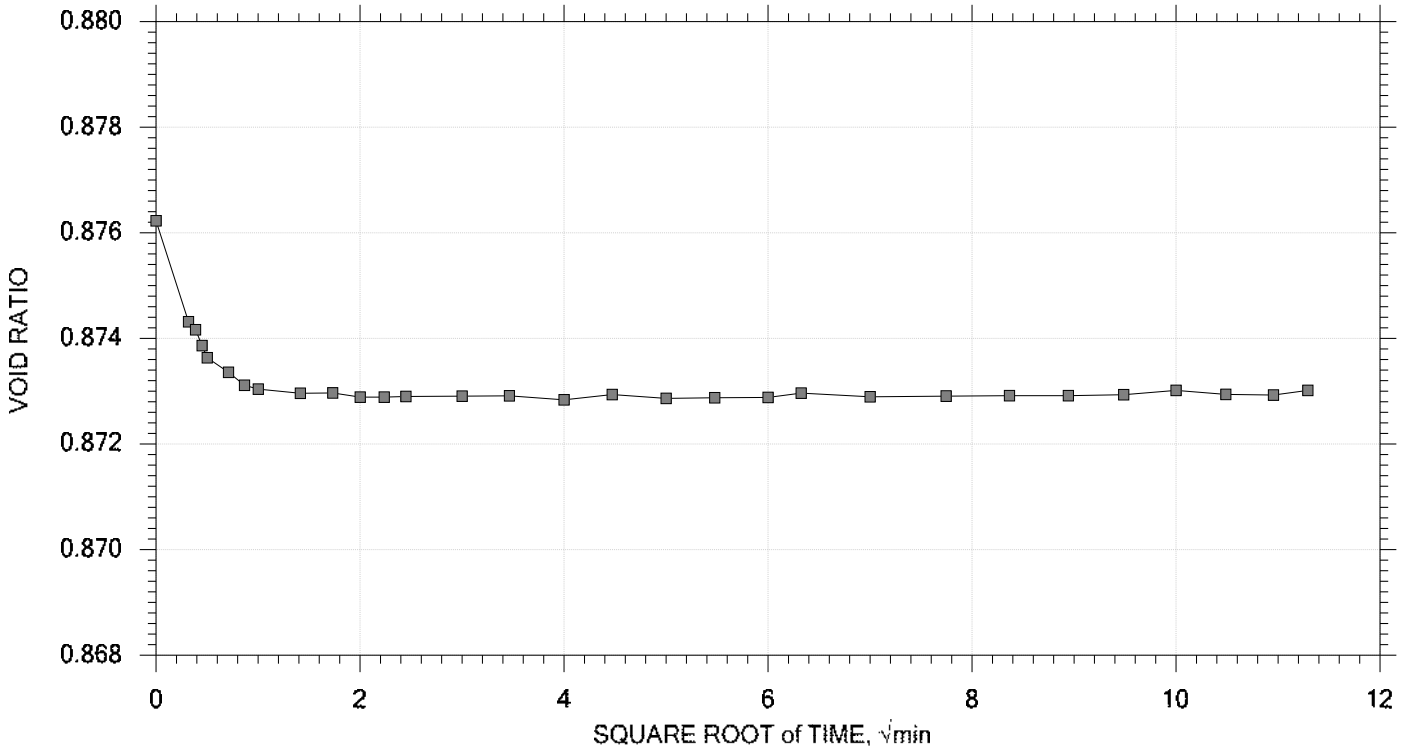
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Volume Step 1 of 15

Stress: 0.088468 tsf





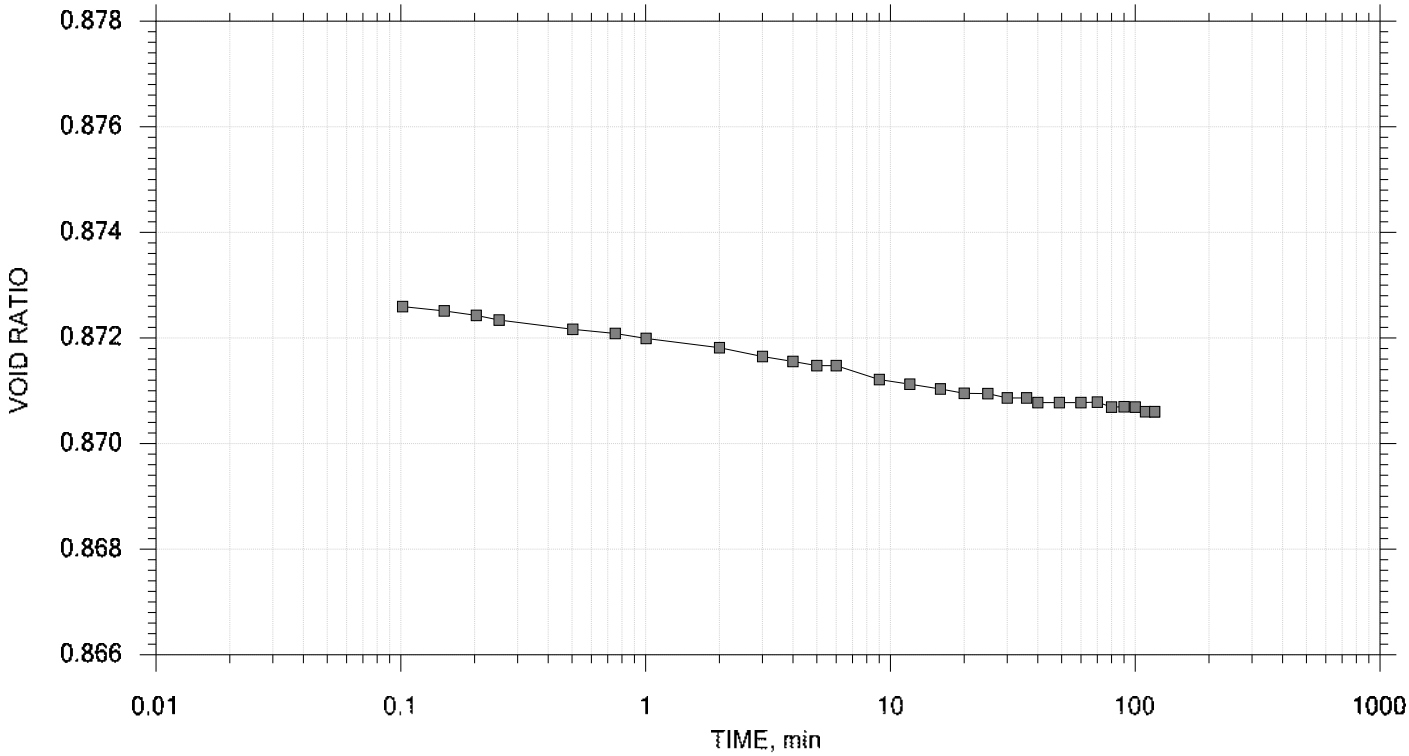
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

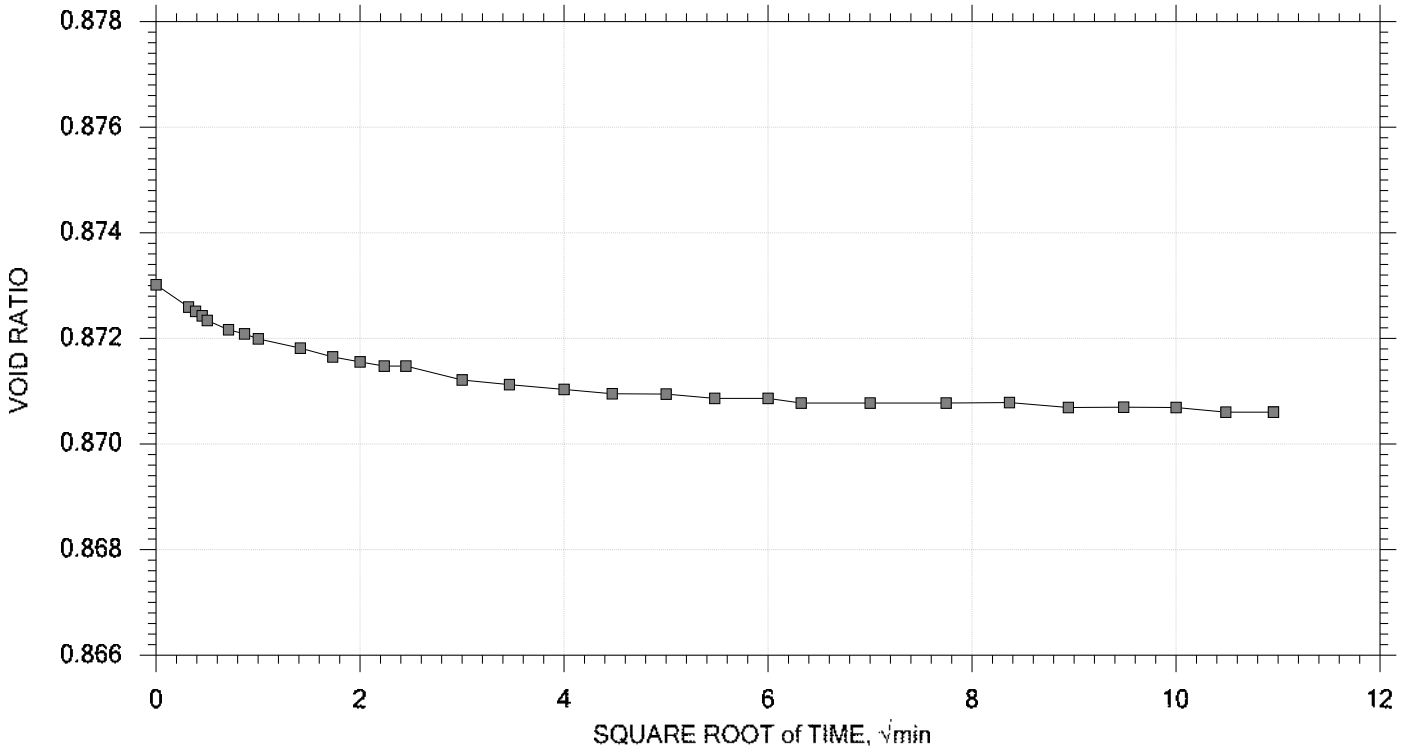
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 2 of 15

Stress: 0.125 tsf





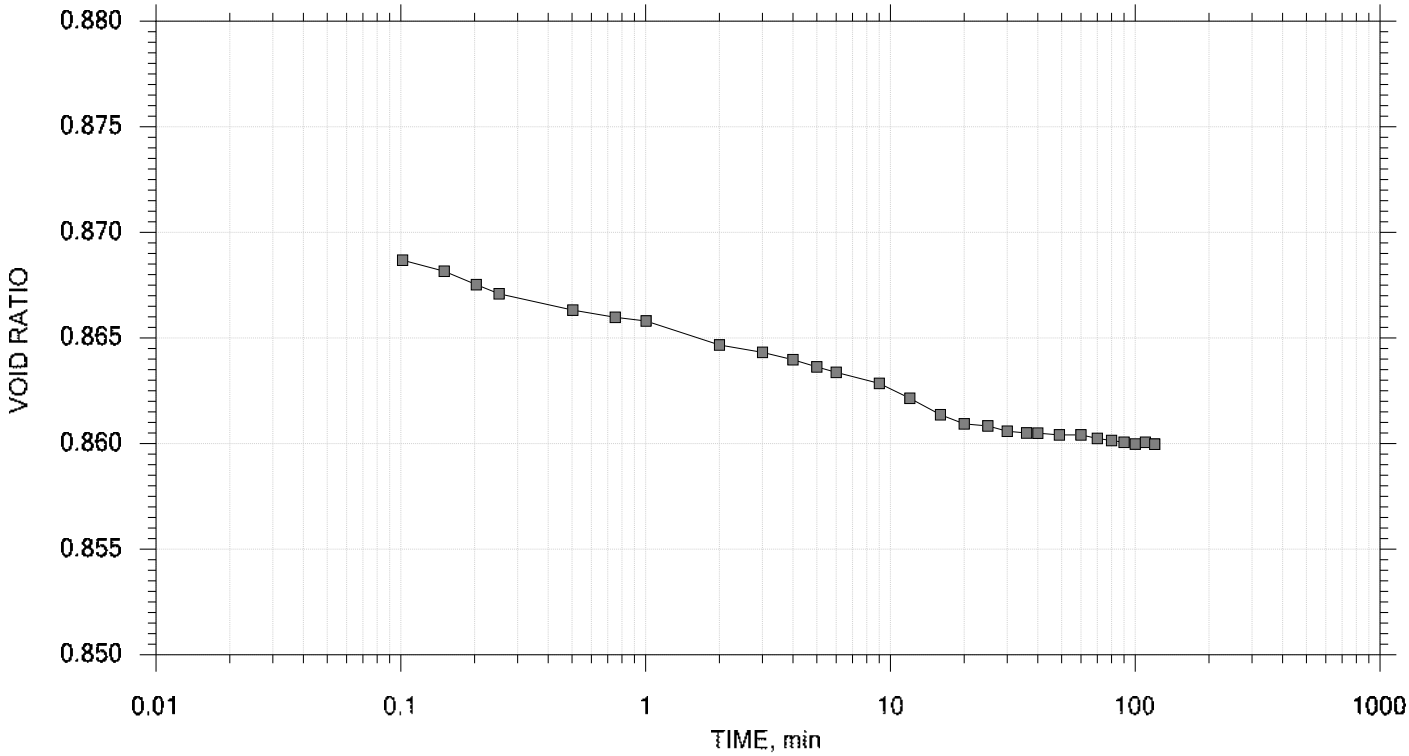
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

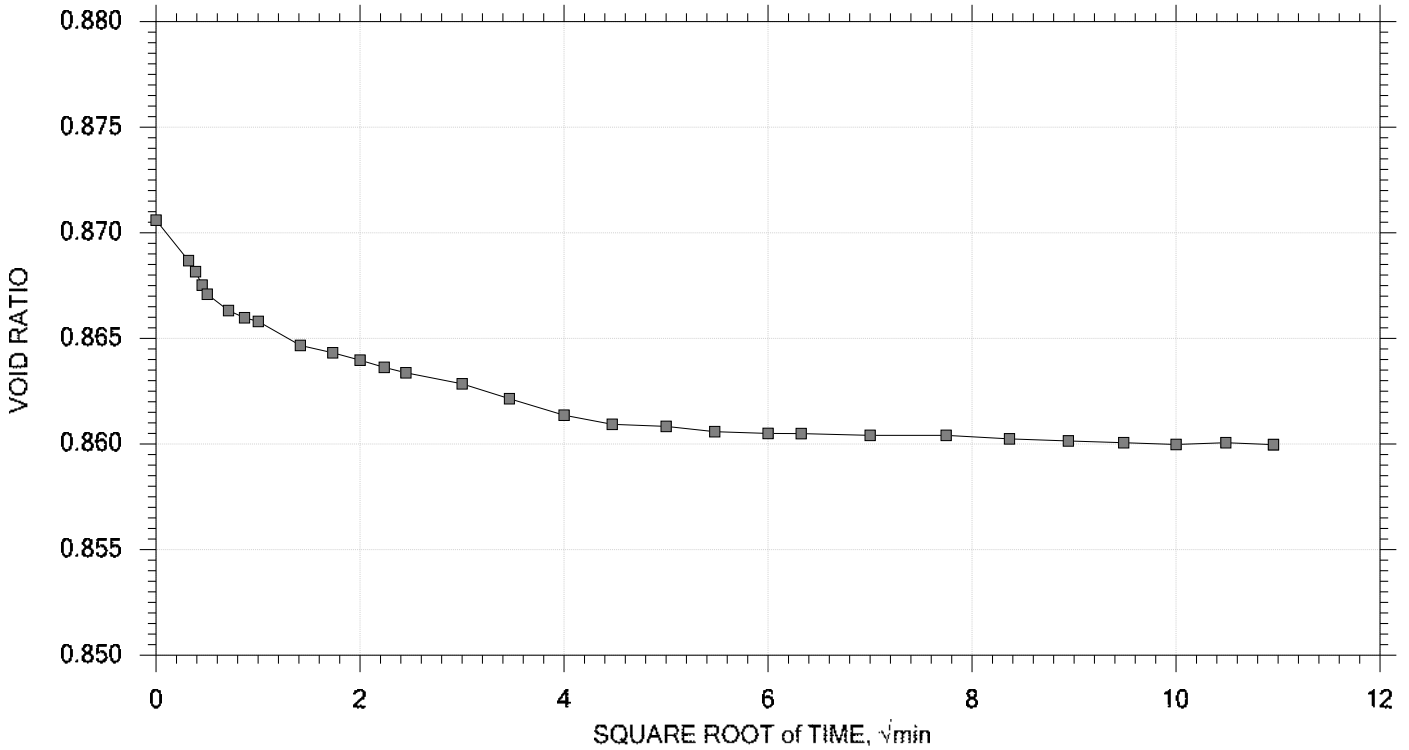
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 3 of 15

Stress: 0.25 tsf





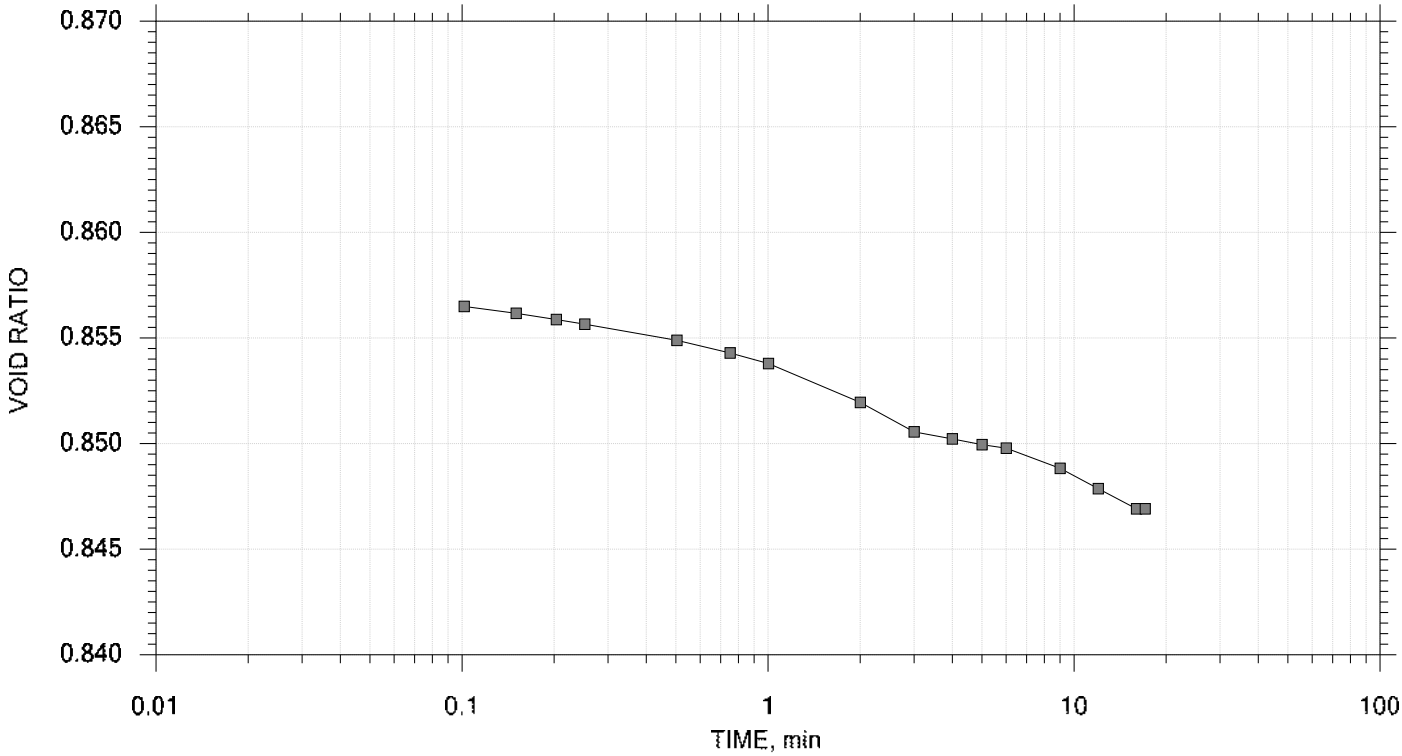
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

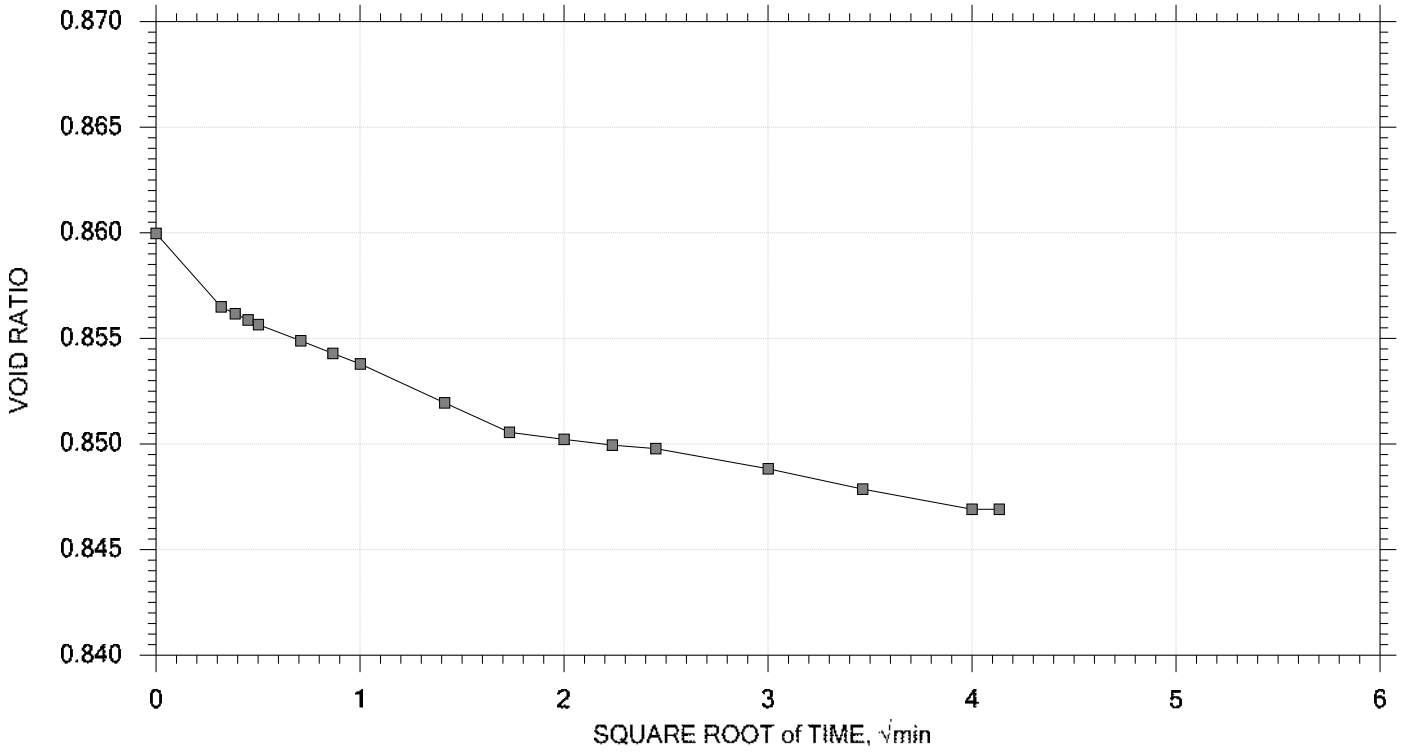
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 4 of 15

Stress: 0.5 tsf





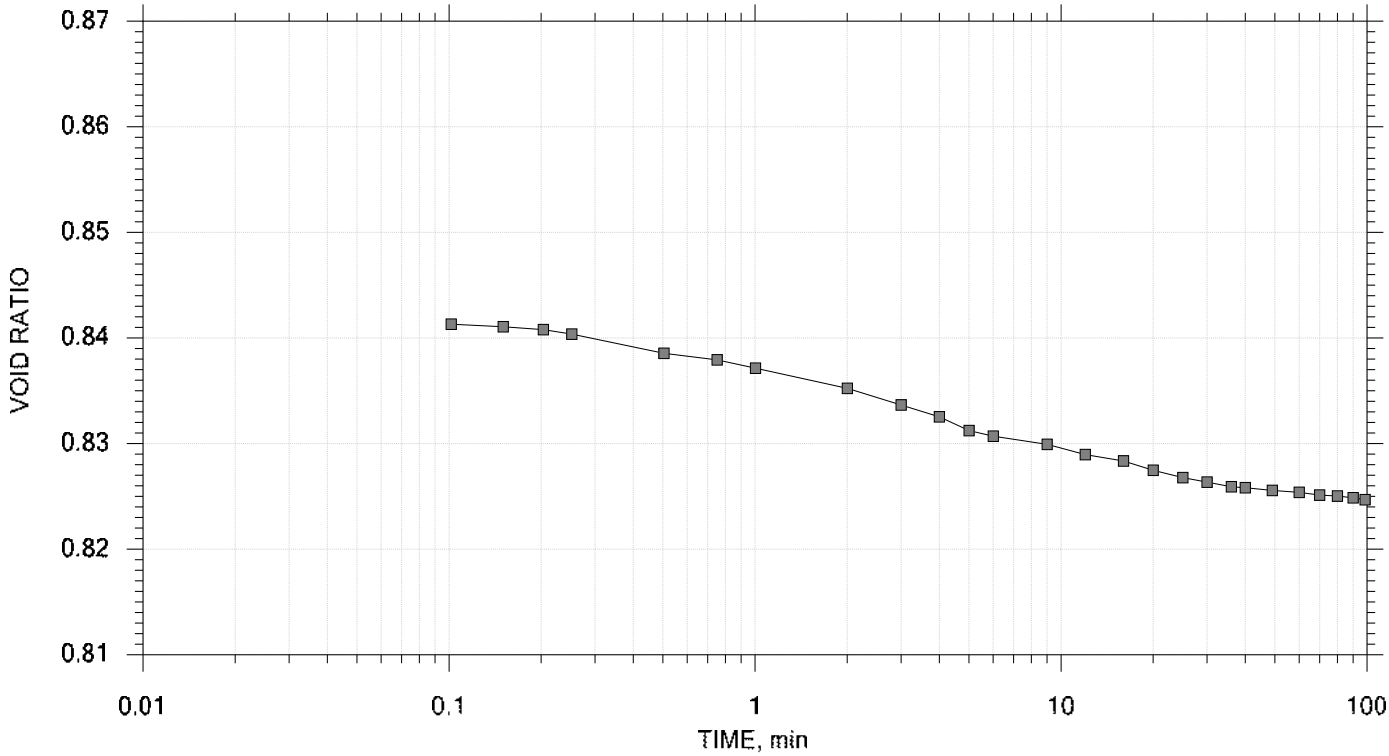
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

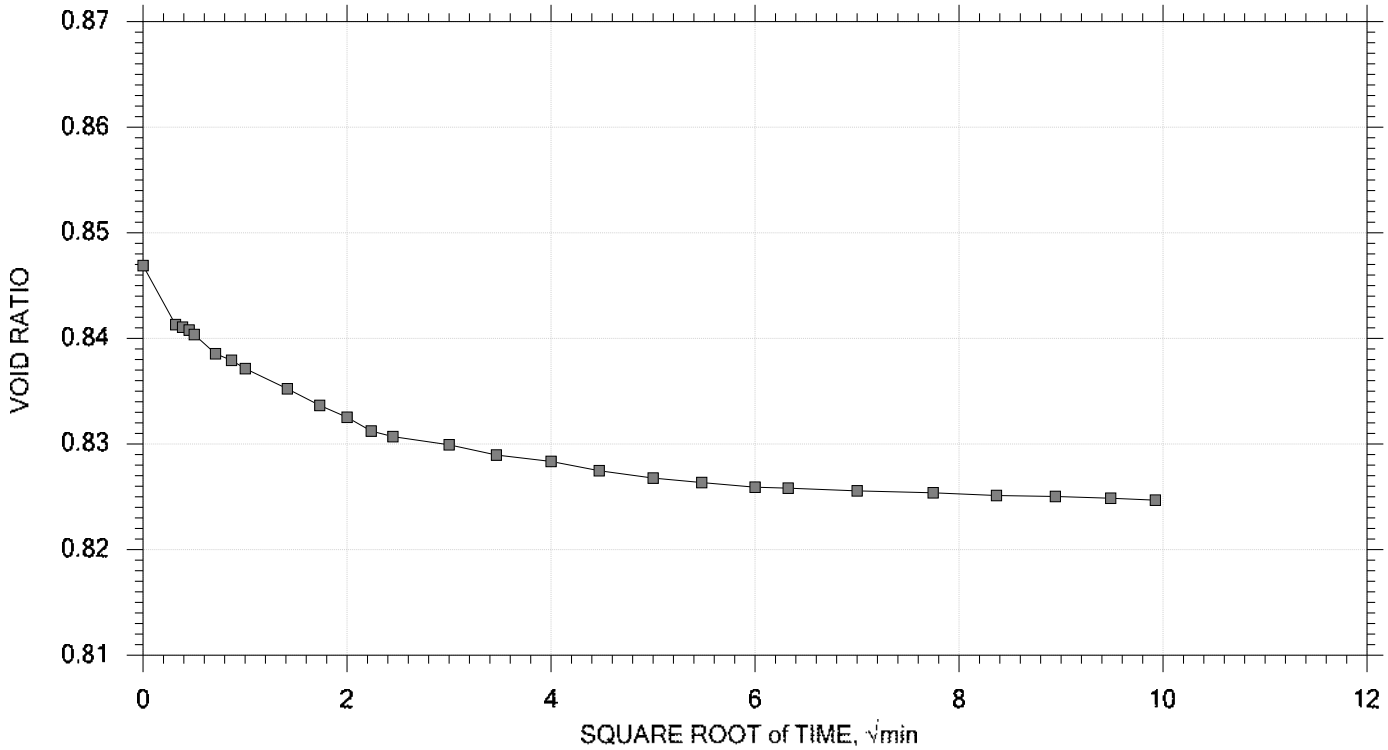
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 5 of 15

Stress: 1 tsf





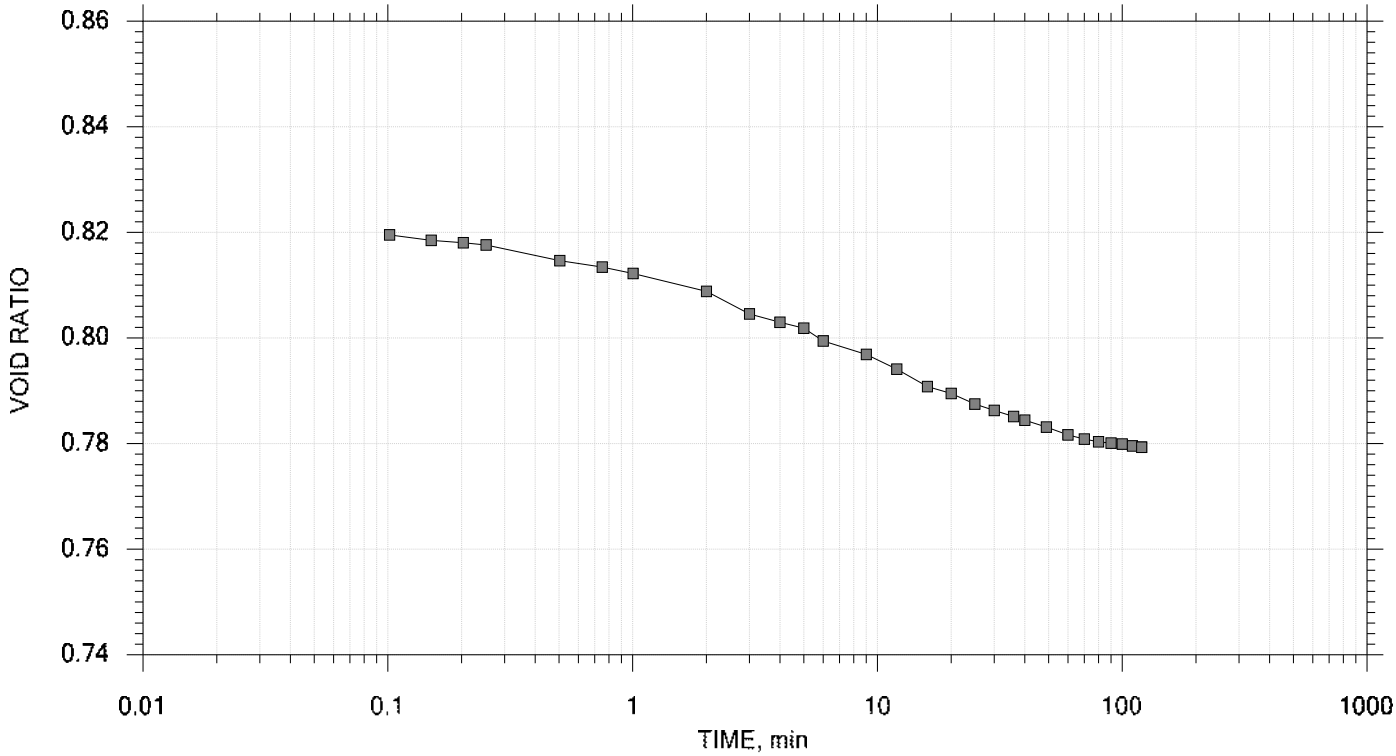
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

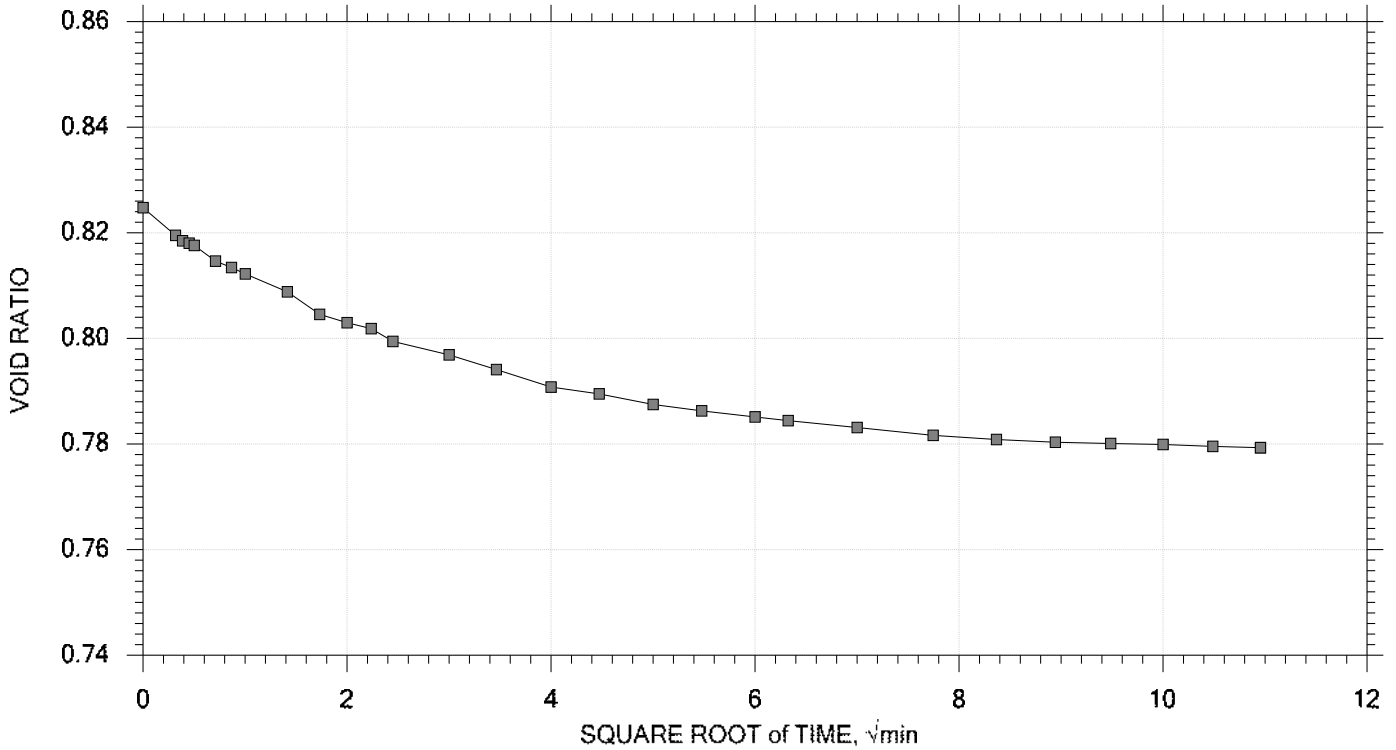
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 6 of 15

Stress: 2 tsf





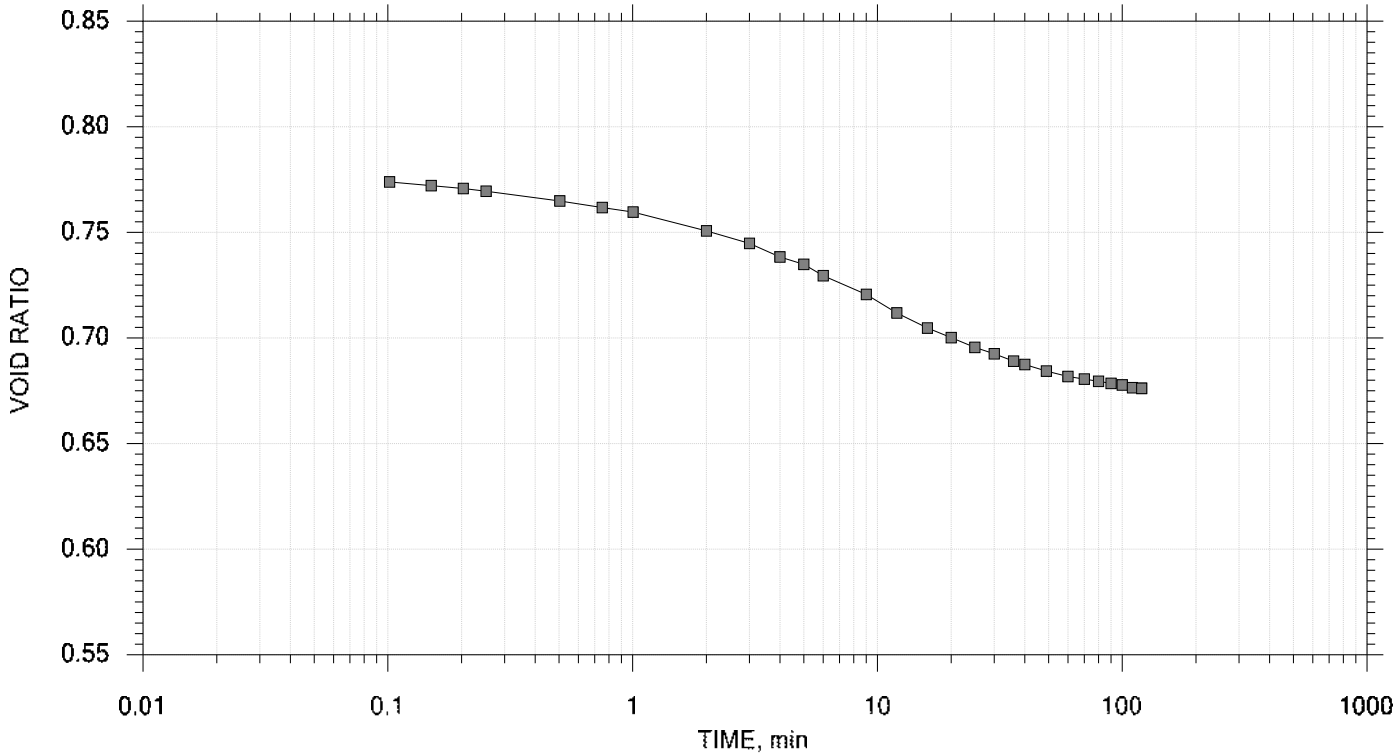
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

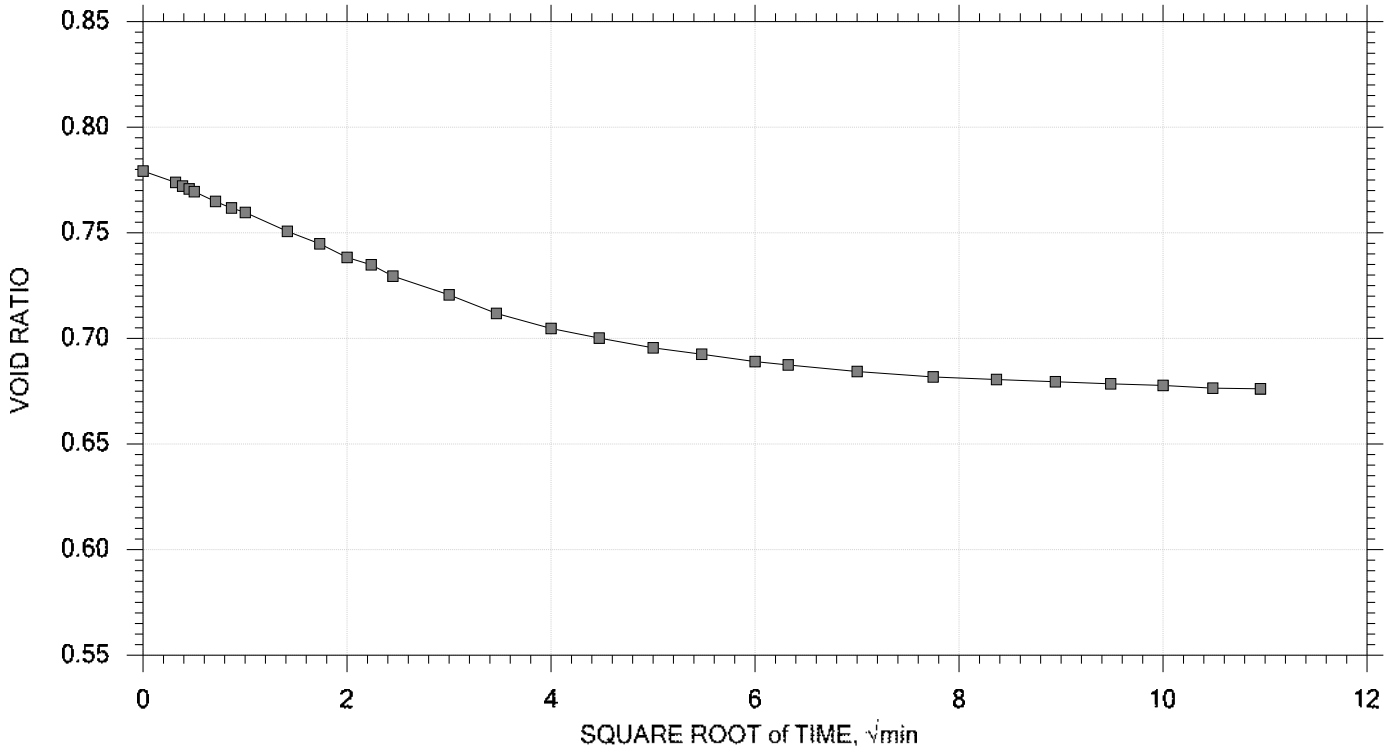
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 7 of 15

Stress: 4 tsf





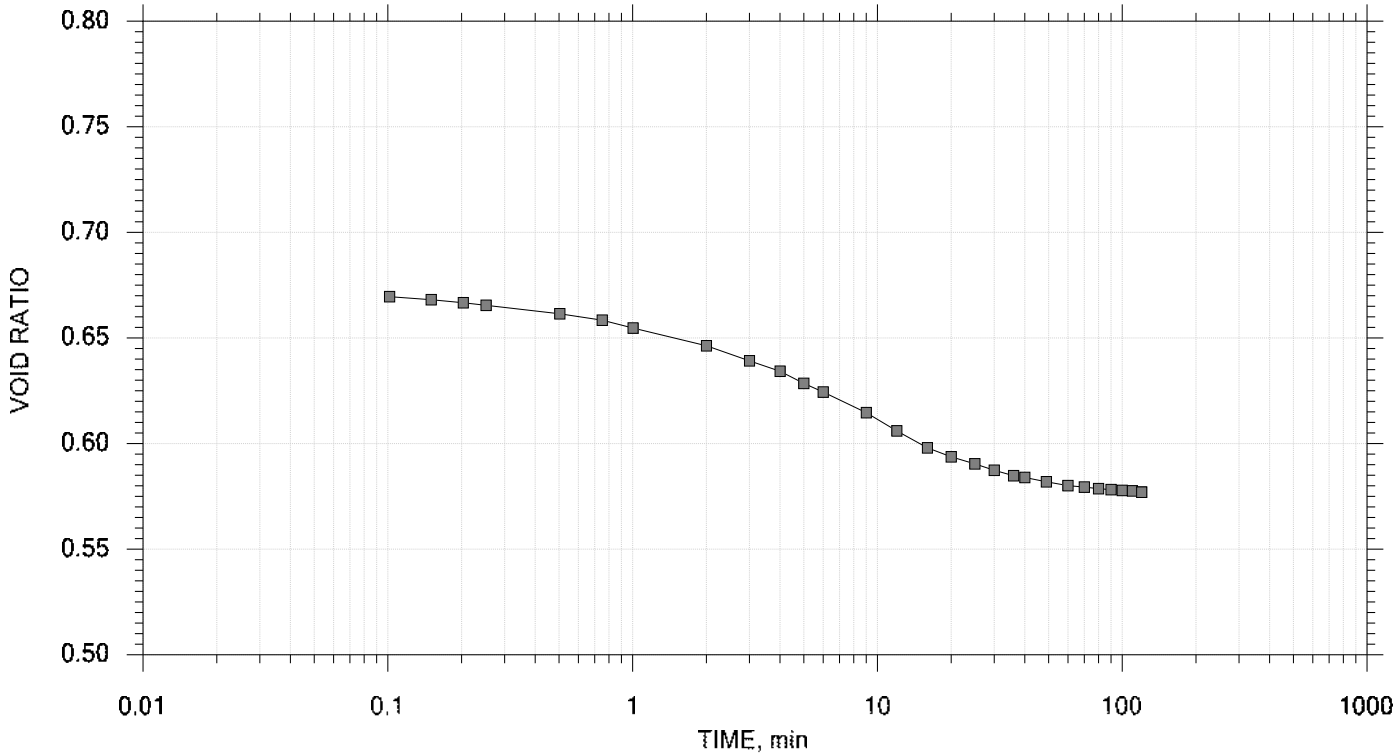
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

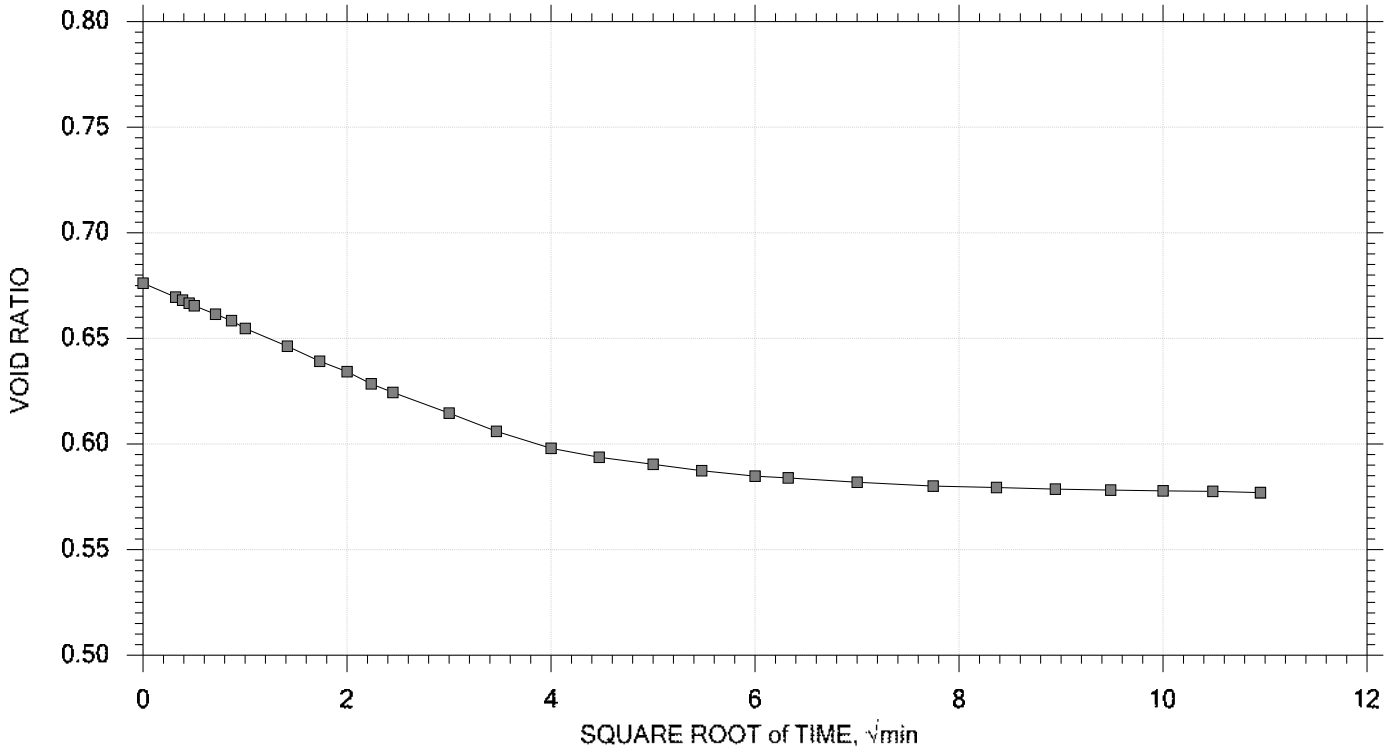
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 8 of 15

Stress: 8 tsf





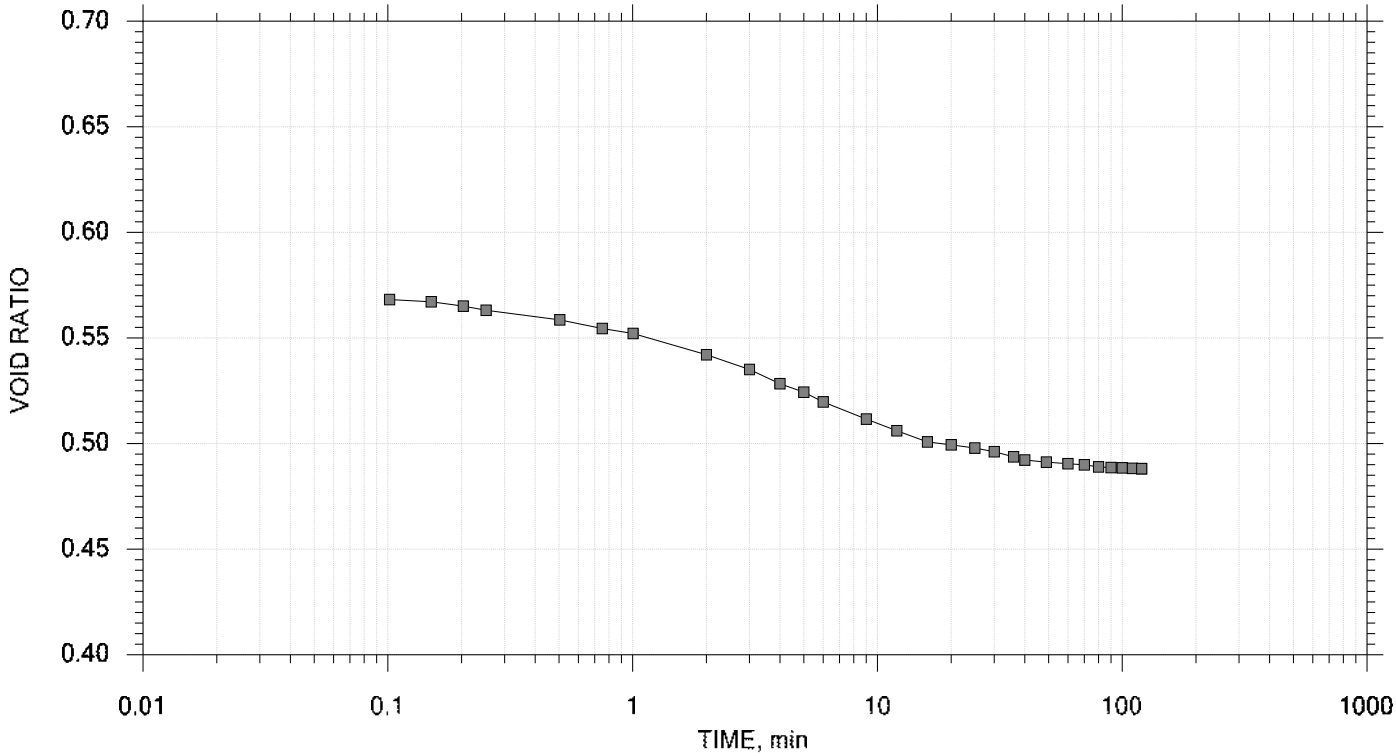
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

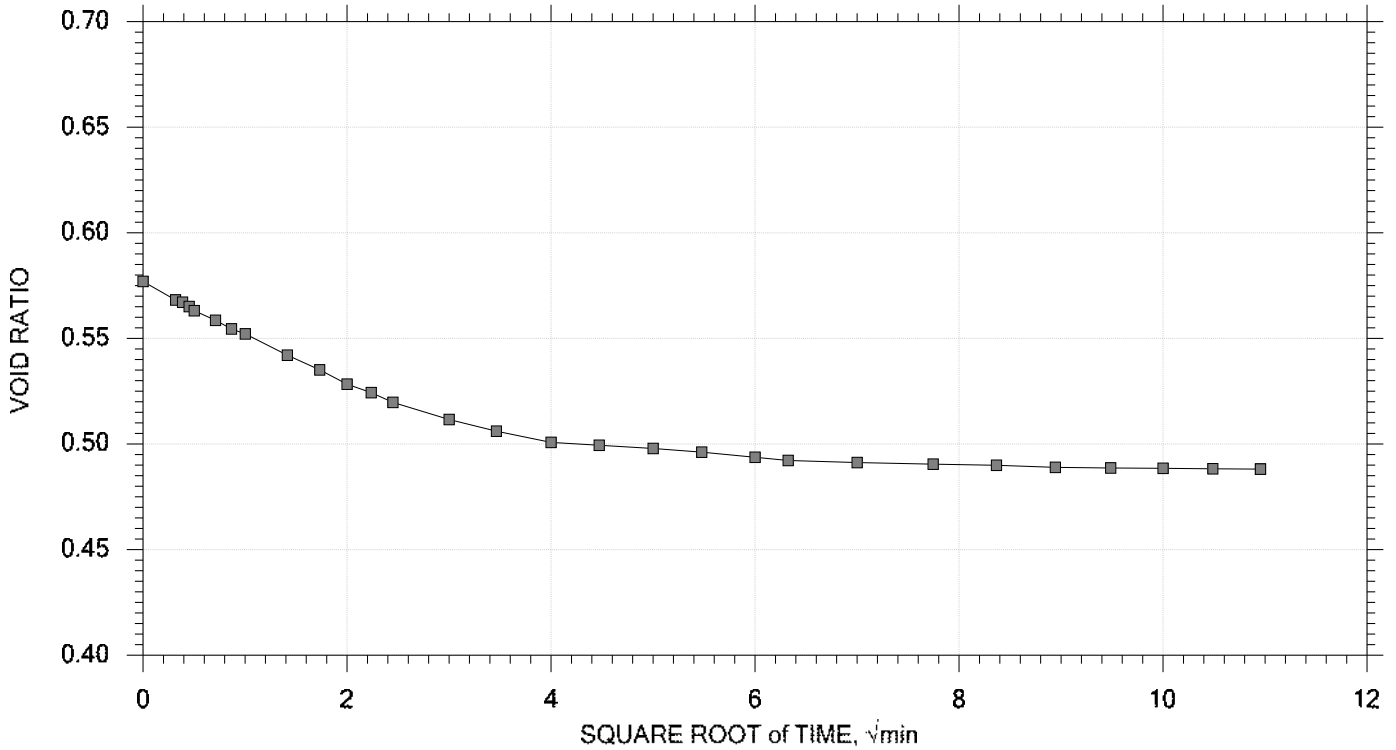
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 9 of 15

Stress: 16 tsf





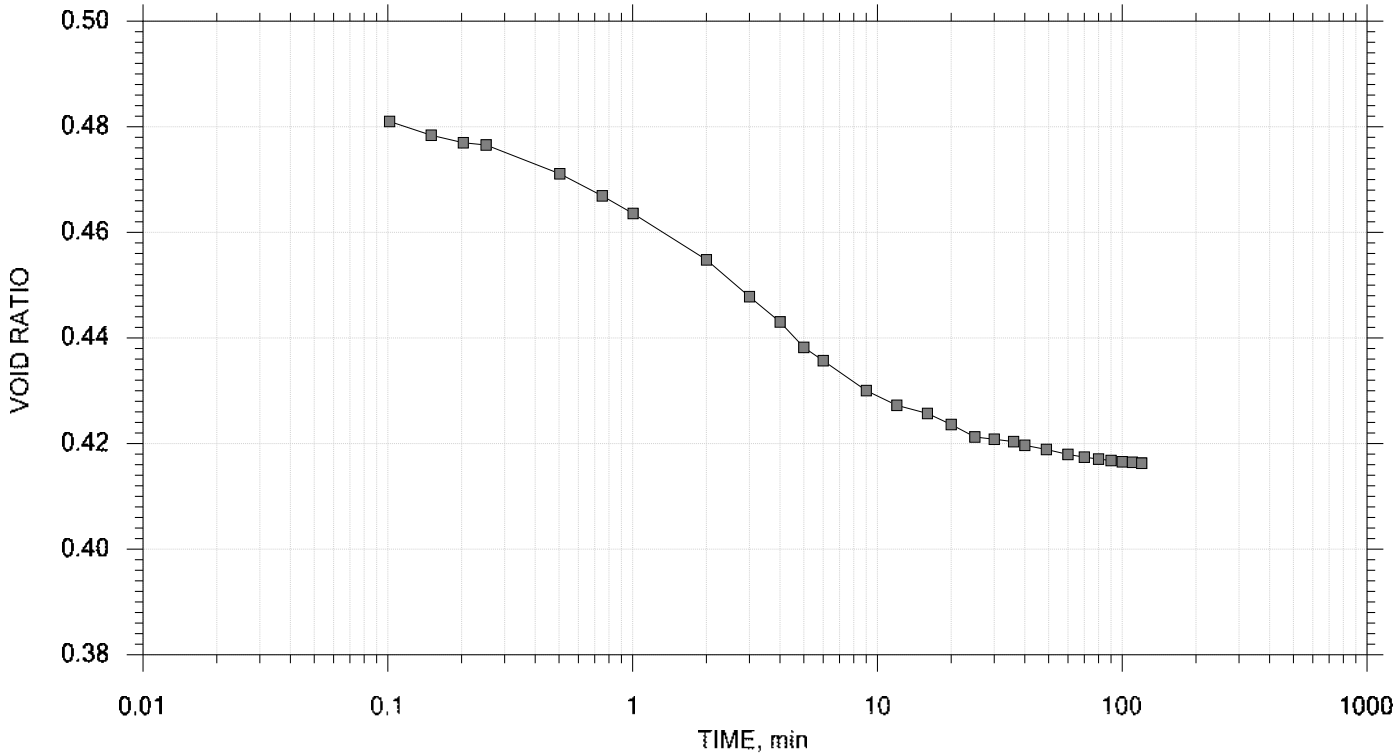
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

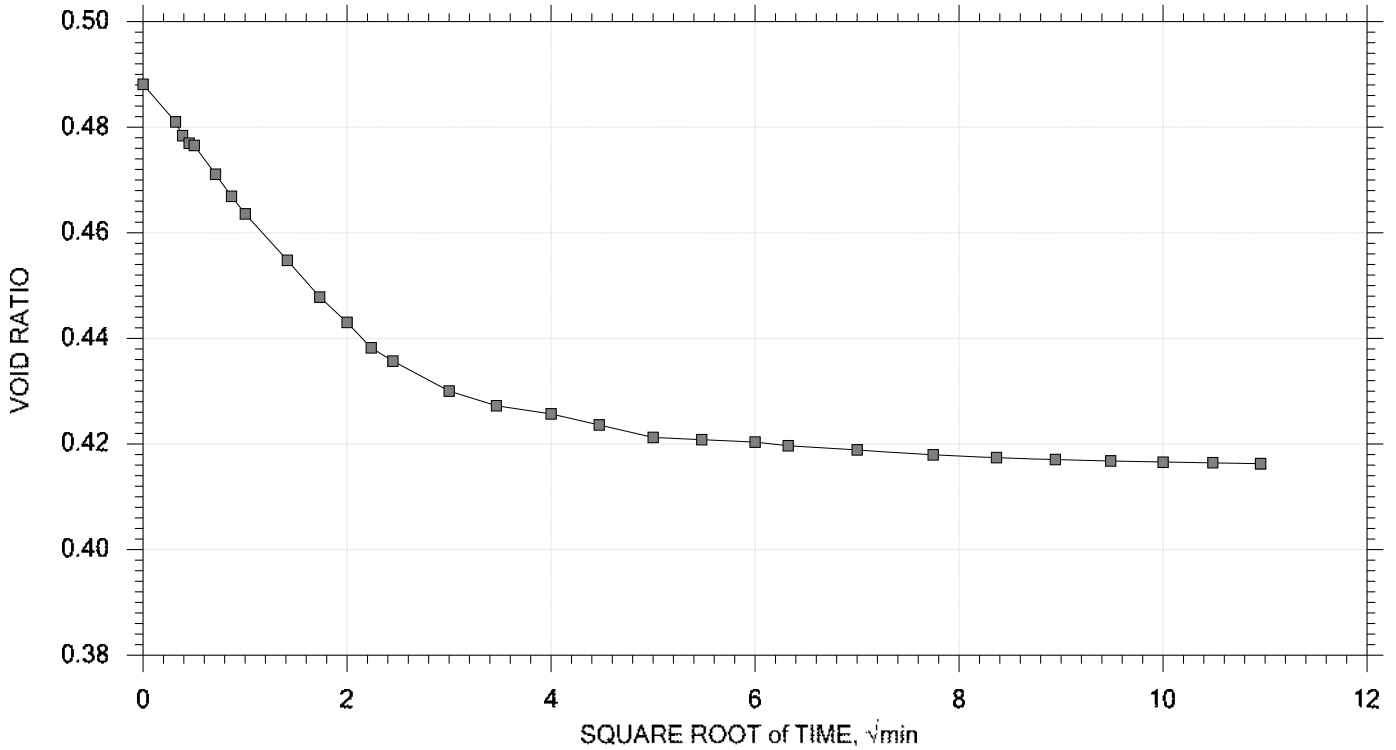
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 10 of 15

Stress: 32 tsf





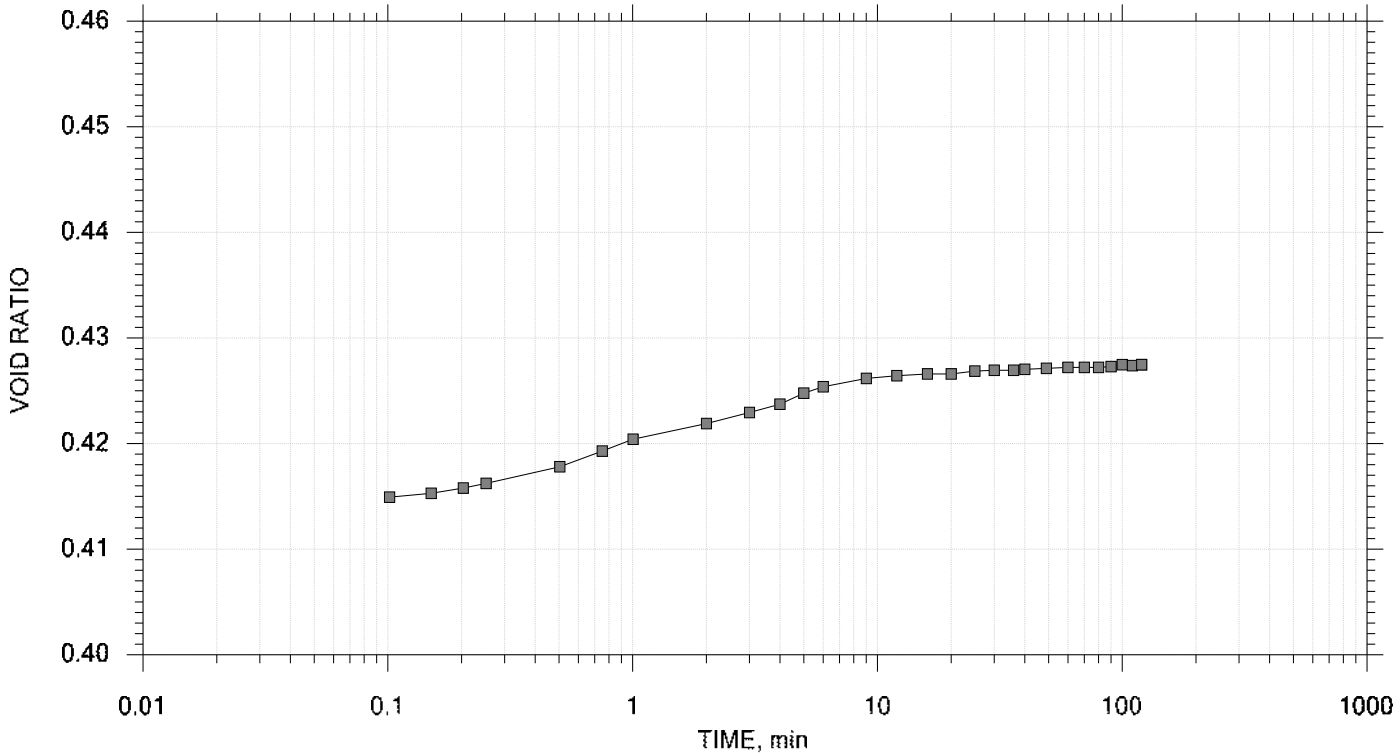
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

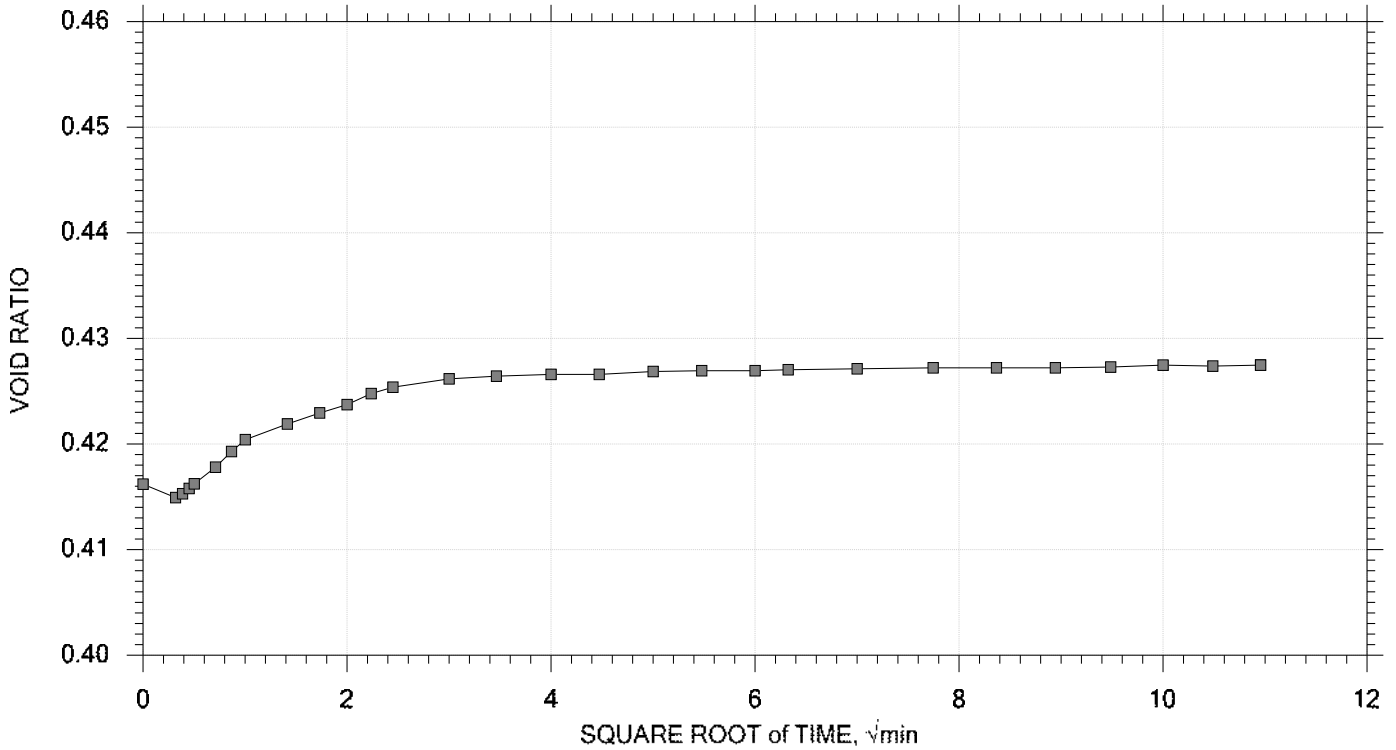
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 11 of 15

Stress: 8 tsf





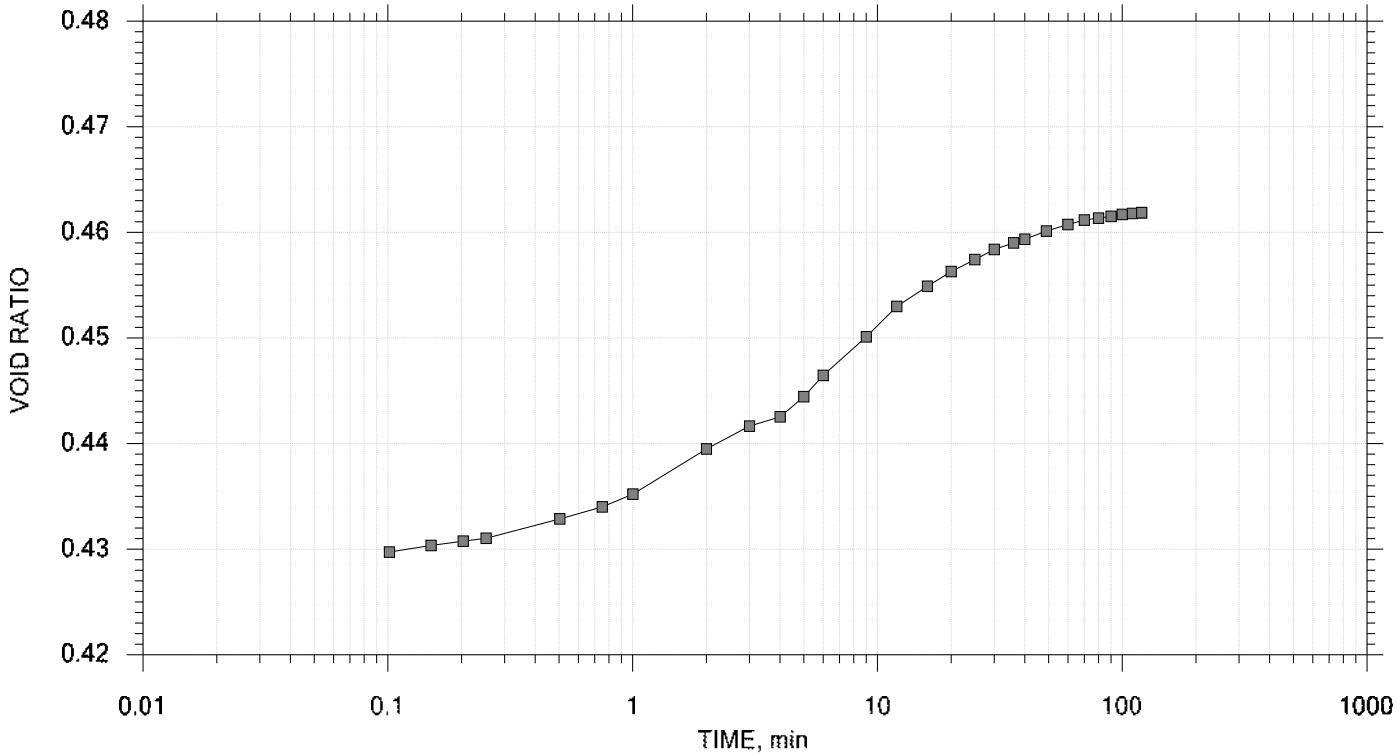
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

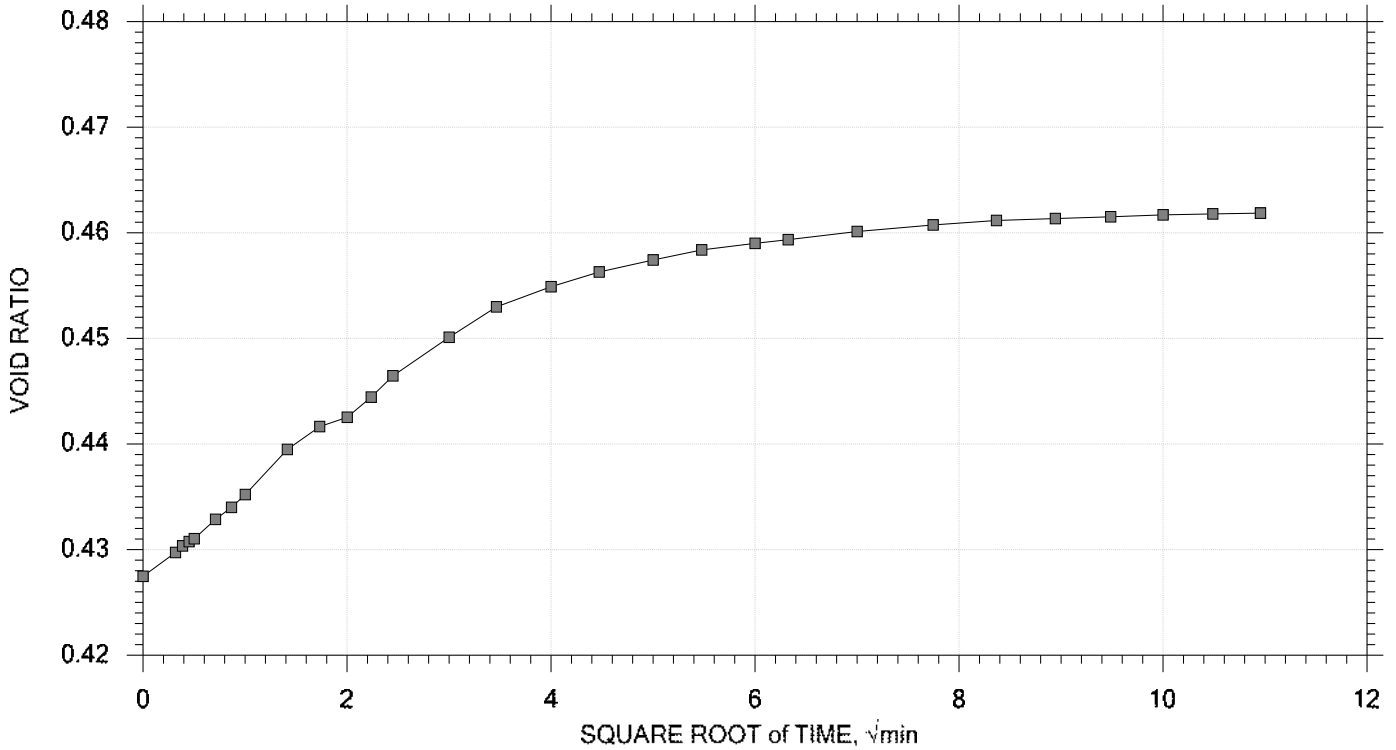
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 12 of 15

Stress: 2 tsf





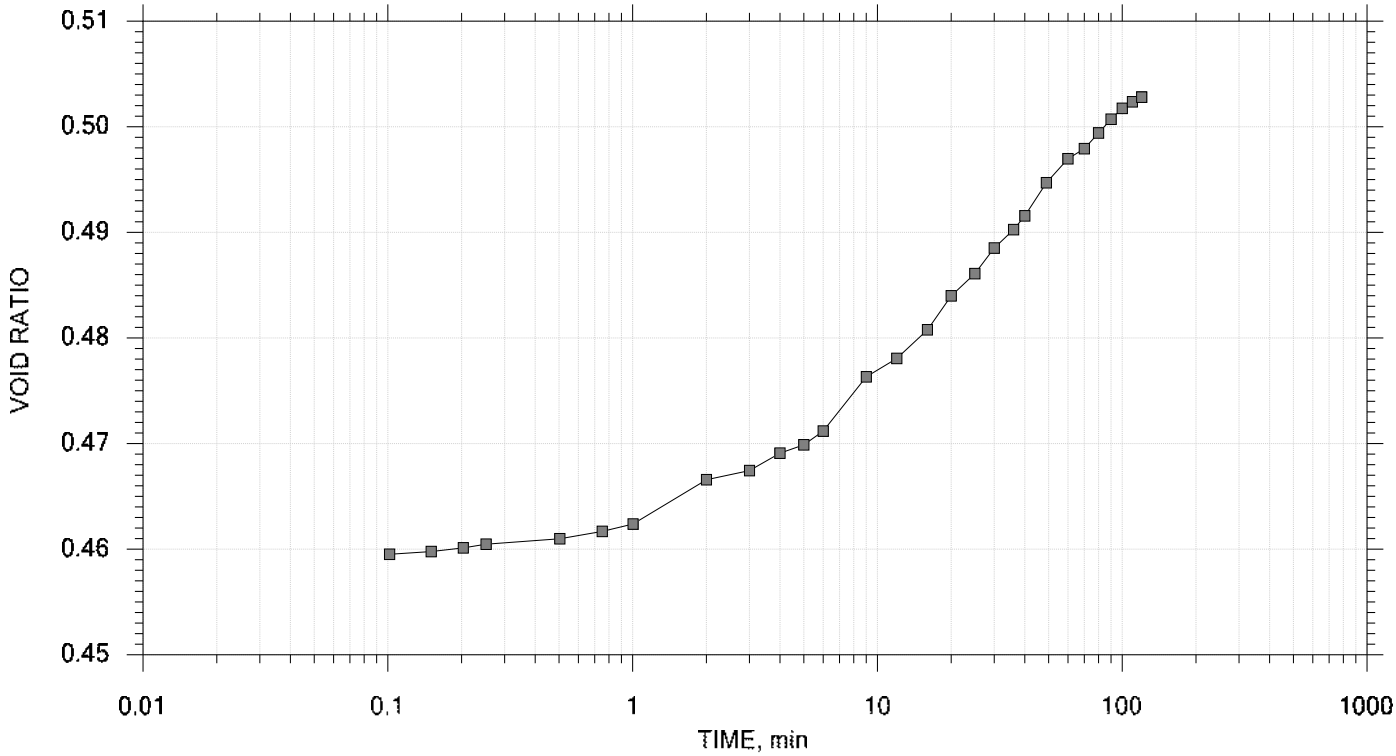
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

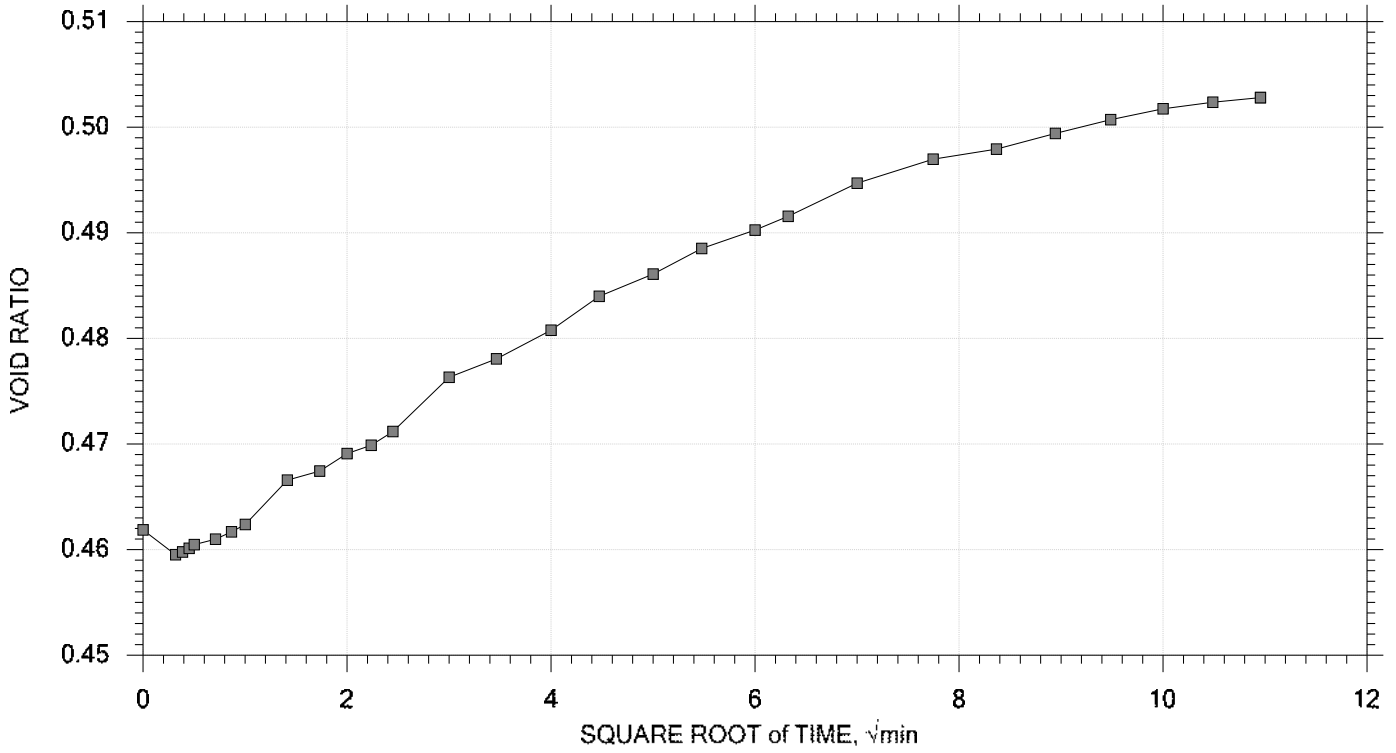
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 13 of 15

Stress: 0.5 tsf





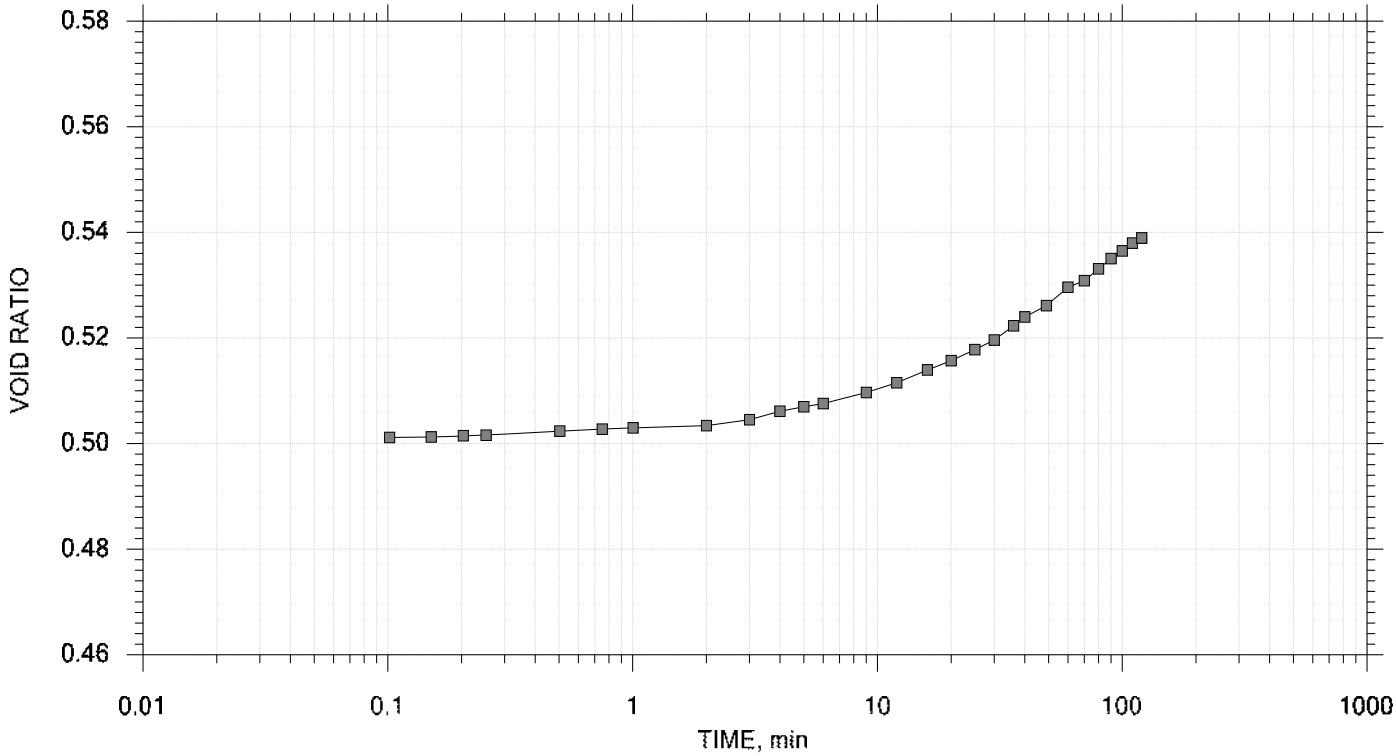
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

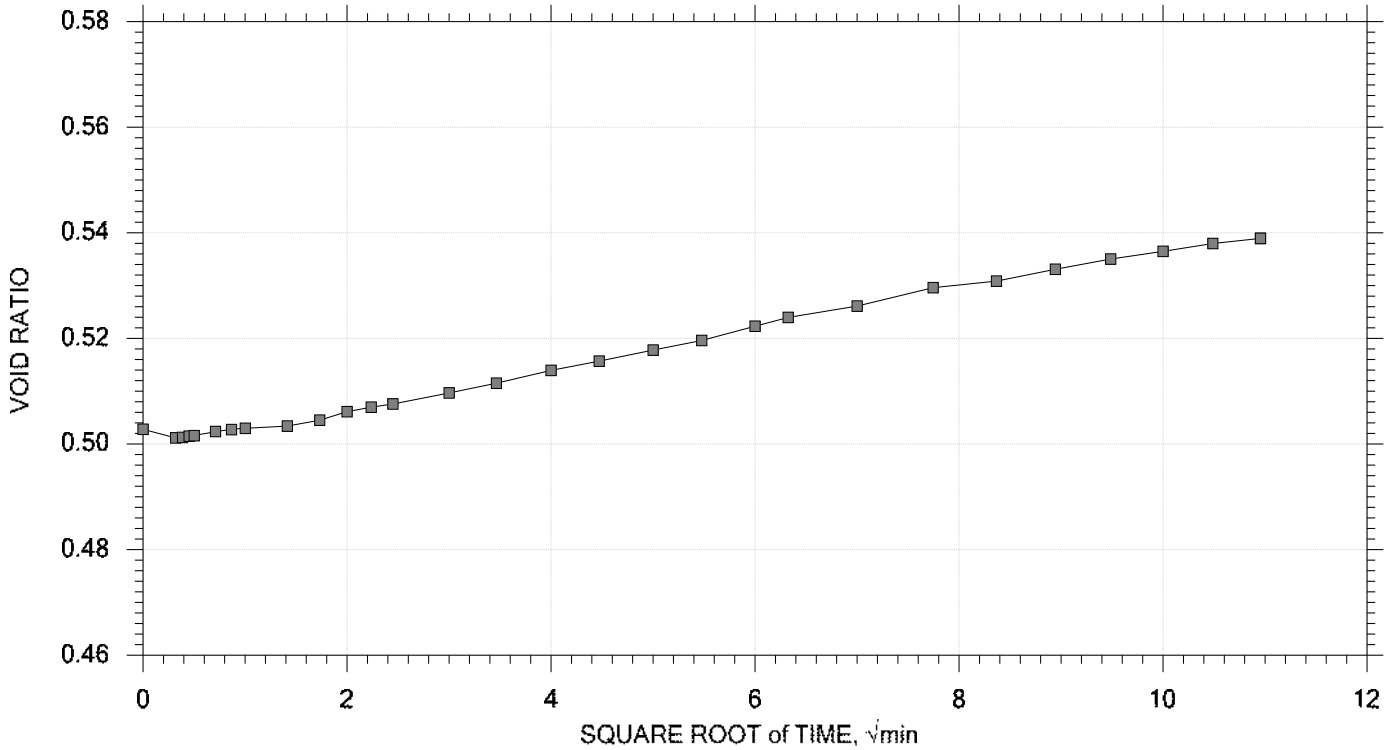
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 14 of 15

Stress: 0.125 tsf





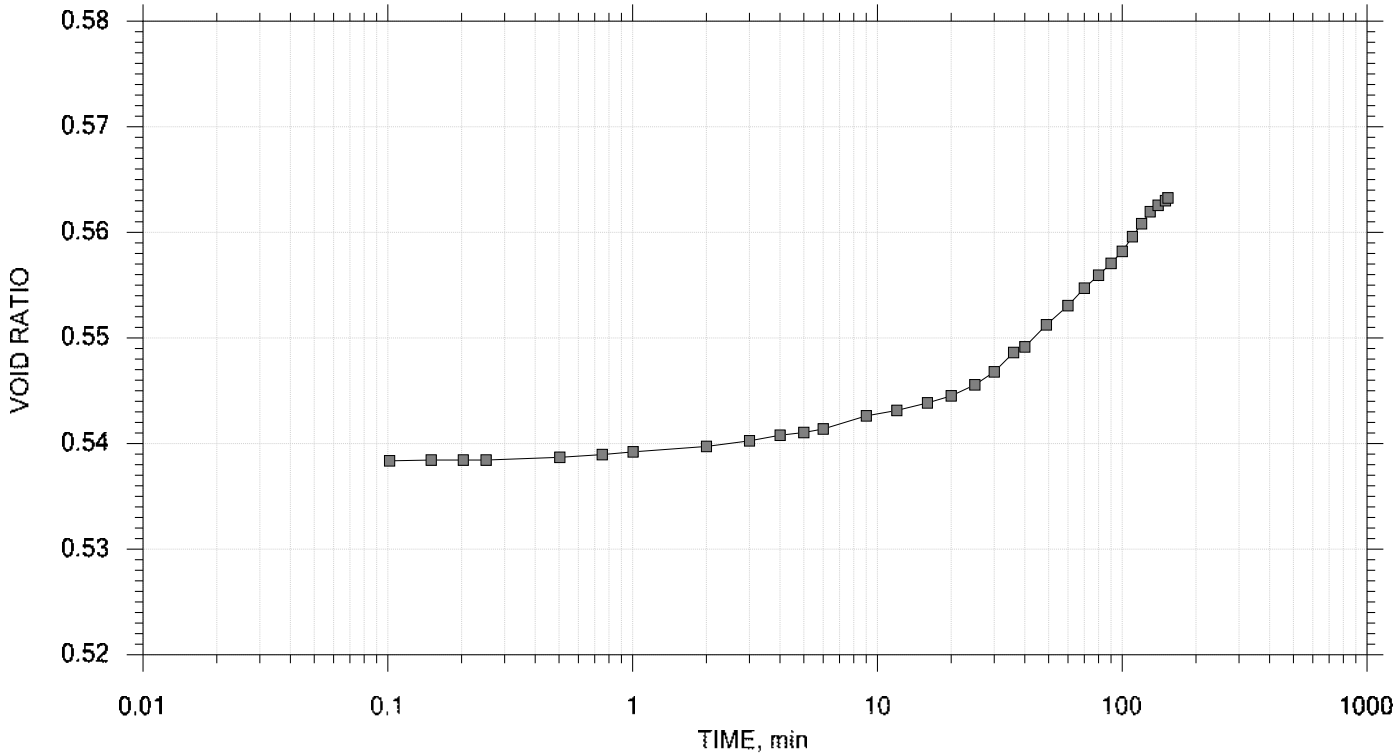
GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

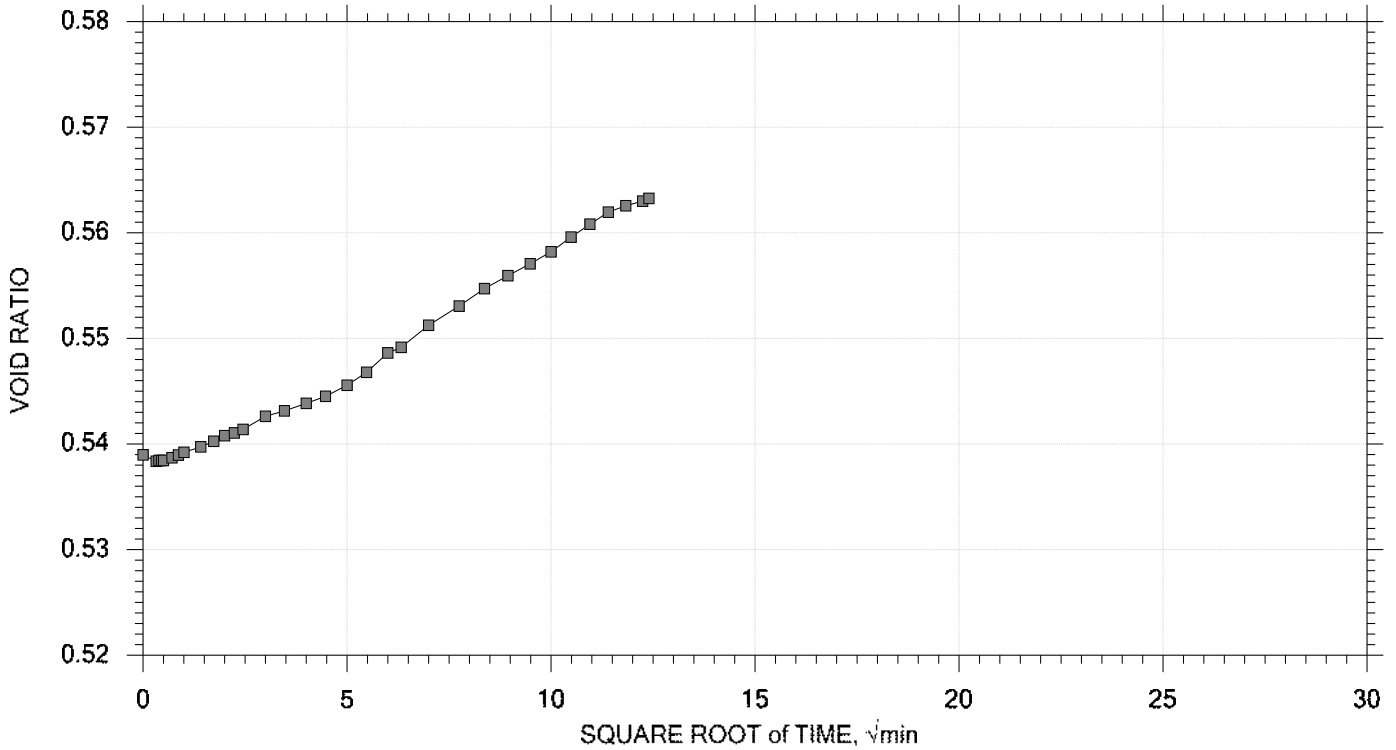
One-Dimensional Consolidation by ASTM D2435 - Method B

TIME CURVES

Constant Load Step 15 of 15

Stress: 0.0625 tsf

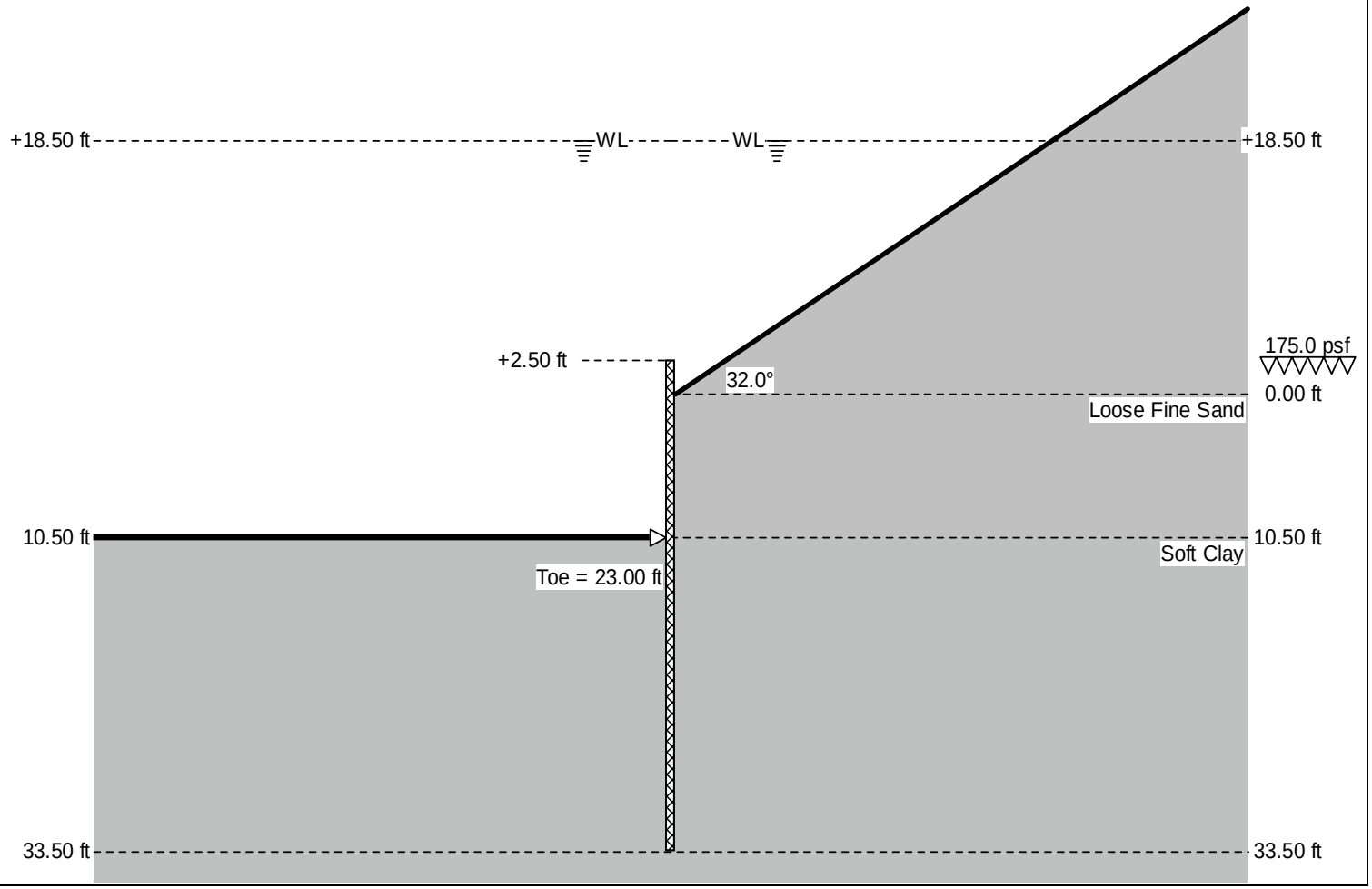




GeoTesting EXPRESS	Project: Buffalo River	Location: Buffalo, NY	Project No.: GTX-303367
	Boring No.: AQ-SB-02A	Tested By: md	Checked By: jdt
	Sample No.: ST-02	Test Date: 07/09/15	Test No.: IP-3
	Depth: —	Sample Type: intact	Elevation: —
	Description: Moist, brown clay		
	Remarks: System V. Swell Pressure = 0.0885 tsf		

Appendix D
Knee Wall Sheeting Design Calculations

Client:	Anchor QEA
Title:	Buffalo River AOC 2015 Additional Dredging
Designer:	MDP
Page:	1
Date:	10.16.15
Sheet:	PZ27
Pressure:	Terzaghi (m = 1.0; a = 0.4)
FOS:	1.5 ($K_p \div 1.3$)
Toe:	Cantilever



Barton & Loguidice, DPC

SPW911, v2.40

Client: Anchor QEA

Title: Buffalo River AOC 2015 Additional Dredging

Designer: MDP

Page: 2

Date: 10.16.15

Sheet: PZ27

Pressure: Terzaghi (m = 1.0; a = 0.4)

FOS: 1.5 ($K_p \div 1.3$)

Toe: Cantilever

Input Data

Depth Of Excavation = 10.50 ft

Surcharge = 175.0 psf

Slope (active) = 32.0 degrees

Depth Of Active Water = +18.50 ft

Depth Of Passive Water = +18.50 ft

Water Density = 62.43 pcf

Minimum Fluid Density = 31.82 pcf

Soil Profile

Depth (ft)	Soil Name	γ (pcf)	γ' (pcf)	C (psf)	C_a (psf)	ϕ(°)	δ(°)	K_a	K_{ac}	K_p	K_{pc}
0.00	Loose Fine Sand	120.00	65.55	0.0	0.0	30.0	0.0	0.33	0.00	3.00 (2.31)	0.00 (0.00)
10.50	Soft Clay	115.00	56.00	0.0	0.0	29.9	0.0	0.34	0.00	2.98 (2.29)	0.00 (0.00)

( ) indicates factored value used in calculations. Factor(s): $K_p \div 1.3$

Solution

Sheet

Sheet Name	I (in^4/ft)	E (psi)	Z (in^3/ft)	f (psi)	Maximum Bending Moment (ftlb/ft)	Upstand (ft)	Toe (ft)	Pile Length (ft)
PZ27	187.50	3.04E+07	31.00	24970.3	64506.5	2.50	23.00	36.00

Maxima

	Maximum	Depth
Bending Moment	36020.8 ftlb/ft	19.64 ft
Deflection	3.0 in	-2.50 ft
Pressure	271.1 psf	0.02 ft
Shear Force	3136.5 lb/ft	12.62 ft

Client: Anchor QEA

Title: Buffalo River AOC 2015
Additional Dredging

Designer: MDP

Page: 3

Date: 10.16.15

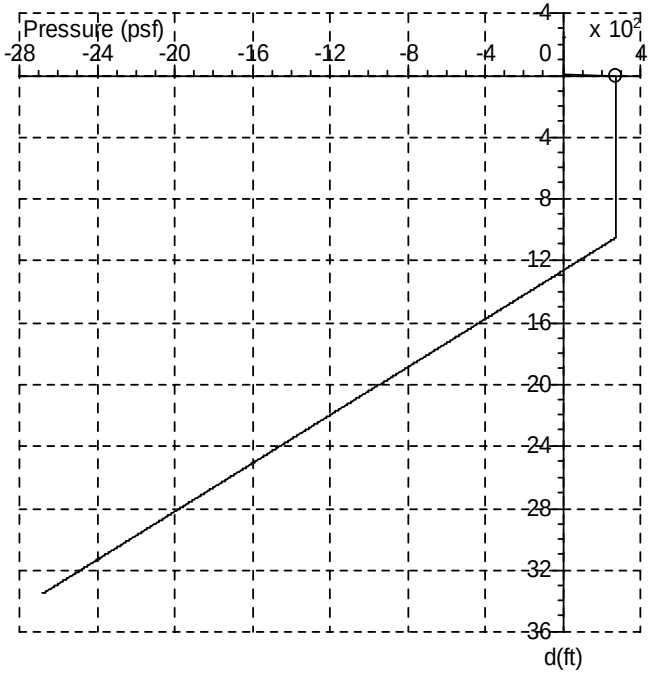
Sheet: PZ27

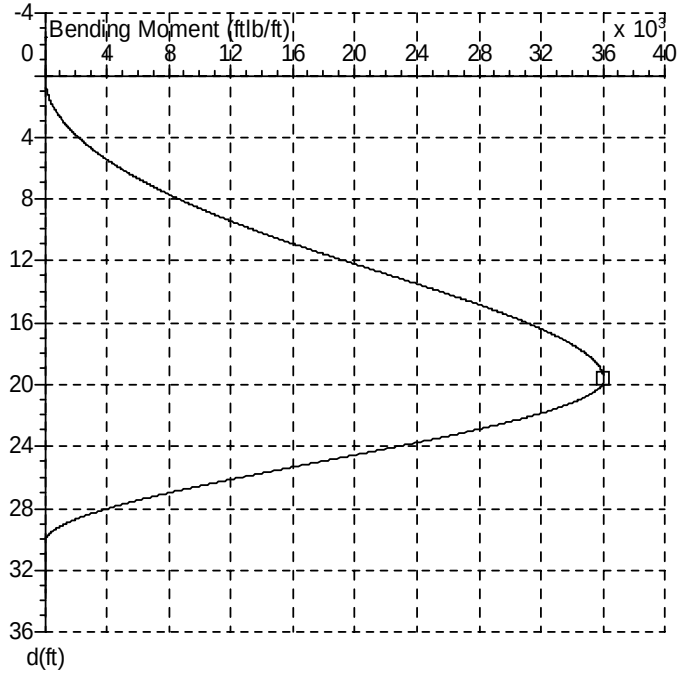
Pressure: Terzaghi (m = 1.0; a = 0.4)

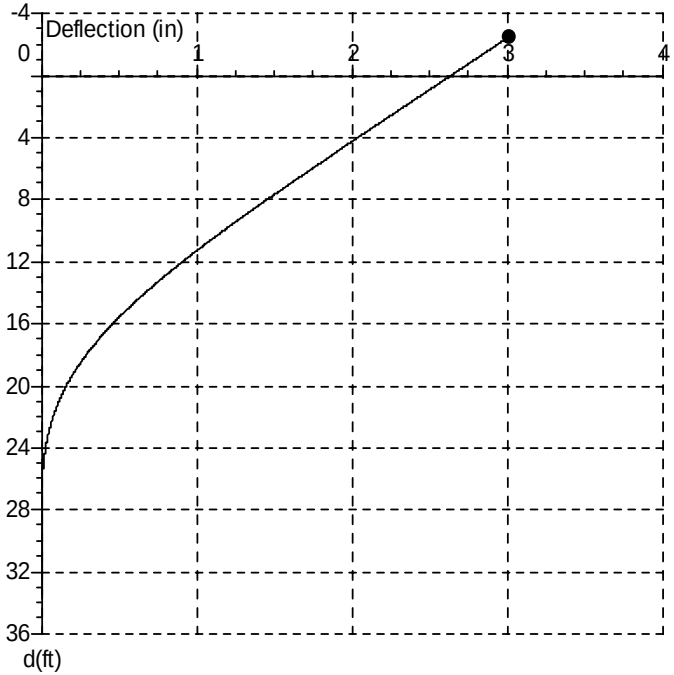
FOS: 1.5 ($K_p \div 1.3$)

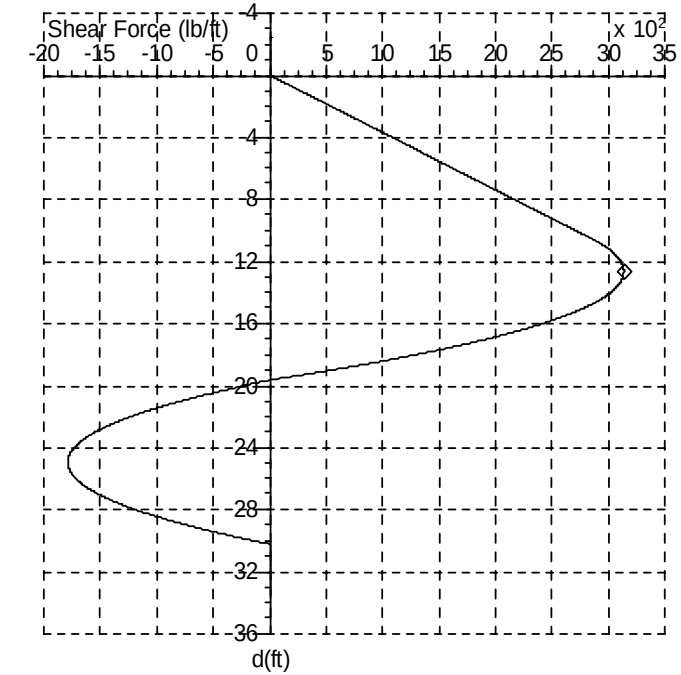
Toe: Cantilever

	Maximum	d (ft)
○	271.1 psf	0.02
□	36020.8 ftlb/ft	19.64
◇	3136.5 lb/ft	12.62
●	3.0 in	-2.50









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SPW911, v2.40

Client: Anchor QEA

Title: Buffalo River AOC 2015 Additional Dredging

Designer: MDP

Page: 4

Date: 10.16.15

Sheet: PZ27

Pressure: Terzaghi (m = 1.0; a = 0.4)

FOS: 1.5 ($K_p \div 1.3$)

Toe: Cantilever

depth (ft)	P (psf)	M (ftlb/ft)	D (in)	F (lb/ft)	depth (ft)	P (psf)	M (ftlb/ft)	D (in)	F (lb/ft)	depth (ft)	P (psf)	M (ftlb/ft)	D (in)	F (lb/ft)
0.00	271.1	0.0	2.6	8.1	11.27	174.6	17148.5	1.0	3020.4	22.53	-1273.5	29383.7	0.1	-1428.8
0.30	271.1	13.4	2.6	89.5	11.56	136.1	18058.8	1.0	3066.5	22.83	-1312.0	28124.1	0.1	-1514.3
0.59	271.1	51.1	2.5	170.8	11.86	97.6	18981.3	0.9	3100.9	23.12	-1350.5	26795.7	0.0	-1588.3
0.89	271.1	105.9	2.5	244.0	12.15	59.0	19912.5	0.9	3123.8	23.42	-1389.0	25408.3	0.0	-1650.7
1.19	271.1	189.8	2.5	325.3	12.45	20.5	20849.1	0.9	3135.2	23.72	-1423.7	24117.4	0.0	-1696.9
1.48	271.1	298.1	2.4	406.7	12.75	-18.0	21787.5	0.8	3135.5	24.01	-1462.2	22645.3	0.0	-1737.4
1.78	271.1	430.8	2.4	488.0	13.04	-56.5	22724.6	0.8	3124.9	24.31	-1500.7	21142.9	0.0	-1766.3
2.08	271.1	587.7	2.3	569.3	13.34	-95.0	23657.0	0.7	3102.7	24.61	-1539.2	19620.2	0.0	-1783.6
2.37	271.1	769.0	2.3	650.7	13.64	-129.7	24489.2	0.7	3072.9	24.90	-1577.7	18087.2	0.0	-1789.4
2.67	271.1	974.7	2.2	732.0	13.93	-168.2	25403.0	0.7	3028.8	25.20	-1616.2	16553.6	0.0	-1783.6
2.96	271.1	1204.7	2.2	813.3	14.23	-206.7	26302.1	0.6	2973.2	25.50	-1654.7	15029.4	0.0	-1766.3
3.26	271.1	1459.0	2.1	894.6	14.53	-245.2	27183.0	0.6	2906.0	25.79	-1693.2	13524.6	0.0	-1737.4
3.56	271.1	1708.7	2.1	967.8	14.82	-283.7	28042.3	0.6	2827.2	26.09	-1727.9	12194.9	0.0	-1701.5
3.85	271.1	2009.3	2.1	1049.2	15.12	-322.2	28876.4	0.5	2736.9	26.38	-1766.4	10754.1	0.0	-1650.7
4.15	271.1	2334.1	2.0	1130.5	15.42	-360.7	29681.9	0.5	2635.0	26.68	-1804.9	9361.4	0.0	-1588.3
4.45	271.1	2683.4	2.0	1211.8	15.71	-399.2	30455.4	0.5	2521.6	26.98	-1843.4	8026.6	0.0	-1514.3
4.74	271.1	3057.0	1.9	1293.2	16.01	-433.9	31121.3	0.5	2409.7	27.27	-1881.9	6759.7	0.0	-1428.8
5.04	271.1	3454.9	1.9	1374.5	16.31	-472.4	31824.4	0.4	2274.3	27.57	-1920.5	5570.7	0.0	-1331.8
5.34	271.1	3877.1	1.8	1455.8	16.60	-510.9	32485.4	0.4	2127.4	27.87	-1959.0	4469.3	0.0	-1223.2
5.63	271.1	4323.7	1.8	1537.2	16.90	-549.4	33100.9	0.4	1968.9	28.16	-1997.5	3465.6	0.0	-1103.0
5.93	271.1	4746.4	1.8	1610.4	17.19	-588.0	33667.5	0.4	1798.9	28.46	-2036.0	2569.3	0.0	-971.3
6.23	271.1	5239.2	1.7	1691.7	17.49	-626.5	34181.6	0.3	1617.3	28.76	-2070.7	1862.9	0.0	-842.9
6.52	271.1	5756.4	1.7	1773.0	17.79	-665.0	34639.8	0.3	1424.1	29.05	-2109.2	1198.3	0.0	-689.3
6.82	271.1	6297.9	1.6	1854.4	18.08	-703.5	35038.6	0.3	1219.5	29.35	-2147.7	670.0	0.0	-524.1
7.12	271.1	6863.7	1.6	1935.7	18.38	-742.0	35374.7	0.3	1003.2	29.65	-2186.2	287.8	0.0	-347.3
7.41	271.1	7453.9	1.5	2017.0	18.68	-776.7	35620.6	0.2	798.7	29.94	-2224.7	61.8	0.0	-159.0
7.71	271.1	8068.4	1.5	2098.4	18.97	-815.2	35827.8	0.2	560.5	30.24	-2263.2	0.0	0.0	0.0
8.00	271.1	8707.2	1.4	2179.7	19.27	-853.7	35962.2	0.2	310.8	30.54	-2301.7	0.0	0.0	0.0
8.30	271.1	9370.4	1.4	2261.0	19.57	-892.2	36020.3	0.2	49.5	30.83	-2340.2	0.0	0.0	0.0
8.60	271.1	9988.1	1.4	2334.2	19.86	-930.7	35972.7	0.2	-159.0	31.13	-2374.9	0.0	0.0	0.0
8.89	271.1	10697.5	1.3	2415.5	20.16	-969.2	35762.8	0.2	-347.3	31.42	-2413.4	0.0	0.0	0.0
9.19	271.1	11431.2	1.3	2496.9	20.46	-1007.7	35395.8	0.1	-524.1	31.72	-2451.9	0.0	0.0	0.0
9.49	271.1	12189.3	1.2	2578.2	20.75	-1046.2	34881.7	0.1	-689.3	32.02	-2490.4	0.0	0.0	0.0
9.78	271.1	12971.8	1.2	2659.5	21.05	-1080.9	34301.3	0.1	-828.1	32.31	-2528.9	0.0	0.0	0.0
10.08	271.1	13778.5	1.2	2740.9	21.35	-1119.4	33534.8	0.1	-971.3	32.61	-2567.5	0.0	0.0	0.0
10.38	271.1	14609.6	1.1	2822.2	21.64	-1157.9	32649.9	0.1	-1103.0	32.91	-2606.0	0.0	0.0	0.0
10.67	247.7	15465.0	1.1	2901.2	21.94	-1196.4	31656.5	0.1	-1223.2	33.20	-2644.5	0.0	0.0	0.0
10.97	213.1	16253.9	1.0	2962.9	22.23	-1234.9	30564.4	0.1	-1331.8	33.50	-2679.1	0.0	0.0	0.0

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Appendix E
Great Lakes Legacy Act Project Permits

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

REPLY TO
ATTENTION OF:

August 14, 2013

Regulatory Branch

SUBJECT: Transmittal of Department of the Army Permit No. 2013-00814, Nationwide Permit No. 38 as Published in the Federal Register, Volume 77, No. 34, on Tuesday, February 21, 2012, New York State Department of Environmental Conservation No. 9-1402-01094

Mr. Rich Galloway
Honeywell International, Inc.
101 Columbia Road
Morristown, New Jersey 07962

Dear Mr. Galloway:

I am writing to you in regard for the Department of the Army permit application you submitted on behalf of Honeywell International, Inc. to dredge approximately 430,000 to 485,000 cubic yards of contaminated sediment and discharge clean sediment/stone to cap an approximate 388,700 square foot area within the Buffalo River Area of Concern (AOC) under the U.S. EPA's Great Lakes Legacy Act (GLLA). The dredging/capping mentioned above will be implemented within 6.2 miles from the mouth of the Buffalo River up to Cazenovia/Buffalo Creeks, including the 1.4 mile City Ship Canal, in the City of Buffalo, Erie County, New York.

I have evaluated the impacts associated with your proposal, and have concluded that they are authorized by the enclosed Nationwide Permit (NWP) provided that the attached conditions are satisfied.

Verification of the applicability of this NWP is valid until March 19, 2017 unless the NWP is modified, suspended, revoked, or the activity complies with any subsequent permit modification. Please note in accordance with 33 CFR part 330.6(b), that if you commence or are under contract to commence an activity in reliance of the permit prior to the date this Nationwide permit expires, is suspended or revoked, or is modified such that the activity no longer complies with the terms and conditions, you have twelve months from the date of permit modification, expiration, or revocation to complete the activity under the present terms and conditions of the permit, unless the permit has been subject to the provisions of discretionary authority.

It is your responsibility to remain informed of changes to the NWP program. A public notice announcing any changes will be issued when they occur and will be available for viewing at our website: http://www.lrb.usace.army.mil/Missions/Regulatory.aspx. Finally, note that if

your activity is not undertaken within the defined period or the project specifications have changed, you must immediately notify this office to determine the need for further approval or reverification.

This affirmation is limited to the attached NWP and associated WQC, and does not obviate the need to obtain any other project specific Federal, state, or local authorization. Specifically, you may need to obtain Article 15 (Protection of Water), Article 24 (Freshwater Wetland), and/or Article 34 (Coastal Erosion Management) authorization from the New York State DEC.

In addition to the general conditions attached to the NWP, your attention is directed to the following Special Conditions which are also appended at the end of the NWP General Conditions:

Administrative

1. At the request of an authorized representative of the Buffalo District, U.S. Army Corps of Engineers, the permittee shall allow access to the project site and all restoration areas to determine compliance with the conditions of this permit.

2. You are responsible for ensuring that all contractors and/or workers executing the activity(s) authorized by this permit have knowledge of the terms and conditions of the authorization and that a copy of the permit document is at the project site throughout the period that the authorized work is underway. You shall also inform all contractors of liabilities associated with non-compliance of this permit.

3. If any historic or archeological artifacts or remains are discovered while conducting work authorized by this permit, you must notify the Corps of Engineers in accordance with General Condition 21 and all work in the vicinity of the discovery must be stopped immediately, pending initiation of any required consultation under the National Historic Preservation Act.

4. Should human remains be encountered during any phase of the proposed project, such person or persons encountering the human remains must immediately cease work in the vicinity of the discovery and must not disturb or remove the remains, must protect the exposed portions of the remains from inclement weather and vandalism, and immediately notify the permittee. Continuing work on the project may result in adverse effects to the remains, which may be contrary to the National Historic Preservation Act. After discovery, the permittee must immediately notify (within 24 hours) Joseph Rowley, USACE Buffalo District, 1776 Niagara Street, Buffalo New York 14207 at (716) 879-4279 or email: joseph.m.rowley@usace.army.mil and the New York State Office of Parks, Recreation, and Historic Preservation, Peebles Island State Park, P.O. Box 189, Waterford, New York 12188-0189, (518) 237-8643.

5. Please note, no dredging activities will extend beyond the horizontal and vertical extent of previous maintenance dredging episodes that may have occurred within DMU-45c (Black shaded area indicated on Sheet 2 of 111).

6. Please note, no dredging can take place within a 100 buffer area around Sonar Target BF-5 where no dredging can take place. This area is adjacent to DMU-11 and is indicated on Sheet 5 of 111.

7. The permittee is authorized to discharge only clean fill material that is free of fines, oil and grease, debris, wood, general refuse, plaster, broken asphalt, or other potential pollutants.

8. The Section 401 Water Quality Certification issued for this project by the State of New York is hereby part of this Department of the Army permit pursuant to Section 401(d) of the Clean Water Act. Noncompliance with any limitations or requirements stated in the certification may be a basis for suspension, revocation or modification of this permit.

9. The permittee is prohibited from performing in-water work between December 30 and June 15 within the Buffalo River and December 30 and June 30 in City Ship Canal to preclude adverse impacts on the spawning, nursery, and feeding activities of indigenous fish species.

Dredging

1. The permittee, including their contractors, must ensure the dredged material is not temporarily or permanently placed in Waters of the U.S., including wetlands.

2. The permitte must notify Mr. Joseph Rowley, USACE Buffalo District, 1776 Niagara Street, Buffalo New York 14207, in writing, at least two (2) weeks prior to initiating any dredging activities authorized by this permit.

3. The permittee or their contractors must have a copy of this permit on the vessel used for the authorized transportation and disposal of dredged material.

4. The permittee must install and maintain, at their expense, any safety lights and signals prescribed by the United States Coast Guard (USCG), through regulations or otherwise, on the structures or vessels being utilized for the dredging operation. The USCG may be reached at the following address: Commander (OAN), U.S. Coast Guard, Ninth Coast Guard District, 1240 East Ninth Street, Cleveland, Ohio 44199-2060, Telephone: (216) 902-6069; FAX: (216) 902-6059

5. Dredging operations must be strictly controlled to minimize spillage and re-suspension of

bottom sediments.

Confined Disposal Facility

1. Prior to conducting any work authorized by this permit including the use of a Federal Confined Disposal Facility (CDF), the permittee must enter into a Memorandum of Agreement (MOA) with the Buffalo District and be willing to abide by all terms and conditions, including but not limited to, paying the required tipping fee (fee varies with each Federal CDF), submitting and complying with an Buffalo District approved Operations Plan, and participating in a site visit with the Corps (Mr. Robert Remmers, see below) to the selected CDF before and after disposal operations.

   NOTE: Issuance of a Corps permit for dredging does not automatically guarantee approval for use of the Federal CDF. An approved MOA must be fully executed prior to use of a federal CDF.

2. The following specific requirements must be met in order for the Corps to allow dredged material to be placed into a Federal CDF:

   a. The dredged material must be from a project that is directly related to navigation.

   b. The material that is proposed to be disposed in the Federal CDF must be toxicologically suitable, as determined by a technical review of relevant contaminant information. This office must approve the technical review prior to final approval of use of the CDF. Such determinations may vary for each CDF depending on site-specific conditions. The material cannot be suitable for open-lake placement, but must not be too contaminated for disposal in the Federal CDF. Upon written request, the Buffalo District will provide guidance on how to adequately characterize the material for Federal CDF disposal. The permittee will be responsible for performing any required sampling, testing and evaluation of the material. The permittee shall submit this required information to the Buffalo District for concurrence regarding the evaluation of the material and its suitability for Federal CDF disposal.

   c. The sediments that are dredged must be physically suitable for placement into the Federal CDF. Dredged materials accepted for disposal shall include natural sediments and, not include large natural or man-made items such as trees, tree stumps, large tree branches, large boulders, concrete rubble, wooden timbers, steel items, construction materials, etc. Sediments containing small stones (under

1-foot in diameter) and/or small branches or other minor natural woody debris are acceptable.

d. The dredged material must be removed from below the ordinary high water mark, which was determined by this office. Material above this elevation shall not be disposed of into the Federal CDF. If necessary, contact the Buffalo District for the elevation of the ordinary high water mark.

3. If the MOA is approved, the permittee must then submit an Operations Plan, prior to dredging as authorized by this permit, to the Corps (Mr. Robert Remmers, see below) for review and approval. The Operations Plan must address operational activities associated with usage of the CDF including, but not limited to, the method of dredged material disposal (i.e. clamshell, hydraulic pipeline, etc.), identification of the disposal location in the CDF as provided by the Corps, and method of quantity measurement and computation.

4. The permitee must perform the work authorized by this permit in such a way that it will not interfere with any scheduled or ongoing maintenance activity conducted by the Federal Government, including at the Federal channel, Federal CDF, or Federal navigation structures. Information regarding the scheduling of Federal maintenance projects may be obtained by contacting Mr. Robert Remmers as noted below.

5. Immediately upon completion of disposal operations (within 5 days) the permittee is required to submit to this office a copy of an itemized contractor's bill or statement showing the total cubic yardage deposited into the Federal Disposal Site and a description of the method used to calculate the yardage (e.g., before and after depth soundings within the dredge area). Backup information (including soundings or other survey data) must also be submitted to this office. This information will be used to calculate the disposal facility usage fee, which they will be billed for this amount. The information must be sent to Mr. Robert Remmers as noted below and a second copy must be sent to: Mr. Harold Keppner, Chief, Monitoring and Enforcement Section, U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207-3199.

6. Approval to use a Federal CDF is subject to space limitations, as determined by the U.S. Army Corps of Engineers, Buffalo District.

7. That should the CDF reach capacity prior to project completion; the permittee will be responsible for finding an alternate upland disposal location and will not be authorized to use the alternate location until they receive written approval from this office.

8. Information on how to coordinate an MOA with this office, and requirements for an Operations Plan, may be obtained by contacting Mr. Robert Remmers, Chief, Operations and Technical Support Section, who may be contacted by calling (716) 879-4277, by e-mail: robert.w.remmers@usace.army.mil, or by writing to: Mr. Robert Remmers, Chief,

Regulatory Branch
SUBJECT: Transmittal of Department of the Army Permit No. 2013-00814, Nationwide Permit No. 38 as Published in the Federal Register, Volume 77, No. 34, on Tuesday, February 21, 2012, New York State Department of Environmental Conservation No. 9-1402-01094

Operations and Tech Support, U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207-3199.

Finally, this letter contains an approved JD for the subject parcel. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form within 60 days of the date on this letter to the Great Lakes/Ohio River Division Office at the following address:

Attn: Appeal Review Officer
Great Lakes and Ohio River Division
CELRD-PD-REG
550 Main Street, Room 10032
Cincinnati, OH 45202-3222
Phone: 513-684-6212;FAX(513) 684-2460

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by October 14, 2013.

It is not necessary to submit an RFA to the Division office if you do not object to the determination in this letter.

A copy of this correspondence has been sent to Ms. Mary Beth Giancarlo of the U.S. Environmental Protection Agency Great Lakes National Program Office.

Questions pertaining to this matter should be directed to me at 716-879-4279, by writing to the following address: U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207, or by e-mail at: joseph.m.rowley@usace.army.mil

Sincerely,

ROWLEY.JOSEPH.M.1266892183

Digitally signed by ROWLEY.JOSEPH.M.1266892183
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=ROWLEY.JOSEPH.M.1266892183
Date: 2013.08.14 09:51:44 -04'00'

Joseph Rowley
Physical Scientist

Enclosures

COMPLETION FORM / COMPLIANCE CERTIFICATION

Each permittee who receives a Nationwide Permit (NWP) verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any compensatory mitigation.

APPLICANT:	POINT OF CONTACT:	File No.: 2013-00814
Honeywell International, Inc.	Mr. Rich Galloway	File Closed: July 24, 2013
101 Columbia Road	Honeywell International, Inc.	NWP No.: 38
Morristown, New Jersey 07962	101 Columbia Road	
	Morristown, New Jersey 07962	

Upon completion of the activity authorized by this permit and any required compensatory mitigation sign this certification and return it to the address listed below within 30 days of project completion.

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, revocation, and/or assessment of administrative penalties.

The permittee shall certify the completion of the authorized work and mitigation:

a. The authorized work was done in accordance with the NWP authorization, including any general, regional, or activity specific conditions.

b. The implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, this certification must include the documentation required by 33 CFR 332.3(1)(3) to confirm that the permittee secured the appropriate number and resource type of credits.

_____ _____

APPLICANTS NAME Date

Permittee Telephone Number: _____

Project location: 6.2 miles from the mouth of the Buffalo River up to Cazenovia/Buffalo Creeks, including the 1.4 mile City Ship Canal, in the City of Buffalo, Erie County, New York.

Project Description: dredge approximately 485,000 cubic yards of contaminated sediment, discharge clean sediment/stone to cap an approximate 388,700 square foot area

Authorized Impacts (Waters of the U.S. Impacted by Project): 6.2 miles of the Buffalo River

Waterway and/or Project Setting: Buffalo River

Return completed form to:
Mr. David Leput
Regulatory Branch
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL		
Applicant: Honeywell International, Inc.	File Number: 2013-00814	Date:
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Joseph Rowley United States Army Corps of Engineers Buffalo District 1776 Niagara Street Buffalo, NY 14207 716-879-4279 joseph.m.rowley@usace.army.mil	Attn: Appeal Review Officer Great Lakes and Ohio River Division CELRD-PD-REG 550 Main Street, Room 10032 Cincinnati, OH 45202-3222 (513) 684-6212;FAX(513) 684-2460

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

NAVIGABLE WATERWAYS IN THE BUFFALO DISTRICT
APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

BACKGROUND INFORMATION

A. **REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):** December 19, 2007

B. **DISTRICT OFFICE:** Buffalo

C. **PROJECT LOCATION AND BACKGROUND INFORMATION:** The Buffalo District has previously determined the extent of navigable waters within their regulatory jurisdiction in the states of New York and Ohio. Posting of this jurisdictional determination establishes Corps jurisdiction over these navigable waters under Section 10 of the Rivers and Harbors Act of 1899. A list of these waters is posted on the Buffalo District's regulatory website at http://www.lrb.usace.army.mil/Portals/45/docs/regulatory/DistrictInfo/waterway_ny.pdf and http://www.lrb.usace.army.mil/Portals/45/docs/regulatory/DistrictInfo/waterway_oh.pdf . The Buffalo District has determined that a site/project specific jurisdictional determination involving these Section 10 navigable waters is not required.

D. **REVIEW PERFORMED FOR EVALUATION:** Office (Desk) Determination. Date: December 19, 2007

SUMMARY OF FINDINGS
RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☒ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain: Prior to the determination and listing of Buffalo District's Section 10 navigable waters, detailed navigability studies were performed throughout the Buffalo District to determine which waters met the navigable waters definition found in 33 CFR Part 329. Upon completion, the Buffalo District issued several public notices updating the listing of Section 10 navigable waters determinations within the Buffalo District's regulatory boundaries. Since the most recent Public Notice (PN) 7-81, dated 27 July 1981, the extent of navigability of these listed waters and additional waters determined to be navigable was further refined pursuant to the "Definition of Navigable Waters of the United States" as provided in 33 CFR Part 329. The PN indicated that federal regulatory jurisdiction extends laterally to the entire water surface and bed of a navigable waterbody, which includes all the land and waters below the ordinary high water mark (OHW) and that all adjacent embayments, or backwater areas, ponds or wetlands located below OHW are considered navigable for administrative purposes. In addition, the Pittsburg District issued PN 00-54, dated 3 October 2000, established Section 10 jurisdiction over a portion of the Allegheny River which now occurs within the Buffalo District's regulatory boundaries. The current list of navigable waters, including extent of jurisdiction, occurring within the geographic limits of the Buffalo District and meeting this definition was established in 1996 and updated in 1999 may also be found on the Buffalo District's regulatory website at http://www.lrb.usace.army.mil/Portals/45/docs/regulatory/DistrictInfo/waterway_ny.pdf and http://www.lrb.usace.army.mil/Portals/45/docs/regulatory/DistrictInfo/waterway_oh.pdf, or provided upon request.

DATA SOURCES

SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☒ Corps navigable waters' study: Navigable water studies are available for the majority of navigable waters within the Buffalo District regulatory jurisdiction; Buffalo District issued PN 7-81, dated 27 July 1981; Pittsburg District issued PN 00-54, dated 3 October 2000
- ☐ U.S. Geological Survey map(s). Cite scale & quad name:.
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date):
  or ☐ Other (Name & Date):
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Applicable/supporting case law:
- ☐ Applicable/supporting scientific literature:
- ☒ Other information (please specify): Definition of Navigable Waters of the United States (33 CFR Part 329).

ACTIVITIES AUTHORIZED BY 2012 NATIONWIDE PERMIT WITHIN THE STATE OF NEW YORK

Expiration March 18, 2017

B. Nationwide Permits

38. Cleanup of Hazardous and Toxic Waste. Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 31.) (Sections 10 and 404)

Note: Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.

Buffalo District Only Permit-specific Regional Conditions: None

New York District Only Permit-specific Regional Conditions:

a. For those activities that are located within Essential Fish Habitat waters as defined in Section G-D.8. below, to the maximum extent practicable, no in-water work shall occur between March 1 and June 30.

b. For those activities that would impact more than 0.5 acres of waters of the United States, and are located within Essential Fish Habitat waters as defined in Section G-D.8. below, a complete copy of any PCN submitted to the Corps of Engineers shall also be forwarded by the applicant, directly to the National Marine Fisheries Service (NMFS) Habitat Conservation Division, 212 Rogers Avenue, Milford, Connecticut 06460. The applicant must provide evidence to the Corps that this has been accomplished. The Corps of Engineers will coordinate review of the PCN with the NMFS pursuant to the requirements of the Magnuson Stevens Fishery Conservation and Management Act.

Section 401 Water Quality Certification:
The New York State Department of Environmental Conservation (NYSDEC) has denied Section 401 Water Quality Certification in New York State for this Nationwide Permit. Any party conducting the activities authorized by this NWP must apply for and obtain an individual Section 401 Water Quality Certification from the New York State Department of Environmental Conservation.

New York State Department of State Coastal Zone Management Consistency Determination:
Pursuant to 15 CFR Part 930.41, the New York State Department of State (NYSDOS) concurs with the USACE consistency determination for this NWP with which all general and all Buffalo and New York District regional conditions are complied.

C. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any "take" permits required under the U.S. Fish and Wildlife Service's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such "take" permits are required for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.

(2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____

(Transferee)

_____

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined

to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

D. District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. For a linear project, this determination will include an evaluation of the individual crossings to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to intermittent or ephemeral streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51 or 52, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in minimal adverse effects. When making minimal effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

2. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to

ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

3. If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (a) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (c) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period, with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

E. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

F. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term "discharge" means any discharge of dredged or fill material.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States. If a jurisdictional wetland is adjacent – meaning bordering, contiguous, or neighboring – to a waterbody determined to be a water of the United States under 33 CFR 328.3(a)(1)-(6), that waterbody and its adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.

G. General Regional Conditions
These conditions apply to ALL Nationwide Permits.

G-A. Construction Best Management Practices (BMP's): Unless specifically approved otherwise through issuance of a waiver by the District Engineer, the following BMP's must be implemented to the maximum degree practicable, to minimize erosion, migration of sediments, and adverse environmental impacts. Note that at a minimum, all erosion and sediment control and stormwater management practices must be designed, installed and maintained in accordance with the latest version of the *"New York Standards and Specifications for Erosion and Sediment Control"* and the *"New York State Stormwater Management Design Manual"*. These documents are available at: http://www.dec.ny.gov/chemical/29066.html and http://www.dec.ny.gov/chemical/29072.html , respectively.

1. All synthetic erosion control features (e.g., silt fencing, netting, mats), which are intended for temporary use during construction, shall be completely removed and properly disposed of after their initial purpose has been served. Only natural fiber materials, which will degrade over time, may be abandoned in place.

2. Materials resulting from trench excavation for utility line installation or ditch reshaping activities which are temporarily sidecast or stockpiled into waters of the United States must be backfilled or removed to an upland area within 30 days of the date of deposition. Note: upland options shall be utilized prior to temporary placement within waters of the U.S., unless it can be demonstrated that it would not be practicable or if the impacts of complying with this upland option requirement would result in more adverse impacts to the aquatic environment.

3. For trenching activities in wetlands the applicant shall install impermeable trench dams or trench breakers at the wetland boundaries and every 100 feet within wetland areas to prevent inadvertent drainage of wetlands or other waters of the United States.

4. Dry stream crossing methods (e.g., diversion, dam and pump, flume, bore) shall be utilized for culvert or other pipe, or utility installations to reduce downstream impacts from turbidity and sedimentation. This may require piping or pumping the stream flow around the work area and the use of cofferdams.

5. No in-stream work shall occur during periods of high flow, except for work that occurs in dewatered areas behind temporary diversions, cofferdams or causeways.

6. Construction access shall be by means that avoid or minimize impacts to aquatic sites (e.g. upland access, floating barges, mats, etc.). Discharges of fill material associated with the construction of temporary access roads and work pads in wetlands shall be placed on filter fabric. All temporary fills shall be removed upon completion of the work and the disturbed area restored to pre-construction contours, elevations and wetland conditions.

7. All return flow from dredge material disposal areas shall not result in an increase in turbidity in the receiving water body that will cause a substantial visible contrast to natural conditions. (See NWP #16)

8. For activities involving the placement of concrete into waters of the U.S., the permittee must employ watertight forms. The forms shall be dewatered prior to the placement of the concrete. The use of tremie concrete is allowed, provided that it complies with New York State water quality standards.

9. New stormwater management facilities shall be located outside of waters of the U.S. A waiver of this requirement may be requested with the submission of a PCN. The PCN must include justification which demonstrates that avoidance and minimization efforts have been met.

10. To the maximum extent practicable, the placement of fill in wetlands must be designed to maintain pre-construction surface water flows/conditions between remaining on or off-site waters. This may require the use of culverts and/or other measures. Furthermore, the activity must not restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters). The activity may alter the pre-construction flows/conditions if it can be shown that it benefits the aquatic environment (i.e. wetland restoration and/or enhancement).

11. In order to ensure compliance with NWP General Condition #2 – Aquatic Life Movement and #9 Management of Water Flows, all new or replacement culverts shall be constructed/installed in accordance with the following:

General Information:

a. Use of the following requirements and recommendations alone will not satisfy the need for proper engineering and design. In particular, appropriate engineering is required to ensure structures are sized

and designed to provide adequate capacity (to pass various flood flows) and stability (bed, bed forms, footings and abutments).

b. Site specific information (i.e. stream bed slope, type and size of stream bed material, stream type, existing natural or manmade barriers, etc.) should be assessed to determine appropriate culvert design and to ensure management of water flows and aquatic life movement.
c. Before replacing a culvert or other crossing structure with a larger structure it is essential that the replacement be evaluated for its impacts on: downstream flooding, upstream and downstream habitat (in-stream habitat, wetlands), potential for erosion and headcutting, and stream stability.
d. Measures should be included in all culvert designs that will promote the safe passage of fish and other indigenous aquatic organisms.
e. The dimension, pattern, and profile of the stream above and below the stream crossing should not be permanently modified by changing the width or depth of the stream channel.

Preconstruction Notification (PCN)/Waiver Requirements:

A. A PCN is not required for projects that are designed to meet Requirements B and C, below, unless a PCN is otherwise required by the NWP regulations.

B. In order to comply with General Condition #2 Aquatic Life Movement, either a bottomless culvert or bridge must be used where practicable. If the stream cannot be spanned, the culvert must be installed with its bottom buried (embedded) below the grade of the stream bed where practicable. (Note: When not practicable to do so due to small culvert size, it is suitable to allow natural deposition to cover the interior of the culvert bed.)

   i. A minimum of three stream channel cross sections shall be taken at proximal locations to the crossing location to determine the average of the lowest points in elevation of the stream bed. This average low point shall be used to ensure low flow is maintained through the culvert and from which all embedment depths are measured.
   ii. To ensure low flow and aquatic life movement is maintained, an embedment depth of a minimum of 20 percent of the culvert vertical rise throughout the length of the culvert is recommended. Additionally, it is recommended that the culvert bed slope remain consistent with the slope of the adjacent stream channel.

C. In order to comply with General Condition #9 Management of Water Flows, bank-full flows shall be accommodated through maintenance of the existing bank-full channel cross sectional dimensions within the culvert. Bank-full width is generally considered to be the top width at the stage where a stream begins to overtop its banks and spread into the floodplain.

   i. An average of three measurements (project location and straight sections of the stream upstream and downstream) shall be used to determine appropriate opening width. If the project is a replacement of an existing structure then only upstream and downstream locations shall be used to compute the average.
   ii. To ensure bank-full flow is accommodated by the culvert, it is recommended that minimum culvert widths include a minimum of 1.25 times width of the stream channel at the ordinary high water or a 2 year design storm.

D. In summary, a PCN is required, requesting a waiver of the above requirements for projects where:
   i. both spanning the waterway and embedding are found to be not practicable;
   ii. embedding is practicable but the recommendations for embedment depth cannot be met;
   iii. bank-full flow will not be accommodated within the culvert;
   iv. less than the recommended minimum culvert width is proposed

E. In addition to the PCN requirements of General Condition #31, the PCN must include the following information:
   i. a note indicating which of the above requirements will not be met by the proposed project;
   ii. information as to why the use of such structures or measures would not be practicable;
   iii. a brief description of the stream discussing the items outlined in the above General Information section;
   iv. the cross sections of the stream used to calculate the stream bed low point and bank-full

width;

v. an evaluation of the effects the crossing would have on aquatic life movement and/or water flows; and

vi. mitigation measures that will be employed to minimize these effects.

A waiver of the requirement(s) will be issued if it can be demonstrated that the proposal would result in the least environmentally damaging practicable alternative (e.g. compliance with any of the requirement(s) would result in detrimental impacts to the aquatic system).

12. Culvert Rehabilitation Projects, not including culvert replacement projects:

a. A PCN is required for culvert rehabilitation projects which will involve pipe slip lining or other activities, including concrete invert paving and concrete lining, that raise the existing invert elevation such that it causes an impediment to the passage of low flow or aquatic life movement. A PCN is not required for projects that utilize cured-in-place pipe lining. Slip lining is defined as the insertion of a smaller diameter pipe into an existing pipe by pulling pushing, or spiral winding.

b. Culvert rehabilitation projects shall assess the existing culvert, prior to the proposed repair, for compliance with Nationwide Permit General Conditions (GC) #2 (Aquatic Life Movements) and #9 (Management of Water Flows). If an impediment is found to exist, a PCN is required for any rehabilitation project.

c. For all projects requiring PCN, the applicant must provide an evaluation of the existing culvert and proposed rehabilitation project and their effects upon aquatic life movements and low/ high flow conditions in order to show compliance with GC #2 & #9. For those culverts that will impede the movement of aquatic life and water flows, the applicant must provide information as to how they will mitigate for those deficiencies. Mitigation measures may include, but are not limited to baffles, weirs, roughened channels, and grade control structures.

G-B. No regulated activity authorized by a Nationwide Permit can cause the loss of areas classified as a bog or fen in the State of New York, as determined by the Buffalo or the New York District Corps of Engineers, due to the scarcity of this habitat in New York State and the difficulty with in-kind mitigation. The Districts will utilize the following document in the classification:

Reschke, C. 1990. *Ecological Communities of New York State*. New York Natural Heritage Program. New York State Department of Environmental Conservation. Latham, N.Y. 96p. This document is available at the following location: http://www.dec.ny.gov/animals/29389.html

G-C. National Wild and Scenic Rivers (NWSR): The Upper Delaware River has been designated as a National Wild and Scenic River from the confluence of the East and West Branches below Hancock, New York, to the existing railroad bridge immediately downstream of Cherry Island in the vicinity of Sparrow Bush, New York. Also, the portion of the Genesee River located within Letchworth Gorge State Park, beginning at the southern boundary of the park and extending downstream to the Mt. Morris Dam, was designated by Congress as a permanent Study River in the Genesee River Protection Act of 1989. In accordance with General Condition #16, no activity may occur within a NWSR, including Study Rivers, unless the National Park Service (NPS) has determined in writing that the proposed work will not adversely affect the NWSR designation or study status. Therefore, a PCN is required for any NWP which would impact the designated portions of the Genesee River or the Upper Delaware River. (Note: the applicant may not commence work under any NWP until the NPS determines in writing that the project will not adversely affect the NWSR even if 45-days have passed since receipt of the PCN package.) Information regarding NWSR may be found at: http://www.rivers.gov/wildriverslist.html

G-D. For all proposals requiring a pre-construction notification (PCN), in addition to the requirements in General Condition 31, the applicant shall also include: (Note: the application will not be considered complete until all of the applicable information is received).

1. **New York State/USACE Joint Application Form:** The application form shall be completed and signed and shall clearly indicate that the submission is a PCN.

2. **Drawings:** The PCN must include legible, black and white project drawings on 8.5" x 11" paper. Full size drawings may be submitted in addition to the 8.5" x 11" plans to aid in the application review. Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are a Vicinity Map (i.e. a location map such as a USGS topographical map), a Plan View and a Cross-Section Map. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view or cross section). The Vicinity Map shall provide the location of the entire project site. In addition, each illustration should be identified with a figure or attachment number. The location map shall include the Latitude and Longitude or UTM coordinates of the project. For linear projects, the PCN shall include a map of the entire project including a delineation of all waters of the U.S. within the corridor. Aquatic resource information shall be submitted using the Cowardin Classification System mapping conventions (e.g. PFO, PEM, etc.)

3. **Color photographs:** The photos should be sufficient to accurately portray the project site, keyed to a location map and not taken when snow cover is present.

4. **Avoidance and Minimization:** The PCN must include a written narrative explaining how avoidance and minimization of temporary impacts and permanent losses of waters of the U.S. were achieved on the project site (i.e. site redesign, reduction in scope, alternate methods, etc). It should include a description of the proposed construction practices that would be implemented to perform the proposed work and a description of the reasonably foreseeable direct and indirect effects to waters of the U.S. from the proposed construction practices.

5. **Mitigation**(See General Conditions 23 & 31(b)(5)):The PCN must include at least a conceptual compensatory mitigation plan for all projects resulting in the loss of greater than $1/10^{th}$ of an acre of waters of the United States; or for which a waiver of the 300 linear foot limit on intermittent and ephemeral streams is being requested. Mitigation conceptual plans submitted with the PCN must include the following information at a minimum: proposed compensation type (bank or in-lieu fee credit, restoration, creation, preservation, etc.), location and brief discussion on factors considered for site selection (i.e. soils, water source, potential for invasive species, etc.), amount proposed per resource type and a discussion of how the proposal will compensate for aquatic resource functions and services lost as a result of the project.
Note 1: All mitigation projects must comply with the Federal Regulations on compensatory mitigation (33 CFR 332) entitled "Compensatory Mitigation for Losses of Aquatic Resources: Final Rule", dated April 10, 2008, which is available at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title33/33cfr332_main_02.tpl, and any applicable District Guidelines.
Note 2: Although a conceptual mitigation plan may be sufficient for the purposes of a PCN submission, a detailed mitigation plan must be approved by the Corps before any jurisdictional work may occur on the project site.

6. **Nationwide Rivers Inventory:** The PCN shall indicate if a river segment listed within the National Park Service Nationwide Rivers Inventory (NRI) is located within the proposed project area. For project areas containing a listed NRI segment, the PCN shall also include a statement as to how adverse effects to the river have been avoided or mitigated. The list is available at: http://www.nps.gov/ncrc/programs/rtca/nri/states/ny.html.

7. **Historic or Cultural Resources:** In accordance with General Condition 20, a PCN is required for any non-federal activity which may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places. Please refer to General Condition 20 for submission requirements. In addition, all PCNs must include a written statement indicating if any such properties may be affected by the proposed project. A copy of any completed survey reports shall be provided with the PCN. If a survey has not been performed, the statement shall include a list of resources checked in the determination. Copies of any available correspondence from the New York State Office of Parks, Recreation, and Historic Preservation State Historic Preservation Officer (SHPO) regarding historic properties shall be provided with the PCN. Information regarding cultural resources may be found at: http://nysparks.state.ny.us/shpo/. In addition, assistance regarding the determination of the presence of historic or cultural resources at or near the project site should be directed to SHPO. NOTE: as stated in General Condition 20, if any listed, eligible or potentially eligible properties are present, the applicant shall not begin the activity until notified by the district engineer in writing either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

8. **Endangered Species** (See General Condition 18) **and Essential Fish Habitat:** The PCN must include a written statement and documentation concerning any Essential Fish Habitat (EFH) and any federally listed Threatened and Endangered (T&E) species or designated critical habitat that might be affected or is in the vicinity of the project, or

if the project is located in designated critical habitat. The PCN must include a copy of any correspondence from the U.S. Fish and Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration Fisheries Service (NOAA-Fisheries) formerly National Marine Fisheries Service (NMFS), regarding the presence of T&E species or evidence that the applicant has utilized the USFWS T&E website: http://www.fws.gov/northeast/nyfo/es/section7.htm. Information on NOAA-Fisheries (NMFS) species (both T&E and EFH) can be found at: http://www.nero.noaa.gov/nero.
Website evidence shall include a County list of T&E species. For projects located in counties containing T&E species, the PCN shall also include a discussion of potential T&E habitat within the project site. If there is potential habitat for any Federally listed species within the project site the following should be submitted:

a. The results of any habitat surveys and presence/absence surveys. Note: all surveys should be coordinated with the USFWS and/or NOAA-Fisheries(NMFS) prior to initiation.

b. A detailed description of the proposed project, including secondary impacts and approximate proposed project construction schedule of project activities (e.g. land clearing, utilities, stormwater management).

c. A description of the natural characteristics of the property and surrounding area (e.g. forested areas, freshwater wetlands, open waters, and soils). Additionally, please include a description of surrounding land use (residential, agricultural, or commercial).

d. A description of the area to be impacted by the proposed project, including the species and number or acres of trees to be removed.

e. The location of the above referenced property and extent of any project related activities or discharges clearly indicated on a copy of a USGS 7.5 minute topographic quadrangle (quad) with the name of the quad(s) and latitude/longitude clearly labeled.

f. A description of conservation measures to avoid or minimize impacts to listed species.

Please note that there are no known threatened or endangered (T&E) species or EFH species under the jurisdiction of the NOAA-Fisheries (NMFS) within the Buffalo District. Therefore, all Buffalo District requests for information regarding the presence of T&E species should be directed to the USFWS.

General Condition #18 is emphasized, ..."In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed work will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed."

9. **100 Year Floodplain:** For permanent fills within waters of the United States within the 100 year floodplain, documentation of compliance with FEMA-approved state or local floodplain management requirements.

10. **Submission of Multiple Copies of PCN**:

a) One (1) additional copy of the PCN package shall be provided to USACE for coordination with National Oceanic and Atmospheric Administration (NOAA) for utility lines to be constructed or installed in navigable waters of the U.S. proposed under NWP #12, (See Note 1 of NWP #12)

b) One (1) additional copy of the PCN package shall be provided to USACE for coordination with Department of Defense Siting Clearinghouse (See NWP #12, 39, 51 & 52 Notes) for:
   i. overhead utility lines proposed under NWP #12 and
   ii. any activity that involves the construction of a wind energy generating structure, solar tower, or overhead transmission lines proposed under NWP #39, 51 or 52

c) Two (2) additional copies of the PCN package shall be provided to USACE when the project is located within the New York City Watershed, for coordination with the New York City Department of Environmental Protection.

d) Five (5) additional copies of the PCN package shall be submitted to USACE for agency coordination in accordance with General Condition # 31(d)(2) for:
   i. All NWP activities that result in the loss of greater than 1/2-acre of waters of the United States,
   ii. NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed,
   iii. All NWP 48 activities requiring pre-construction notification.

G- E. CRITICAL RESOURCE WATERS

In accordance with NWP General Condition (GC) #22, certain activities in Critical Resource Waters cannot be authorized under the NWP program or would require a PCN (see GC #22 for a list of the NWP activities that are either excluded or require a PCN).

Critical Resource Waters in New York State include the following:

1. **East-of-Hudson portion of the New York City Water Supply:** This area includes portions of Dutchess, Putnam and Westchester Counties as delineated on Enclosure 2.

2. **Hudson River National Estuarine Research Reserves (NERR):** The Hudson River NERR consists of four components: Piermont Marsh, Iona Island, Tivoli Bay, and Stockport Flats.

H. NYSDEC General Water Quality Certification (WQC) Conditions applicable to all NWPs for which WQC has been provided are as follows:

1. Non-contamination of Waters:
• All necessary precautions shall be taken to preclude contamination of any wetland or waterway by suspended solids, resins, sediments, fuels, solvents, lubricants, epoxy coatings, paints, concrete, leachate or any other environmentally deleterious materials associated with the project.

2. Installation and Maintenance of Culverts:
• This certification does not authorize the installation of any culverts that are not embedded beneath the existing grade of the stream channel.
• This certification does not authorize culvert rehabilitation projects that involve slip lining, invert paving, or similar treatments that can result in an impediment to the passage of aquatic life movement through the culvert.
• This certification does authorize the rehabilitation of culverts utilizing Cure in Place Pipe Lining (CIPP) or concrete spray lining for culverts which currently meet Nationwide Permit General Condition # 2 - Aquatic Life Movements.

3. Discharges and Disturbances:
• Except for Nationwide Permit # 3, 4, 20, 22, 27, 30, 33, 37, 41 and maintenance activities under Nationwide Permit 43, this certification does not authorize discharges greater than 1/4 acre in size or more than 300 feet of stream disturbance.

4. Maintenance of Water Levels:
• Except for Nationwide Permit 27, this certification does not authorize any activity that results in a permanent water level alteration in waters of the United States, such as draining or impounding.

5. Dewatering:
• Authorized dewatering is limited to immediate work areas that are cofferdammed or otherwise isolated from the larger water body or waters of the United States. Dewatering must be localized and not drain extensive areas of a water body or reduce the water level such that fish and other aquatic vertebrates are killed, or their eggs and nests are exposed to desiccation, freezing or depredation in areas outside of the immediate work site.
• Cofferdams or diversions shall not be constructed in a manner that causes or exacerbates erosion of the bed or banks of a watercourse.
• All dewatering structures must be permanently removed when construction is completed.

6. Endangered or Threatened Species:
• Applicants must certify that the proposed activity will not jeopardize the existence of an endangered species or threatened species listed in 6 NYCRR Part 182, or likely to destroy or adversely modify the habitat of such species. Information on New York State endangered or threatened species may be obtained from the NYS Department of Environmental regional offices, the New York Natural Heritage Program in Albany, New York or on the NYSDEC website at http://www.dec.ny.gov/animals/29338.html. If it is determined that there is a species of concern that may be impacted by the proposed activity, this blanket water quality certification is not applicable, and the applicant will need an individual water quality certification from the Department.

7. Prohibition Period/or In-stream Work:
Unless approved in writing by the Regional Natural Resources Supervisor or their designee, in-stream work is prohibited during the following time periods:

- in cold water trout fisheries (waters classified under Article 15 of New York's Environmental Conservation Law with a "t" or "ts" designation), beginning October 1 and ending May 31
- in perennial warm water fisheries, (non- trout waters classified under Article 15 of New York's Environmental Conservation Law as "A, B or C"), beginning March 1 and ending July 15.

To determine which prohibition period is in effect for a particular water, contact the Regional Natural Resources Supervisor in the appropriate NYSDEC regional office.

8. Significant Coastal Fish and Wildlife Habitat:
• This certification does not authorize any discharge occurring in a designated Significant Coastal Fish and Wildlife Habitat area pursuant to 19 NYCRR Part 602 ; Title 19 Chapter 13, Waterfront Revitalization and Coastal Resources.

9. Coastal Erosion Hazard Areas:
• This certification does not authorize projects in Coastal Erosion Hazard Areas, as identified in NYS Environmental Conservation Law (ECL) Article 34, and its implementing regulations, 6 NYCRR Part 505.

10. State-owned Underwater Lands:
• Prior to undertaking any Nationwide Permit activity that will involve or occupy state owned lands now or formerly under the waters of New York State, the party proposing the activity must first obtain all necessary approvals from:

NYS Office of General Services
Division of Real Estate Development
Corning Tower Building, 26th Floor
Empire State Plaza
Albany, NY 12242
Tel. (518) 474-2195

11. Tidal Wetlands:
• This authorization does not authorize any activities in tidal wetlands as defined in Article 25 of NYS ECL, with the exception of NWP # 4, 20 and 48.

12. Wild, Scenic and Recreational Rivers:
• This certification docs not authorize activities in any Wild, Scenic or Recreational River or state designated WSR corridors.

13. Floodplains:
• Authorized projects must be in compliance with State and Local Floodplain Regulations.

14. Combined use of permits:
• This authorization does not allow the stacking of NWPs so that in combination they exceed *1/4* of an acre of fill or 300 linear feet of stream disturbance. When used in combination, the most restrictive conditions apply.

15. Public Service Commission:
• This certification does not authorize activities regulated pursuant to Article VII of the New York State Public Service Law. For such projects, Section 401 Water Quality Certification is obtained from the New York State Public Service Commission.

16. Utility Projects:
• This certification does not authorize maintenance or other activities associated with hydropower projects.
• This certification does not authorize the construction of substation facilities or permanent access roads in wetlands or within the FEMA mapped 100 year floodplain.
• Excess materials resulting from trench excavation must be moved out of the wetland and contained so that they do not re-enter any waters of the United States.

1. New York State Department of State (NYSDOS) Coastal Zone Management Consistency Determination applicable to all NWPs located within or affecting the NYS Coastal Zone:

To ensure that the NWPs and activities authorized by USACE would be consistent with the NYS Coastal Management Program and approved LWRPs, the following conditions will apply to NWPS where NYSDOS has objected to the USACE consistency determination or where the project will not comply with the NYSDOS NWP specific condition(s):

The applicant will submit a request for an individual consistency determination to NYSDOS. Within thirty (30) days of receipt by NYSDOS of an applicant's submission, which should include a complete joint New York State Department of Environmental Conservation and U.S. Army Corps of Engineers Permit Application, completed Federal Consistency Assessment Form, and all information and data necessary to assess the effects of the proposed activity on and its consistency with the CMP, including location maps and photographs of the site where the activity is proposed, NYSDOS will inform the applicant and the Corps whether:

1) Necessary data and information is missing from the applicant's submission. If so, the NYSDOS will notify the applicant and the Corps of the missing necessary data and information, and state that the NYSDOS review will not commence until the date the necessary data and information is provided;

2) The activity meets the General Concurrence criteria set forth in the CMP and therefore, further review of the proposed activity by the NYSDOS, and the NYSDOS concurrence with an individual consistency certification for the proposed activity, are not required; or

3) NYSDOS review of the proposed activity and NYSDOS concurrence with the applicant's consistency certification is necessary. If NYSDOS indicates review of the activity and a consistency certification for it is necessary, the activity shall not be authorized by NWP or other form of Corps authorization unless NYSDOS concurs with an applicant's consistency certification, in accordance with 15 CFR Part 930, Subpart D, or unless NYSDOS indicates the activity meets CMP General Concurrence criteria (see item 2 above).

NYSDOS concurrence with an applicant's consistency certification shall not be presumed unless NYSDOS fails to concur with or object to an applicant's consistency certification within six (6) months of commencement of NYSDOS review of an applicant's consistency certification and all necessary data and information in accordance with 15 CFR Parts 930.62 or 930.63.

Notes:

- Unless NYSDOS issues consistency concurrence or USACE has determined that NYSDOS concurrence is presumed, NWPs are not valid within the Coastal Zone.

- Limits of the coastal zone, including the CMP special management area designations of Significant Coastal Fish and Wildlife Habitats (SCFWH), can be viewed at: http://www.dos.ny.gov/communitieswaterfronts/atlas/index.html Local Waterfront Revitalization Program information can be viewed at: http://www.dos.ny.gov/communitieswaterfronts/WFRevitalization/LWRP_status.html
- All consistency concurrence determination requests must be submitted directly to NYSDOS.
- Details regarding NYSDOS submission requirements can be obtained at: http://www.dos.ny.gov/communitieswaterfronts/consistency/federal.html

J. INFORMATION ON NATIONWIDE PERMIT VERIFICATION

Verification of the applicability of these Nationwide Permits is valid until March 19, 2017 unless the Nationwide Permit is modified, suspended revoked, or the activity complies with any subsequent permit modification.

It is the applicant's responsibility to remain informed of changes to the Nationwide Permit program. A public notice announcing any changes will be issued when they occur and will be available for viewing at our website: http://www.lrb.usace.army.mil/Missions/Regulatory.aspx.

Please note in accordance with 33 CFR part 330.6(b), that if you commence or are under contract to commence an activity in reliance of the permit prior to the date this Nationwide permit expires, is suspended or revoked, or is modified such that the activity no longer complies with the terms and conditions, you have twelve months from the date of permit modification, expiration, or revocation to complete the activity under the present terms and conditions of the permit, unless the permit has been subject to the provisions of discretionary authority.

Possession of this permit does not obviate you of the need to contact all appropriate state and/or local governmental officials to insure that the project complies with their requirements.

NOTE: This document is an excerpt of the May 30, 2012 Public Notice by USACE Buffalo & New York Districts. The above referenced Enclosures 2-4 and Appendix A are not included in this Buffalo District document as they are only applicable within the geographic boundaries of the New York District. The Public Notice is available at the USACE websites or by contacting the Districts at the addresses provided below in Section K.

K. AGENCY CONTACT INFORMATION

NYS Department of Environmental Conservation

www.dec.ny.gov

NYS DEC REGION 1
Regional Permit Administrator
SUNY @ Stony Brook
50 Circle Road
Stony Brook, NY 11790-3409
(631) 444-0365

NYS DEC REGION 2
Regional Permit Administrator
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, NY 11101-5407
(718) 482-4997

NYS DEC REGION 3
Regional Permit Administrator
21 South Putt Corners Road
New Paltz, NY 12561-1620
(845) 256-3054

NYS DEC REGION 4
Regional Permit Administrator
1130 North Westcott Road
Schenectady, NY 12306-2014
(518) 357-2069

NYS DEC REGION 4 Sub-Office
Deputy Regional Permit Administrator
65561 State Hwy 10
Stamford, NY 12167-9503
(607) 652-7741

NYS DEC REGION 5
Regional Permit Administrator
PO Box 296
1115 Route 86
Ray Brook, NY 12977-0296
(518)897-1234

NYS DEC REGION 5 Sub-Office
Deputy Regional Permit Administrator
PO Box 220
232 Golf Course Rd
Warrensburg, NY 12885-0220
(518) 623-1281

NYS DEC REGION 6
Regional Permit Administrator
317 Washington Street
Watertown, NY 13601-3787
(315) 785-2245

NYS DEC REGION 6 Sub-Office
Deputy Regional Permit Administrator
207 Genesee Street
Utica, NY 13501-2885
(315) 793-2555

NYS DEC REGION 7
Regional Permit Administrator
615 Erie Blvd. West
Syracuse, NY 13204-2400
(315)426-7438

NYS DEC REGION 7 Sub-Office
Deputy Regional Permit Administrator
1285 Fisher Avenue
Cortland, NY 13045-1090
(607) 753-3095

NYS DEC REGION 8
Regional Permit Administrator
6274 E. Avon - Lima Road
Avon, NY 14414-9519
(585) 226-2466

NYS DEC REGION 9
Regional Permit Administrator
270 Michigan Avenue
Buffalo, NY 14203-2915
(716) 851-7165

NYS DEC REGION 9 Sub-Office
Deputy Regional Permit Administrator
182 East Union Street
Allegany, NY 14706-1328
(716) 372-0645

NYS Department of State

Division of Coastal Resources
Consistency Review Unit
One Commerce Plaza
99 Washington Avenue, Suite 1010
Albany, NY 12231-00001
(518) 474-6000
www.nyswaterfronts.com
PO Box 296
1115 Route 86
Ray Brook, NY 12977-0296
(518) 897-1234

US Army Corps of Engineers

www.usace.army.mil

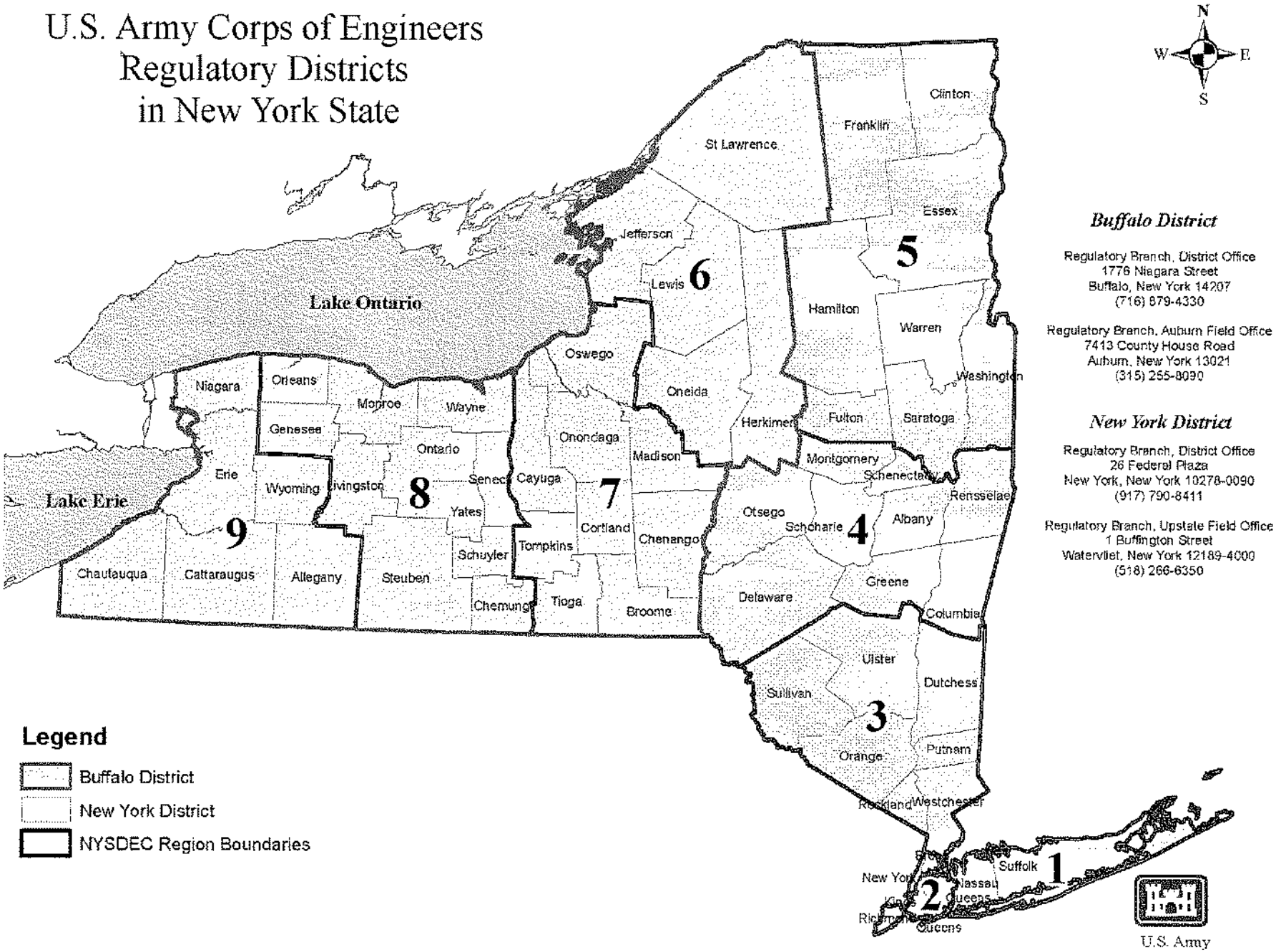
For DEC Regions 1, 2 and 3
US Army Corps of Engineers NY District
ATTN: Regulatory Branch
26 Federal Plaza, Room 1937
New York, NY 10278-0090
Email: CENAN.PublicNotice@usace.army.mil
For DEC Regions 1, 2, Westchester County and Rockland County (917) 790-8511
For the other counties of DEC Region 3 -
(917) 790-8411

For DEC Regions 4, 5
Department of the Army
ATTN: CENAN-OP-R
NY District, Corps of Engineers
1 Buffington Street
Building 10, 3rd Floor
Watervliet, NY 12189-4000
(518) 266-6350 - Permits team
(518) 266-6360 - Compliance Team

Email: cenan.rfo@usace.army.mil

For DEC Regions 6, 7, 8, 9
US Army Corps of Engineers
Buffalo District
ATTN: Regulatory Branch
1776 Niagara Street
Buffalo, NY 14207-3199
(716) 879-4330
Email: LRB.Regulatory@usace.army.mil
www.lrb.usace.army.mil

U.S. Army Corps of Engineers Regulatory Districts in New York State



Legend

- Buffalo District
- New York District
- NYSDEC Region Boundaries

Buffalo District

Regulatory Branch, District Office
1776 Niagara Street
Buffalo, New York 14207
(716) 879-4330

Regulatory Branch, Auburn Field Office
7413 County House Road
Auburn, New York 13021
(315) 255-8090

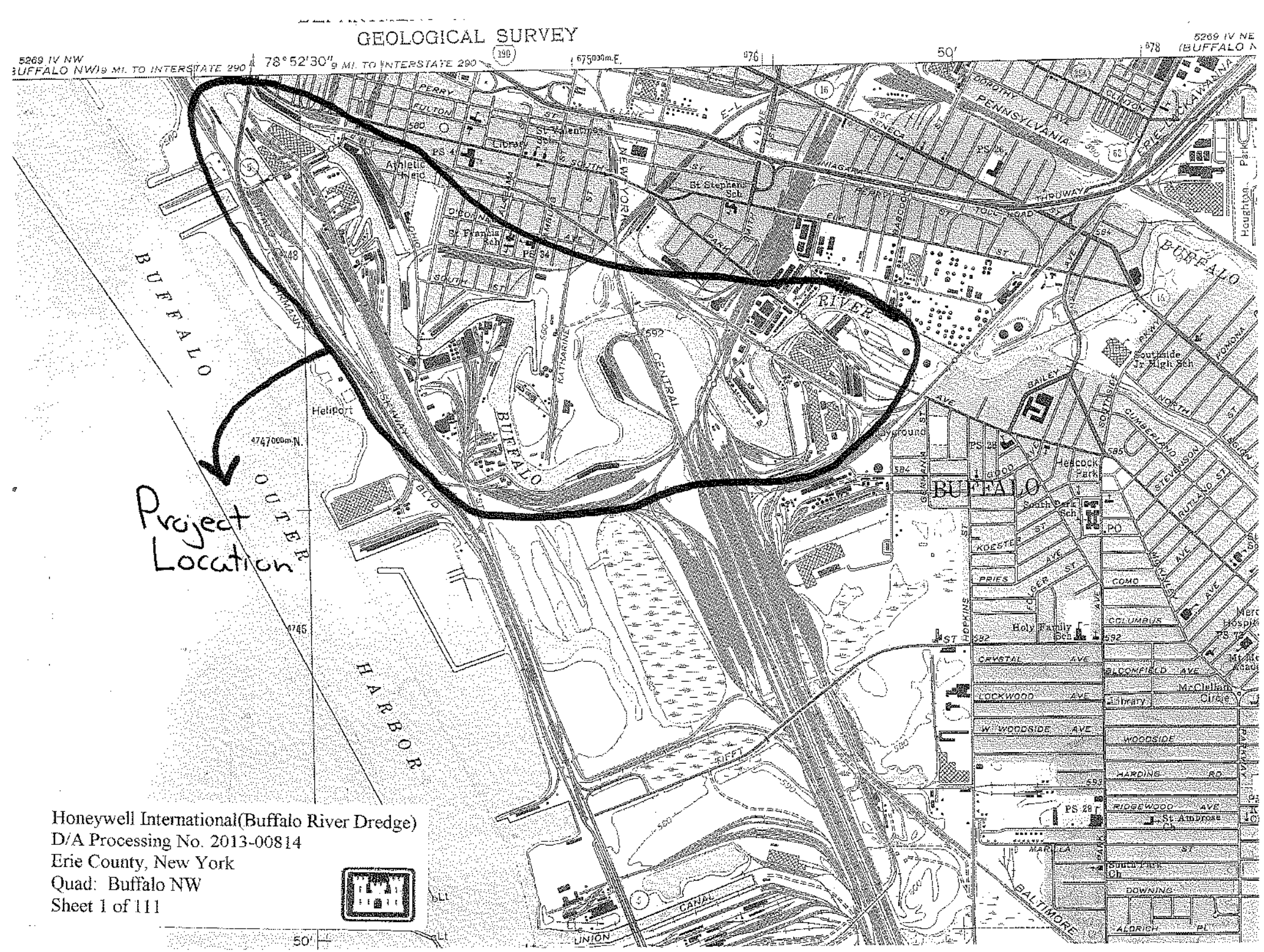
New York District

Regulatory Branch, District Office
26 Federal Plaza
New York, New York 10278-0090
(917) 790-8411

Regulatory Branch, Upstate Field Office
1 Buffington Street
Watervliet, New York 12189-4000
(518) 266-6350

U.S. Army
Corps of Engineers

ENCLOSURE 1


GEOLOGICAL SURVEY
5269 IV NW
BUFFALO NW
9 MI. TO INTERSTATE 290
78°52'30"
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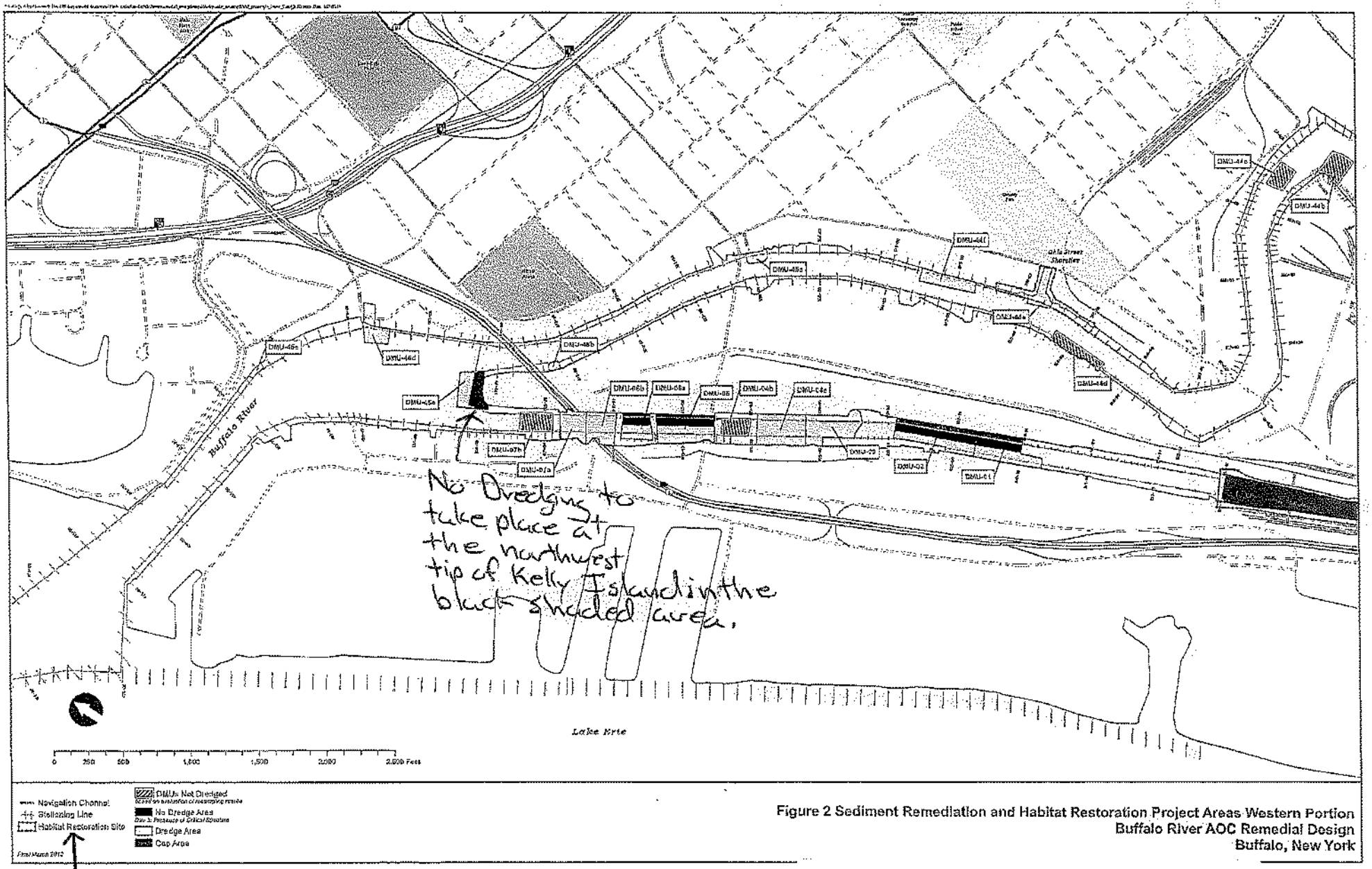
5269 IV NE
(BUFFALO N
BUFFALO
RIVER
OUTER
HARBOR
Heliport
4747000m.N.
4745
Project Location
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 1 of 111



No Dredging to take place at the northwest tip of Kelly Island in the black shaded area.

Will be constructed at a different time

Figure 2 Sediment Remediation and Habitat Restoration Project Areas Western Portion
Buffalo River AOC Remedial Design
Buffalo, New York

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW

Honeywell International(Buffalo River Dredge)
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Erie County, New York
Quad: Buffalo NW
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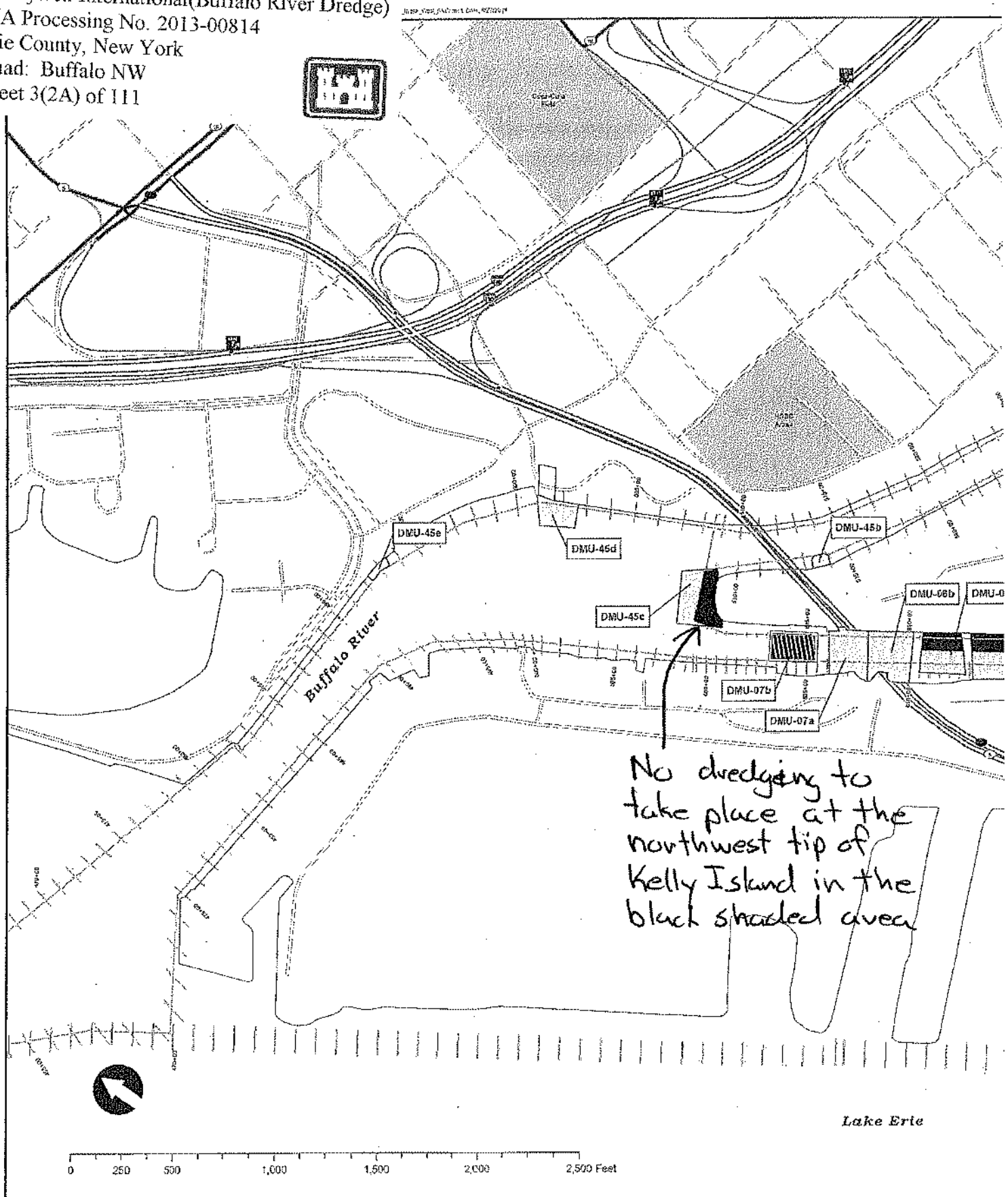

No dredging to take place at the northwest tip of Kelly Island in the black shaded area

Navigation Channel
Stationing Line
Habitat Restoration Site

DMUs Not Dredged
based on evaluation of resampling results
No Dredge Area
Due to Presence of Critical Structure
Dredge Area
Cap Area

Final March 2013

↓ will be constructed at a different time

Honeywell International(Buffalo River Dredge)
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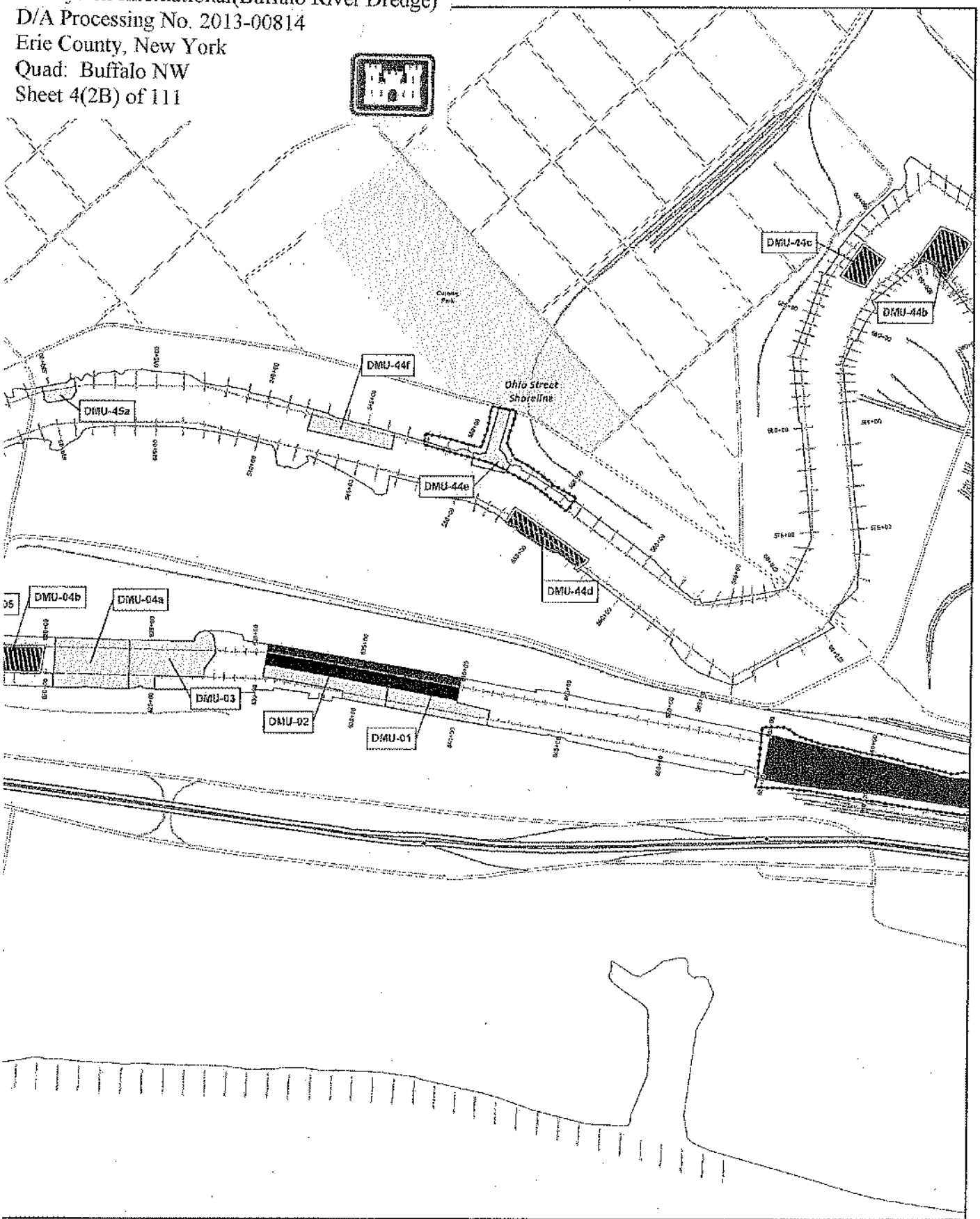

Figure 2 Sediment Remediation and Habitat Restoration Project Areas Western Portion
Buffalo River AOC Remedial Design
Buffalo, New York

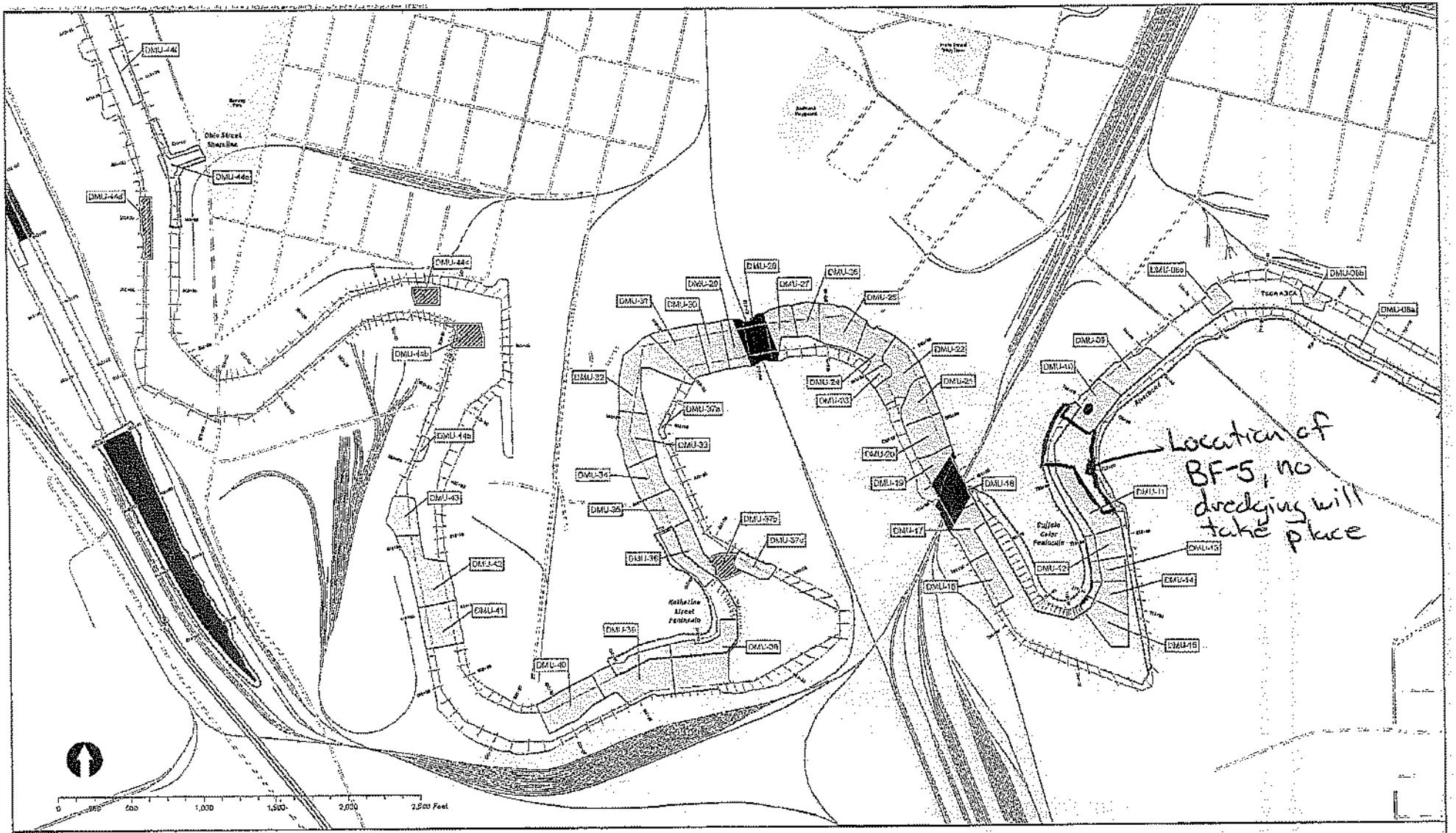

Figure 3 Sediment Remediation and Habitat Restoration Project Areas Eastern Portion
Eastern Portion, Buffalo River AOC

Will be constructed at a different time

Honeywell International(Buffalo River Dredge)
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Honeywell International(Buffalo River Dredge)
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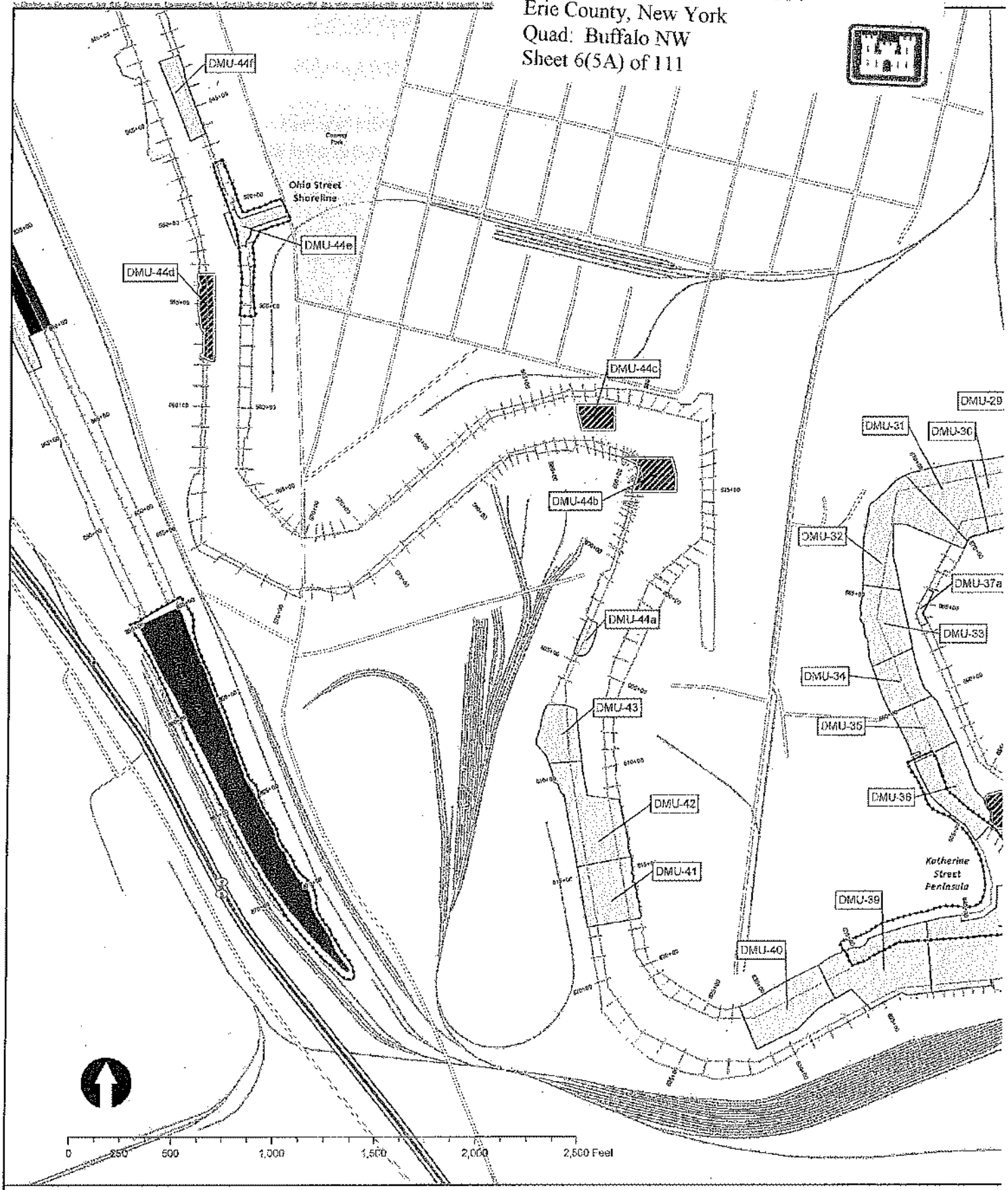

Will be constructed at a different time

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
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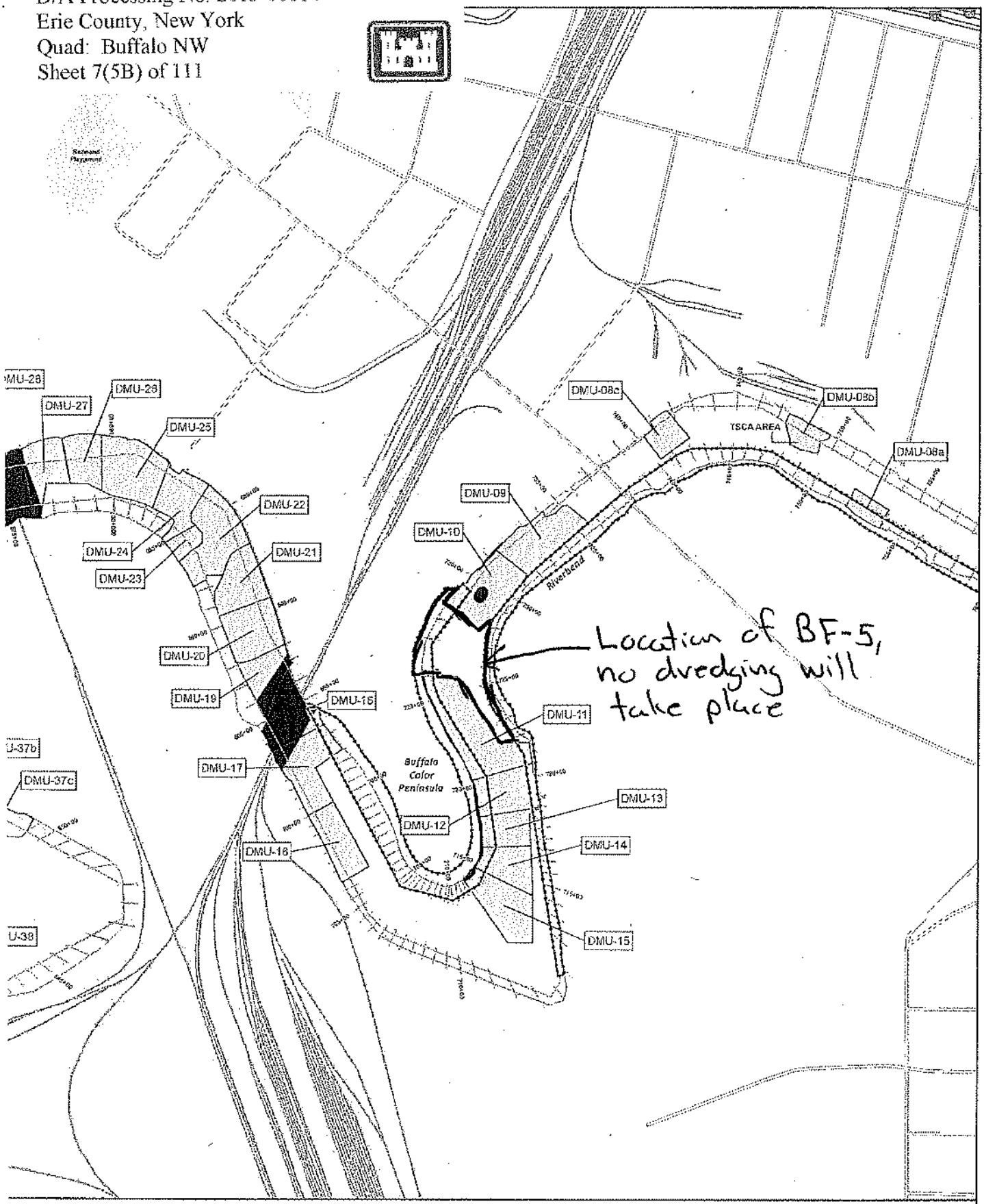

Figure 3 Sediment Remediation and Habitat Restoration Project Areas Eastern Portion
Eastern Portion, Buffalo River AOC
Buffalo, New York

Table 2. Addendum 1 Design Volume Estimates by Dredge Management Unit (DMU)

last update: 5/13/2013

DMU No.	Dredge Area Name	USACE Dredge Depth	EPA Dredge Depth	DMU Total Dredge Volume	USACE Dredge Volume (cy)	Total EPA Dredge Volume (cy)	Potential Undredged Volume (total DMU) (cy)	Potential Dredged Volume (cy)	DMU Dredge Surface Area (ft^2)	Average Dredge Depth (ft)	Allowable Over-dredge Volume (cy)	Operational Dredge Volume (cy)	Change Note
Buffalo Ship Canal													
1	DA-1	545.7	to till on noncritical structure side of the river only and to 5 ft of noncritical structure	9,800	1,600	8,200	5,500	2,700	44,800	2.1	800	3,500	
2		545.7		8,000	1,500	6,500	5,100	1,400	38,800	1.5	700	2,100	
3	DA-2	545.7	to till	6,600	1,700	4,900	0	4,900	75,600	2.3	1,400	6,300	
4a		545.7		8,100	2,500	5,600	0	5,600	82,400	2.3	1,500	7,100	
4b	R-01	545.7	No environmental dredging										
5	DA-03	545.7	to till on noncritical structure side of the river only	12,400	2,700	9,700	4,400	5,300	52,900	3.2	1,000	6,300	
6a	R-02	545.7		8,800	1,300	7,500	3,700	3,800	24,600	4.7	500	4,300	
6b	DA-04	545.7	to till, to riprap	10,000	1,000	9,000	200	8,800	48,800	6.4	900	9,700	
7a		545.7		7,000	600	6,400	200	6,200	40,900	4.6	800	7,000	
7b	R-03	545.7	No environmental dredging										
Buffalo River													
8a	DA-17	545.7	to till	3,700	1,600	2,100	0	2,100	20,500	3.3	400	2,500	
8b*	DA-16	545.7	See the TSCA Tables for the volumes of this DMU	1,300	0	1,300	0	1,300	5,600	6.8	100	1,400	
8c	R-15	545.7	to till, to 5 ft of noncritical structure	3,200	1,000	2,200	0	2,200	27,100	2.7	500	2,700	
9	DA-15	545.7	to till, to 5 ft of noncritical structure	25,700	12,200	13,500	400	13,100	69,600	5.6	1,300	14,400	
10		545.7	to till, to 20ft of critical structure	18,700	7,000	11,700	1,800	9,900	71,100	4.3	1,300	11,200	
11	DA-14	545.7	to till, to riprap	30,200	12,500	17,700	500	17,200	113,100	4.6	2,100	19,300	
12		545.7		20,500	10,000	10,500	600	9,900	57,900	5.1	1,100	11,000	
13		545.7		7,800	4,100	3,700	200	3,500	39,000	2.9	700	4,200	
14		545.7		7,000	4,200	2,800	100	2,700	43,800	2.2	800	3,500	
15		545.7		18,700	11,400	7,300	100	7,200	67,700	3.4	1,300	8,500	
16	DA-13	545.7	to till	5,900	1,200	4,700	0	4,700	50,800	3.0	900	5,600	
17		545.7	to till, to no dredge boundary	14,400	6,700	7,700	2,100	5,600	65,300	2.8	1,200	6,800	
18		545.7	no dredge zone	14,700	500	14,200	13,300	900	5,400	5.0	100	1,000	
19	R-14	545.7	to till, to no dredge boundary	8,100	2,600	5,500	3,200	2,300	29,200	2.6	600	2,800	
20	DA-12	545.7	to till	12,300	6,700	5,600	0	5,600	64,100	2.9	1,200	6,900	
21		545.7	to till	11,100	3,900	7,200	0	7,200	56,500	3.9	1,000	8,200	
22	R-13	545.7	to till	19,100	8,500	10,600	0	10,600	85,900	3.8	1,600	12,200	
23	DA-11	545.7	to till	4,400	2,000	2,400	0	2,400	16,500	4.4	300	2,700	
24		545.7	to till, to 5 ft of noncritical structure	12,200	6,700	5,500	0	5,500	51,100	3.4	900	6,400	
25		545.7	to till	17,000	8,800	8,200	0	8,200	61,600	3.2	1,500	9,700	
26		545.7	to till	7,800	2,100	5,700	0	5,700	41,100	4.3	800	6,500	
27	DA-11	545.7	to till, to no dredge boundary	11,600	2,100	9,500	2,300	7,200	43,300	5.0	800	8,000	
28		545.7	no dredge zone	13,600	0	13,600	13,600	0	100	0.0	0	0	
29		545.7	to till, to no dredge boundary	7,900	800	7,100	1,600	5,500	40,700	4.2	800	6,300	
30	DA-11	545.7	to till	12,200	2,900	9,300	0	9,300	53,100	5.2	1,000	10,300	
31		545.7	to till	23,600	6,700	17,100	0	17,100	84,300	6.0	1,600	18,700	
32		545.7	to till	34,000	8,300	25,700	100	25,600	123,600	6.1	2,300	27,900	
33		545.7	to till	13,400	800	12,600	0	12,600	75,700	5.0	1,400	14,000	
34		545.7	to till	10,900	300	10,600	0	10,600	53,300	5.9	1,000	11,600	
35		545.7	to till	11,200	2,400	8,800	0	8,800	56,400	4.7	1,000	9,800	
36		545.7	to till	21,500	3,300	18,200	200	18,000	86,300	6.1	1,600	19,600	
37a	DA-18	545.7	to till, to 10 ft of critical structure	3,100	600	2,500	400	2,100	5,900	0.0	100	2,200	A
37b	R-12	545.7	No environmental dredging										

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Table 2. Addendum 1 Design Volume Estimates by Dredge Management Unit (DMU) last update: 5/13/2013

DMU No.	Dredge Area Name	USACE Dredge Depth	EPA Dredge Depth	DMU Total Dredge Volume	USACE Dredge Volume (cy)	Total EPA Dredge Volume (cy)	Potential Undredged Volume (total DMU) (cy)	Potential Dredged Volume (cy)	DMU Dredge Surface Area (ft^2)	Average Dredge Depth (ft)	Allowable Over-dredge Volume (cy)	Operational Dredge Volume (cy)	Change Note
37c	DA-10	545.7	to till, to 10 ft of critical structure	15,400	7,200	8,200	1,600	6,600	31,800	6.1	600	7,200	A
38	DA-9	545.7	to till, to 10 ft of critical structure	23,500	5,700	17,800	400	17,400	152,600	3.6	2,800	20,200	A
39		545.7		24,000	6,700	17,300	1,100	16,200	149,200	3.4	2,800	19,000	A
40		545.7	to till	7,400	200	7,200	0	7,200	90,500	2.7	1,700	8,900	A
41	DA-8	545.7	to till, to 5 ft of noncritical structure	13,900	3,300	10,600	100	10,500	79,300	4.1	1,500	12,000	
42		545.7	to till, to 5 ft of noncritical structure	16,300	2,200	14,100	400	13,700	110,500	3.8	2,000	15,700	
43		545.7	to till	10,700	700	10,000	100	9,900	51,200	5.7	900	10,800	
44a	R-11	--	no dredge zone	700	0	700	0	700	12,100	0.0	200	900	
44b	R-10	--	No environmental dredging										
44c	R-09	--	No environmental dredging										
44d	R-08	545.7	No environmental dredging										
44e	DA-07	545.7	to till, to 5 ft of noncritical structure	17,700	500	17,200	400	16,800	25,600	18.2	500	17,300	
44f	R-07	--	to till	2,400	100	2,300	0	2,300	36,100	2.2	700	3,000	
45a	R-06	545.7	to till, to 5 ft of noncritical structure	1,400	200	1,200	0	1,200	12,200	3.1	200	1,400	
45b	R-05	--	to till, to structure	900	0	900	0	900	4,600	0.0	100	1,000	
45c	DA-05	545.7	to till	16,800	3,400	13,400	9,600	3,800	24,700	4.7	500	4,300	
45d	DA-06	545.7	to till, to 10ft of critical structure	6,800	4,300	2,500	400	2,100	23,700	0.0	400	2,500	A
45e	R-04	545.7	to till, to 5 ft of noncritical structure	1,200	200	1,000	0	1,000	4,600	6.5	100	1,100	
Totals:				656,800	189,500	467,300	73,700	393,600	2,903,200	4.99	53,800	447,400	
											Additional dredging based on confirmation sampling		0
											Sedimentation (Year 1)		10,000
											Sedimentation (Year 2)		30,000
													487,400
											Rounded Volume		488,000
											Volume Range (Rounded)	464,000	512,000

* The volume is shown for Non-TSCA material in DMU-8b. The estimated volume of TSCA material is 4200 cy.

Notes:

1. Volume estimates are presented in cubic yards (cy), rounded to the nearest 100 cy.
2. ***USACE Dredge Depth*** based on USACE contract drawing C-102, and is the depth beneath low water datum of 569.2'.
3. ***EPA Dredge Depth*** based on evaluation of till elevation measurements within the DMU and presence of structures (critical and non-critical) which affect potential dredge prisms.
4. ***DMU Total Dredge Volume*** based on a total volume within a DMU between the EPA dredge depth and current (2010) bathymetric surface.
5. DMUs 4b, 7b, 37b, 44b, 44c, and 44d (Resample Areas R-1, R-3, R-12, R-10, R-9, and R-8 respectively) will not be dredged based on the DMU evaluations.
6. ***USACE Dredge Volume*** was calculated by the difference between the bathymetric surface and USACE Dredge Prism within the DMU boundaries (assuming a 1H:1V side slope and dredge depth to elevation 545.7'). Refer to USACE contract drawing C-101).
7. ***Total EPA Dredge Volume*** is the difference between the ***DMU Total Dredge Volume*** and the ***UASCE Dredge Volume***.
8. ***Potential Undredged Volume*** is the volume of sediment assumed to be left in place without bank stabilization and assuming 1H:1V side slopes or estimated remaining material at critical structures based on CAD calculations of no dredge zones and hand calculations of offsets.
9. ***Potential Dredge Volume*** is the difference between ***Total EPA Dredge Volume*** and ***Potential Undredged Volume***.
10. ***Dredge Surface Area*** is the ***Total DMU surface area adjusted for no dredge boundaries***.
11. **Allowable Over-Dredge Volume** was estimated as 6" thick over each DMU area. This volume is the overdredge volume for which the contractor will be reimbursed.
12. **Operational Dredge Volume** was the **Potential Dredge Volume** plus the **Allowable Over-Dredge Volume.**

Change Note:

A - Change in approach to critical structure with dredging to within 10 feet of structure.

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GENERAL NOTES

1. THIS PROJECT IS ENVIRONMENTAL DREDGING IN SELECTED AREAS OF THE BUFFALO RIVER AND CITY SHIP CANAL. THE PROJECT ALSO INCLUDES CAPPING AND HABITAT RESTORATION WORK IN SELECTED AREAS.
2. DWGS ED-1 THROUGH ED-4 SHOW EXISTING BATHYMETRIC CONTOURS AND DWGS DD-1 THROUGH DD-10 SHOW DREDGE CUT LINE CONTOURS.
3. THE BATHYMETRIC CONTOURS SHOWN ON THE EXISTING CONDITIONS SHEETS ARE BASED ON POINT DATA PROVIDED BY AFFILIATED RESEARCHERS (OCTOBER 24TH, 2011). IN AREAS WHERE DATA WAS NOT INCLUDED BY AFFILIATED RESEARCHERS, THE TOPOGRAPHIC AND BATHYMETRIC INFORMATION SHOWN ON THEW ASSOCIATES SURVEY DRAWING (2010) WAS USED. EXISTING CONDITION DRAWINGS (EH-1 THROUGH EH-5) ARE NOT POST DREDGE DRAWINGS AND ACTUAL SITE TOPOGRAPHY AND BATHYMETRY MAY VARY.
4. USACE HAS COMPLETED DREDGING WITHIN THE NAVIGATION CHANNEL UNDER THE GREAT LAKES RESTORATION INITIATIVE (GLRI) IN 2011 AND 2012. EXISTING BATHYMETRY SHOWN WILL HAVE SIGNIFICANT DIFFERENCES WITHIN THE NAVIGATION CHANNEL.
5. DREDGE CUT LINE CONTOURS ARE BASED ON EVALUATION OF THE ELEVATION OBSERVATIONS MADE AT TEST BORING LOCATIONS AND SEDIMENT THICKNESS POLING LOCATIONS.
6. ELEVATIONS SHOWN BASED ON THE INTERNATIONAL GREAT LAKES DATUM 1985 (IGLD 85).
7. LOW WATER DATUM (LWD) FOR LAKE ERIE IS 569.2 FT (IGLD 85). BECAUSE THE WATER LEVEL DEPICTED IN SECTIONS AND USED TO ESTABLISH SHORE LINE IN PLAN VIEWS WAS THE LOW WATER DATUM, CONTRACTOR MAY FIND AT SLOPING SHORELINES THAT SOME DREDGING OCCURS OUT OF THE WATER AT THE TIME OF THE DREDGING.
8. LOCATIONS OF UNDERGROUND UTILITIES ARE SHOWN FOR BIDDING PURPOSES ONLY, AS SPECIFIED IN SPECIFICATION 01 71 00 EXAMINATION AND PREPARATION. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL UTILITIES.
9. BATHYMETRIC CONTOURS SHOWN ARE 1-FOOT INTERVALS.
10. LOCATION OF NAVIGATION CHANNEL AND STATIONING IN PROJECT AREA PROVIDED BY USACE.
11. DREDGE MANAGEMENT UNITS (DMUs) WERE DELINEATED BASED ON THE 2010 FEASIBILITY STUDY (ENVIRON INTERNATIONAL CORPORATION, MACTEC ENGINEERING & CONSULTING, INC., LIMNOTECH, 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.
12. DMUs 4b, 7b, 37b, 44b, 44c AND 44d WILL NOT BE DREDGED BASED ON THE EVALUATIONS OF THE 2010 RESAMPLE RESULTS.
13. DMUs 37a, 44a, 46d, WILL NOT BE DREDGED BECAUSE THE PROPERTY OWNERS HAVE NOT SIGNED A LIABILITY AGREEMENT.
14. LOCATIONS DISPLAYED FOR EXISTING CONDITIONS SUCH AS SHORELINES, STRUCTURES, AND UTILITIES ARE APPROXIMATE.
15. CRITICAL STRUCTURE BUFFERS ARE SHOWN ON THE DREDGING OPERATION DRAWINGS.
16. EXISTING STRUCTURE INFORMATION IS BASED ON VISUAL OBSERVATION AND LIMITED HISTORICAL INFORMATION WITH SIDE SCAN SONAR VERIFICATION (OCTOBER 24, 2011) ABOVE THE SEDIMENT ELEVATION. E&E AND CH2MHILL HAVE NOT EVALUATED THE IMPACT OF THE PROPOSED DREDGING ON EXISTING STRUCTURES.
17. IF AN UNDERWATER SHORELINE STRUCTURE (e.g. RIPRAP, CONCRETE BOAT RAMPS, ETC.) IS ENCOUNTERED IN ANY AREA WHERE RIPRAP IS INDICATED, CONTRACTOR SHALL NOTIFY ENGINEER FOR A DECISION ON HOW TO PROCEED.
18. THE HABITAT RESTORATION DESIGN WAS BASED ON AN AVERAGE WATER SURFACE ELEVATION OF 571 FEET.

ABBREVIATIONS

DBH	DIAMETER AT BREAST HEIGHT
DMU	DREDGE MANAGEMENT UNIT
EV	EMERGENT VEGETATION
KB	KNEE BRACE
LUNKERS	LITTLE UNDERWATER NEIGHBORHOOD KEEPERS ENCOMPASSING RHEOTACTIC SALMONIDS
NTS	NOT TO SCALE
N.I.C.	NOT IN CONTRACT
SAV	SUBMERGED AQUATIC VEGETATION

SHORELINE TYPES

AWD	ALUMINUM/WOOD BOAT DOCKS	NS	NATURALLY SLOPED SHORE
AC	ANCHORED CONCRETE SHEET WALL	NSS	NATURALLY AND STONE SLOPED SHORE
ASP	ANCHORED STEEL SHEET PILE WALL	NST	NATURALLY SLOPED SHORE WITH TIMBER PILES
BR	BOAT RAMP	OTP	OLD TIMBER PILES
CGS	COBBLE AND GRAVEL SHORELINE	RPRP	RIPRAP
CGDS	COBBLE, GRAVEL, AND DEBRIS SHORELINE	RRA	RR ABUTMENT
CCT	CONCRETE CAP ON TIMBER PILES	SSG	SLOPED STONE GABION
CPCW	CONCRETE PIER CRIB WALL	SHPC	STEEL H PILES WITH CONCRETE CAP
CPC	CONCRETE PILES AND CAP	SSPW	STEEL SHEET PILE WALL
CW	CONCRETE WALL	SSPW	STEEL SHEET PILE WALL (UNANCHORED)
CSW	CUT STONE WALL	SPC	STEEL SHEET PILE WITH CONCRETE CAP
GSSS	GROUTED SLOPE STONE SHORELINE	SFC	STONE FILLED TIMBER CRIB
LD	LARGE DIAMETER STEEL SHEET PILE CELLS	TB	TIMBER BULKHEAD
		TWTP	TIMBER WHARF OR TIMBER PILE

UTILITY INFORMATION TABLE

Designation	Drawing (s)	Company	Description
BSA-1	ED-1, ED-2	Buffalo Sewer Authority	Sewer shaft is 50 feet below grade 25' west (downstream) of Buffalo Skyway (Route 5)
BSA-2	ED-2, ED-3, EH-5	City of Buffalo Division of Water	From south shaft of tunnel to south shaft of tunnel, 24" pipe in tunnel, under Buffalo River near Ohio Street Bridge. 16' west (downstream) of Ohio Street bridge.
A	ED-1, EH-2	Linde LLC (formerly Air Reduction Company)	Two (2) 10" steel air lines, 50' downstream of Erie-Lackawanna RR Bridge (-35' LWD)
B	ED-4, EH-1, EH-2	National Grid (formerly Niagara Mohawk Power Corporation)	Maps sent by National Grid (current owner of Niagara Mohawk Power Corporation) show crossing near South Park Bridge. USACE description, four (4) power submarine cables, 37' upstream of South Park Avenue Lift Bridge (-30' LWD)
C	ED-4, EH-2	City of Buffalo	54" diameter concrete pipeline 200' upstream of Buffalo Creek RR Bridge (-51.5' LWD)
D	ED-2	City of Buffalo Division of Water	City of Buffalo Division of Water drawing from Big Sale shows old 2" pipe below the Michigan Avenue Bridge. USACE description, three (3) 3-1/2" diameter plastic pipes below Michigan Avenue Lift Bridge, on River natural bottom
E	ED-4, EH-1, EH-2	City of Buffalo Division of Water	City of Buffalo Division of Water drawing shows 10" PVC inside old 16" submarine line, 52' upstream of South Park Avenue Lift Bridge (-35' LWD)
F	ED-4, EH-1, EH-2	City of Buffalo	2-3/4" diameter television cable in trench, immediately upstream of South Park Avenue Lift Bridge (-35' LWD)
G	ED-2	New York Telephone	2 6" armored communications cable, 20' downstream of removed Lower Michigan Avenue Bridge (-35' LWD).
H	ED-4, ED-2	City of Buffalo Division of Water	16" diameter flexible water pipeline crossing Buffalo River through Fire Tug Slip, 100' downstream of Michigan Avenue Lift Bridge (-35' LWD)
I	ED-1, EH-1, EH-2	City of Buffalo Fire Department	2" diameter submarine cable, 130' downstream of South Park Avenue Lift Bridge (-30' LWD).
J	ED-3	New York Central Railroad	Submarine cable, 30' downstream of N.Y. Central RR Bridge (-35' LWD)
K	ED-4, EH-1, EH-2	National Grid (formerly Niagara Mohawk Power Corporation)	Maps sent by National Grid (current owner of Niagara Mohawk Power Corporation) show crossing near South Park Bridge. USACE Description: twelve (12) 4" steel conduits approximately 30' upstream of South Park Avenue Lift Bridge (-35' LWD)
L	ED-4, EH-1, EH-2	City of Buffalo	Five (5) 2-3/4" & four (4) 2-1/2" armored power cables, immediately downstream of South Park Avenue Lift Bridge (-30' LWD)
M	ED-4, EH-2	CSX	2" diameter electric cable, 30' upstream of Buffalo Creek RR Bridge (-35' LWD)
N	ED-3	AT&T (formerly US Sprint)	Map sent by AT&T (current owner of US Sprint) shows 4" steel submerged pipe adjacent to the east side of the CSX railroad bridge. According to the drawing the crossing location is marked on both sides of the river. USACE Description: two (2) 4" steel pipe for fiber-optic cable, 30' upstream of N.Y. Central RR Bridge (-27' LWD)
O	ED-4, EH-1, EH-2	New York Telephone	Eight (8) 3" diameter submarine cables, 160' downstream of South Park Avenue Lift Bridge (-30' LWD)
P	ED-4, EH-1, EH-2	New York Telephone	Submarine communications cable, approximately 60' downstream of South Park Avenue Lift Bridge (-35' LWD)
Q	ED-3	Verizon (formerly MCI)	Submarine communications cable in 5" conduit, approximately 20' upstream of N.Y. Central RR Bridge (-35' LWD)
R	ED-3	Linde LLC (formerly SOC Processing Plant)	Buried 10" nitrogen pipeline, approximately 330' downstream of N.Y. Central RR Bridge (-32.7 LWD)
S	ED-2	City of Buffalo Division of Water	16" flexible submerged pipe crossing City Ship Canal downstream of Michigan Ave Bridge.
T	ED-3, EH-2	City of Buffalo Division of Water	6" broken waterline pipe, wrought iron pipe, 6 feet south of center of Ensign street
U	ED-1, ED-2	National Grid	Maps from National Grid show a crossing at the Skyway Bridge
V	ED-2, ED-3, EH-5	National Grid	Maps from National Grid show a crossing at the Ohio St. Bridge

SEE EXISTING CONDITIONS DRAWINGS (DREDGING AND HABITAT) FOR APPROXIMATE LOCATIONS

LEGEND

542 / DMU 4 540 / 539	DREDGE MANAGEMENT UNIT (DMU) (DASH REPRESENTS LIMIT OF NO DREDGE WITHIN DMU, DESIGN CUT LINE CONTOURS ARE SHOWN IN THE DREDGE AREA)
540	MAJOR CONTOUR (SEE NOTE 2)
541	MINOR CONTOUR (SEE NOTE 2)
BUFFALO SKYWAY ROUTE 5	EXISTING ROAD
	EXISTING PARCEL BOUNDARY
	EXISTING NAVIGATION CHANNEL
	EXISTING SHORELINE
820+00	STATIONING LINE
U	APPROXIMATE UTILITY LOCATION
MATCH STATION 650+00 SEE DO-2 FOR CONTINUATION	MATCH STATION LINE
	SHORELINE TYPE START/STOP
	AVERAGE SURFACE WATER ELEVATION LINE
	NAVIGATION CHANNEL
TS	DETAIL OR SECTION LETTER/NUMBER
	DRAWING DETAIL OR SECTION IS SHOWN ON
	SUBMERGED AQUATIC VEGETATION (SAV) PLANTING AREA, SEE SHEET HD-1
	EMERGENT VEGETATION (EV) PLANTING AREA WITH COIR LOGS ALONG ENTIRE LENGTH OF DOWNSLOPE SIDE OF AREA (569' ELEVATION), SEE SHEET HD-1
554	IN-WATER FILL, SEE DETAIL ON HD-4
	REACTIVE CAP AREA, SEE HD-5

CH2MHILL

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

GENERAL NOTES, ABBREVIATIONS AND LEGEND

NO	DATE	REVISION	BY	APVD
F	3-1-12	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KJK	TPK
E	12-2-12	ISSUED FOR PREFINAL DESIGN (NOT FOR CONSTRUCTION)	KJK	TML
D	12-2-11	REVISED FOR 90% DRAFT (NOT FOR CONSTRUCTION)	BMC	TML
C	12-9-11	ISSUED FOR 90% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KJK	TRI
B	2-7-11	REVISED FOR 30% DESIGN (NOT FOR CONSTRUCTION)	KJK	TRI
A	3-16-11	ISSUED FOR 30% DRAFT REVIEW (NOT FOR CONSTRUCTION)	BMC	TRI

DSGN M. ZILER P.E. · DR K. KRAJEWSKI · CHK M. COLLINGS · APVD T. REEBS P.E.

NOT TO SCALE · VERIFY SCALE · BAR IS ONE INCH ON ORIGINAL DRAWING

DATE 3-1-12 · PROJ 38-002304-0053-03-01 · DWG G-2 · SHEET 2 OF 51

FILENAME G-2.DWG · PLOT DATE 3-1-12 · PLOT TIME 5:00 PM

PRELIMINARY - NOT FOR CONSTRUCTION

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 10 of 111

GENERAL NOTES

1. THIS PROJECT IS ENVIRONMENTAL DREDGING IN SELECTED AREAS OF THE BUFFALO RIVER AND CITY SHIP CANAL. THE PROJECT ALSO INCLUDES CAPPING AND HABITAT
2. DWGS ED-1 THROUGH ED-4 SHOW EXISTING BATHYMETRIC CONTOURS AND DWGS DC-1 THROUGH DC-10 SHOW DREDGE CUT LINE CONTOURS.
3. THE BATHYMETRIC CONTOURS SHOWN ON THE EXISTING CONDITIONS SHEETS ARE BASED ON POINT DATA PROVIDED BY AFFILIATED RESEARCHERS (OCTOBER 24TH, 201 NOT INCLUDED BY AFFILIATED RESEARCHERS, THE TOPOGRAPHIC AND BATHYMETRIC INFORMATION SHOWN ON THEW ASSOCIATES SURVEY DRAWING (2010) WAS USED. E (EH-1 THROUGH EH-5) ARE NOT POST DREDGE DRAWINGS AND ACTUAL SITE TOPOGRAPHY AND BATHYMETRY MAY VARY.
4. USACE HAS COMPLETED DREDGING WITHIN THE NAVIGATION CHANNEL UNDER THE GREAT LAKES RESTORATION INITIATIVE (GLRI) IN 2011 AND 2012. EXISTING BATHYMET SIGNIFICANT DIFFERENCES WITHIN THE NAVIGATION CHANNEL.
5. DREDGE CUT LINE CONTOURS ARE BASED ON EVALUATION OF TILL ELEVATION OBSERVATIONS MADE AT TEST BORING LOCATIONS AND SEDIMENT THICKNESS POLING LOC
6. ELEVATIONS SHOWN BASED ON THE INTERNATIONAL GREAT LAKES DATUM 1985 (IGLD 85).
7. LOW WATER DATUM (LWD) FOR LAKE ERIE IS 569.2 FT (IGLD 85). BECAUSE THE WATER LEVEL DEPICTED IN SECTIONS AND USED TO ESTABLISH SHORE LINE IN PLAN DATUM, CONTRACTOR MAY FIND AT SLOPING SHORELINES THAT SOME DREDGING OCCURS OUT OF THE WATER AT THE TIME OF THE DREDGING.
8. LOCATIONS OF UNDERGROUND UTILITIES ARE SHOWN FOR BIDDING PURPOSES ONLY. AS SPECIFIED IN SPECIFICATION 01 71 00 EXAMINATION AND PREPARATION, THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL UTILITIES.
9. BATHYMETRIC CONTOURS SHOWN ARE 1-FOOT INTERVALS.
10. LOCATION OF NAVIGATION CHANNEL AND STATIONING IN PROJECT AREA PROVIDED BY USACE.
11. DREDGE MANAGEMENT UNITS (DMUs) WERE DELINEATED BASED ON THE 2010 FEASIBILITY STUDY (ENVIRON INTERNATIONAL CORPORATION, MACTEC ENGINEERING & CONS DRAFT FINAL FEASIBILITY STUDY FOR THE BUFFALO RIVER, NEW YORK, PREPARED ON BEHALF OF BUFFALO RIVER GREAT LAKES LEGACY ACT PROJECT COORDINATION T AND FURTHER DEFINED DURING DISCUSSIONS WITHIN THE PROJECT COORDINATION TEAM.
12. DMUs 4b, 7b, 37b, 44b, 44c, AND 44d WILL NOT BE DREDGED BASED ON THE EVALUATIONS OF THE 2010 RESAMPLE RESULTS.
13. DMUs 37a, 44a, 45d, WILL NOT BE DREDGED BECAUSE THE PROPERTY OWNERS HAVE NOT SIGNED A LIABILITY AGREEMENT.
14. LOCATIONS DISPLAYED FOR EXISTING CONDITIONS SUCH AS SHORELINES, STRUCTURES, AND UTILITIES ARE APPROXIMATE.
15. CRITICAL STRUCTURE BUFFERS ARE SHOWN ON THE DREDGING OPERATION DRAWINGS.
16. EXISTING STRUCTURE INFORMATION IS BASED ON VISUAL OBSERVATION AND LIMITED HISTORICAL INFORMATION WITH SIDE SCAN SONAR VERIFICATION (OCTOBER 24, 201 EEEPC AND CH2MHILL HAVE NOT EVALUATED THE IMPACT OF THE PROPOSED DREDGING ON EXISTING STRUCTURES.
17. IF AN UNDERWATER SHORELINE STRUCTURE [e.g. RIPRAP, CONCRETE BOAT RAMPS, ETC.] IS ENCOUNTERED IN ANY AREA WHERE NONE IS INDICATED, CONTRACTOR SHA
18. THE HABITAT RESTORATION DESIGN WAS BASED ON AN AVERAGE WATER SURFACE ELEVATION OF 571 FEET.

ABBREVIATIONS

DBH	DIAMETER AT BREAST HEIGHT
DMU	DREDGE MANAGEMENT UNIT
EV	EMERGENT VEGETATION
KB	KNEE BRACE
LUNKERS	LITTLE UNDERWATER NEIGHBORHOOD KEEPERS ENCOMPASSING RHEOTACTIC SALMONIDS
NTS	NOT TO SCALE
N.I.C.	NOT IN CONTRACT
SAV	SUBMERGED AQUATIC VEGETATION

SHORELINE TYPES

AWB	ALUMINUM/WOOD BOAT DOCKS	NS	NATURALL SLOPED
AC	ANCHORED CONCRETE SHEET WALL	NSS	NATURALLY AND S
ASP	ANCHORED STEEL SHEET PILE WALL	NST	NATURALLY SLOPE
BR	BOAT RAMP	OTP	OLD TIMBER PILES
CGS	COBBLE AND GRAVEL SHORELINE	RPRP	RIPRAP
CGSS	COBBLE, GRAVEL, AND DEBRIS SHORELINE	RRA	RR ABUTTMENT
CCT	CONCRETE CAP ON TIMBER PILES	SSG	SLOPED STONE GA
CPCW	CONCRETE PIER CRIB WALL	SHPC	STEEL H PILES WI
CPC	CONCRETE PILES AND CAP	SSPW	STEEL SHEET PILE
CW	CONCRETE WALL	SSPW	STEEL SHEET PILE
CSW	CUT STONE WALL	SPC	STEEL SHEET PILE
GSSS	GROUTED SLOPE STONE SHORELINE	SFC	STONE FILLED TIM
LD	LARGE DIAMETER STEEL SHEET PILE CELLS	TB	TIMBER BULKHEAD
		TWTP	TIMBER WHARF ON

UTILITY INFORMATION TABLE

Designation	Drawing (s)	Company	Description
BSA-1	ED-1, ED-2	Buffalo Sewer Authority	Sewer shaft is 60 feet below grade 26' west (downstream) of Buffalo Skyway (Route 5)
18A-2	ED-2, ED-3, EH-5	City of Buffalo Division of Water	From north shaft of tunnel to south shaft of tunnel, 24" pipe in tunnel under Buffalo River nea (downstream) of Ohio Street bridge.
A	ED-4, EH-2	Linde LLC. (formerly Air Reduction Company)	Two (2) 10" steel air lines, 50' downstream of Erie-Lackawanna RR Bridge (-35' LWD).
B	ED-4, EH-1, EH-2	National Grid (formerly Niagara Mohawk Power Corporation)	Maps sent by National Grid (current owner of Niagara Mohawk Power Corporation) show orc description: four (4) power submarine cables, 32' upstream of South Park Avenue Lift Bridge
C	ED-4, EH-2	City of Buffalo	54" diameter concrete pipeline, 210' upstream of Buffalo Creek RR Bridge (-61.5' LWD).
D	ED-2	City of Buffalo Division of Water	City of Buffalo Division of Water drawing from Dig Safe shows old 2" pipe below the Michigai three (3) 3-1/2" diameter plastic pipes below Michigan Avenue Lift Bridge, on River natural b
E	ED-4, EH-1, EH-2	City of Buffalo Division of Water	City of Buffalo Division of Water drawing shows 10" PVC inside old 16" submarine line, 32' Bridge-33' LWD).
F	ED-4, EH-1, EH-2	City of Buffalo	2-1/4" diameter television cable in trench, immediately upstream of South Park Avenue Lift E
G	ED-2	New York Telephone	2.64" armored communications cable, 30' downstream of removed Lower Michigan Avenue E
H	ED-1, ED-2	City of Buffalo Division of Water	16" diameter flexible water pipeline crossing Buffalo River through Fire Tug Slip, 100' downst (-35' LWD)
I	ED-4, EH-1, EH-2	City of Buffalo Fire Department	4" diameter submarine cable, 130' downstream of South Park Avenue Lift Bridge (-38' LWD)
J	ED-3	New York Central Railroad	Submarine cable, 60' downstream of N.Y. Central RR Bridge (-35' LWD)
K	ED-4, EH-1, EH-2	National Grid (formerly Niagara Mohawk Power Corporation)	Maps sent by National Grid (current owner of Niagara Mohawk Power Corporation) show orc Description, twelve (12) 4" steel conduits approximately 30' upstream of South Park Avenue
L	ED-4, EH-1, EH-2	City of Buffalo	Five (5) 2-3/4" & four (4) 2-1/2" armored power cables, immediately downstream of South Pa
M	ED-4, EH-2	OSX	2" diameter electric cable, 30' upstream of Buffalo Creek RR Bridge (-30' LWD).
N	ED-3	AT&T (formerly US Sprint)	Map sent by AT&T (current owner of US Sprint) shows 4" steel submerged pipe adjacent to bridge. According to the drawing the crossing location is marked on both sides of the river. pipe for fiber-optic cable, 30' upstream of N.Y. Central RRBridge (-27' LWD)
O	ED-4, EH-1, EH-2	New York Telephone	Eight (8) 4" diameter submarine cables, 180' downstream of South Park Avenue Lift Bridge (
P	ED-4, EH-1, EH-2	New York Telephone	Submarine communications cable, approximately 50' downstream of South Park Avenue Li
Q	ED-3	Verizon (formerly MCI)	Submarine communications cable in 5" conduit, approximately 20' upstream of N.Y. Cent/a
R	ED-3	Linde LLC. (formerly BOC Processing Plant)	Buried 10" nitrogen pipeline, approximately 387' downstream of N.Y. Central RR Bridge (-32
S	ED-2	City of Buffalo Division of Water	16" flexible submerged pipe crossing City Ship Canal downstream of Michigan Ave Bridge.
T	ED-3, EH-3	City of Buffalo Division of Water	6" broken waterline pipe, wrought iron pipe, 6 feet south of center of Ensign street
U	ED-1, ED-2	National Grid	Maps from National Grid show a crossing at the Skyway Bridge
V	ED-2, ED-3, EH-3	National Grid	Maps from National Grid show a crossing at the Ohio St. Bridge

SEE EXISTING CONDITIONS DRAWINGS (DREDGING AND HABITAT) FOR APPROXIMATE LOCATIONS

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 11(10A) of 111

N WORK IN SELECTED AREAS.

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VD).
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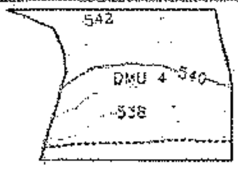
35' LWD).
Bridge (-30' LWD).
of the CSX railroad
cription: two (2) 4" steel
LWD).
33' LWD).

LEGEND



DREDGE MANAGEMENT UNIT (DMU) (DASH REPRESENTS LIMIT OF NO DREDGE WITHIN DMU, DESIGN CUT LINE CONTOURS ARE SHOWN IN THE DREDGE AREA)

Symbol	Description
540 ———	MAJOR CONTOUR (SEE NOTE 2)
541 - - - -	MINOR CONTOUR (SEE NOTE 2)
BUFFALO SKYWAY ROUTE 5	EXISTING ROAD
	EXISTING PARCEL BOUNDARY
	EXISTING NAVIGATION CHANNEL
	EXISTING SHORELINE
820+00	STATIONING LINE
U	APPROXIMATE UTILITY LOCATION
MATCH STATION 550+00 SEE DC-2 FOR CONTINUATION	MATCH STATION LINE
●	SHORELINE TYPE START/STOP
	AVERAGE SURFACE WATER ELEVATION LINE
	NAVIGATION CHANNEL
15 / SC-4	DETAIL OR SECTION LETTER/NUMBER; DRAWING DETAIL OR SECTION IS SHOWN ON
	SUBMERGED AQUATIC VEGETATION (SAV) PLANTING AREA. SEE SHEET HD-1
	EMERGENT VEGETATION (EV) PLANTING AREA WITH COIR LOGS ALONG ENTIRE LENGTH OF DOWNSLOPE SIDE OF AREA (569' ELEVATION). SEE SHEET HD-1
564	IN-WATER FILL, SEE DETAIL ON HD-4
	REACTIVE CAP AREA, SEE HD-5

NO.	DATE	REVISION	BY	APVD
F	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
E	12-7-12	REVISED FOR PREFINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
D	10-12-11	REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-6-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
B	3-7-11	REVISED FOR 30% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	2-18-11	ISSUED FOR 30% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M ABOL P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL.

GENERAL NOTES, ABBREVIATIONS AND LEGEND

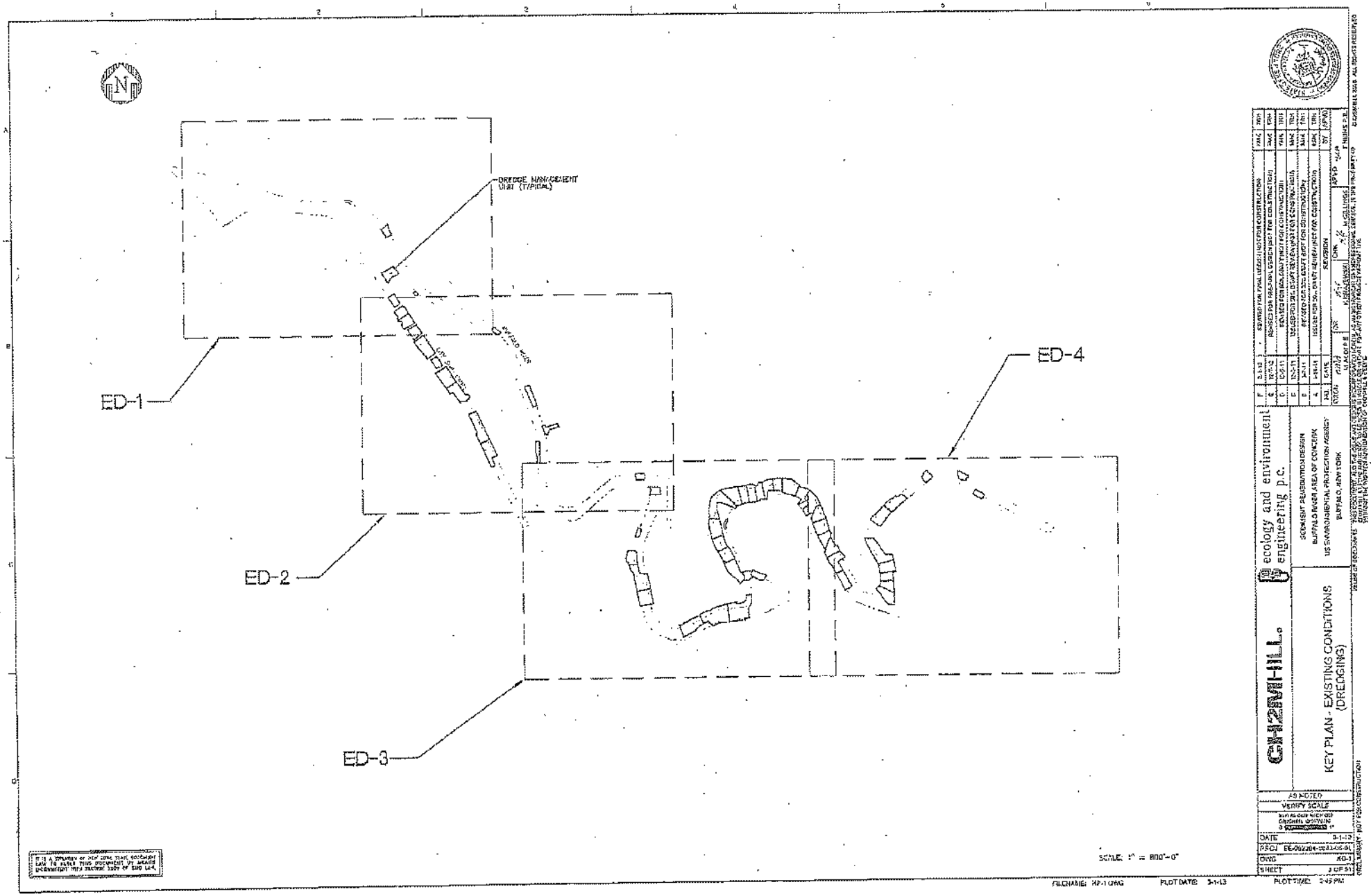
NOT TO SCALE
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"

DATE 3-1-13
PROJ EE-002304-0023-03-01
DWG G-2
SHEET 2 OF 51

PRELIMINARY - NOT FOR CONSTRUCTION

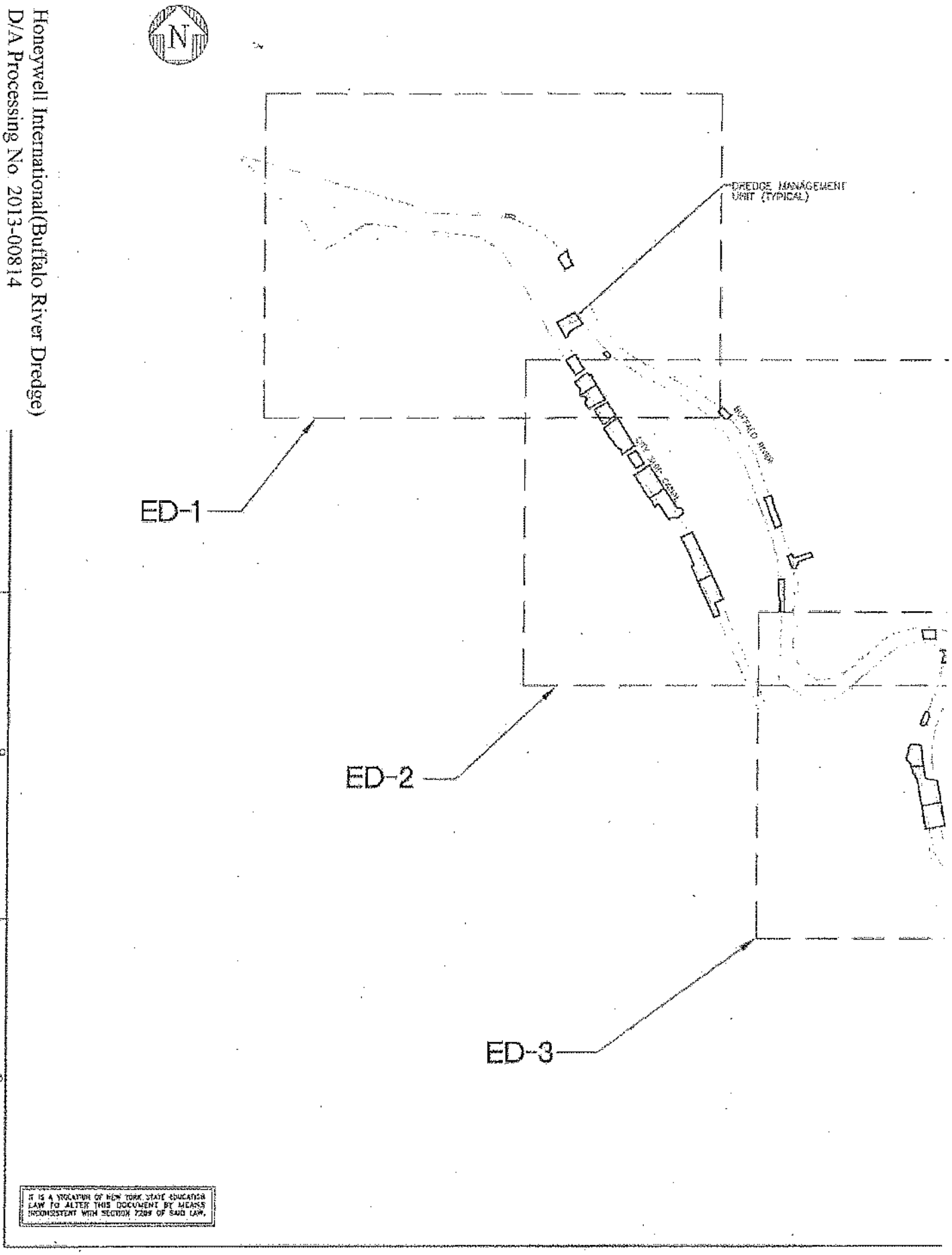
IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 12 (10B) of 111

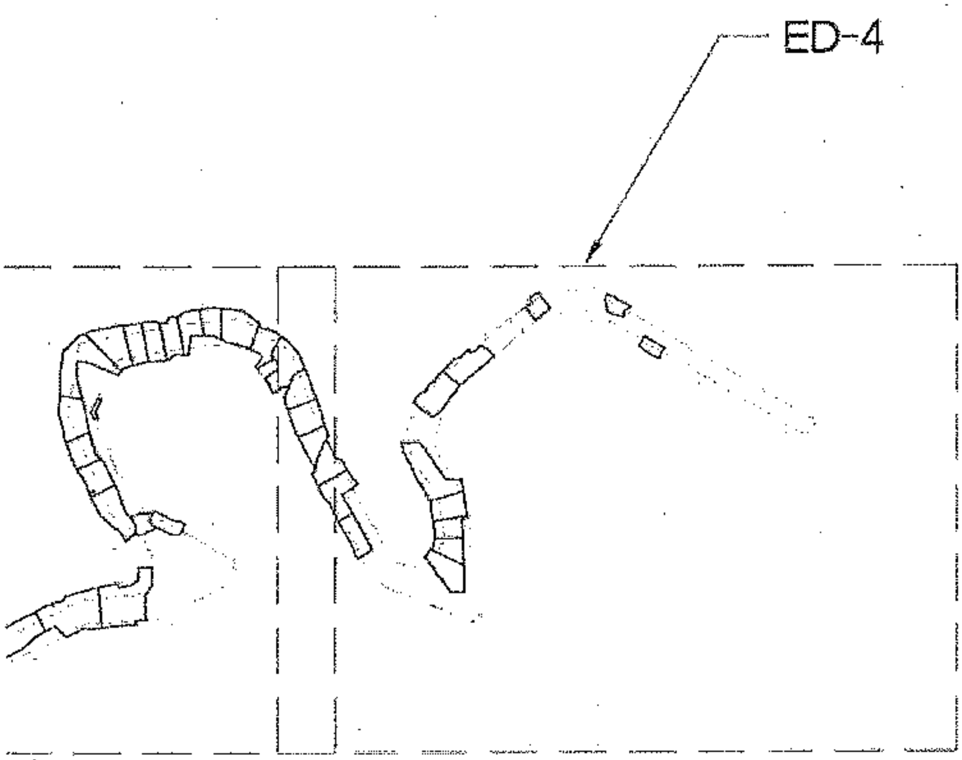


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 13 of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 14(13A) of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 15(13B) of 111



SCALE: 1" = 600'-0"

NO.	DATE	REVISION	BY	APVD
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E	12-7-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
D	12-3-11	REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-2-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
B	3-7-11	REVISED FOR 30% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	2-16-11	ISSUED FOR 30% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M ALOI P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

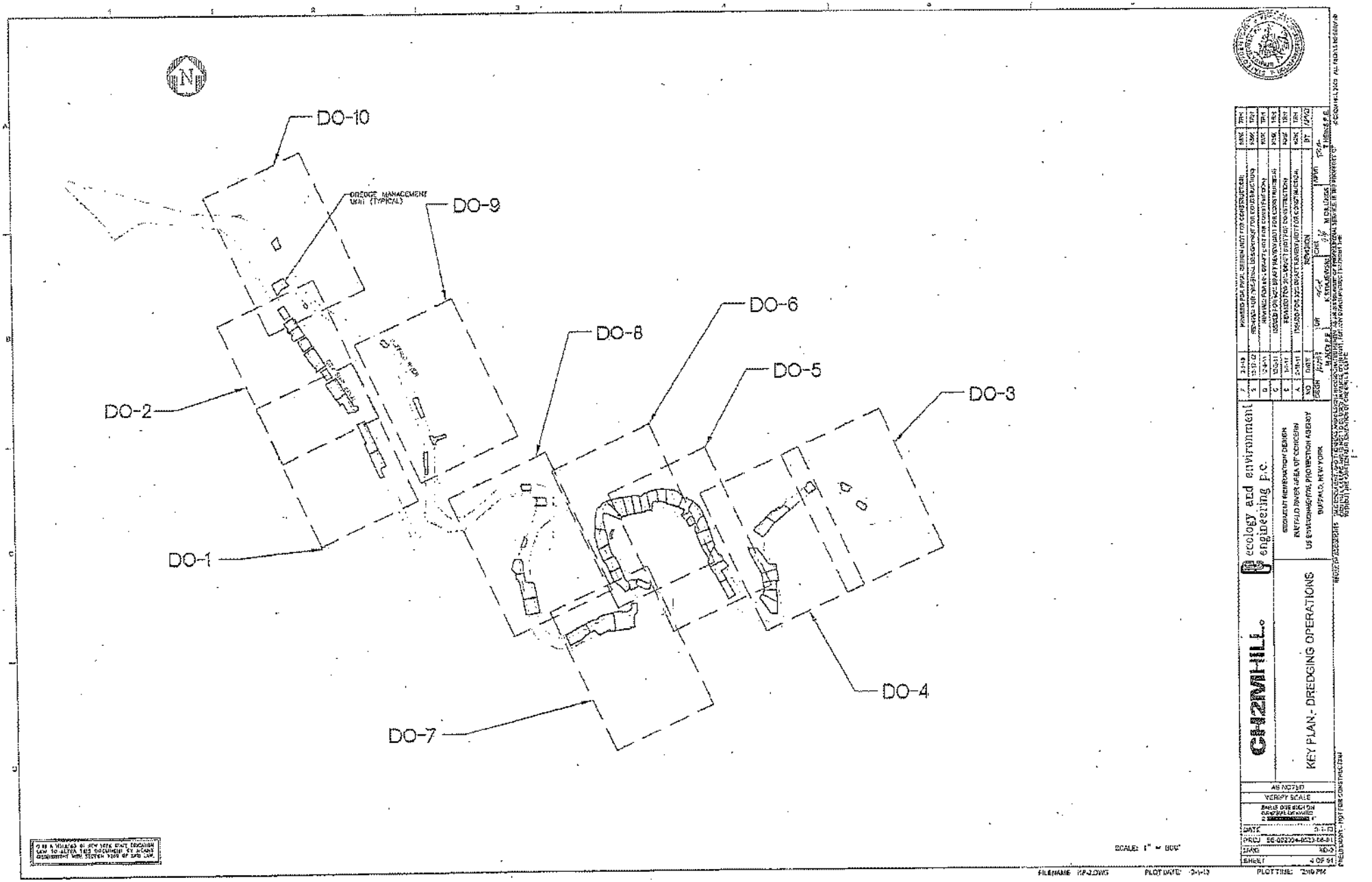
CH2MHILL

KEY PLAN - EXISTING CONDITIONS (DREDGING)

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

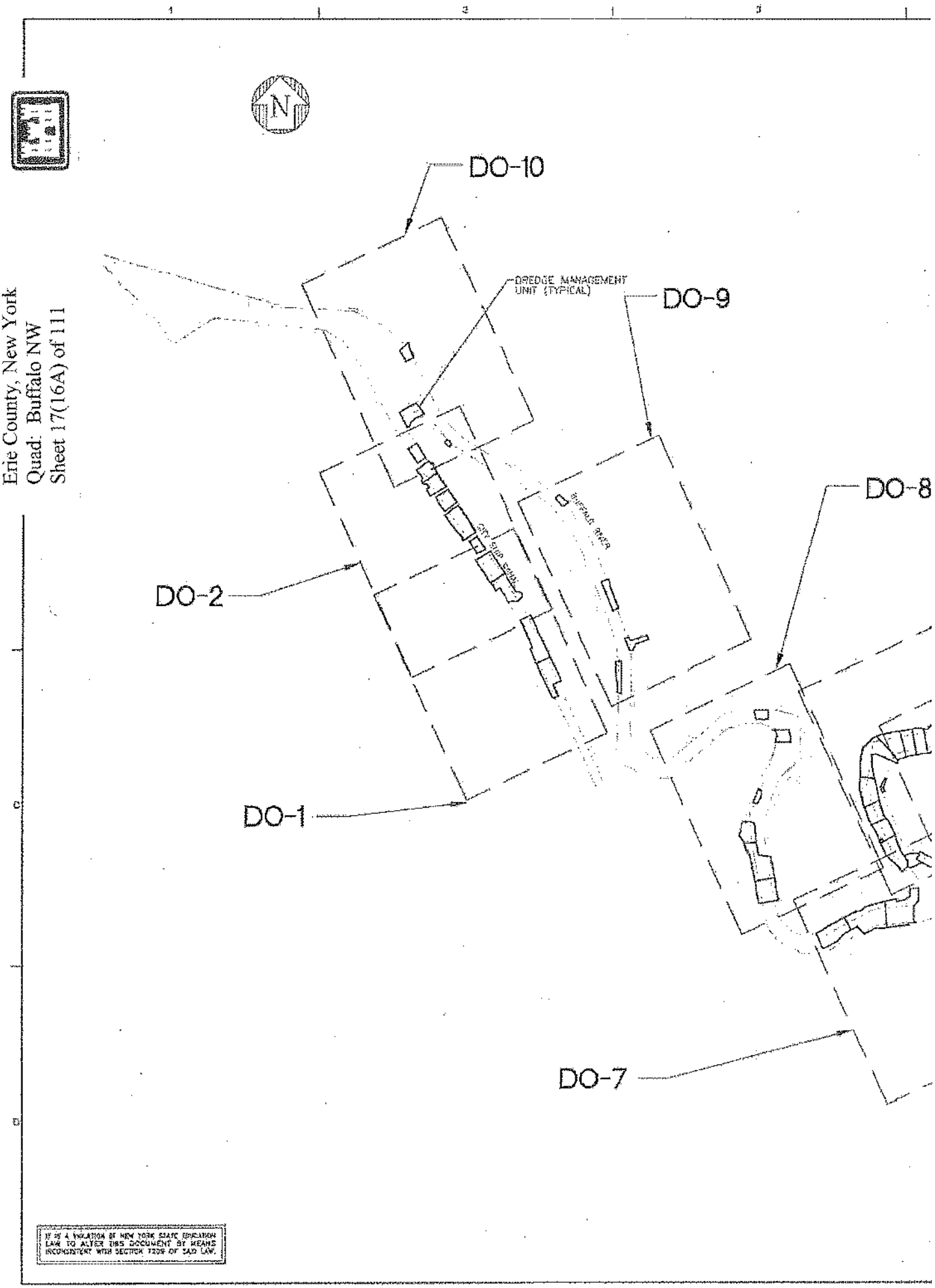
DATE 3-1-13
PROJ EE-002304-0523-08-01
DWG KP-1
SHEET 3 OF 31

FILENAME: KP-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:48 PM



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 16 of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 17(16A) of 111



IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 18(16B) of 111

SCALE: 1" = 800'

FILENAME: KP-2.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:40 PM

NO	DATE	DESIGN	DR	CHK	APVD	REVISION	BY	APVD
F	3-1-13					REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
E	12-17-12					REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
D	12-5-11					REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
C	8-2-11					ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
B	3-7-11					REVISED FOR 30% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	2-16-11					ISSUED FOR 30% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH

K KRAJEWSKI — M GILLINGS — T HEINKS P.E.

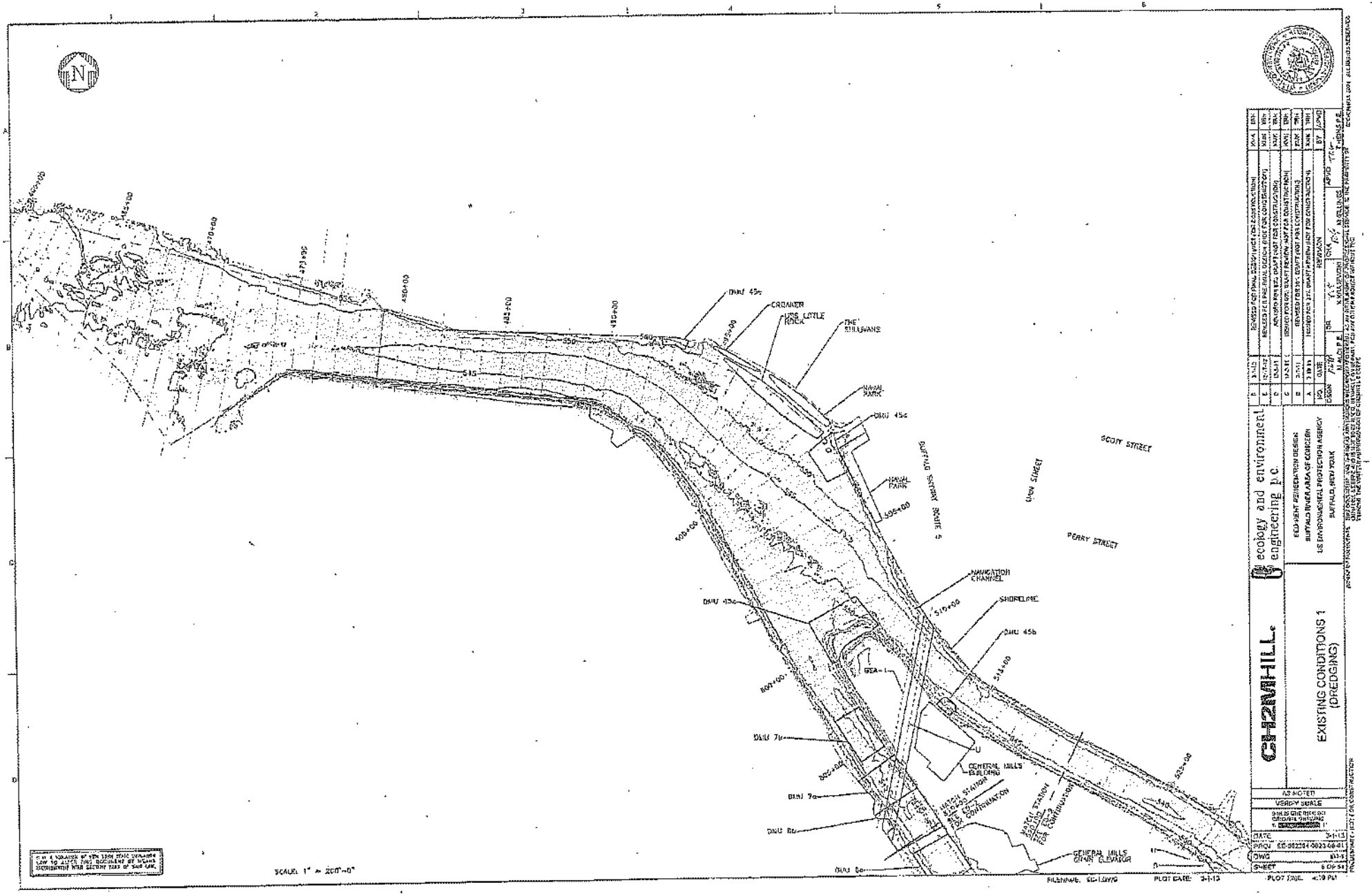
CH2MHILL ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

KEY PLAN - DREDGING OPERATIONS

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE 3-1-13
PROJ EE-002304-0023-08-01
DWG KD-2
SHEET 4 OF 51



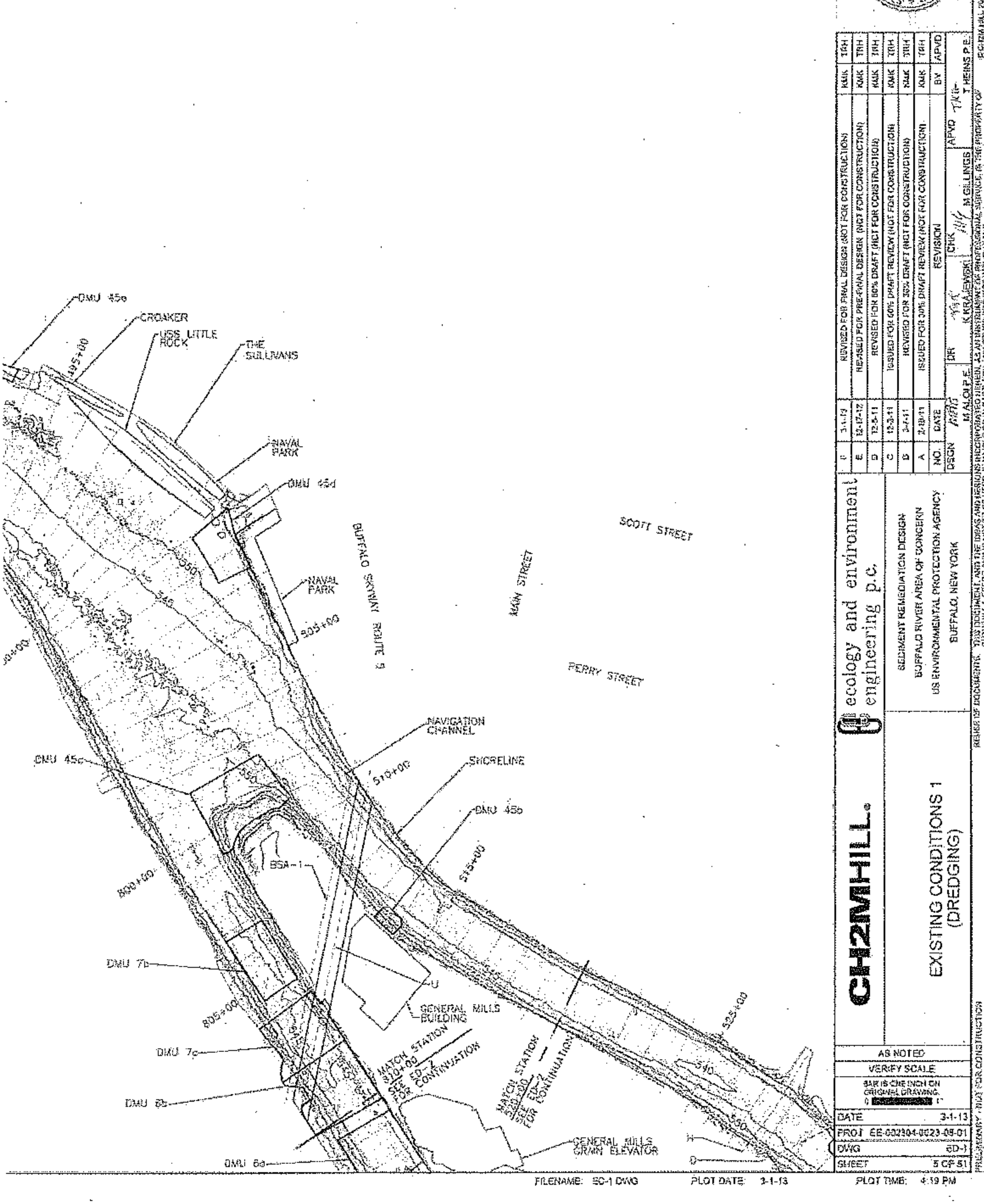
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 19 of 111

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209-(2) OF SAID LAW.

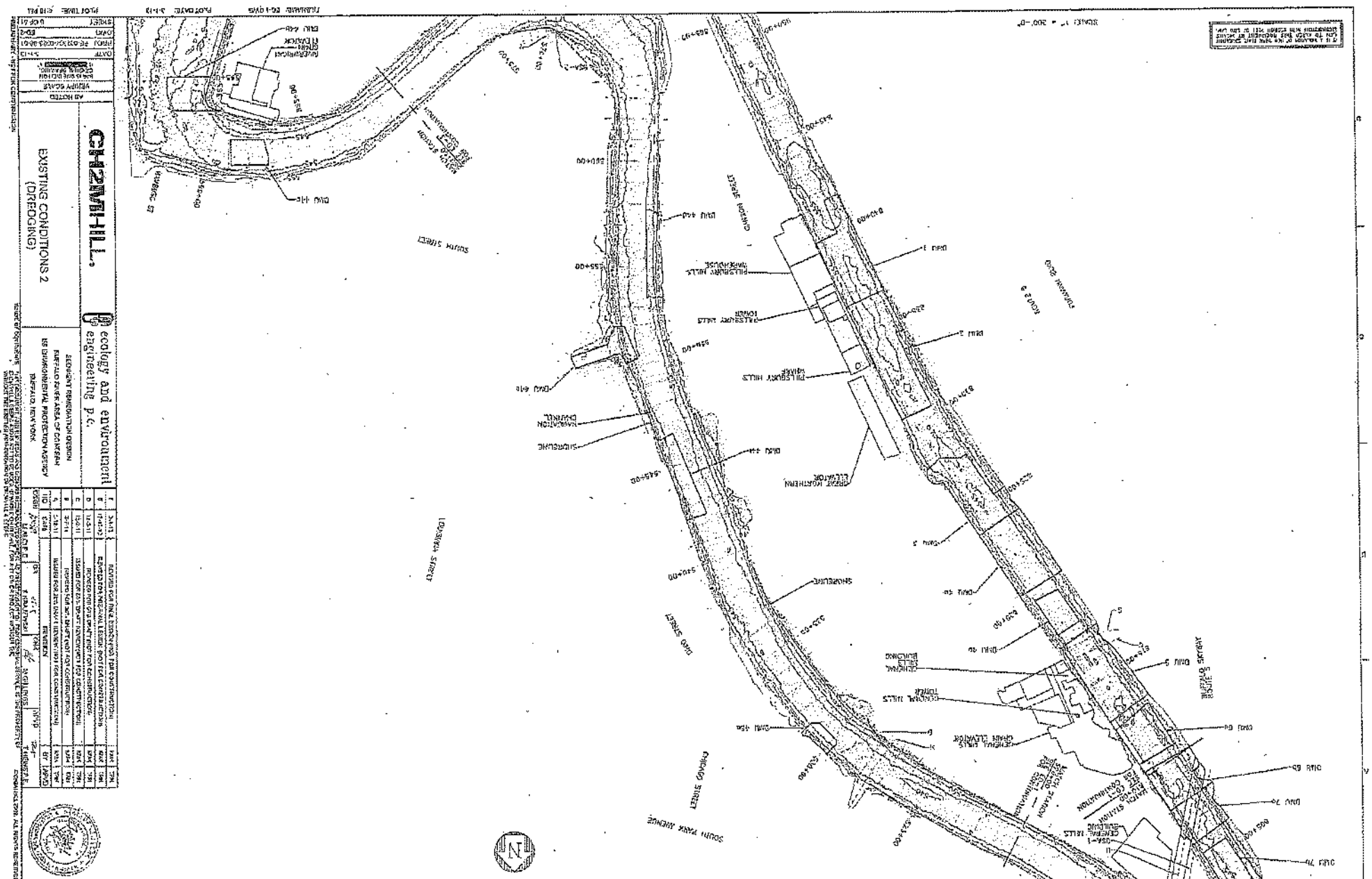
SCALE: 1" = 200'-0"

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 20(19A) of 111

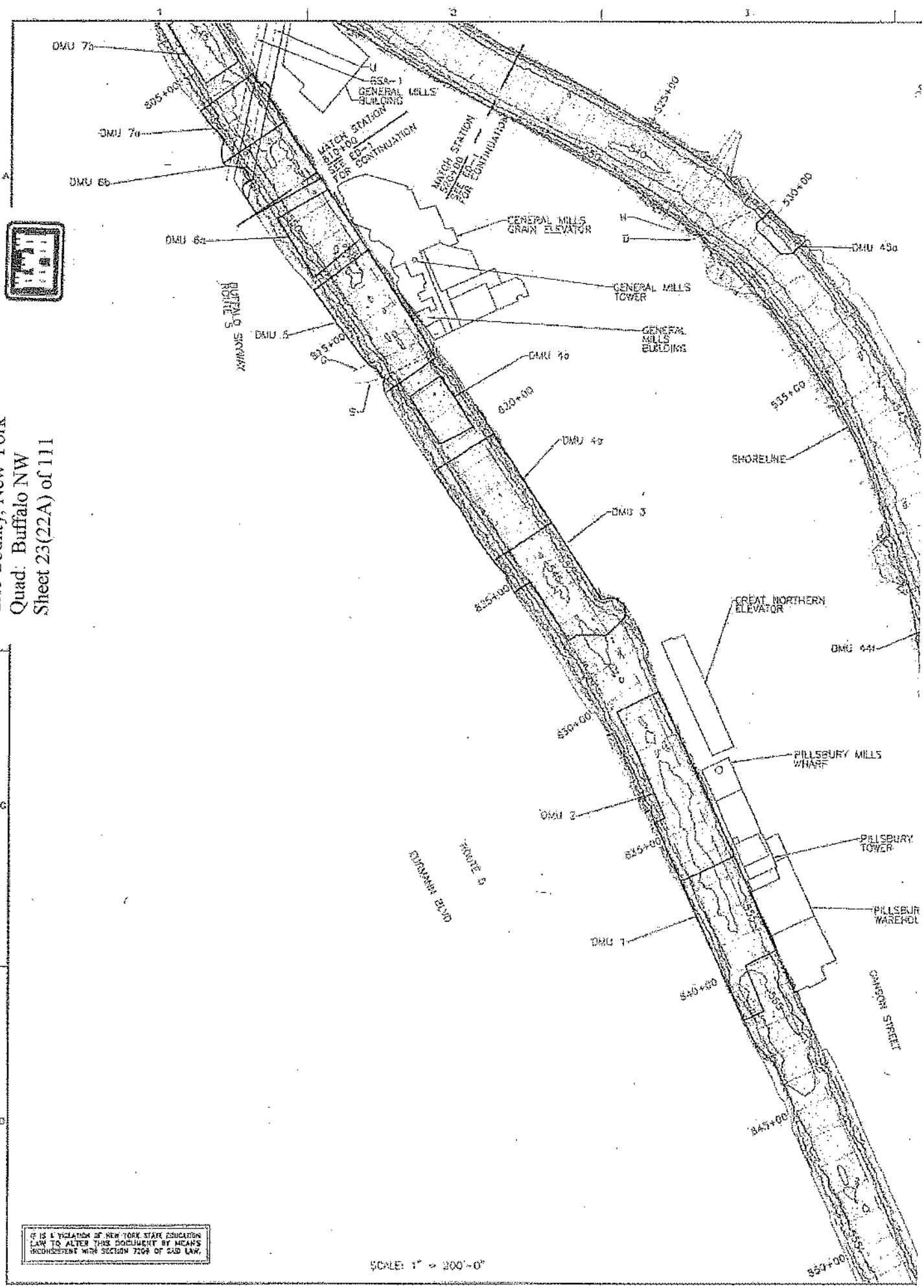
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 21(19B) of 111


DMU 45a
CROAKER
USS LITTLE ROCK
THE SULLIVANS
NAVAL PARK
DMU 45d
BUFFALO SKYWAY ROUTE 5
MAIN STREET
SCOTT STREET
PERRY STREET
NAVAL PARK
805+00
NAVIGATION CHANNEL
SHORELINE
510+00
DMU 45c
DMU 45b
515+00
BSA-1
800+00
DMU 7b
GENERAL MILLS BUILDING
805+00
DMU 7c
MATCH STATION 810+00 SEE ED-2 FOR CONTINUATION
MATCH STATION
SEE ED-2 FOR CONTINUATION
525+00
DMU 8b
GENERAL MILLS GRAIN ELEVATOR
DMU 8a
CH2MHILL
EXISTING CONDITIONS 1 (DREDGING)
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
AS NOTED
VERIFY SCALE
DATE 3-1-13
PROJ EE-002304-0023-09-01
DWG ED-1
SHEET 5 OF 51
FILENAME: ED-1.DWG
PLOT DATE: 3-1-13
PLOT TIME: 4:19 PM

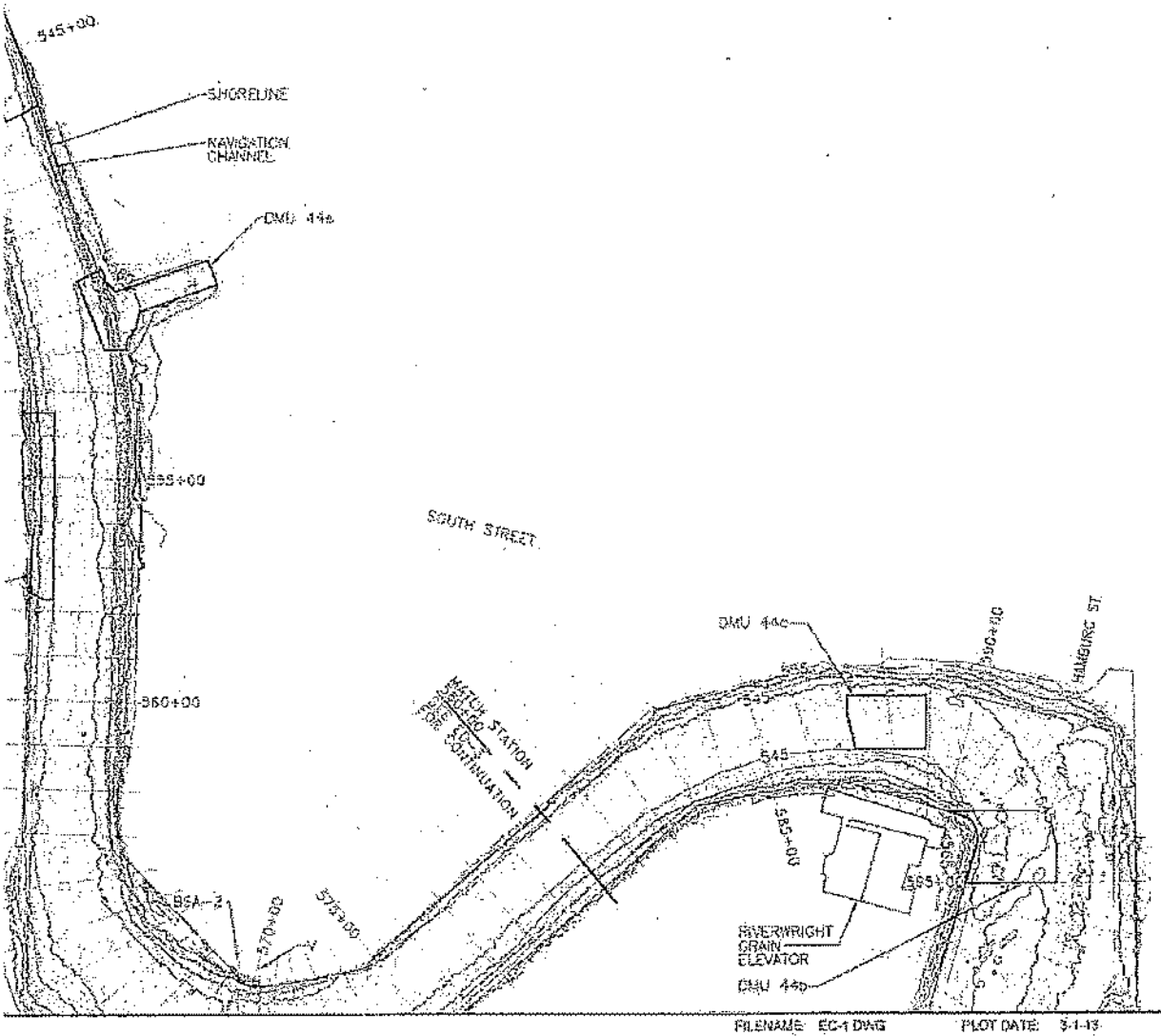
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 22 of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 23(22A) of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 24(22B) of 111



NO.	DATE	REVISION	BY	APVD
F	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
E	12-19-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
D	12-5-11	REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-5-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
B	9-7-11	REVISED FOR 30% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	5-16-11	ISSUED FOR 30% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH

DESIGN M ALOI P.E. DR K KRAJEWSKI CHK M GILLINGS APVD T HEINS P.E.

ecology and environment engineering p.c.

CH2MHILL

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
U.S. ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

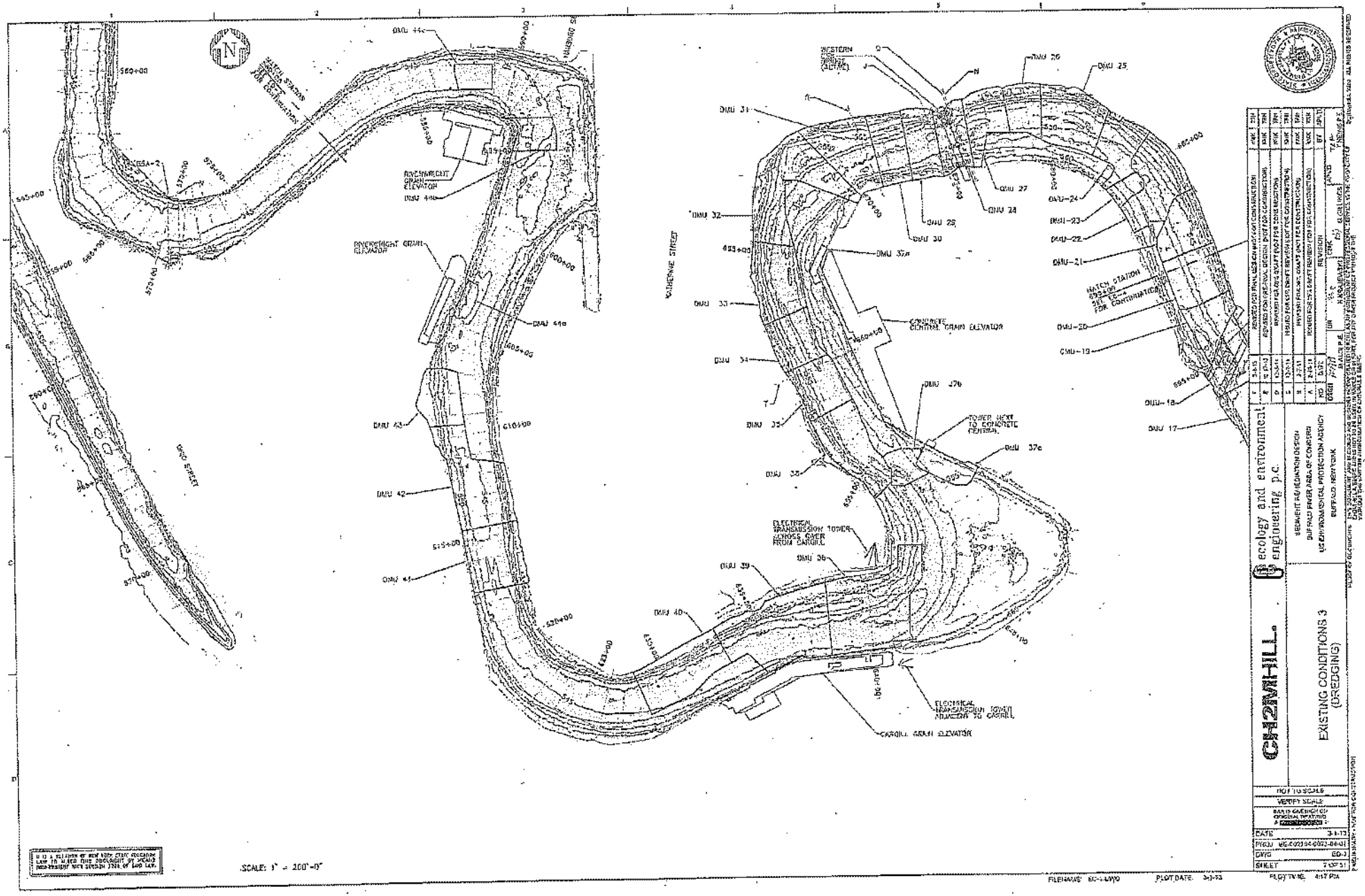
EXISTING CONDITIONS 2
(DREDGING)

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

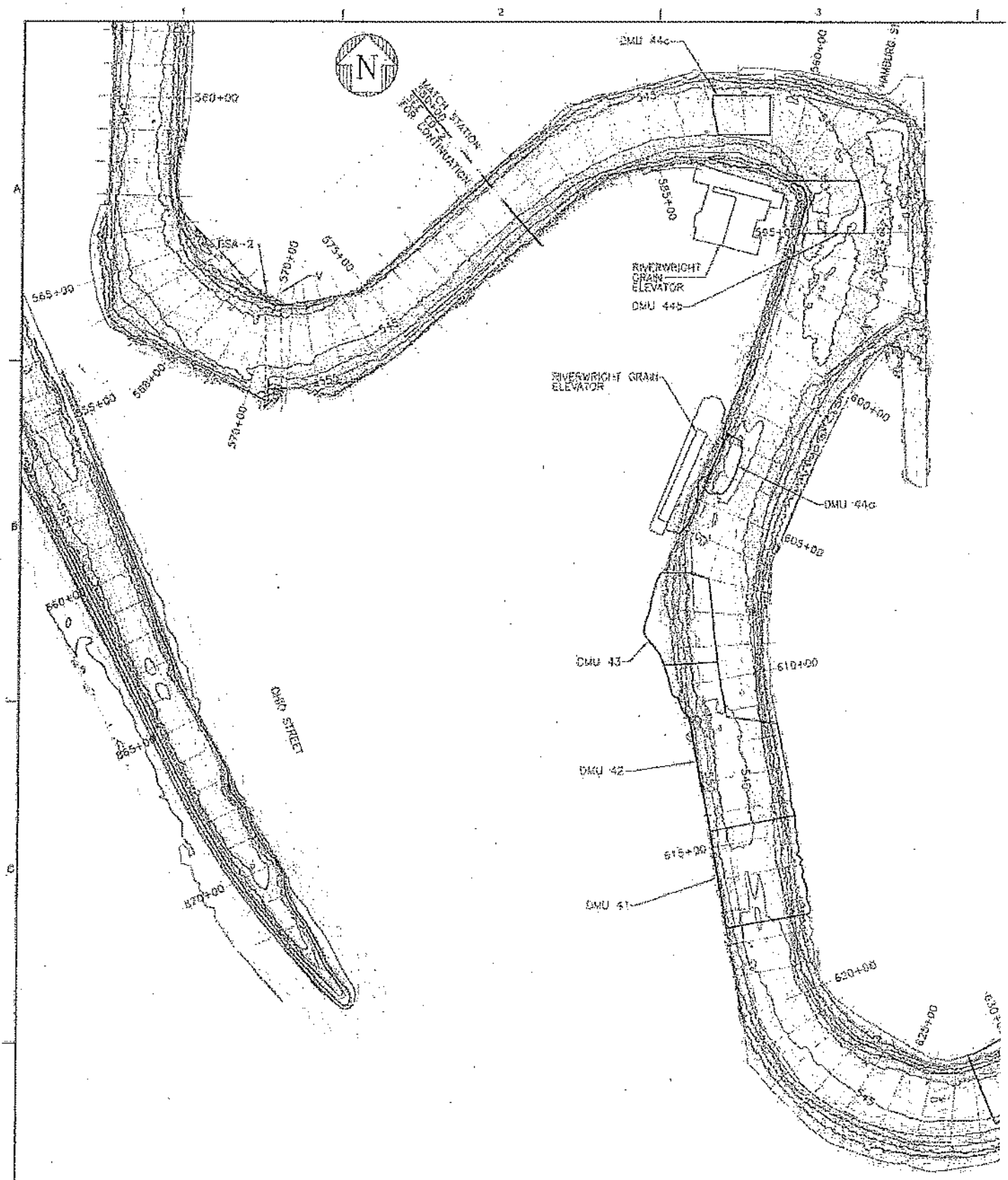
DATE 3-1-13
PROJ EE-002304-0023-08-01
DWG EC-2
SHEET 6 OF 81

PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME: EC-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:18 PM



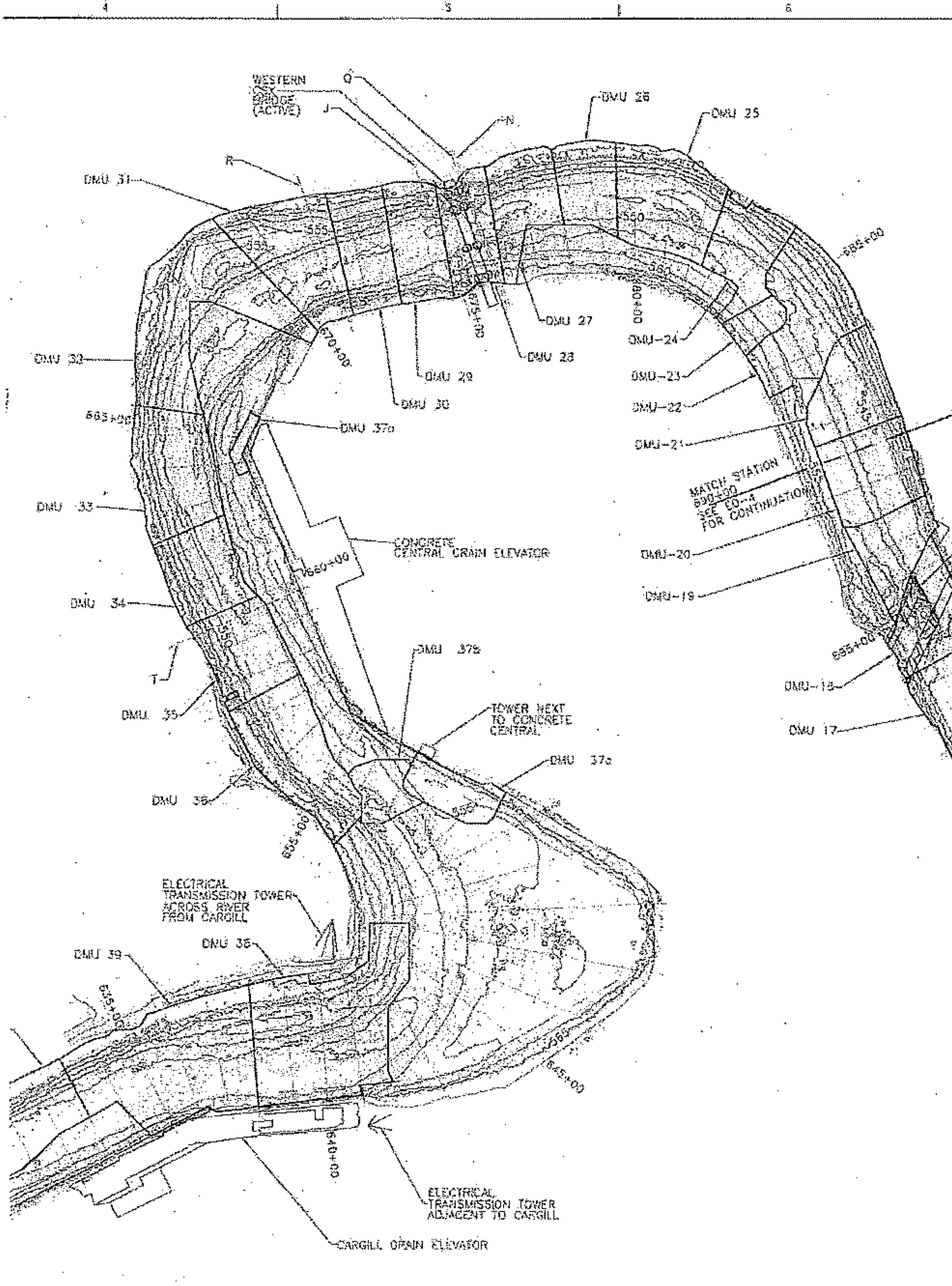
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 25 of 111



IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

SCALE: 1" = 200'-0"

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 26(25A) of 111



NO.	DATE	REVISION	BY	APVD
F	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
E	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
D	12-5-11	REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-2-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
B	3-7-11	REVISED FOR 30% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	2-16-11	ISSUED FOR 30% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M ALOI P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL

EXISTING CONDITIONS 3 (DREDGING)

NOT TO SCALE
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

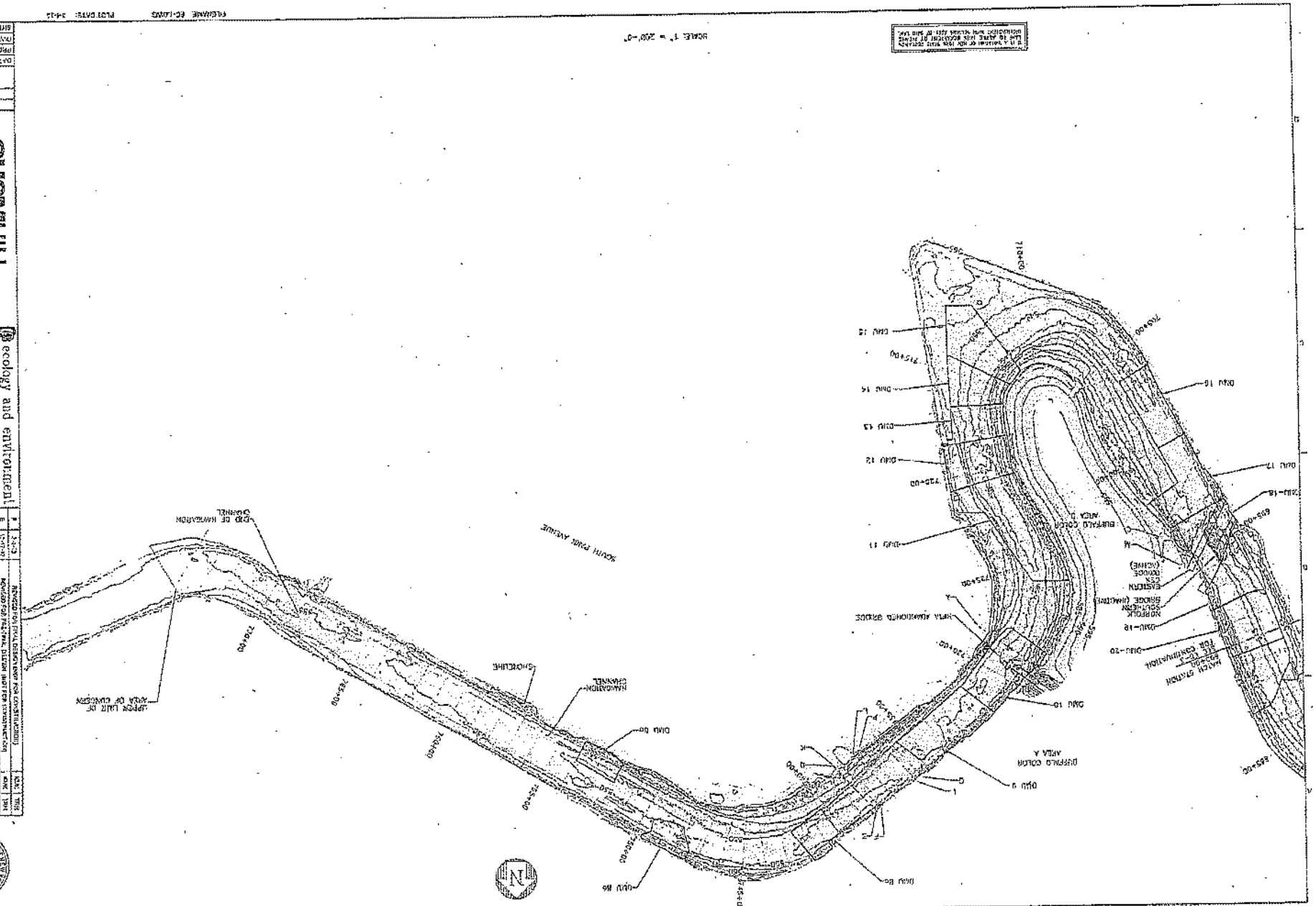
DATE 3-1-13
PROJ EE-002304-0023-08-01
DWG EO-3
SHEET 7 OF 51

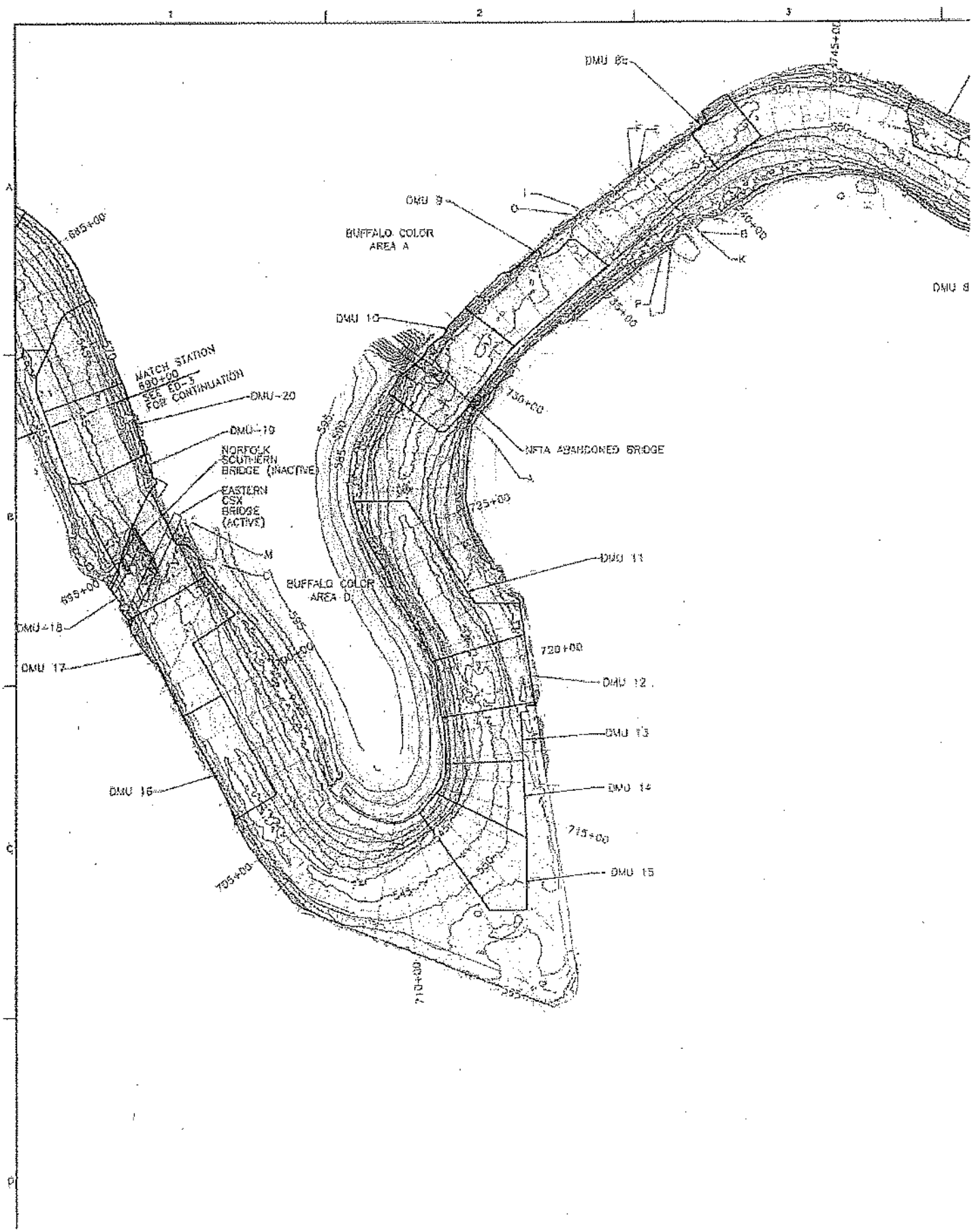
FILENAME: EC-4.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:17 PM

PRELIMINARY - NOT FOR CONSTRUCTION

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 27 (25B) of 111

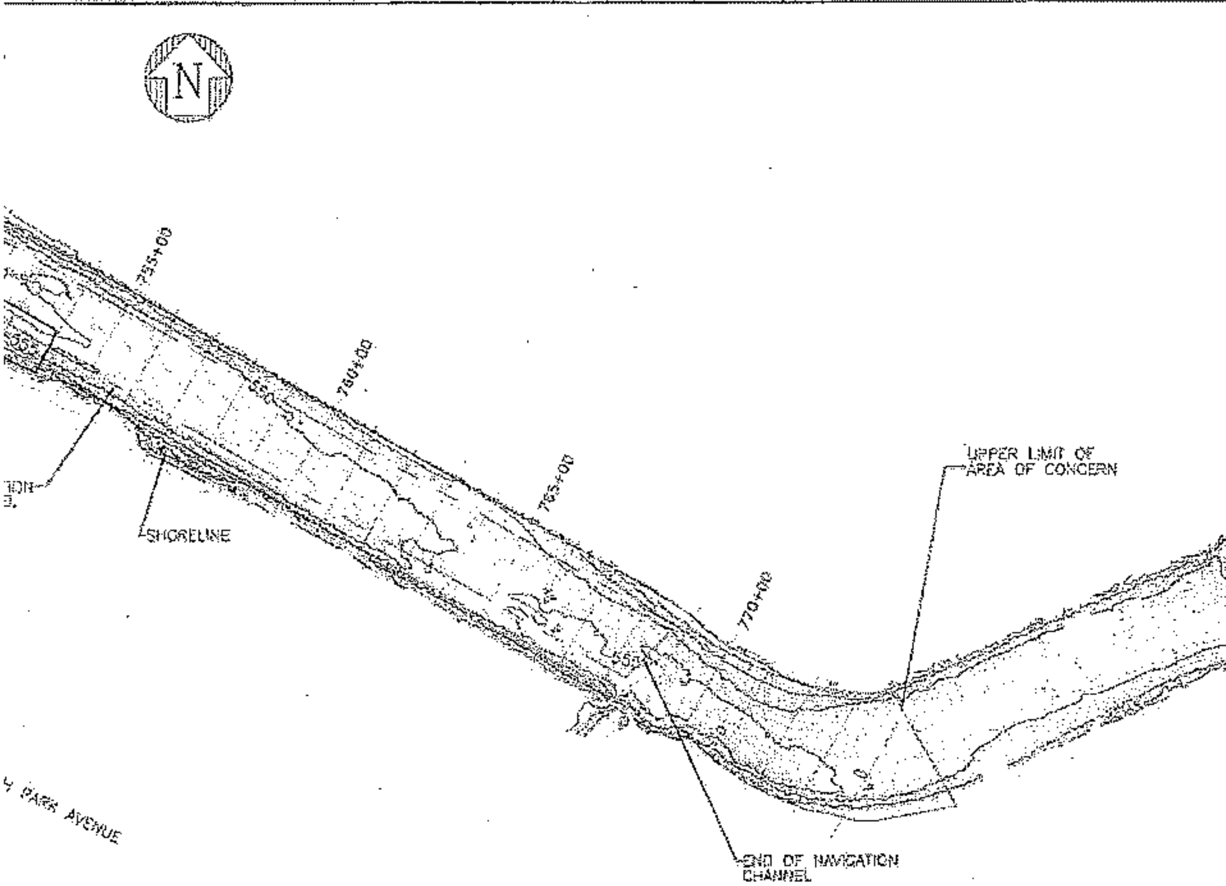
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 28 of 111





Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 29(28A) of 111

SCALE: 1" = 200'



CH2MHILL

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

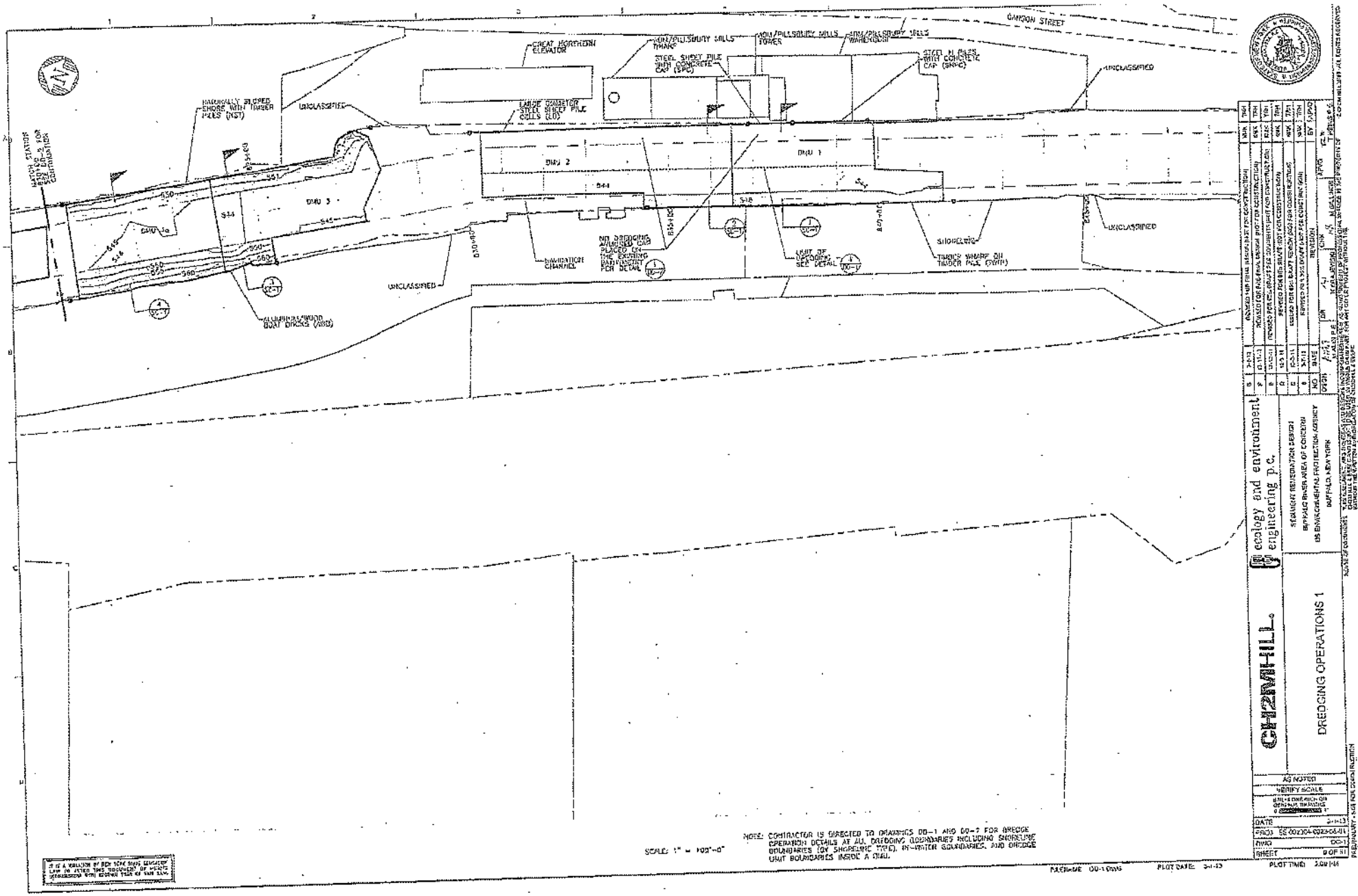
EXISTING CONDITIONS 4 (DREDGING)

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.

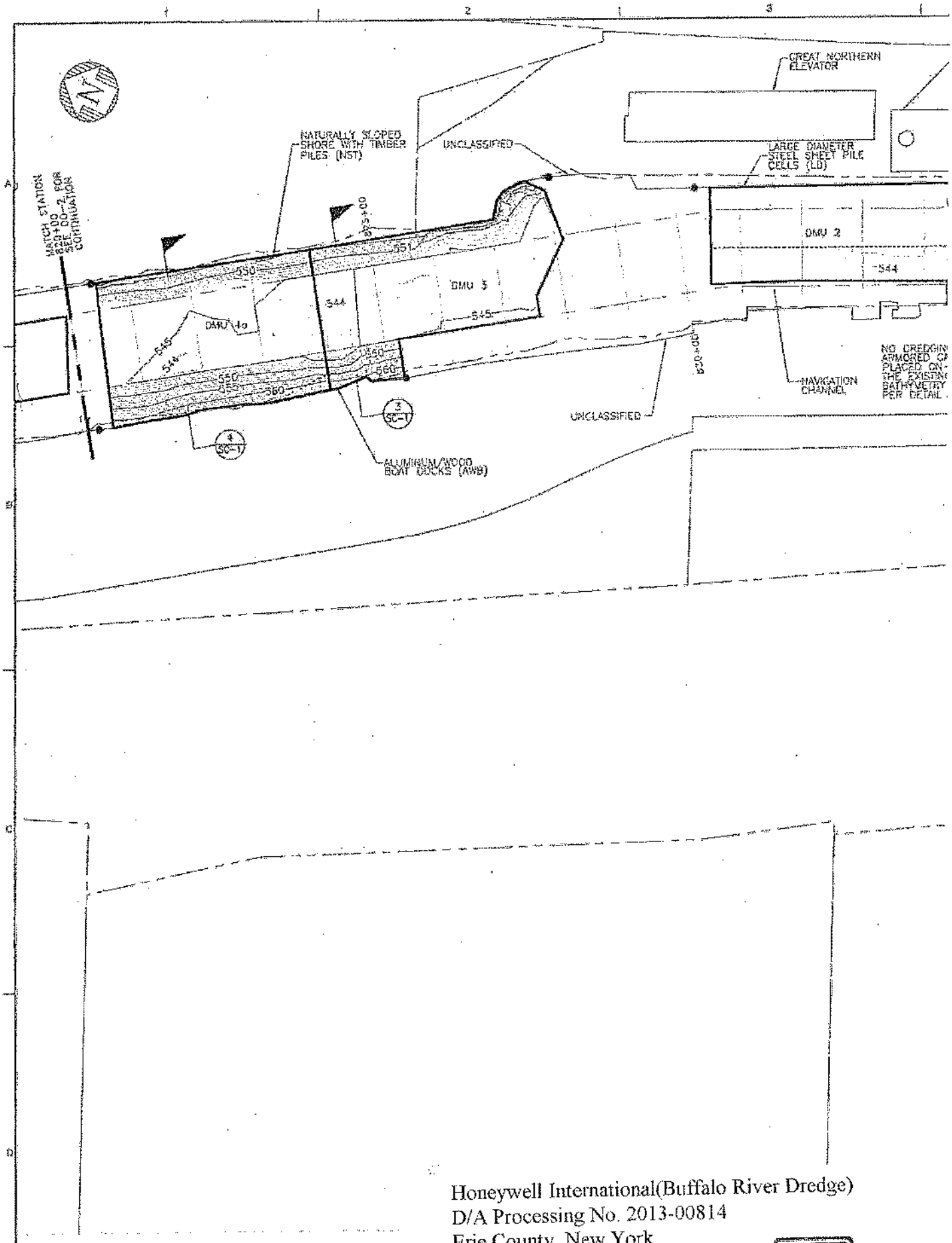
DATE 3-1-13
DWG EC-4

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 30(28B) of 111

FILENAME: EC-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:18 PM

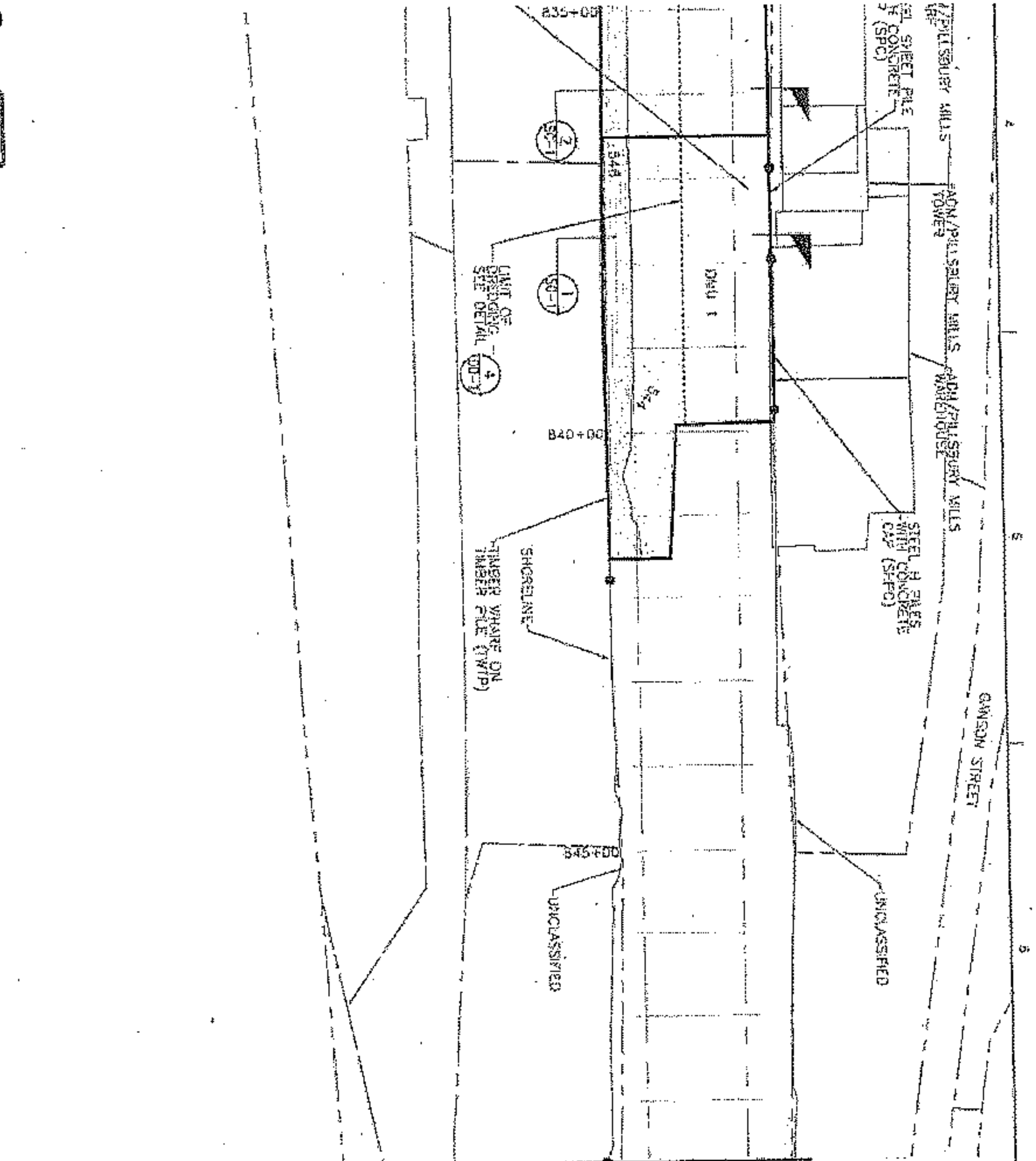


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 31 of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 32(31A) of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 33(31B) of 111



NOTE: CONTRACTOR IS DIRECTED TO DRAWINGS DD-1 AND DD-2 FOR DREDGE OPERATION DETAILS AT ALL DREDGING BOUNDARIES INCLUDING SHORELINE BOUNDARIES (BY SHORELINE TYPE), IN-WATER BOUNDARIES, AND DREDGE LIMIT BOUNDARIES INSIDE A DMU.

1" = 100'-0"

NO.	DATE	REVISION	BY	APVD
G	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
F	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
E	12-12-11	REVISED FOR 60% DRAFT PER COMMENTS (NOT FOR CONSTRUCTION)	KMK	TRH
D	12-6-11	REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-2-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
B	3-7-11	REVISED FOR 30% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M ALOI P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

CH2MHILL.

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

DREDGING OPERATIONS 1

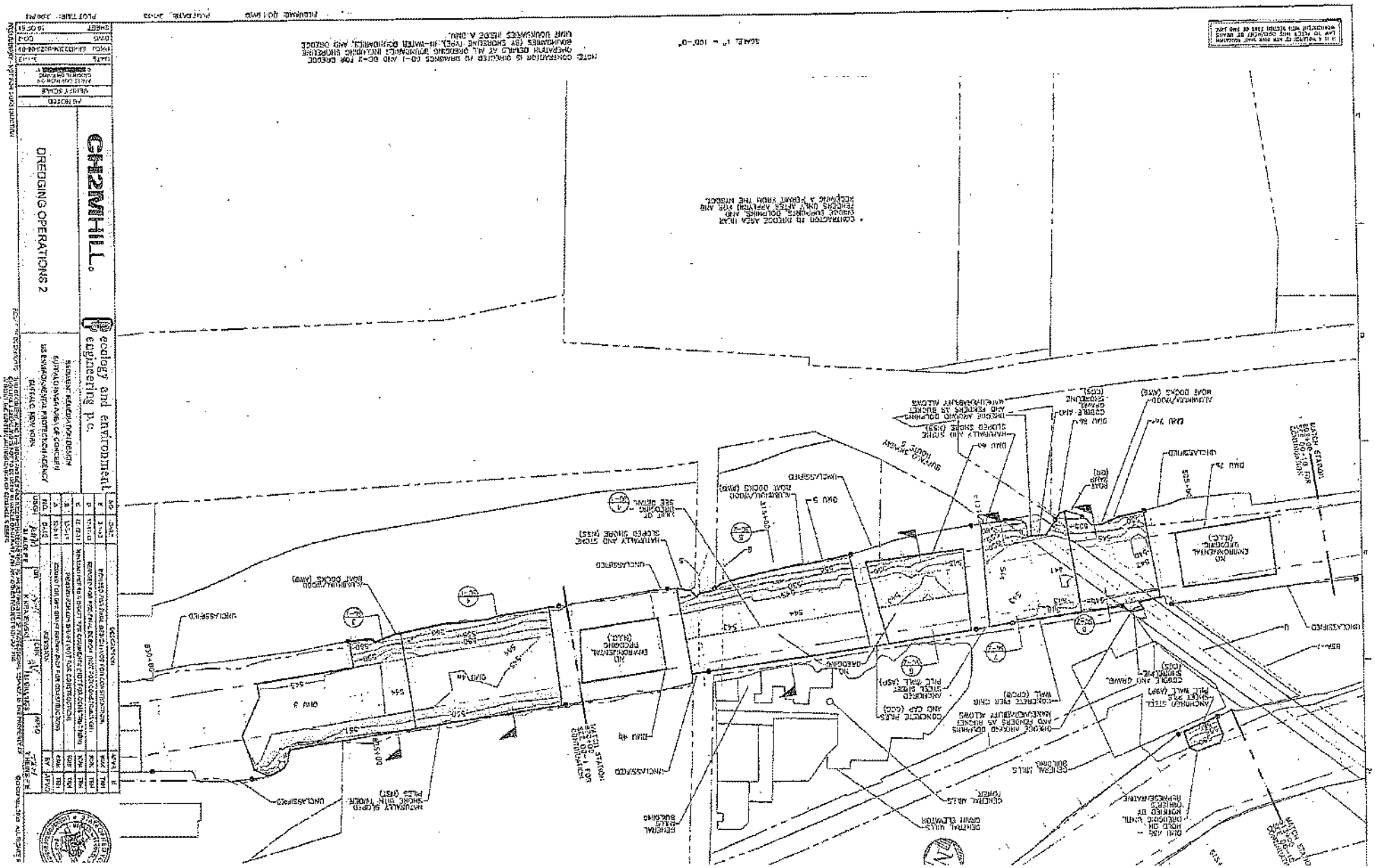
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

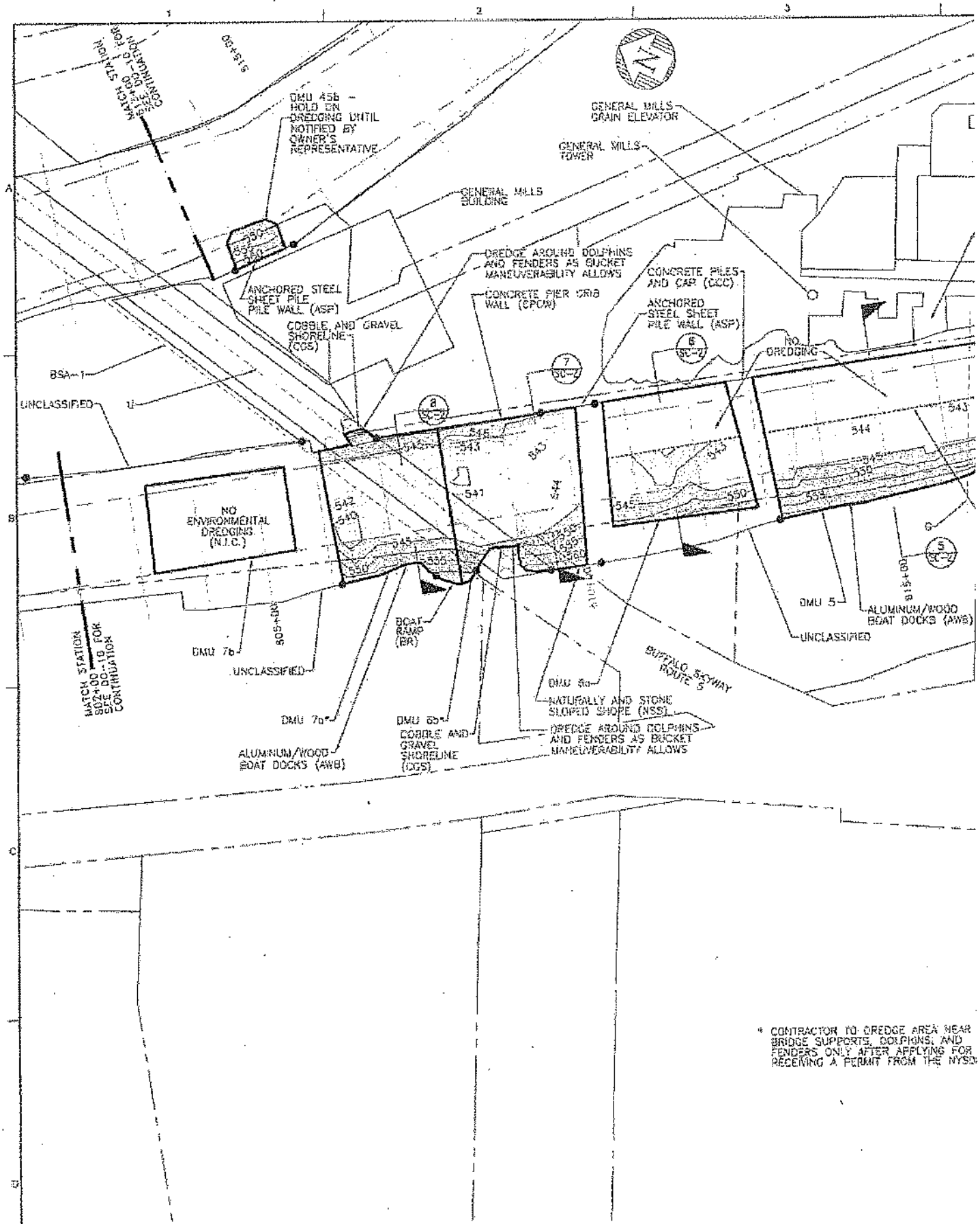
DATE 3-1-13
PROJ EE-002804-0023-03-01
DWG DD-1
SHEET 9 OF 51

PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME: DD-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 34 of 111

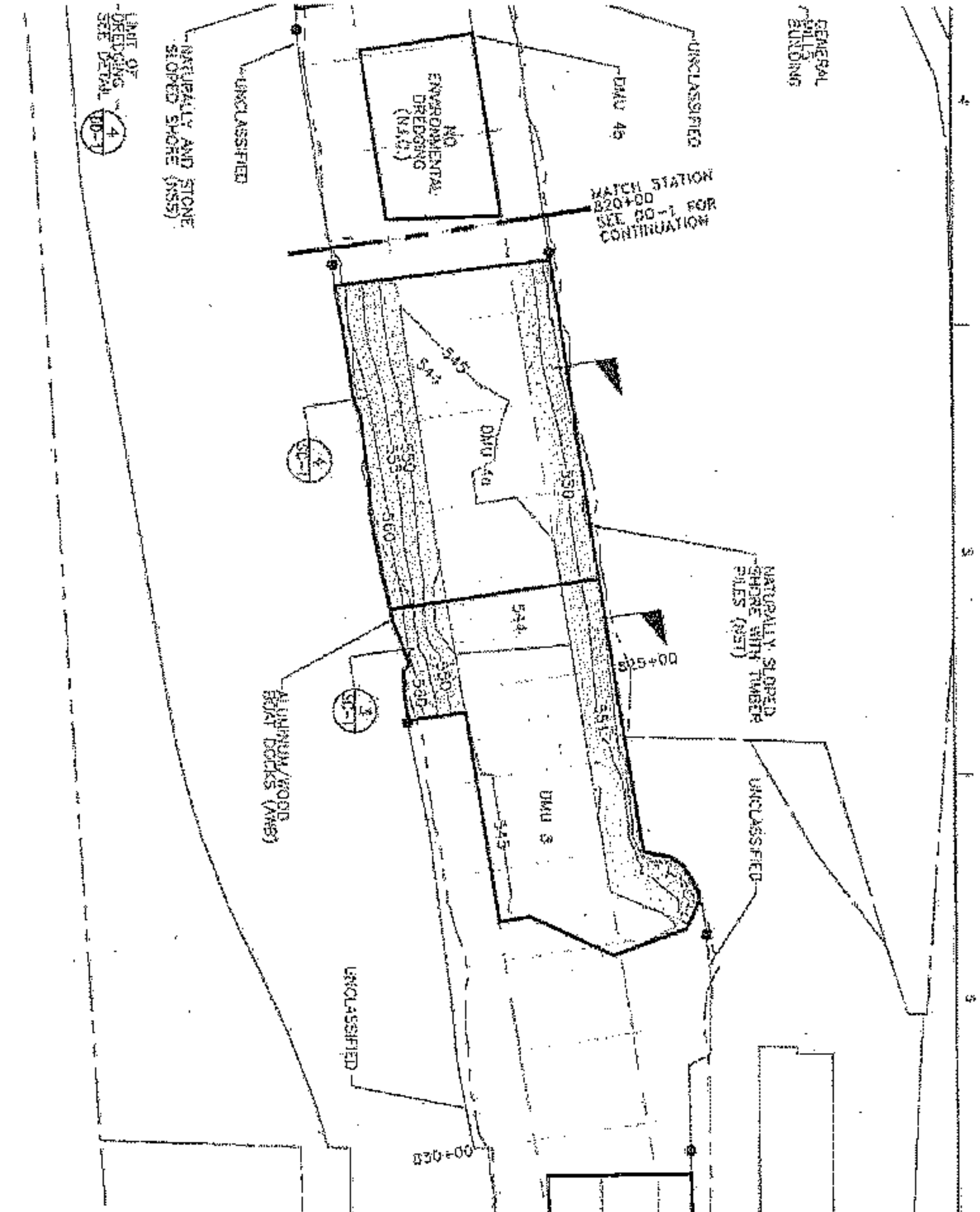




Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 35(34A) of 111

SCALE: 1" =

D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 36(34B) of 111



NOTE: CONTRACTOR IS DIRECTED TO DRAWINGS DD-1 AND DD-2 FOR DREDGE OPERATION DETAILS AT ALL DREDGING BOUNDARIES INCLUDING SHORELINE BOUNDARIES (BY SHORELINE TYPE), IN-WATER BOUNDARIES, AND DREDGE LIMIT BOUNDARIES INSIDE A DMU.

NO.	DATE	DESCRIPTION	APVR	R
E	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
D	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-12-11	REVISED PER 50% DRAFT PER COMMENTS (NOT FOR CONSTRUCTION)	KMK	TRH
B	12-5-11	REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-2-11	ISSUED FOR 50% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
NO.	DATE	REVISION	BY	APVD

DSGN M ALOI P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

CH2MHILL

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

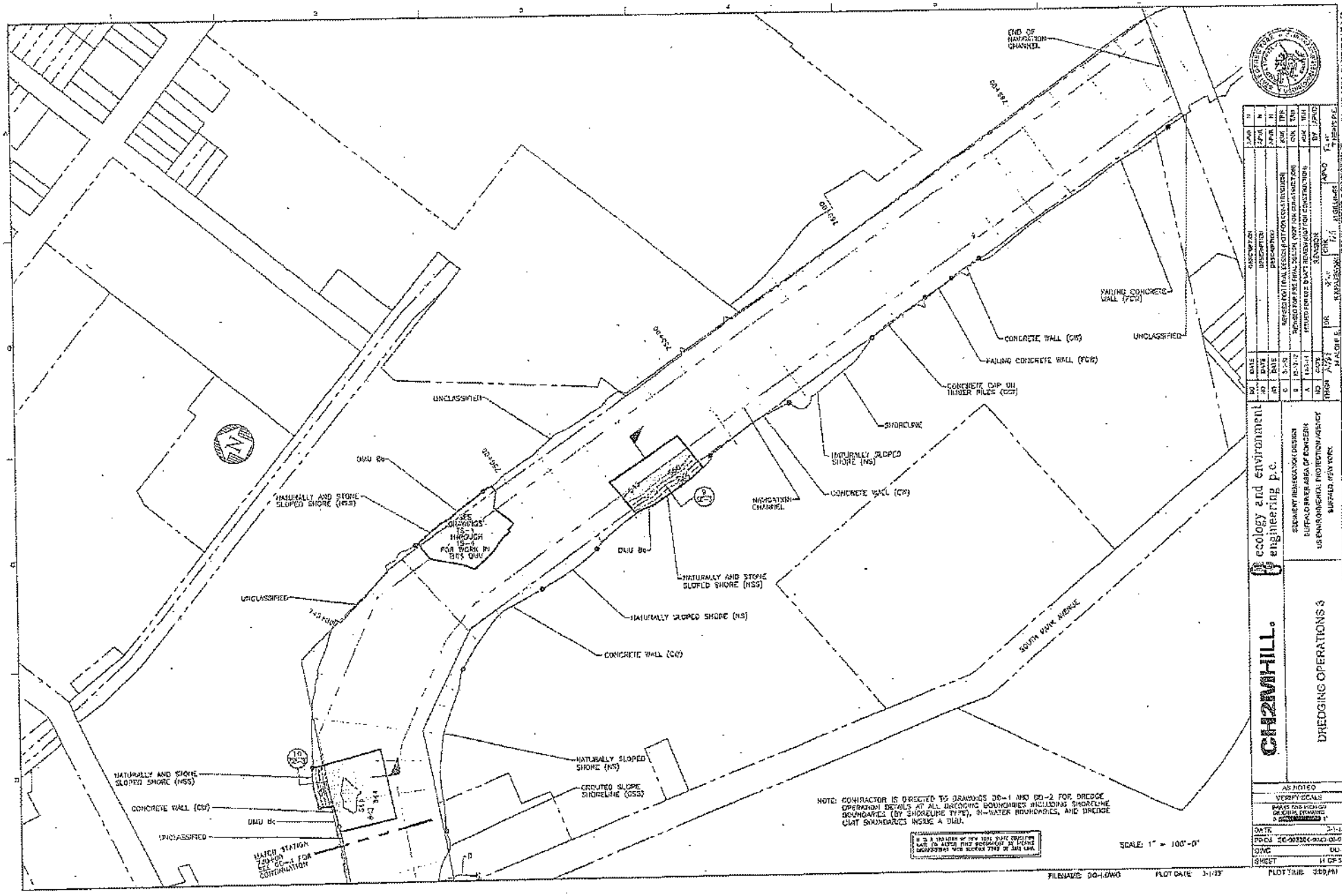
DREDGING OPERATIONS 2

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 [redacted] 1"

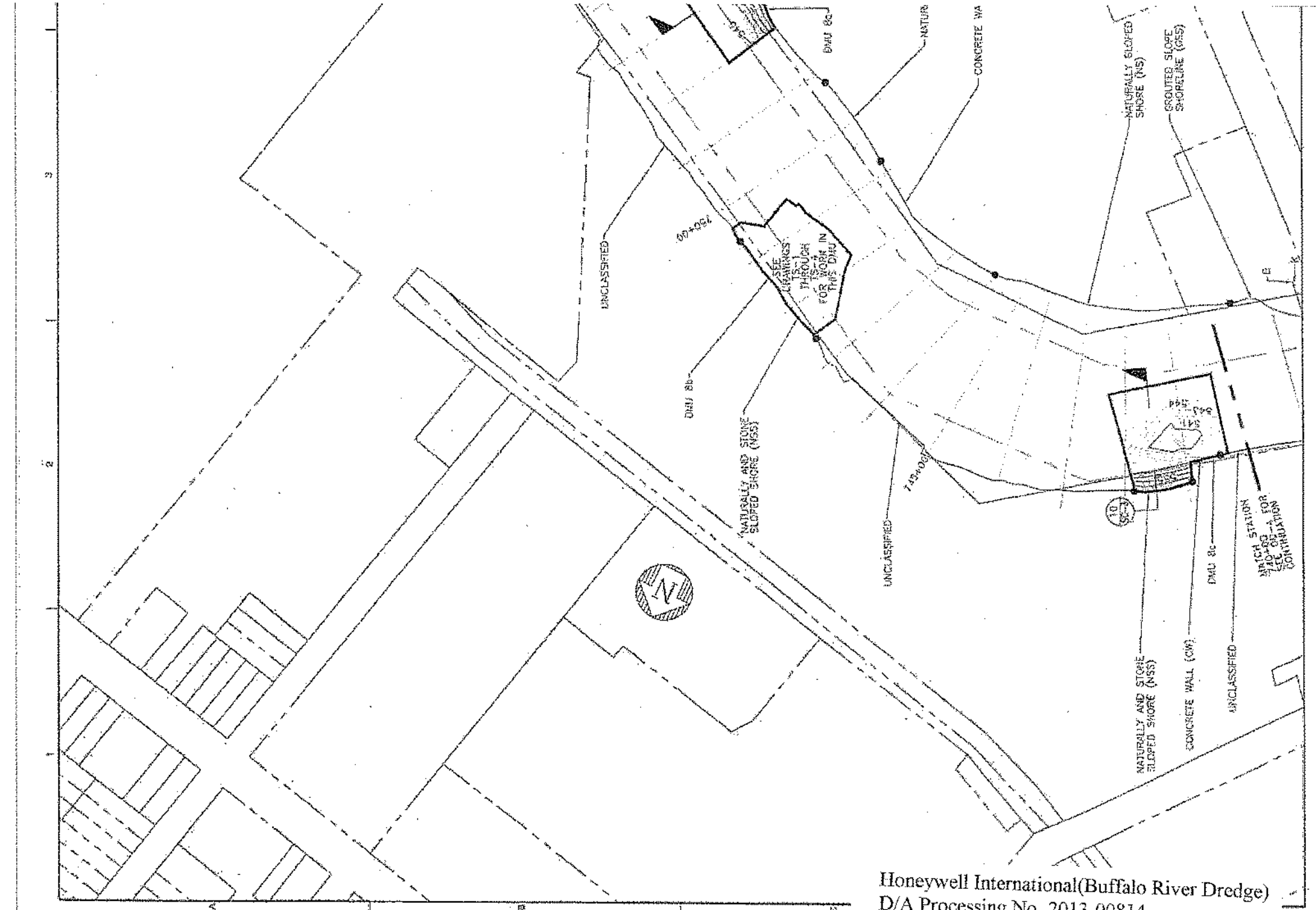
DATE 3-1-13
PROJ EE-082304-0023-08-01
DWG DO-2
SHEET 10 OF 51

FILENAME DO-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

PRELIMINARY - NOT FOR CONSTRUCTION

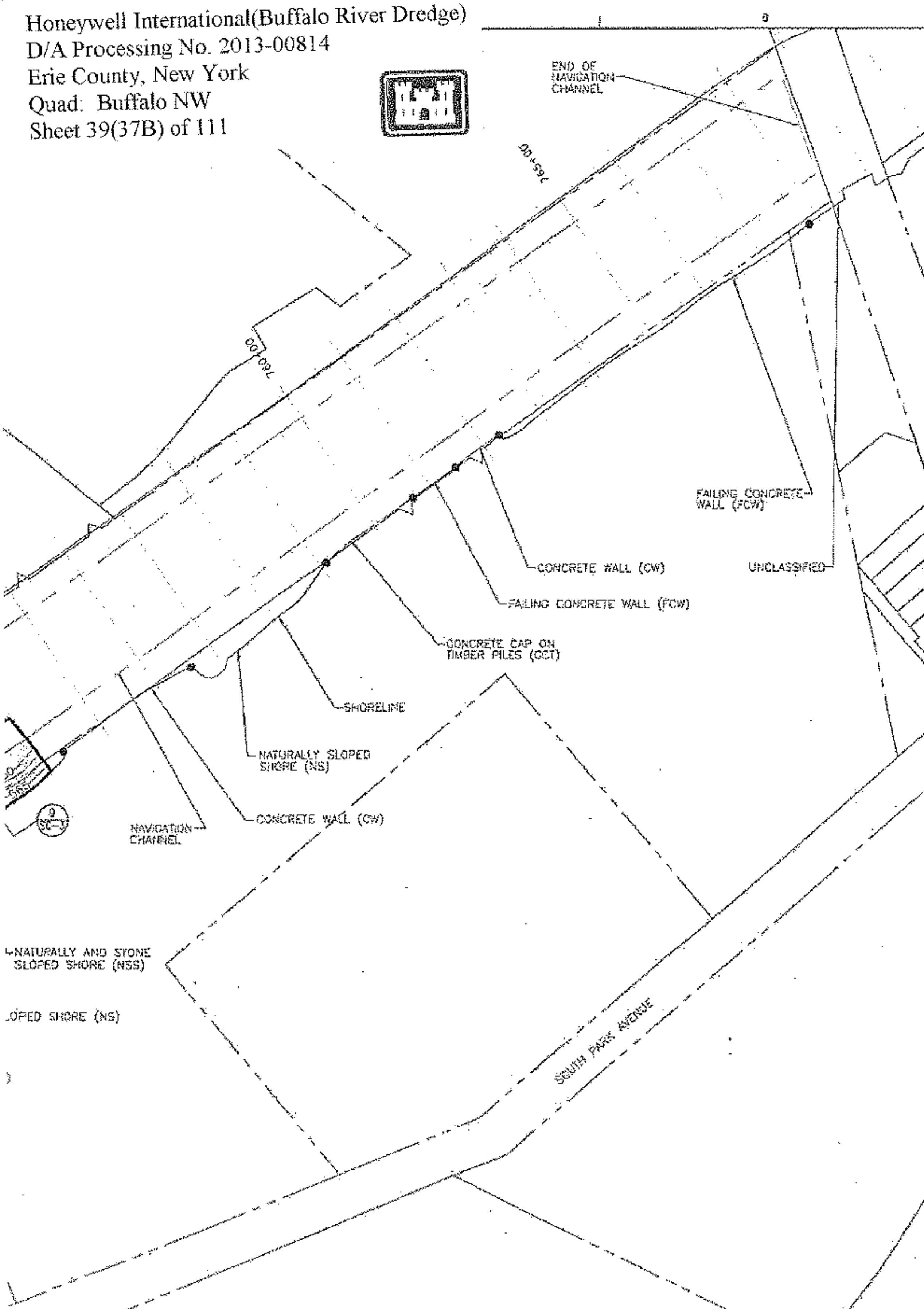


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 37 of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 38(37A) of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 39(37B) of 111



NOTE: CONTRACTOR IS DIRECTED TO DRAWINGS DO-1 AND DO-2 FOR DREDGE OPERATION DETAILS AT ALL DREDGING BOUNDARIES INCLUDING SHORELINE BOUNDARIES (BY SHORELINE TYPE), IN-WATER BOUNDARIES, AND DREDGE LIMIT BOUNDARIES INSIDE A DMU.

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

SCALE: 1" = 100'-0"

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

NO	DATE	DESCRIPTION	BY	APVD
C	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
B	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-6-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M ALOI P.E. | DR K KRAJEWSKI | CHK B GILLINGS | APVD T HEINS P.E.

CH2MHILL®

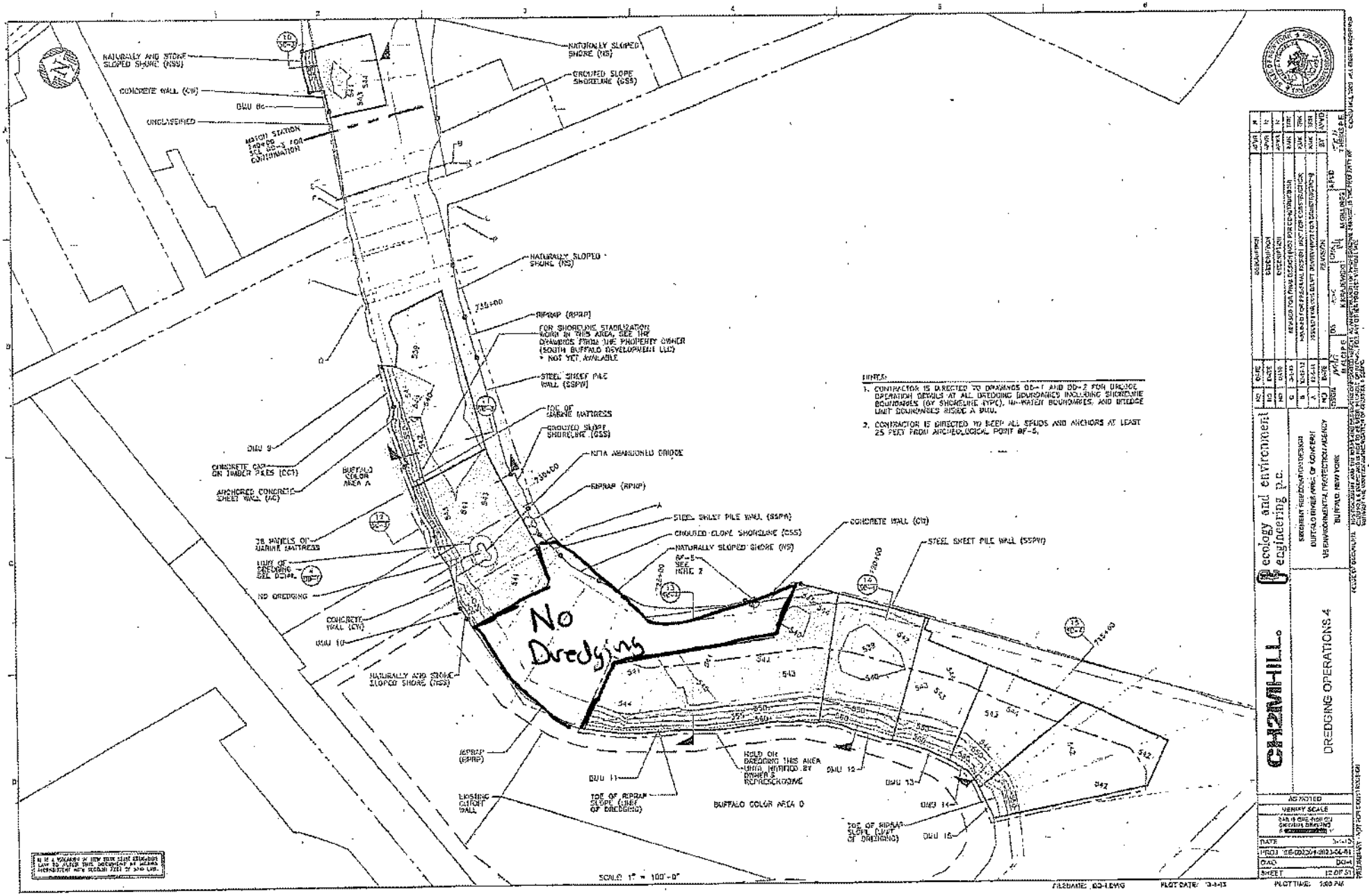
DREDGING OPERATIONS 3

PRELIMINARY - NOT FOR CONSTRUCTION

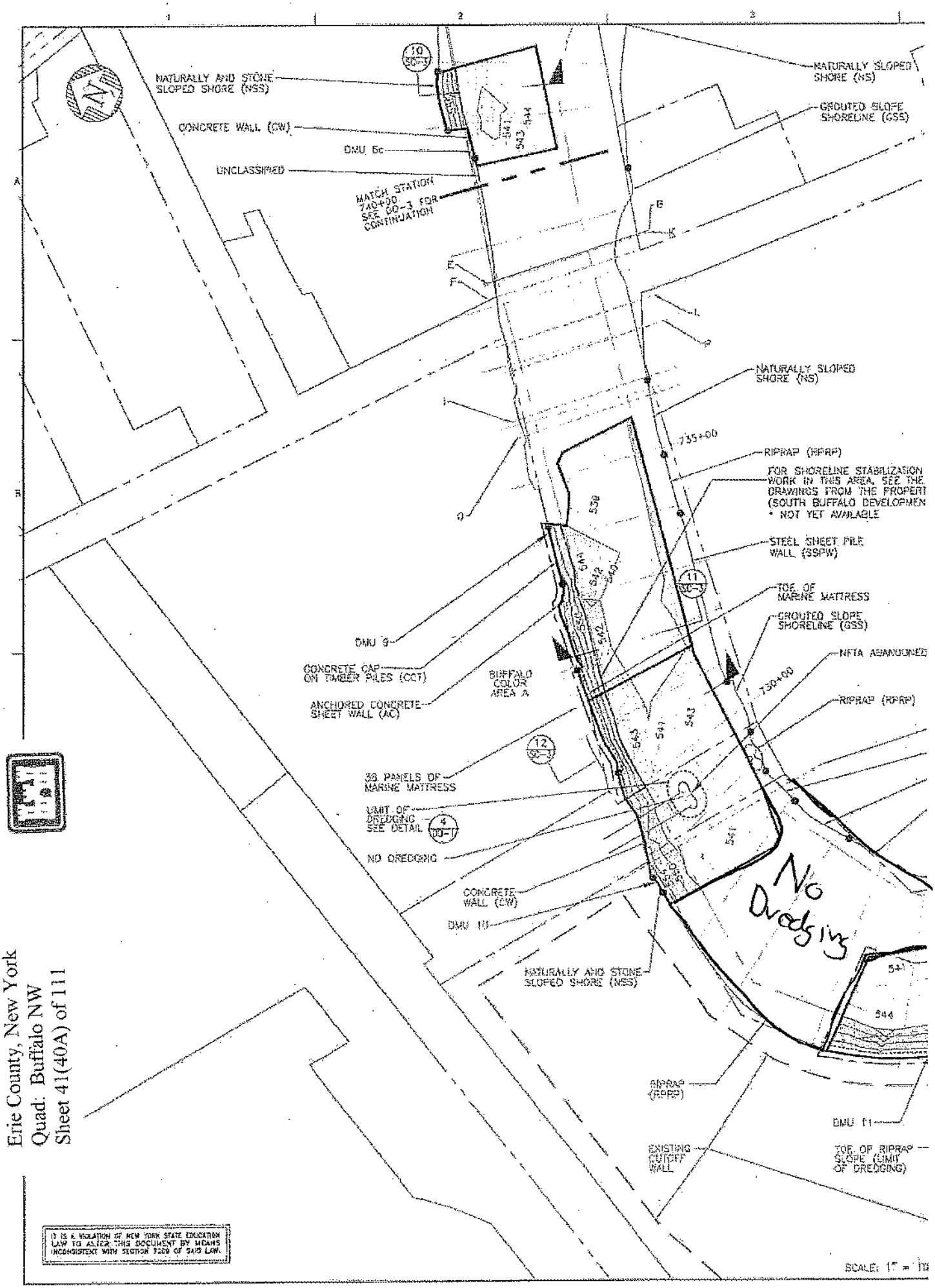
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DATE	3-1-13
PROJ	EE-002304-0023-08-01
DWG	DO-3
SHEET	11 OF 51

FILENAME: DO-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

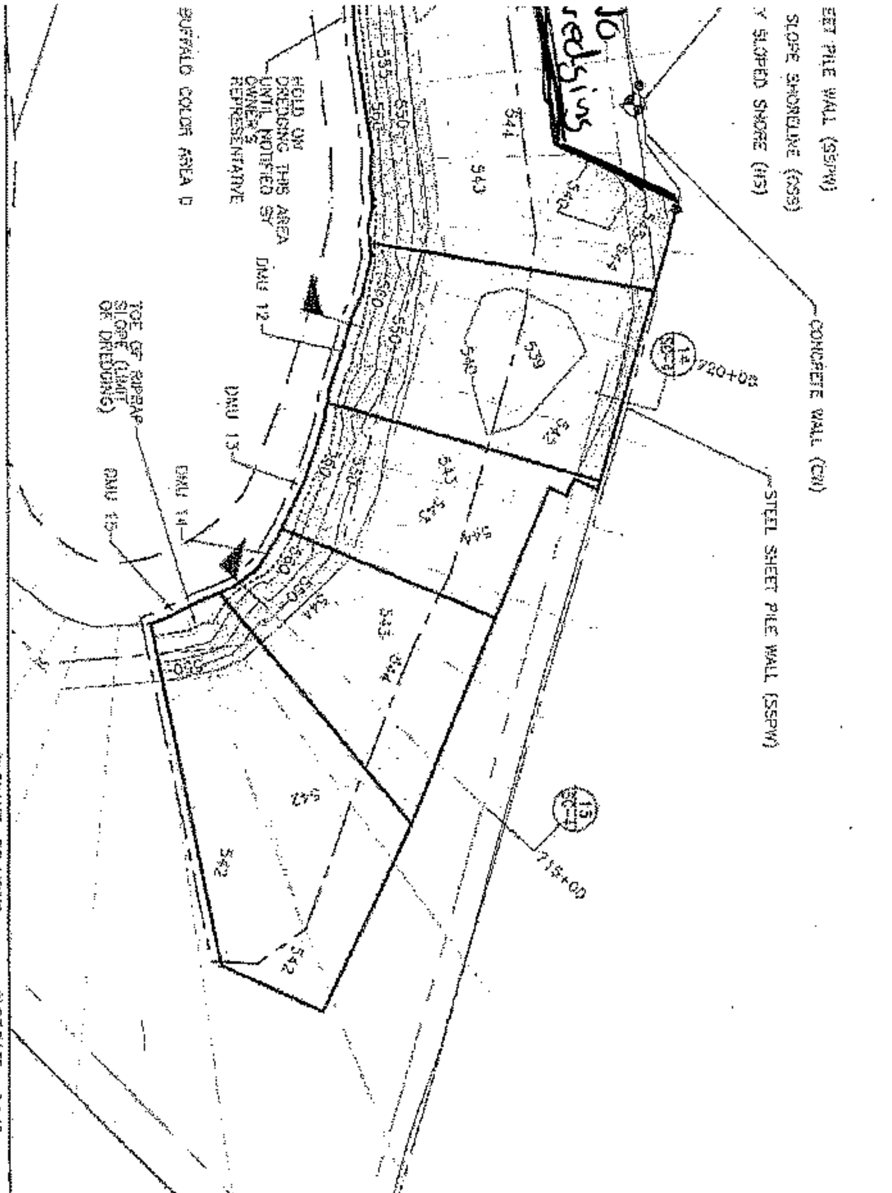


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 40 of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 41(40A) of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 42(40B) of 111



NOTES:

1. CONTRACTOR IS DIRECTED TO DRAWINGS DD-1 AND DD-2 FOR DREDGE OPERATION DETAILS AT ALL DREDGING BOUNDARIES INCLUDING SHORELINE BOUNDARIES (BY SHORELINE TYPE), IN-WATER BOUNDARIES, AND DREDGE LIMIT BOUNDARIES INSIDE A DMU.
2. CONTRACTOR IS DIRECTED TO KEEP ALL SPUDS AND ANCHORS AT LEAST 25 FEET FROM ARCHEOLOGICAL POINT BF-5.

NO	DATE	DESCRIPTION	APVR	N
NO	DATE	DESCRIPTION	APVR	N
NO	DATE	DESCRIPTION	APVR	N
C	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
B	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-5-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
NO	DATE	REVISION	BY	APVD

DSGN M ALOI P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

CH2MHILL.

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

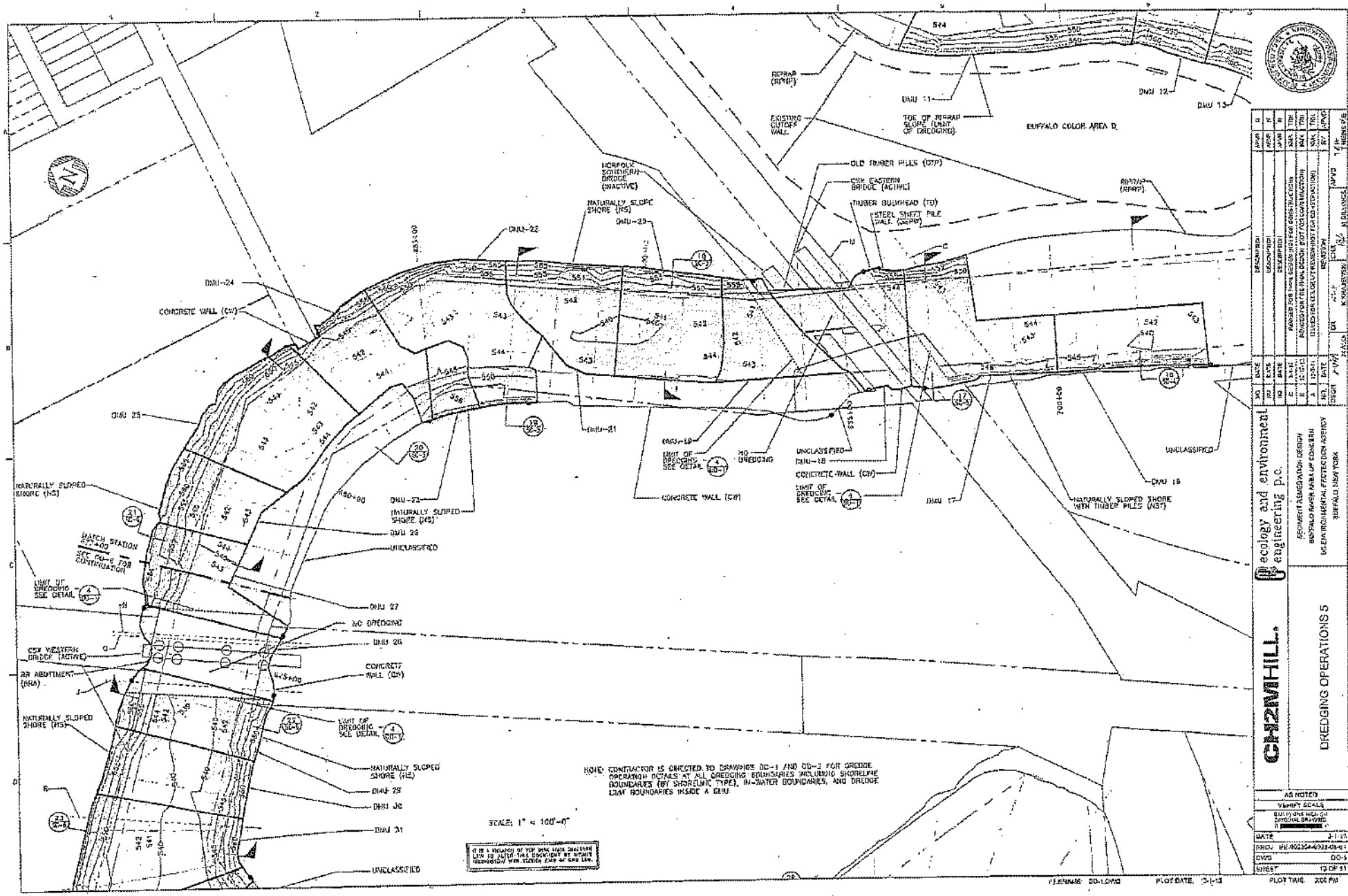
DREDGING OPERATIONS 4

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE 3-1-13
PROJ EE-002304-0023-08-01
DWG DD-4
SHEET 12 OF 51

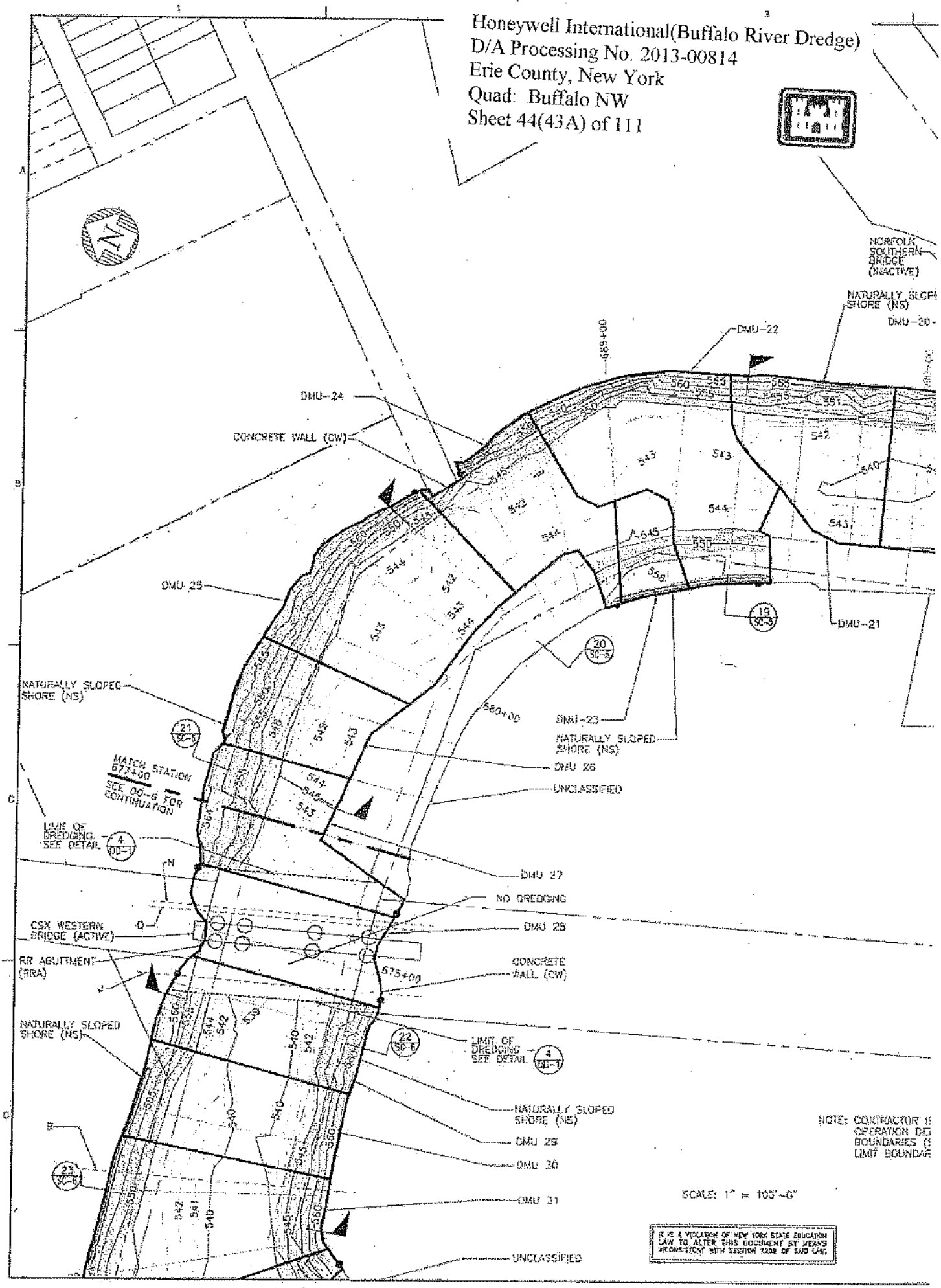
PRELIMINARY - NOT FOR CONSTRUCTION

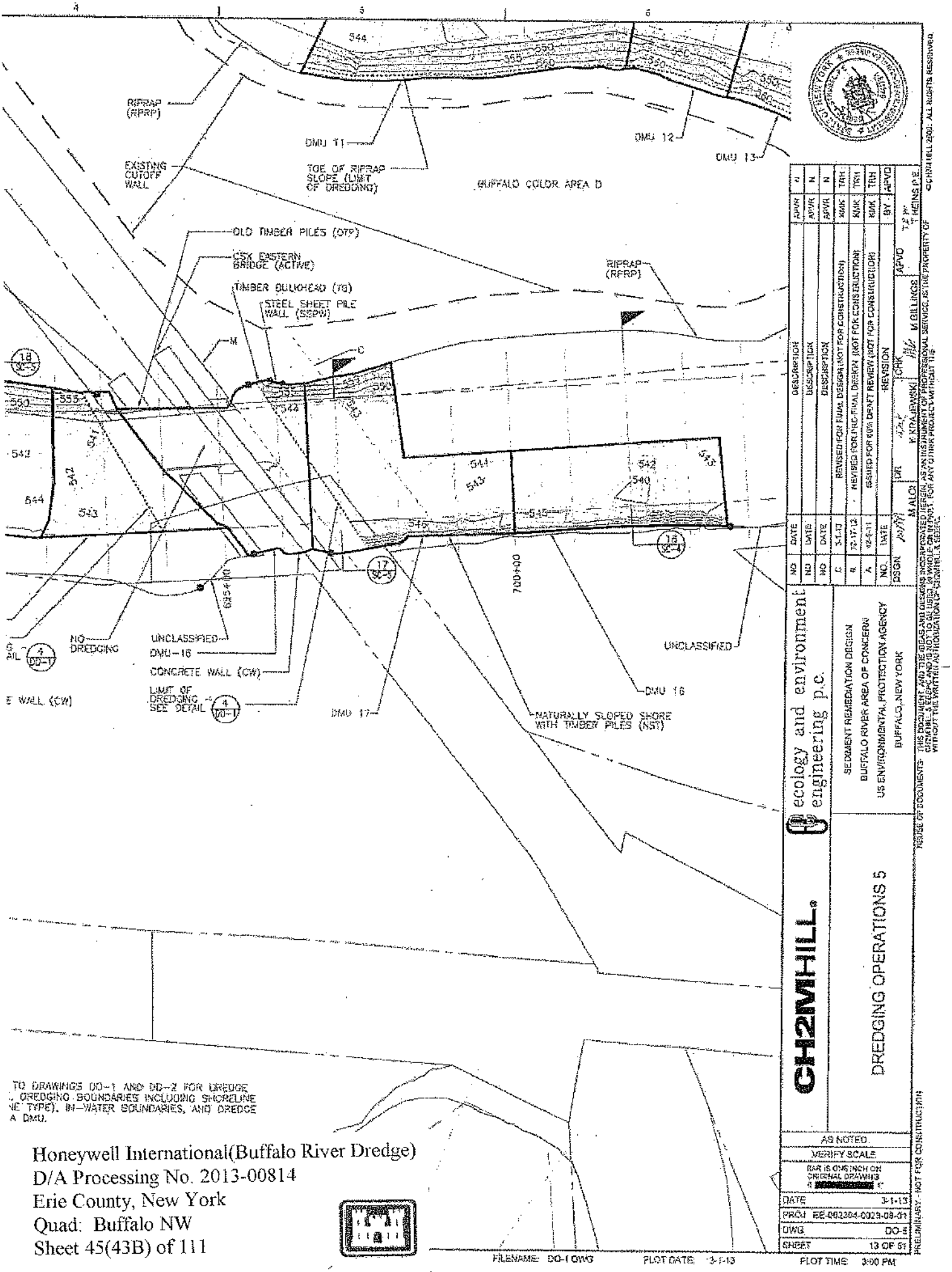
FILENAME: DD-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 43 of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 44(43A) of 111





TO DRAWINGS DO-1 AND DO-2 FOR DREDGE
.. DREDGING BOUNDARIES INCLUDING SHORELINE
NE TYPE), IN-WATER BOUNDARIES, AND DREDGE
A DMU.

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 45(43B) of 111

NO	DATE	DESCRIPTION	APVR
NO	DATE	DESCRIPTION	APVR
NO	DATE	DESCRIPTION	APVR
C	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK
B	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK
A	12-6-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK
NO.	DATE	REVISION	BY
DSGN		CHK	APVD
	M.ALOI	DR K.KRAJEWSKI	M.GILLINGS

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL

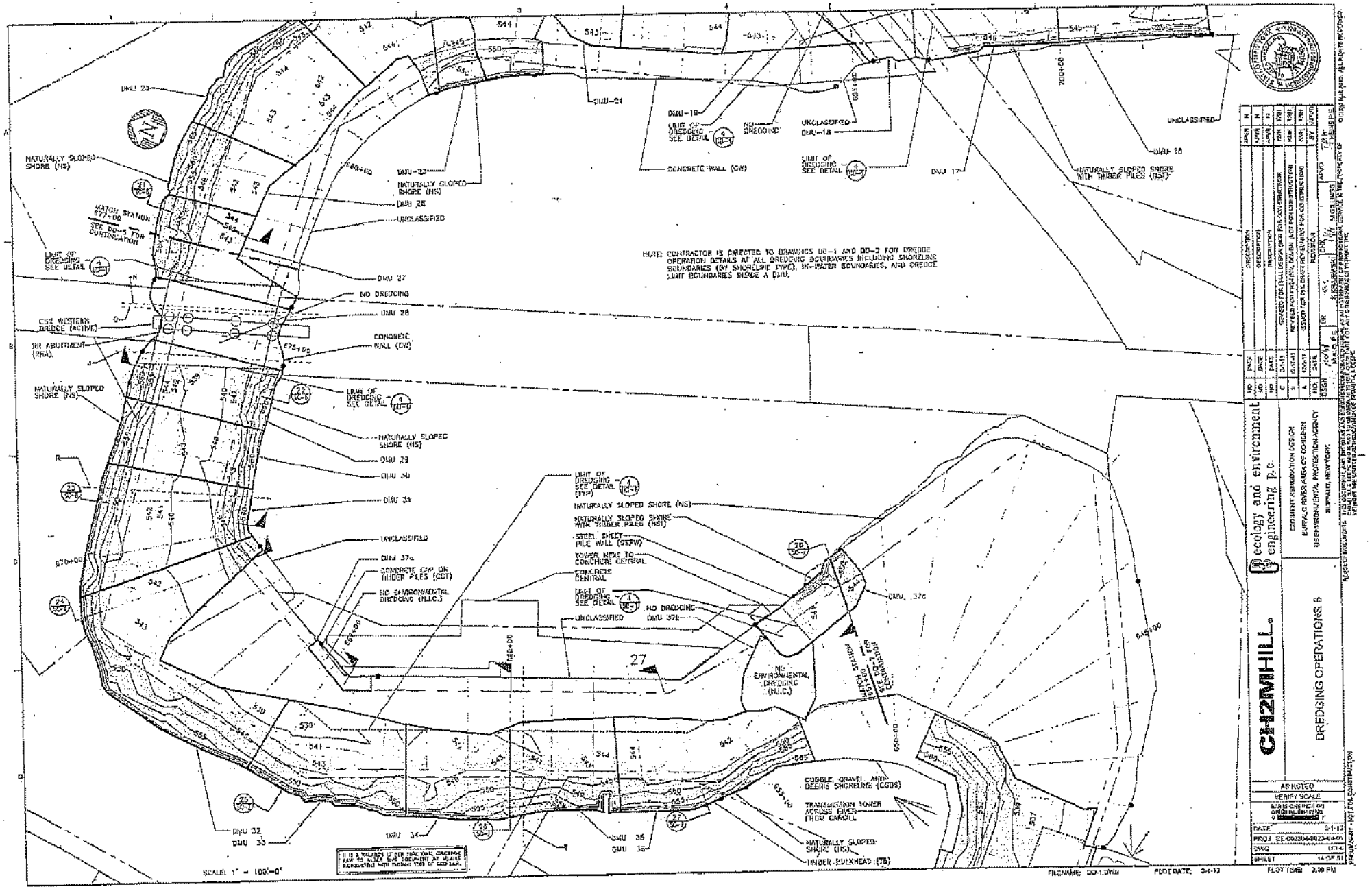
DREDGING OPERATIONS 5

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ADJUST SCALE ACCORDINGLY

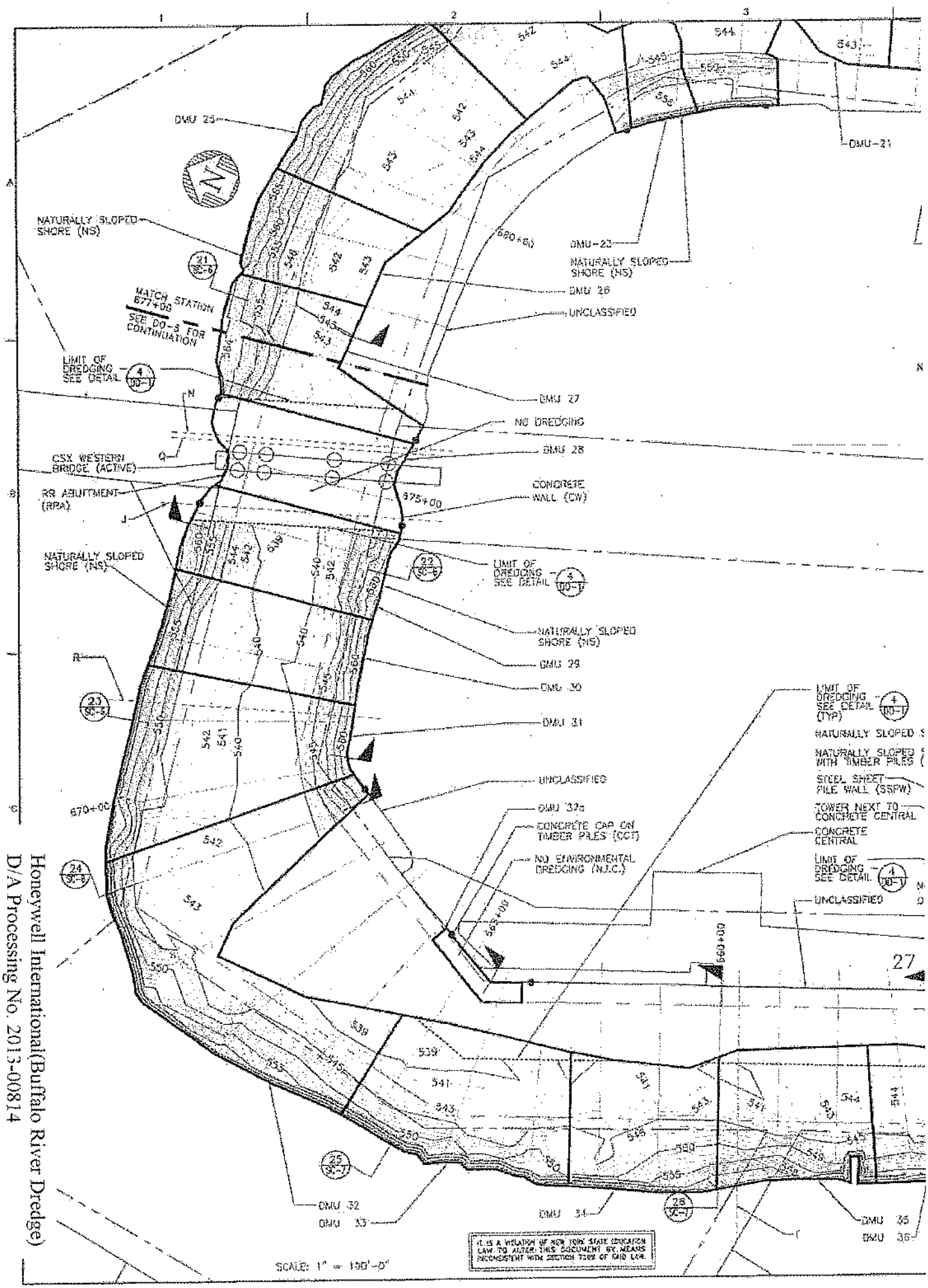
DATE 3-1-13
PROJ RE-092304-0029-08-01
DWG DO-5
SHEET 13 OF 51

FILENAME: DO-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

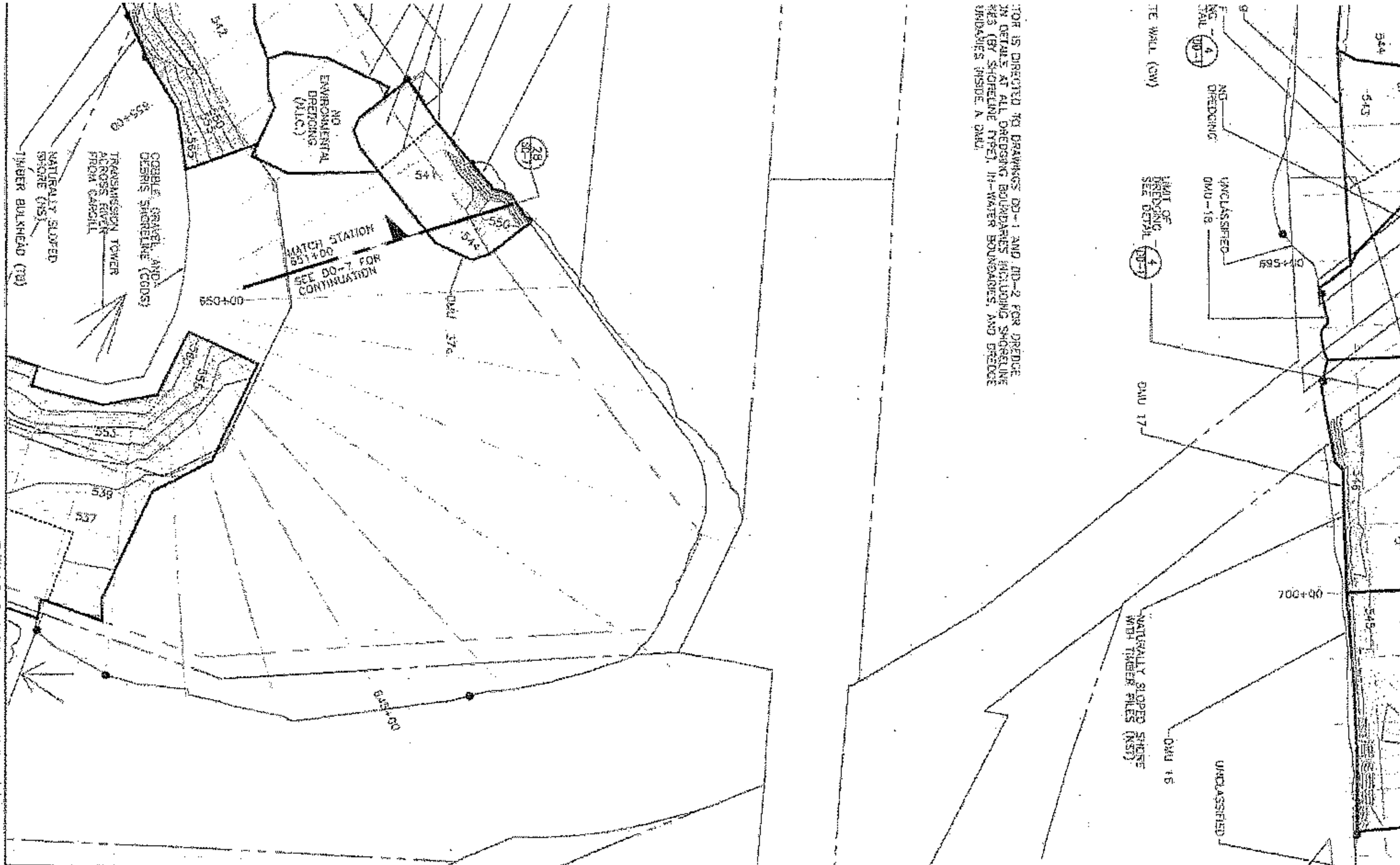
PRELIMINARY - NOT FOR CONSTRUCTION



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 46 of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 47(46A) of 111



CH2MHILL

ecology and environment engineering p.c.

DREDGING OPERATIONS 6

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

NO.	DATE	DESCRIPTION
C	3-1-13	REVISED F
B	12-17-12	REVISED FOR
A	12-5-11	ISSUED FOR

DSGN M. ALOI P.E. DR

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE 3-1-13
PROJ EE-002504-0023-08-01
DWG DD-6
SHEET 14 OF 51

PRELIMINARY - NOT FOR CONSTRUCTION

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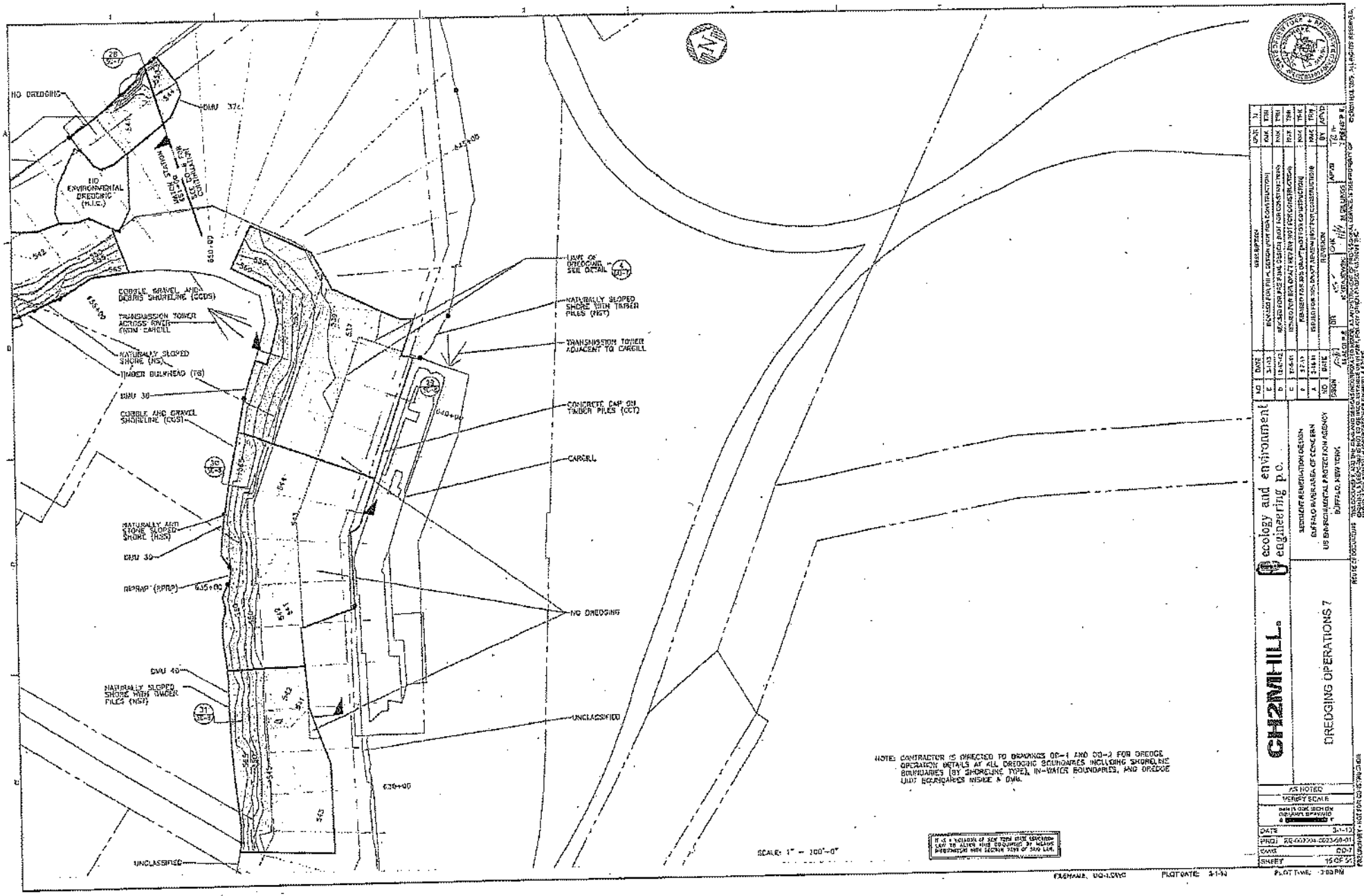
FILENAME: DD-1.DWG PLOT DATE: 2-1-13 PLOT TIME: 3:00 PM

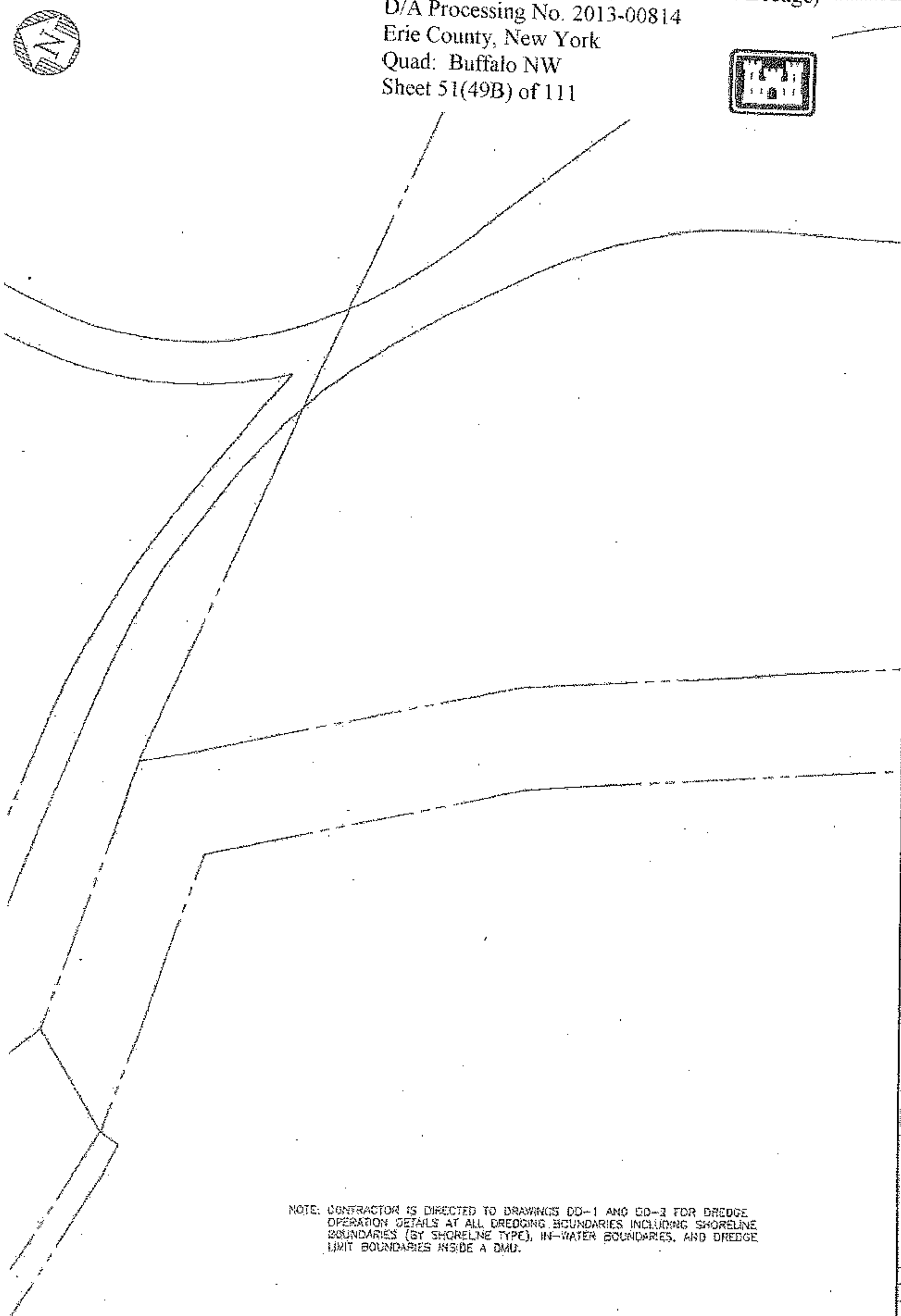
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 48(46B) of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 49 of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 51(49B) of 111



NOTE: CONTRACTOR IS DIRECTED TO DRAWINGS DD-1 AND DD-2 FOR DREDGE OPERATION DETAILS AT ALL DREDGING BOUNDARIES INCLUDING SHORELINE BOUNDARIES (BY SHORELINE TYPE), IN-WATER BOUNDARIES, AND DREDGE LIMIT BOUNDARIES INSIDE A DMU.

SCALE: 1" = 100'-0"

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

NO	DATE	DESCRIPTION	APVR	#
E	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
D	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-5-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
B	3-7-11	REVISED FOR 30% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	2-16-11	ISSUED FOR 30% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
NO.	DATE	REVISION	BY	APVD

DSGN M. ALCH P.E. | DR K. KRAJEWSKI | CHK M. GILLINGS | APVD T. HEINS P.E.

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL®

DREDGING OPERATIONS 7

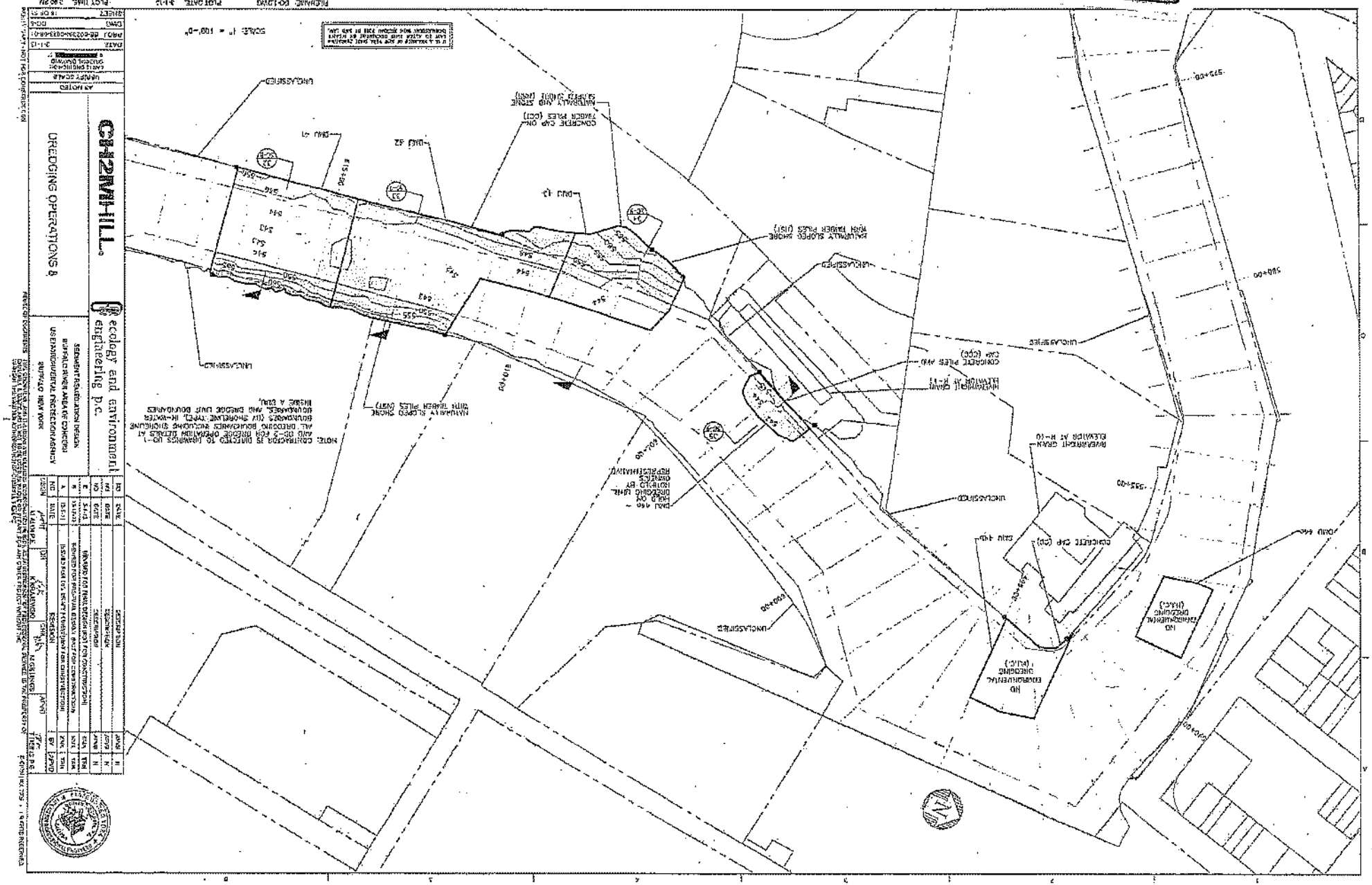
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DATE 3-1-13
PROJ EE-302304-0025-08-01
DWG DD-7
SHEET 16 OF 51

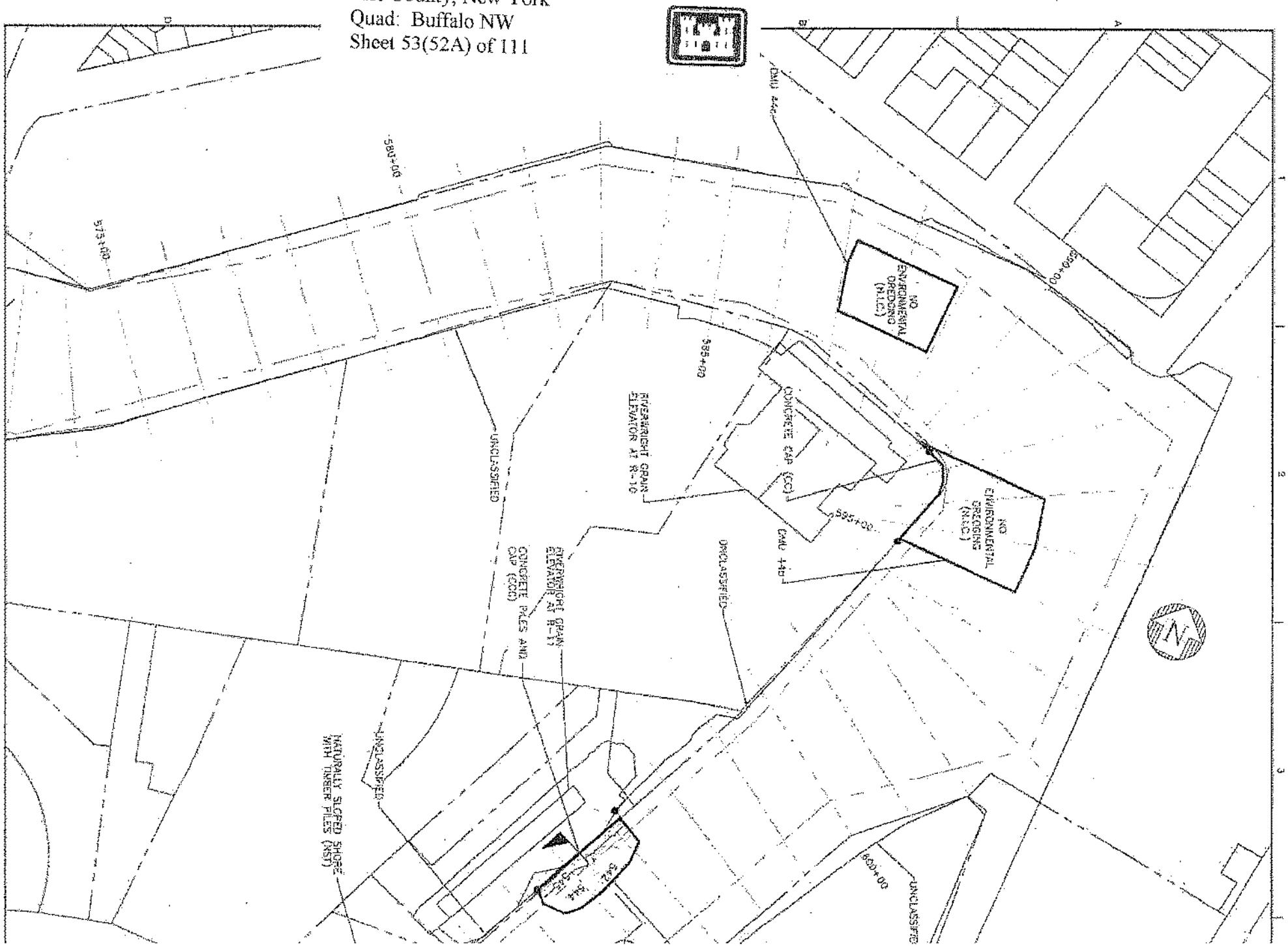
PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME: DD-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

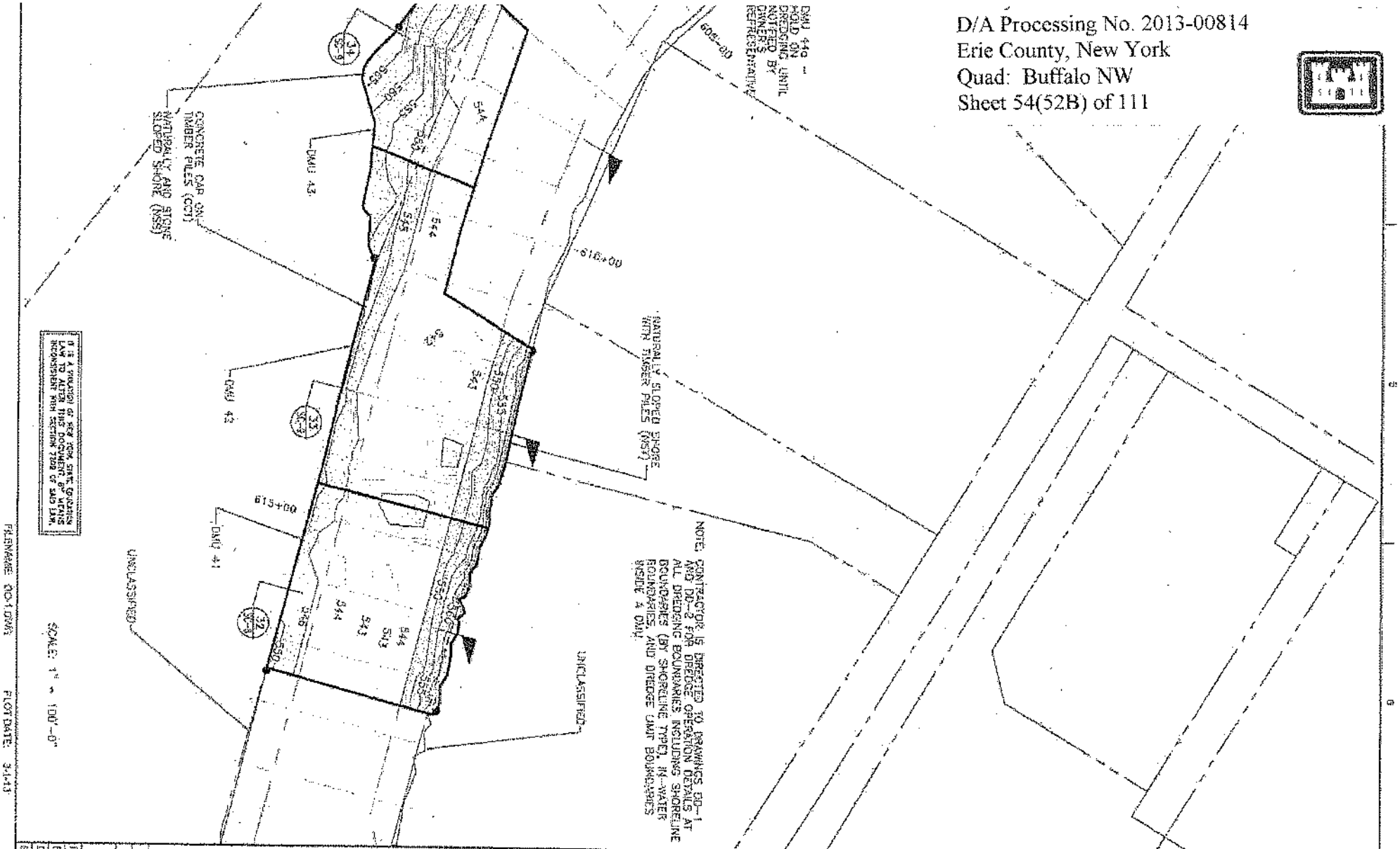
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 52 of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 53(52A) of 111



D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 54(52B) of 111



SCALE: 1" = 100'-0"

CH2MHILL®	ecology and environment engineering p.c.	SEDIMENT REMEDIATION DESIGN BUFFALO RIVER AREA OF CONCERN US ENVIRONMENTAL PROTECTION AGENCY BUFFALO, NEW YORK	DREDGING OPERATIONS 8

NO	DATE	DESCRIPTION	APVR	N
NO	DATE	DESCRIPTION	APVR	N
NO	DATE	DESCRIPTION	APVR	N
C	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
B	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-5-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
NO.	DATE	REVISION	BY	APVD

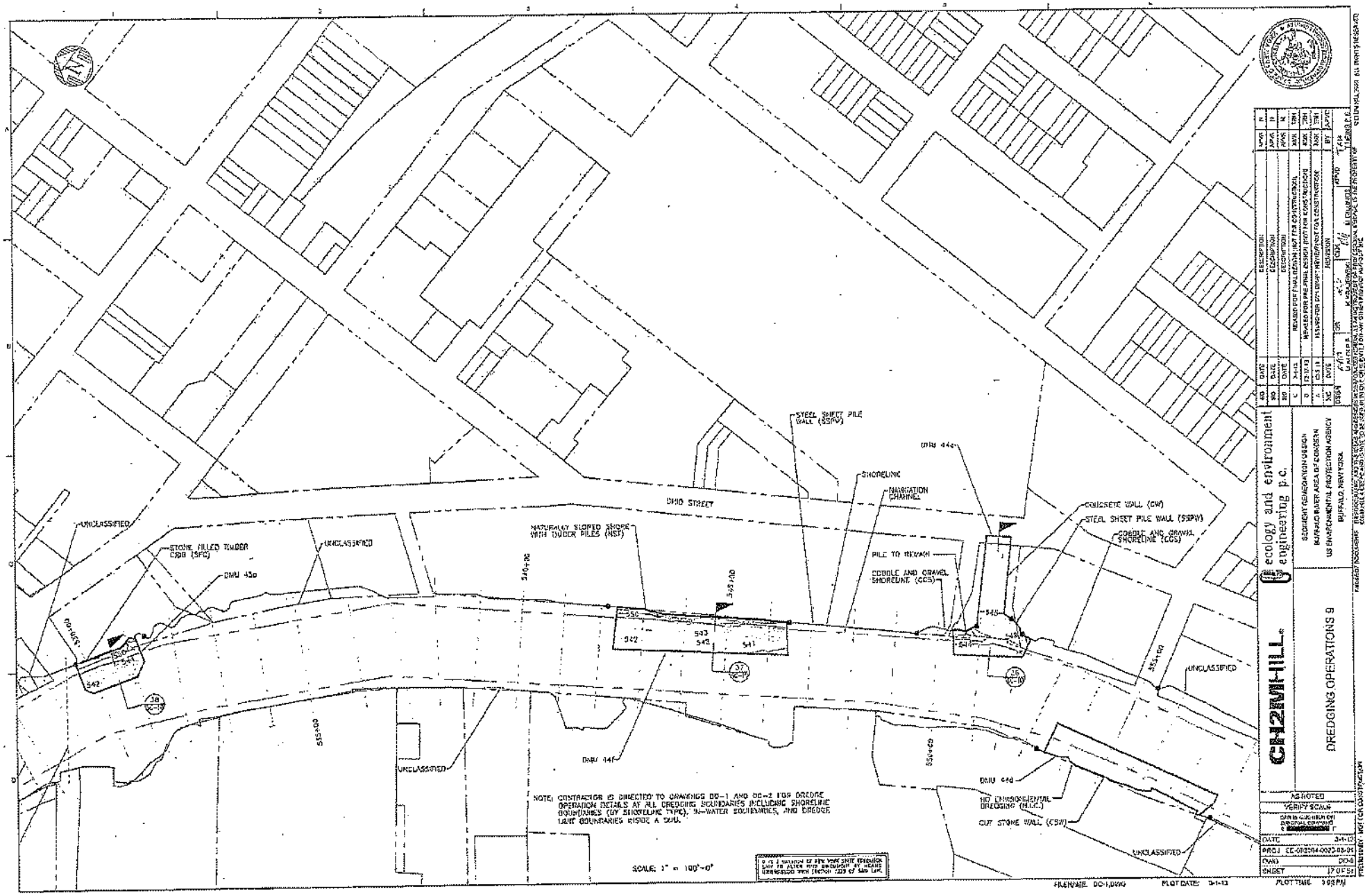
DSGN M ALOI P.E. DR K KRAJEWSKI CHK M GILLINGS APVD T HEINS P.E.

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET ADJUST SCALE ACCORDINGLY

DATE 3-1-13
PROJ EE-0023G4-0023-06-01
DWG DO-8
SHEET 16 OF 51

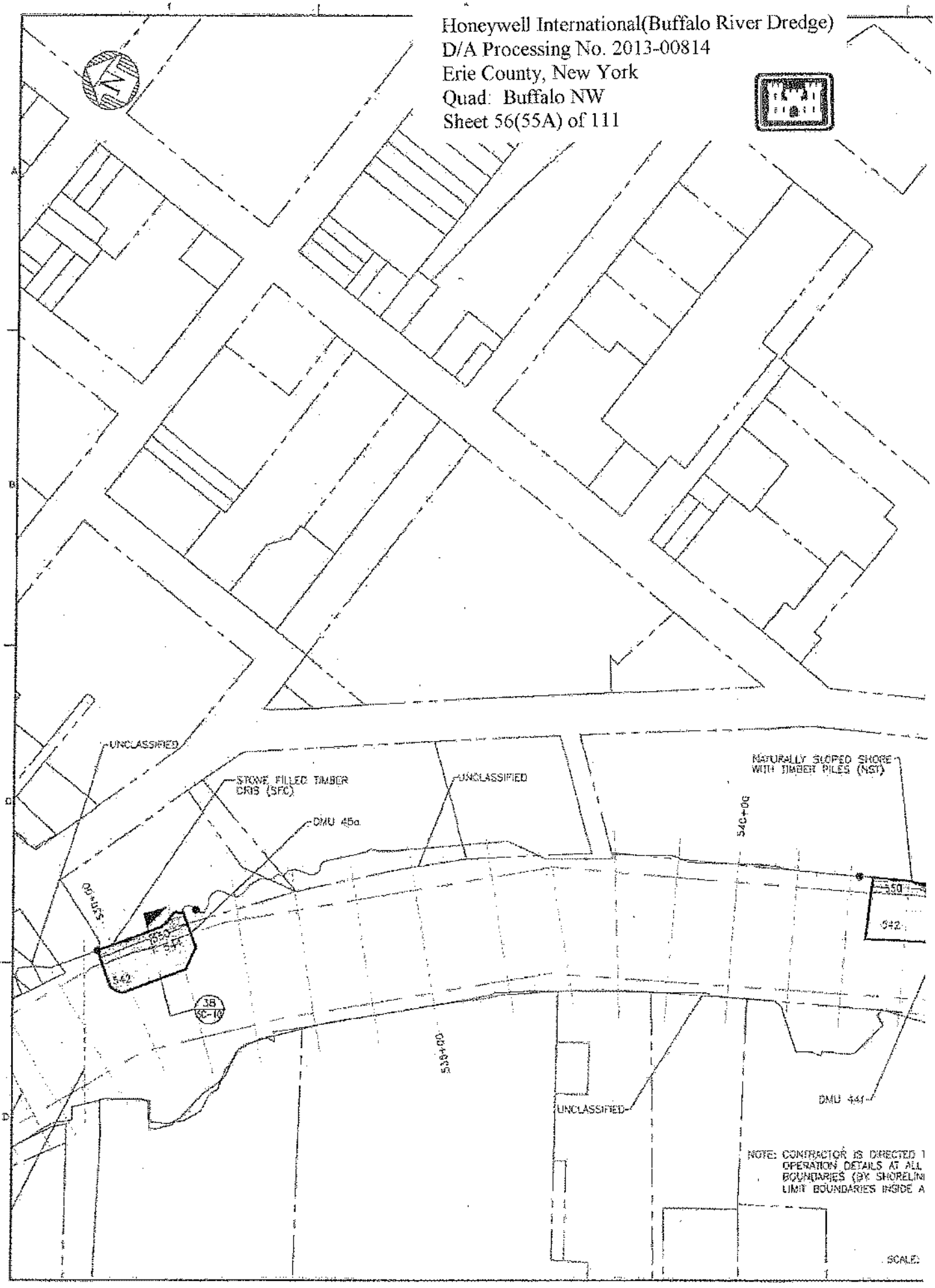
FILENAME: DO-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

PRELIMINARY - NOT FOR CONSTRUCTION

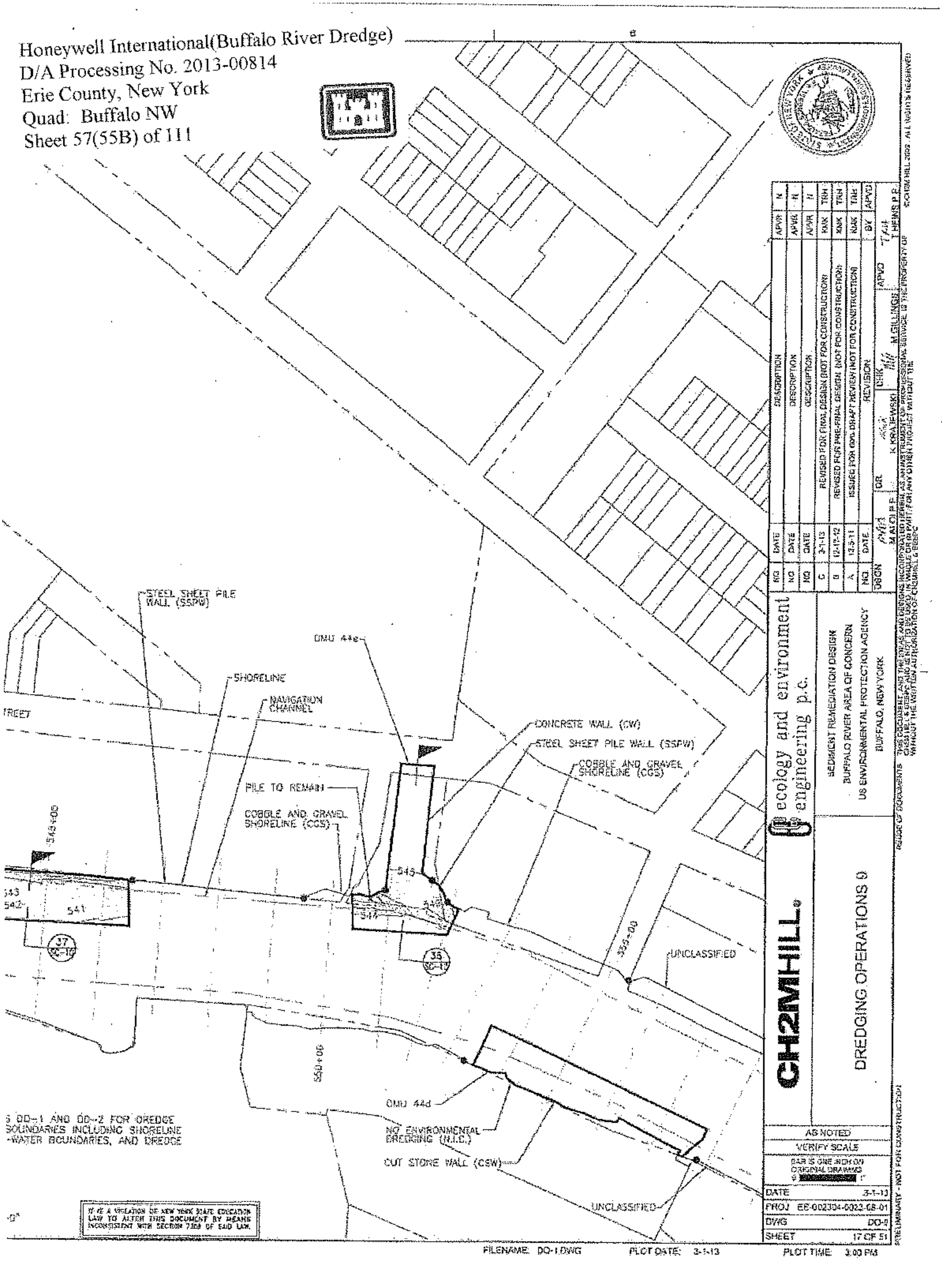


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 55 of 111

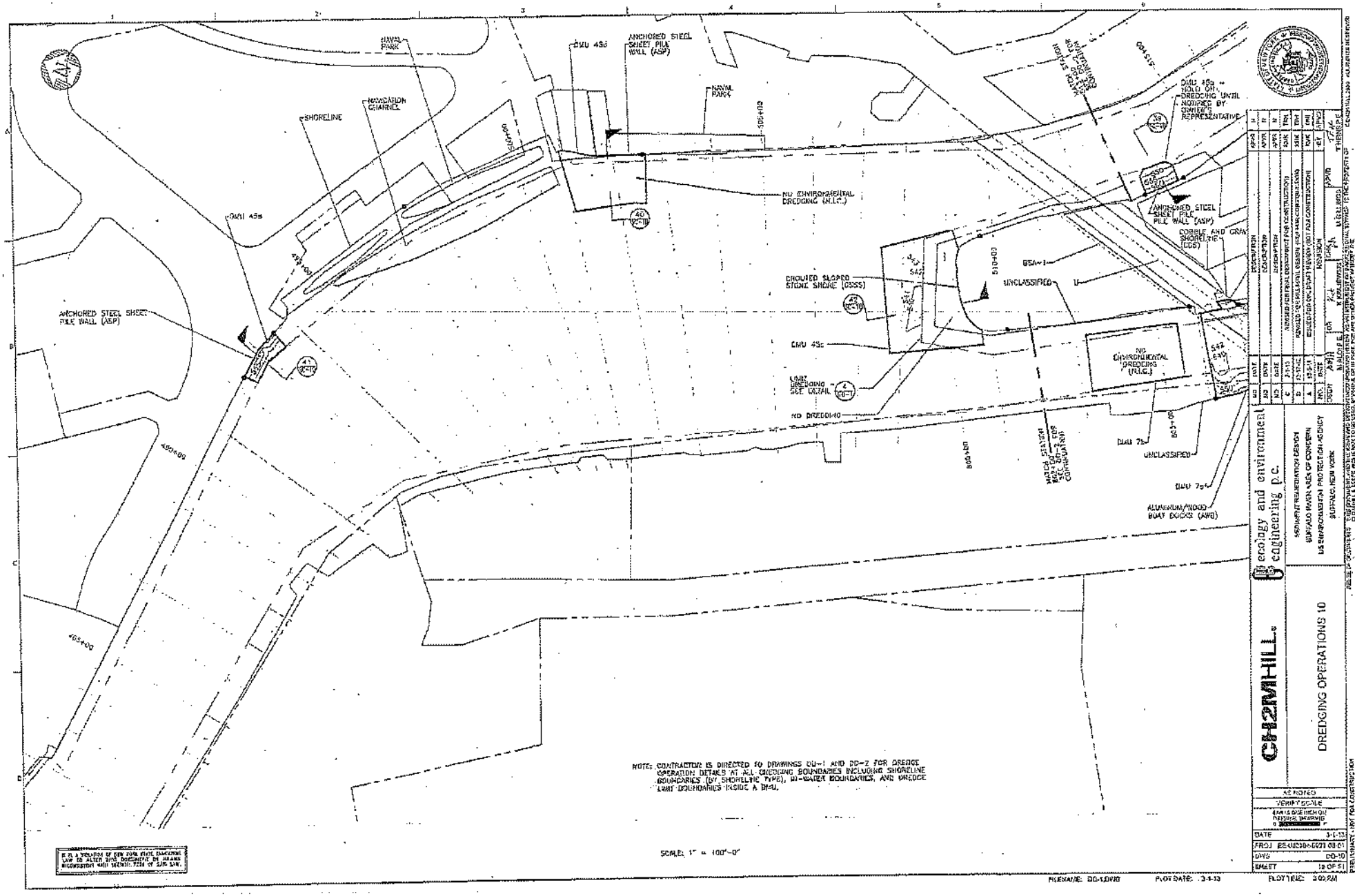
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 56(55A) of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 57(55B) of 111

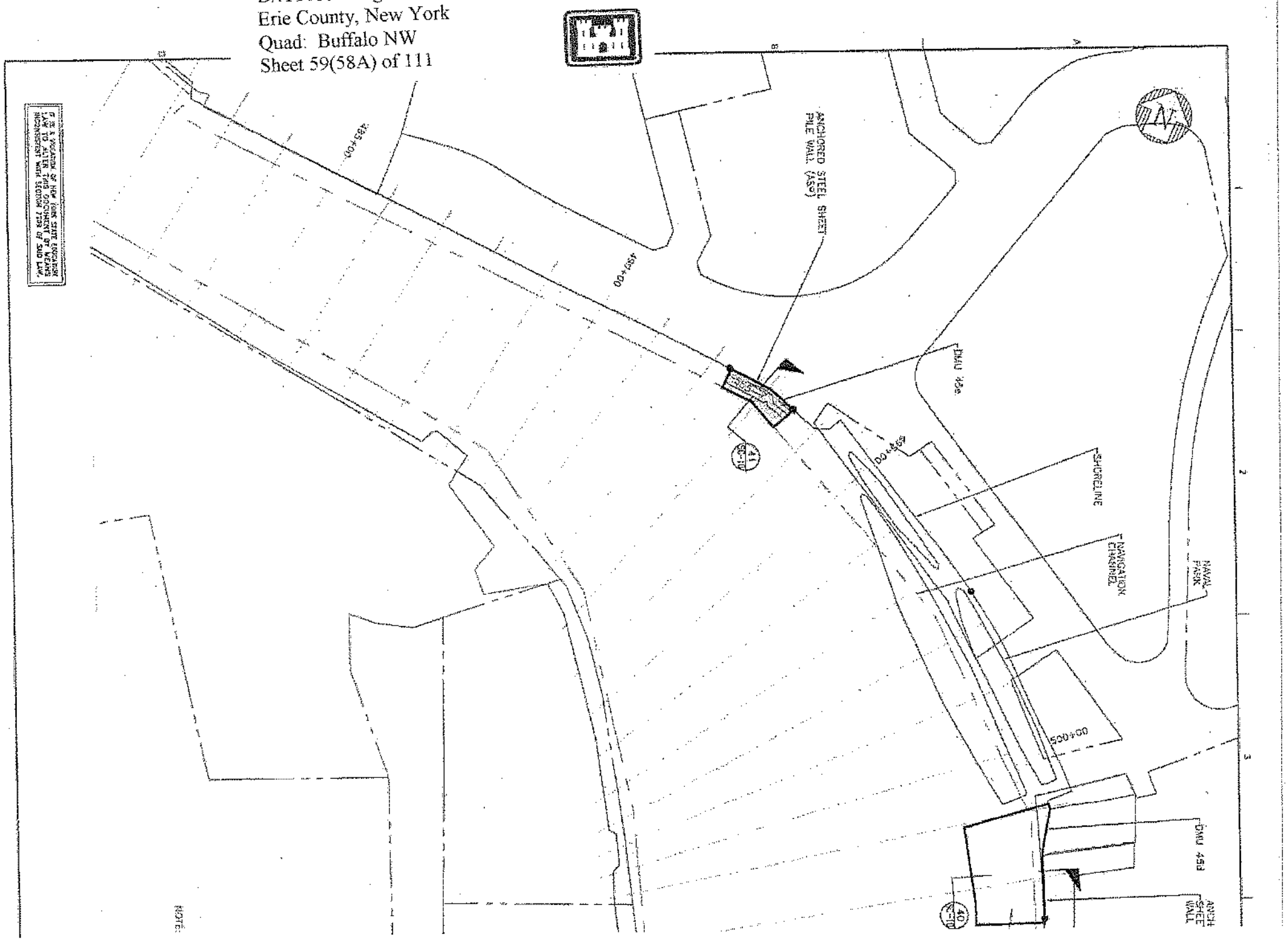


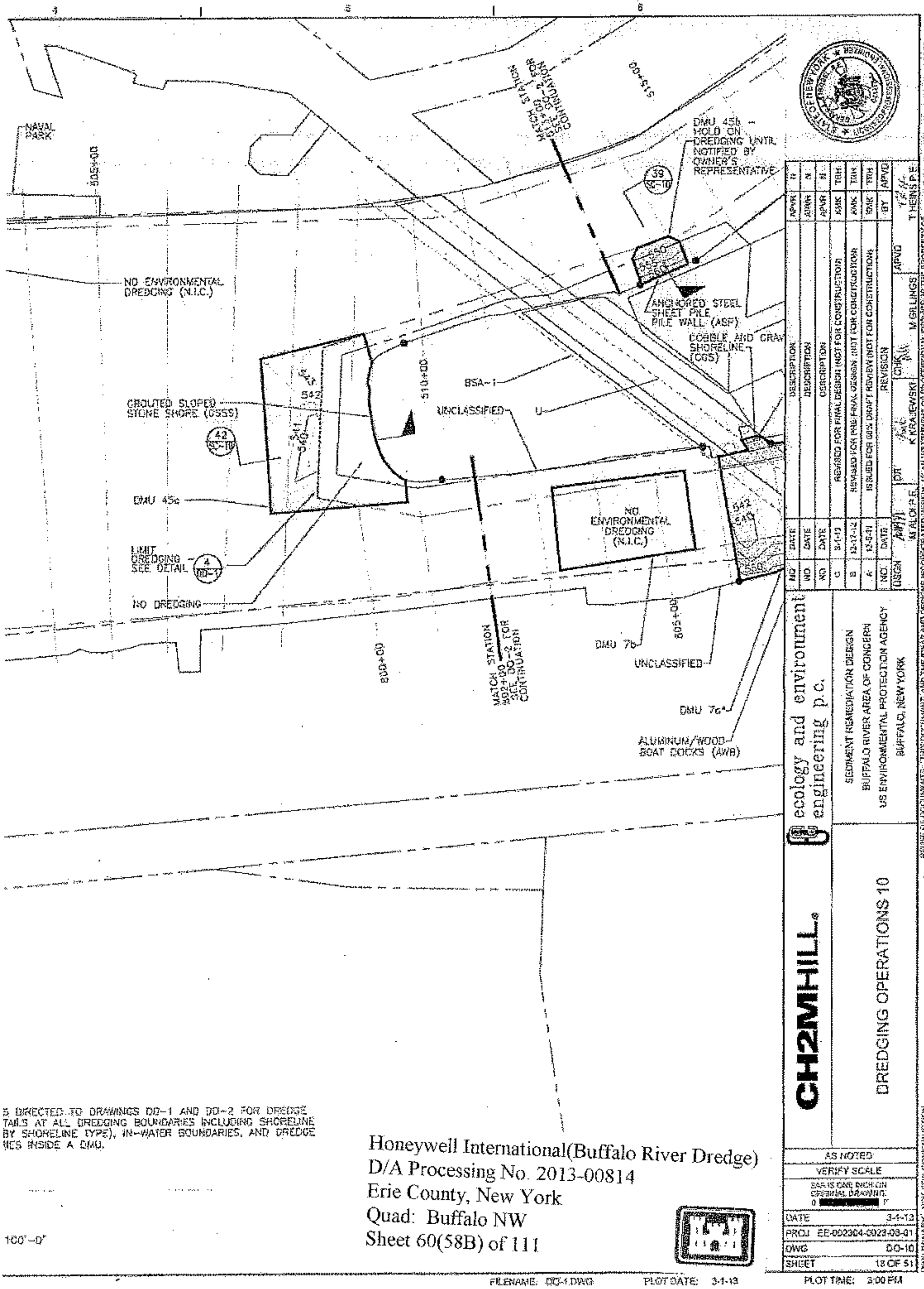
STEEL SHEET PILE WALL (SSPW)
OMU 44e
SHORELINE
NAVIGATION CHANNEL
CONCRETE WALL (CW)
STEEL SHEET PILE WALL (SSPW)
COBBLE AND GRAVEL SHORELINE (CGS)
PILE TO REMAIN
COBBLE AND GRAVEL SHORELINE (CGS)
545
541
37
35
555+00
550+00
UNCLASSIFIED
OMU 44d
NO ENVIRONMENTAL DREDGING (N.E.D.)
CUT STONE WALL (CSW)
UNCLASSIFIED
S DD-1 AND DD-2 FOR DREDGE BOUNDARIES INCLUDING SHORELINE -WATER BOUNDARIES, AND DREDGE
IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.
CH2MHILL
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
DREDGING OPERATIONS 9
AS NOTED
VERIFY SCALE
DATE 3-1-13
PROJ EE-002304-0022-08-01
DWG DO-9
SHEET 17 OF 51
FILENAME: DO-1.DWG
PLOT DATE: 3-1-13
PLOT TIME: 3:00 PM



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 58 of 111

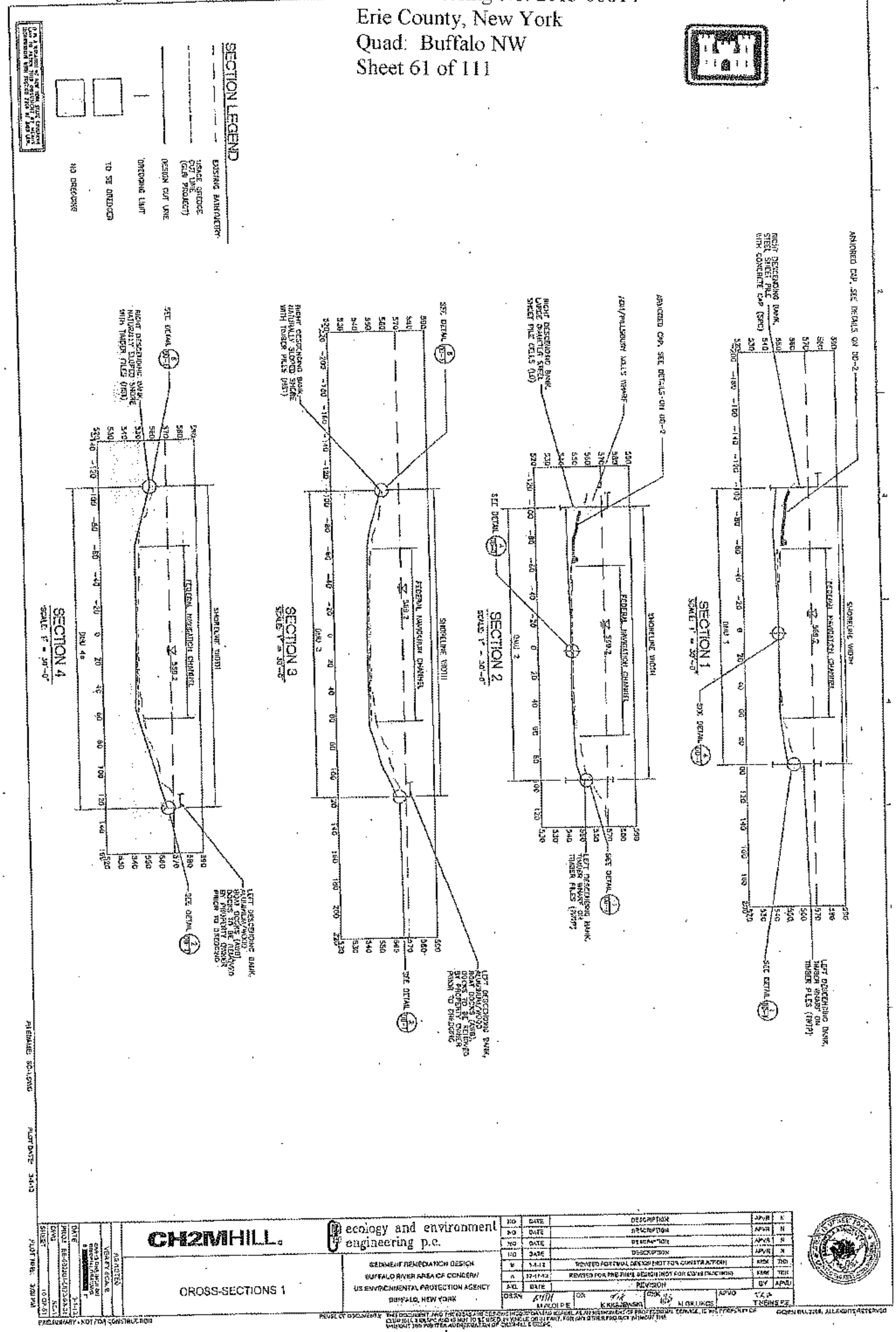
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 59(58A) of 111



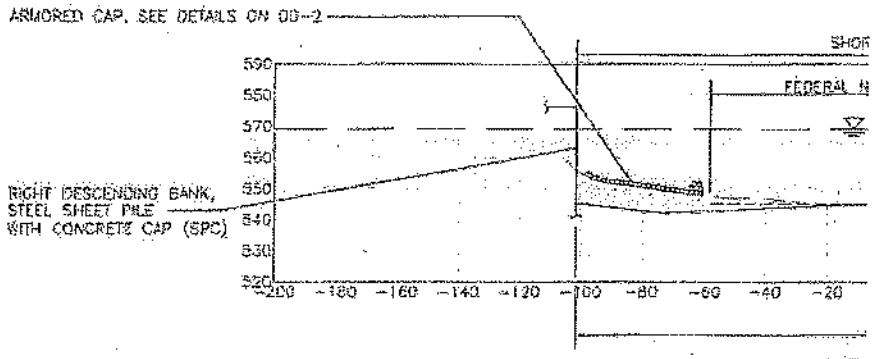

NAVAL PARK
NO ENVIRONMENTAL DREDGING (N.I.C.)
GROUTED SLOPED STONE SHORE (GSSS)
DMU 45c
LIMIT DREDGING SEE DETAIL
NO DREDGING
BSA-1
UNCLASSIFIED
U
NO ENVIRONMENTAL DREDGING (N.I.C.)
DMU 7b
UNCLASSIFIED
DMU 7c
ALUMINUM/WOOD BOAT DOCKS (AWB)
DMU 45b - HOLD ON DREDGING UNTIL NOTIFIED BY OWNER'S REPRESENTATIVE
ANCHORED STEEL SHEET PILE PILE WALL (ASP)
COBBLE AND GRAVEL SHORELINE (CGS)
MATCH STATION 802+00 SEE DO-2 FOR CONTINUATION
800+00
802+00
510+00
515+00
505+00
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
CH2MHILL
DREDGING OPERATIONS 10
AS NOTED
VERIFY SCALE
DATE 3-1-13
DWG DO-10
SHEET 18 OF 51
FILENAME: DO-1.DWG
PLOT DATE: 3-1-13
PLOT TIME: 3:00 PM

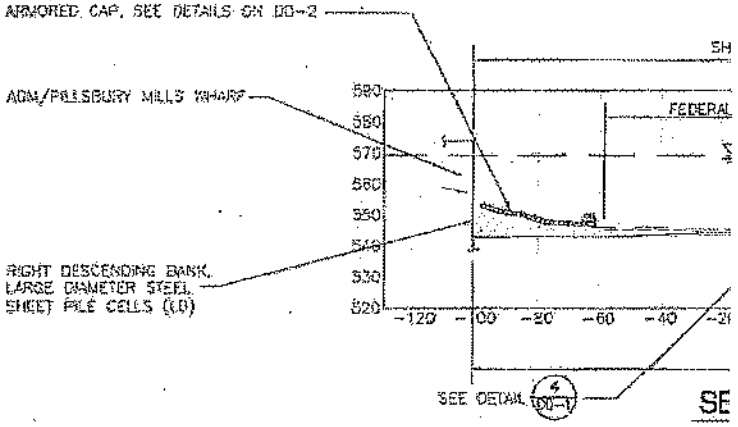
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 60(58B) of 111

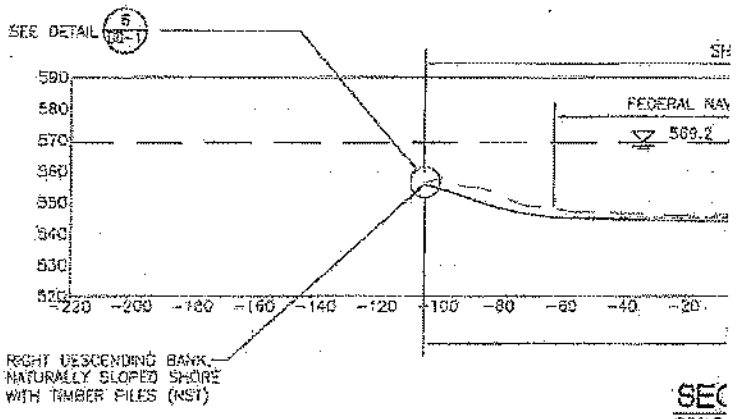
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 61 of 111

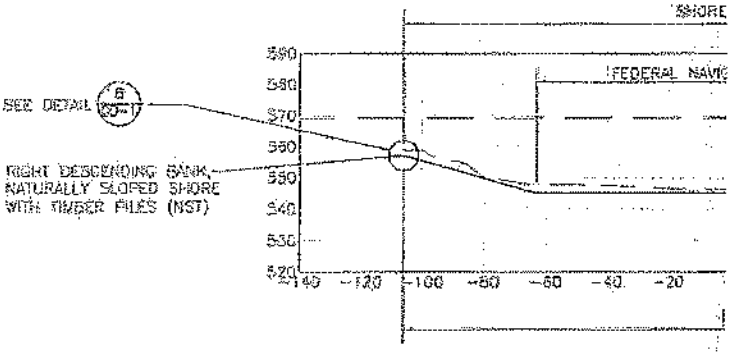


SECTION LEGEND
EXISTING BATHYMETRY
USACE DREDGE CUT LINE (GLB PROJECT)
DESIGN CUT LINE
DREDGING LIMIT
TO BE DREDGED
NO DREDGING
SECTION 1
SCALE: 1" = 30'-0"
SECTION 2
SCALE: 1" = 30'-0"
SECTION 3
SCALE: 1" = 30'-0"
SECTION 4
SCALE: 1" = 30'-0"
SHORELINE WIDTH
FEDERAL NAVIGATION CHANNEL
ARMORED CAP, SEE DETAILS ON DD-2
RIGHT DESCENDING BANK, STEEL SHEET PILE WITH CONCRETE CAP (SPC)
LEFT DESCENDING BANK, TIMBER WHARF ON TIMBER PILES (TWTP)
RIGHT DESCENDING BANK, NATURALLY SLOPED SHORE WITH TIMBER PILES (NST)
CH2MHILL.
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
CROSS-SECTIONS 1
REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)
REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)
PRELIMINARY - NOT FOR CONSTRUCTION



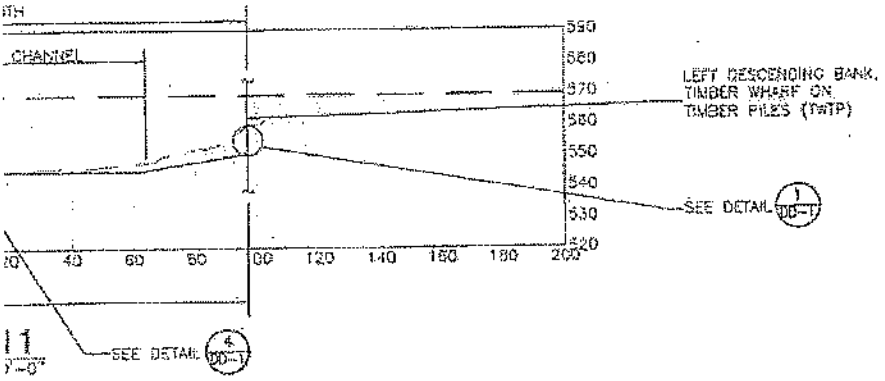


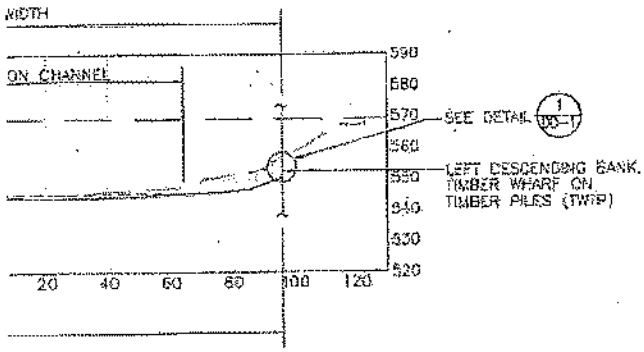


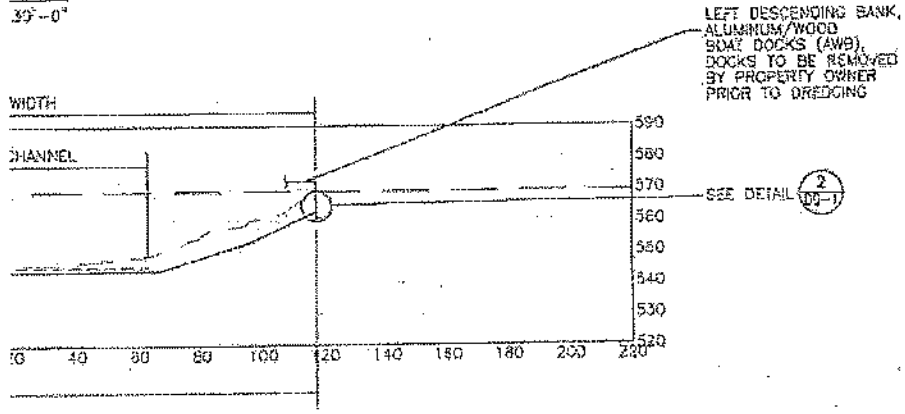


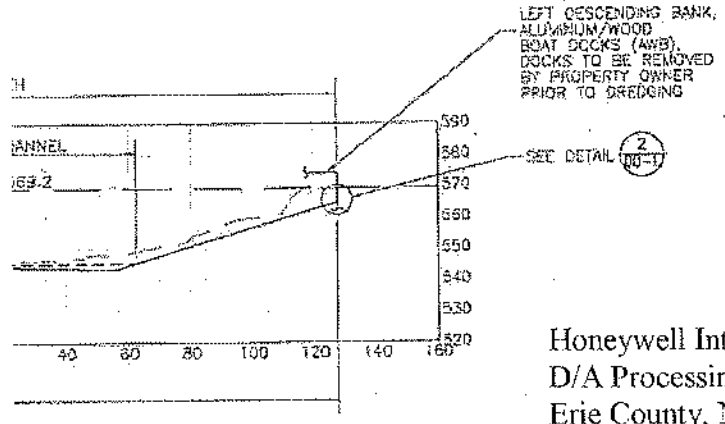
SECTION LEGEND

- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE (GLRI PROJECT)
- DESIGN CUT LINE
- DREDGING LIMIT
- TO BE DREDGED
- NO DREDGING









Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 63(61B) of 111

NO	DATE	DESCRIPTION	APVR
NO	DATE	DESCRIPTION	APVR
NO	DATE	DESCRIPTION	APVR
NO	DATE	DESCRIPTION	APVR
B	3-1-13	RE-VISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK
A	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK
NO.	DATE	REVISION	BY
DESIGN	DR	CHK	APVD
M ALOTTA P.E.	K KRAJEWSKI	M GILLINGS	T THEINS P.E.

ecology and environment engineering p.c.

CH2MHILL

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CROSS-SECTIONS 1

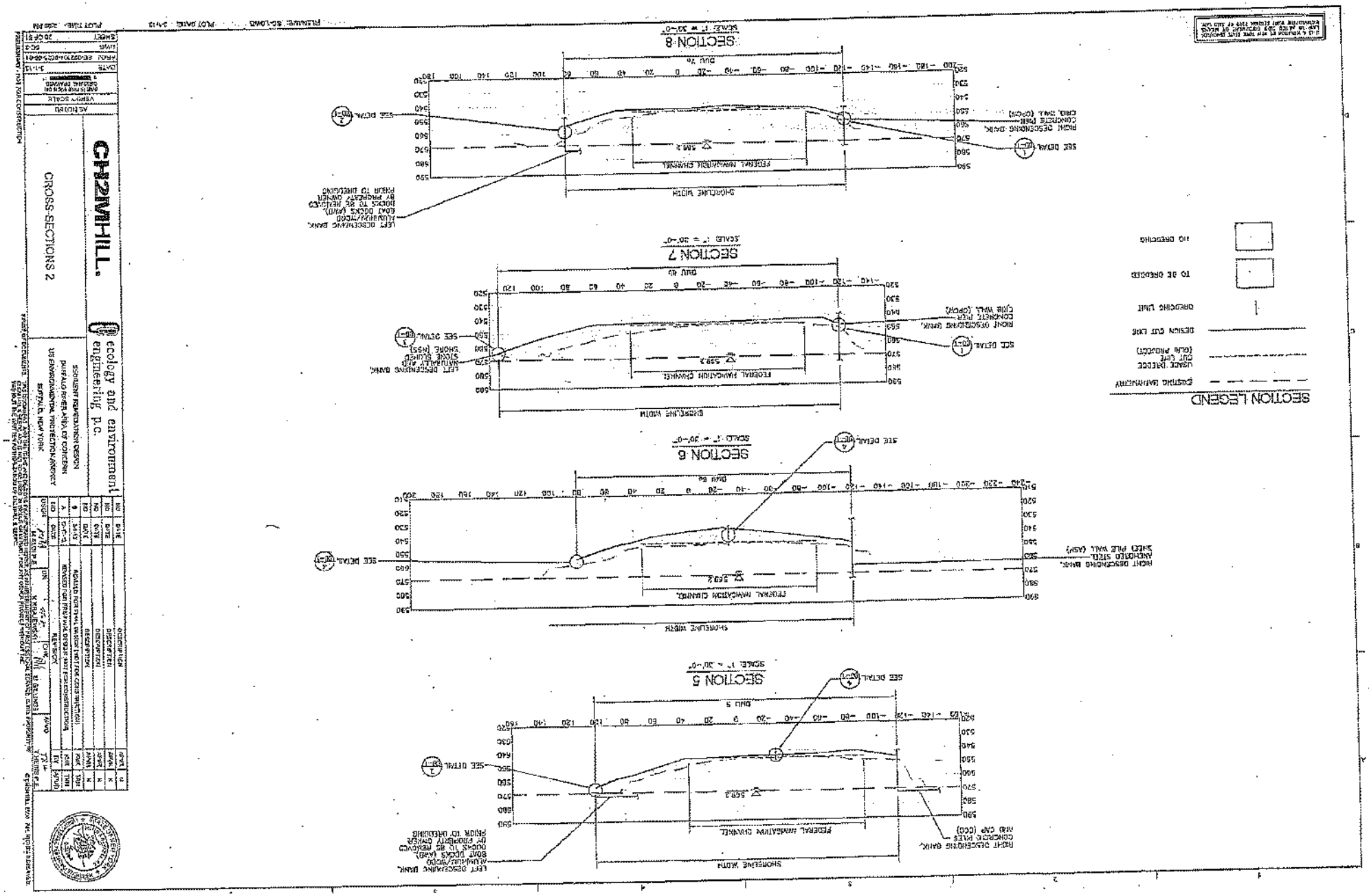
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ADJUST SCALE ACCORDINGLY

DATE 3-1-13
PROJ EE-002304-0023-06-01
DWG SC-1
SHEET 18 OF 51

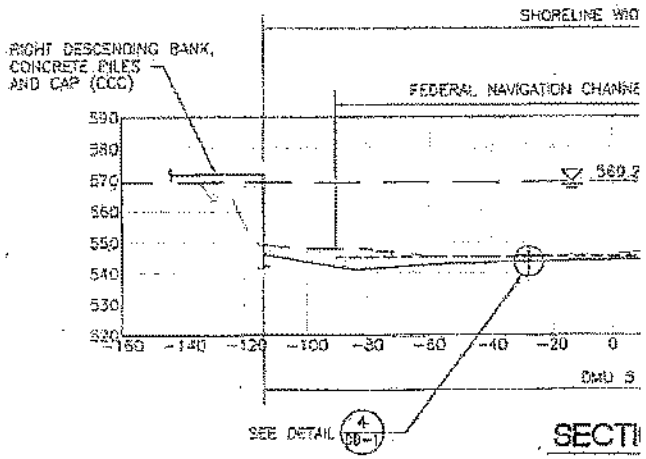
PLOT TIME: 3:00 PM

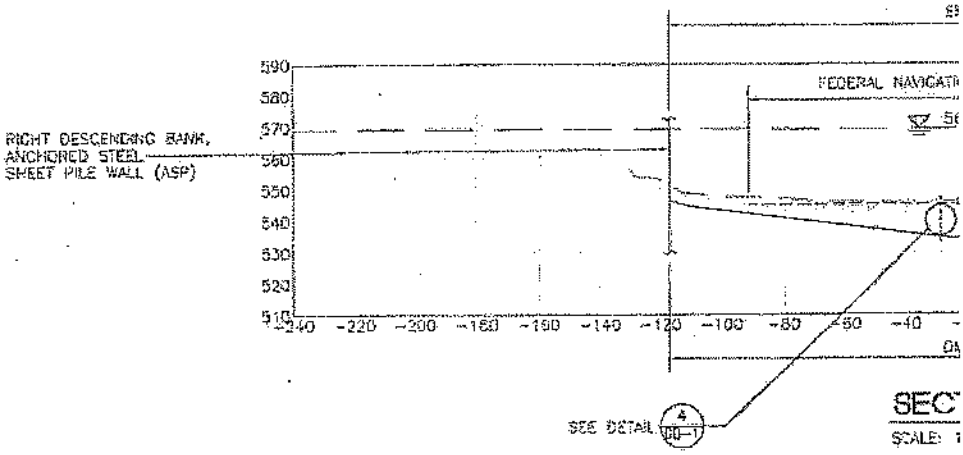
PRELIMINARY - NOT FOR CONSTRUCTION

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 64 of 111



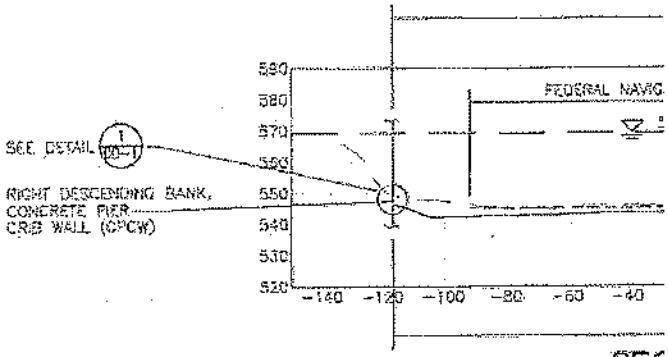
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 65(64A) of 111

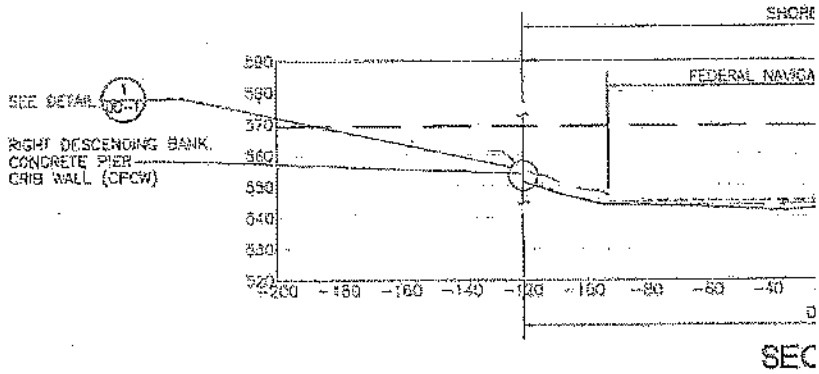




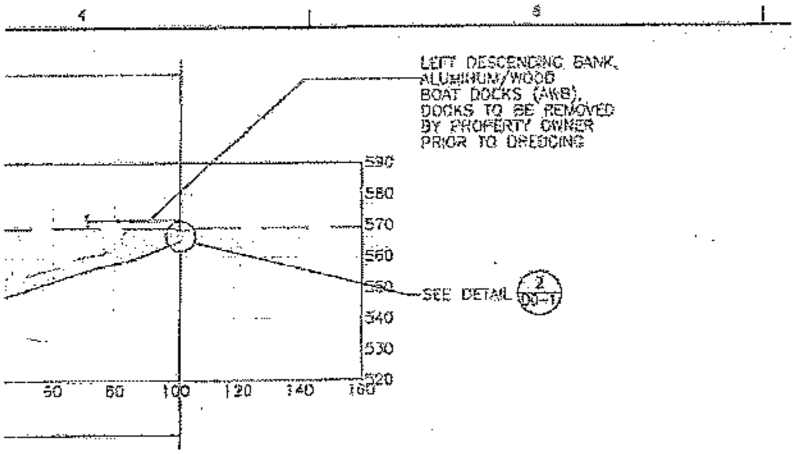
SECTION LEGEND

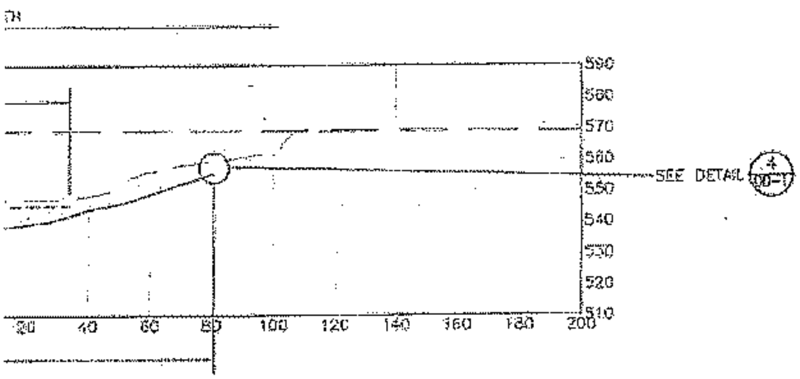
- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE, (GLRI PROJECT)
- DESIGN CUT LINE
- DREDGING LIMIT
- TO BE DREDGED
- NO DREDGING

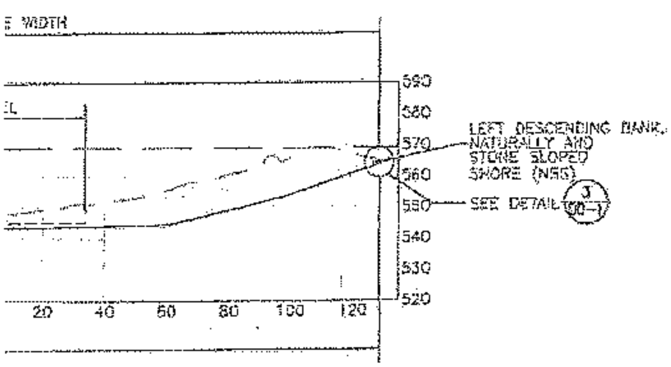


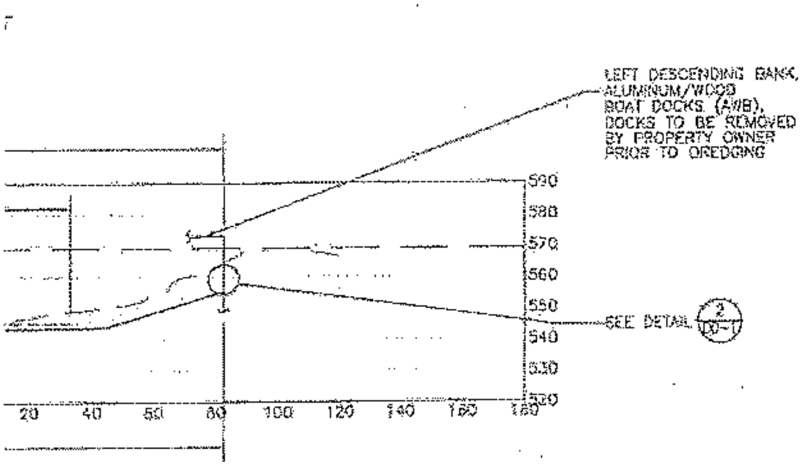


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 66(64B) of 111









CH2MHILL

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CROSS-SECTIONS 2

NO	DATE	DESCRIPTION	BY	APVD
B	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M MALOIR P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

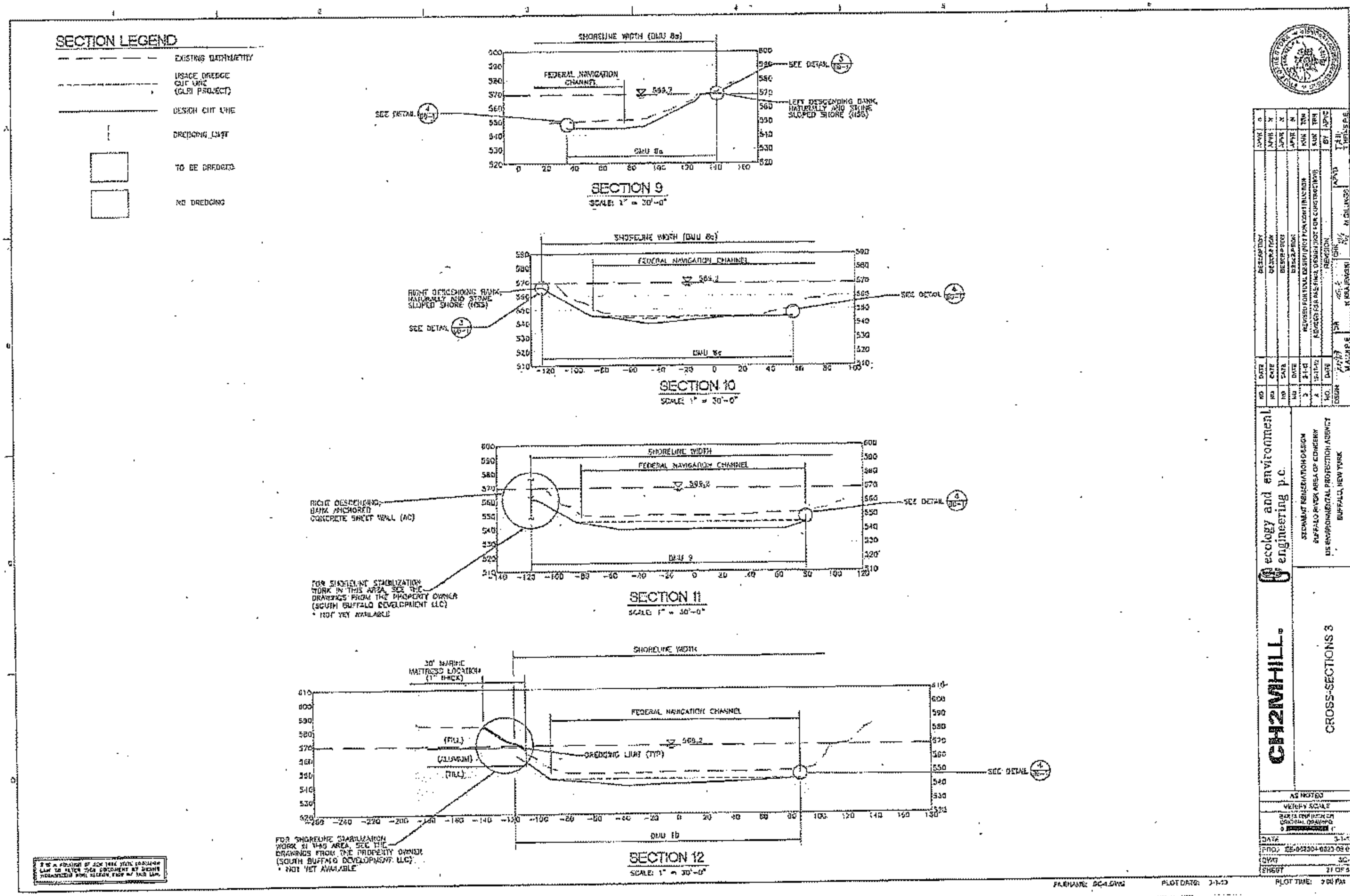
REUSE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL & EEEPC AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL & EEEPC

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE	3-1-13
PROJ	EE-002304-0023-08-01
DWG	SC-2
SHEET	20 OF 51

PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME: SC-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM


SECTION LEGEND
EXISTING BATHYMETRY
USACE DREDGE CUT LINE (GLRI PROJECT)
DESIGN CUT LINE
DREDGING LIMIT
TO BE DREDGED
NO DREDGING
SHORELINE WIDTH (DMU 8a)
FEDERAL NAVIGATION CHANNEL
569.2
SEE DETAIL
LEFT DESCENDING BANK, NATURALLY AND STONE SLOPED SHORE (NSS)
DMU 8a
SECTION 9
SCALE: 1" = 30'-0"
SHORELINE WIDTH (DMU 8c)
RIGHT DESCENDING BANK, NATURALLY AND STONE SLOPED SHORE (NSS)
DMU 8c
SECTION 10
SCALE: 1" = 30'-0"
SHORELINE WIDTH
RIGHT DESCENDING BANK ANCHORED CONCRETE SHEET WALL (AC)
FOR SHORELINE STABILIZATION WORK IN THIS AREA, SEE THE DRAWINGS FROM THE PROPERTY OWNER (SOUTH BUFFALO DEVELOPMENT LLC)
* NOT YET AVAILABLE
DMU 9
SECTION 11
SCALE: 1" = 30'-0"
30' MARINE MATTRESS LOCATION (1" THICK)
(FILL)
(ALLUVIUM)
(TILL)
DREDGING LIMIT (TYP)
DMU 1b
SECTION 12
SCALE: 1" = 30'-0"
CH2MHILL
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
CROSS-SECTIONS 3
AS NOTED
VERIFY SCALE
PLOT TIME:
PLOT DATE:

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 67 of 111

SECTION LEGEND

EXISTING BATHYMETRY

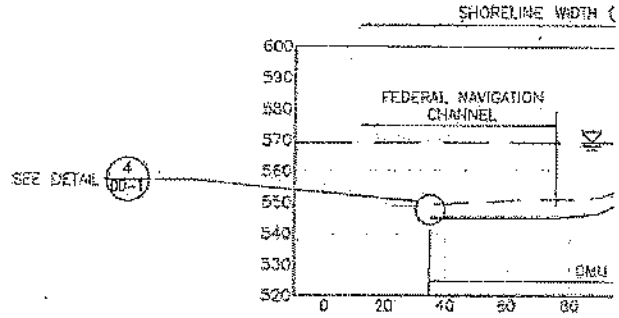
USACE DREDGE CUT LINE (GLRI PROJECT)

DESIGN CUT LINE

DREDGING LIMIT

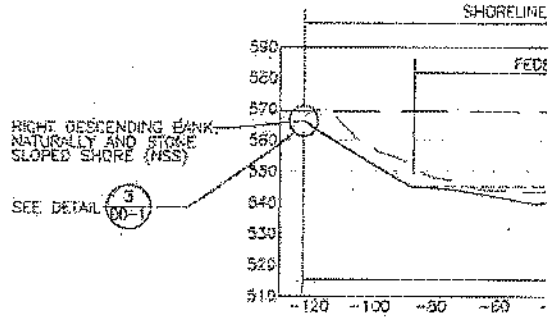
TO BE DREDGED

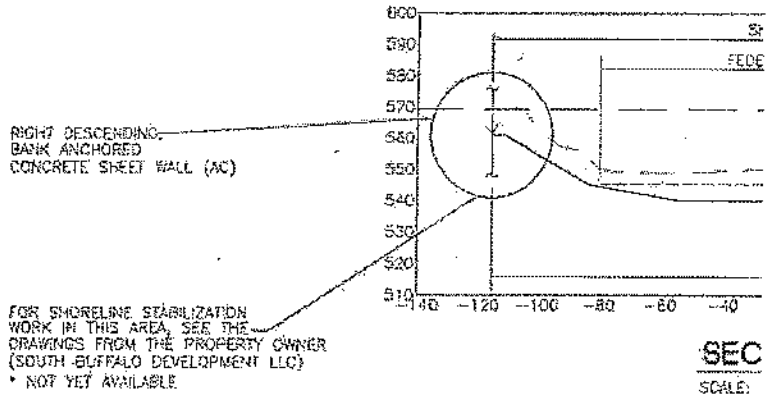
NO DREDGING



SECTION

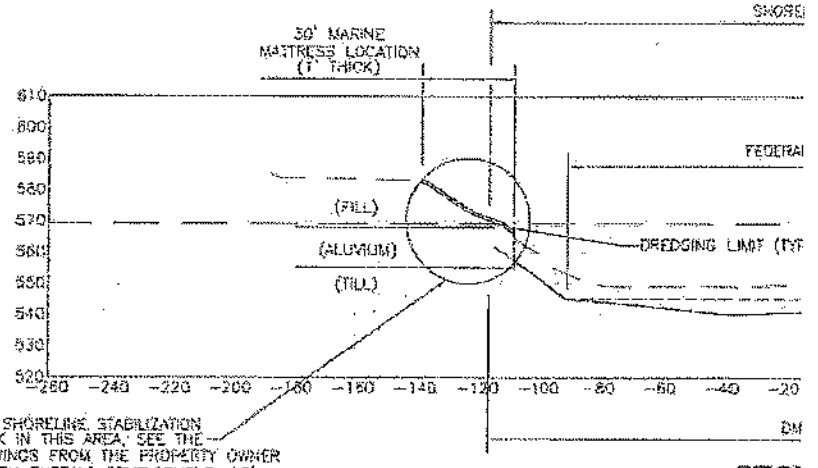
SCALE: 1" = 30'





SEC

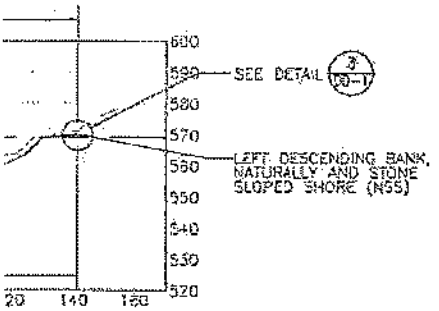
SCALE:

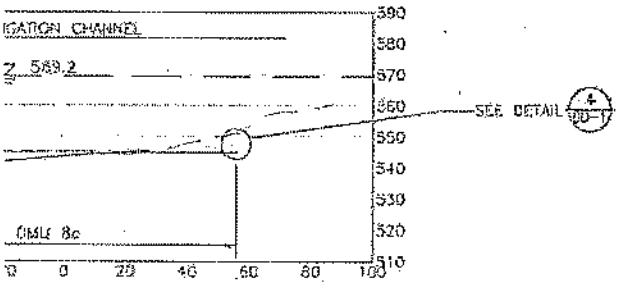


SEC

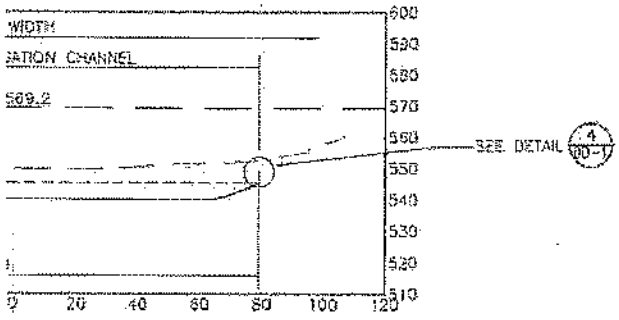
SCALE:

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 69(67B) of 111

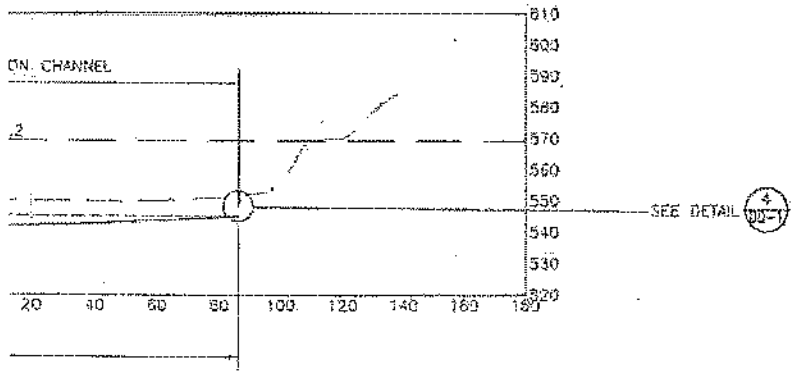




TION 10
1" = 30'-0"



11
-0"



2
0"

NO.	DATE	DESCRIPTION	DR	CHK	APVD
NO	DATE	DESCRIPTION	APVR		N
NO	DATE	DESCRIPTION	APVR		N
NO	DATE	DESCRIPTION	APVR		N
B	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK		TRH
A	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK		TRH
NO.	DATE	REVISION	BY		APVD
DESIGN		K KRAJEWSKI	M GILLINESS		T HEINS P.E.
		M AUG P.E.			

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

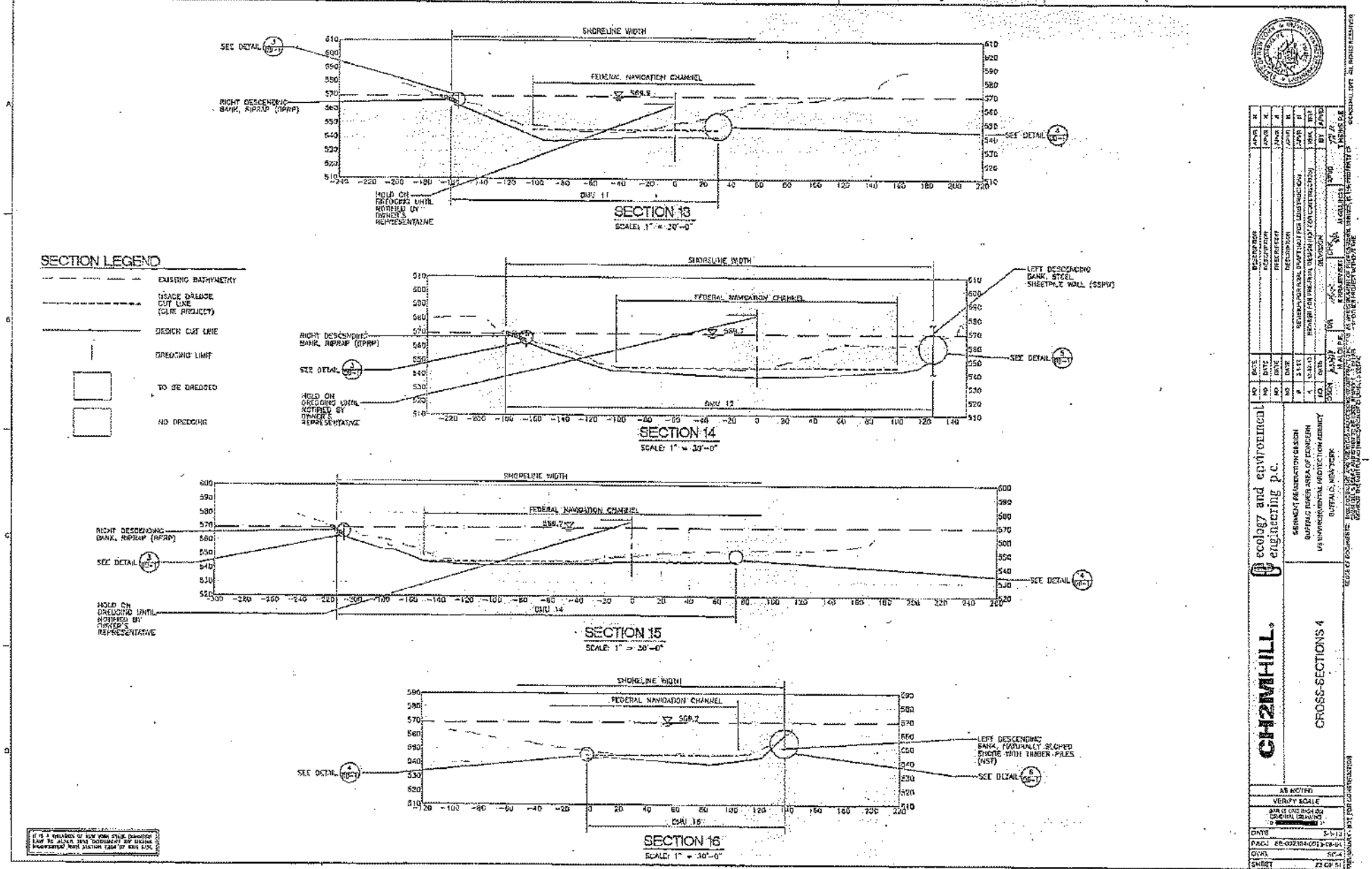
CH2MHILL

CROSS-SECTIONS 3

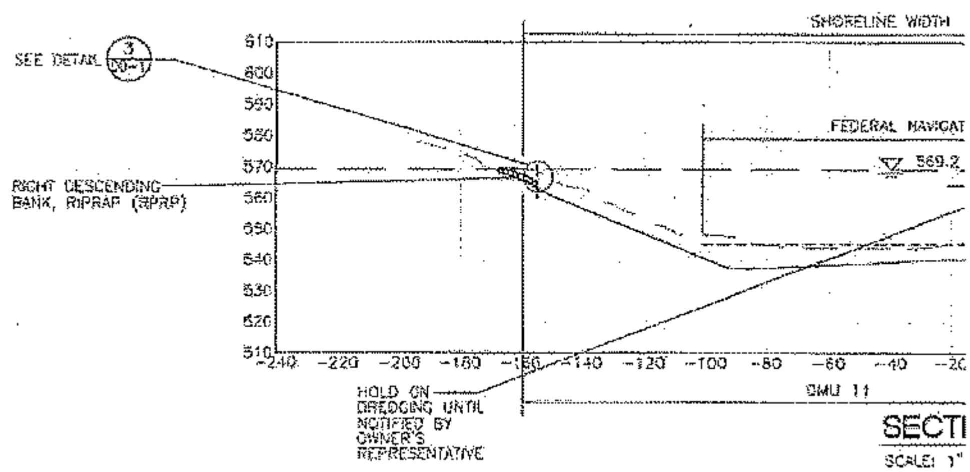
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

DATE 3-1-13
PROJ EE-052304-2023-08.01
DWG SC-3
SHEET 21 OF 51

FILENAME: SC-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

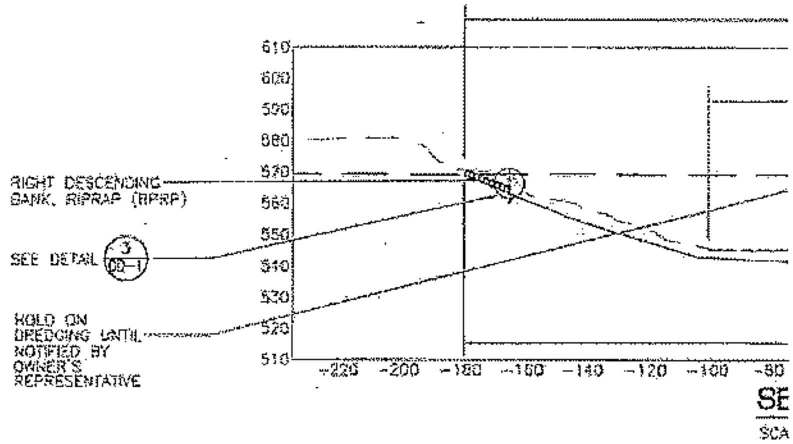


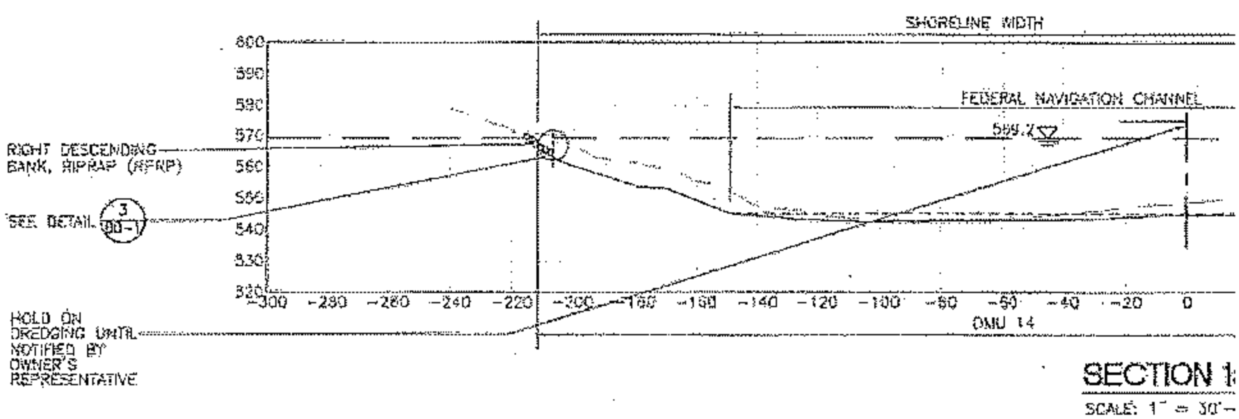
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 70 of 111

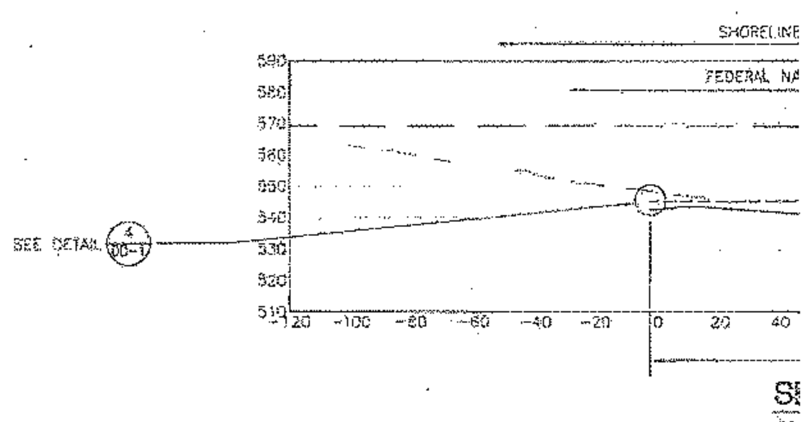


SECTION LEGEND

— — — —	EXISTING BATHYMETRY
- - - - - - -	USACE DREDGE CUT LINE (CLRI PROJECT)
———	DESIGN CUT LINE
⋮	DREDGING LIMIT
☐	TO BE DREDGED
☐	NO DREDGING

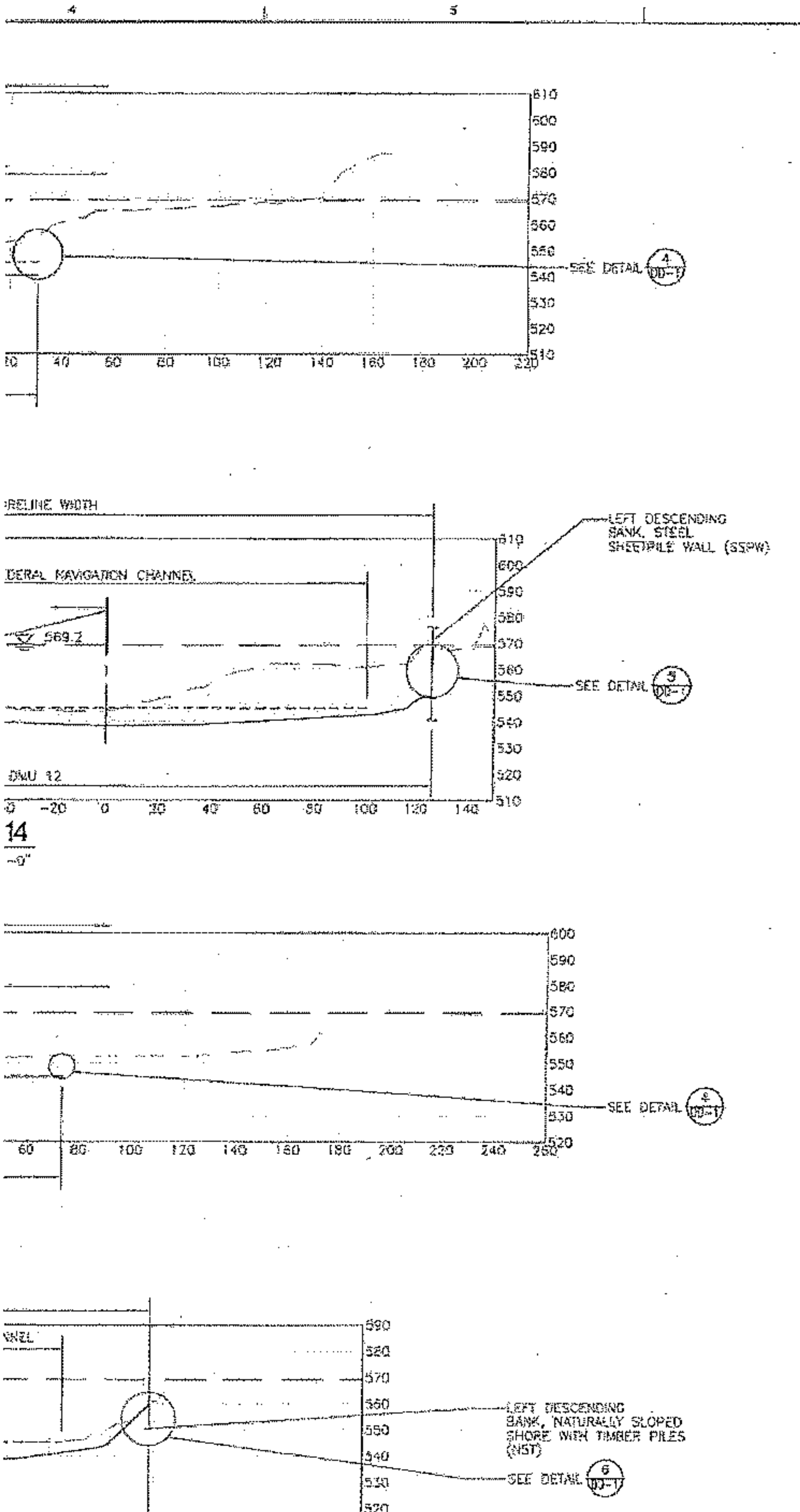


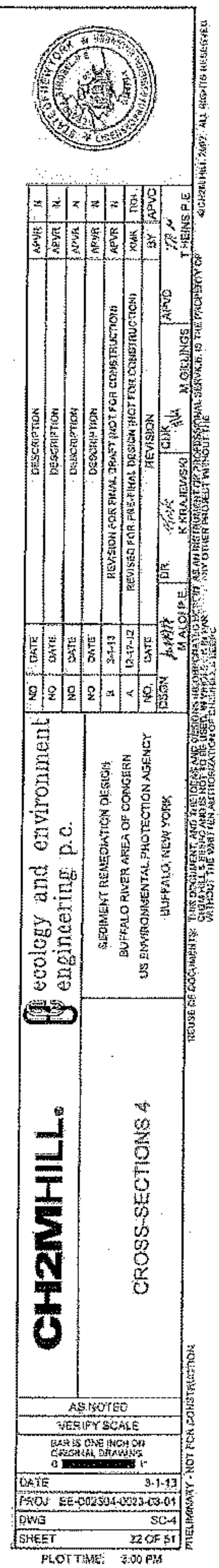




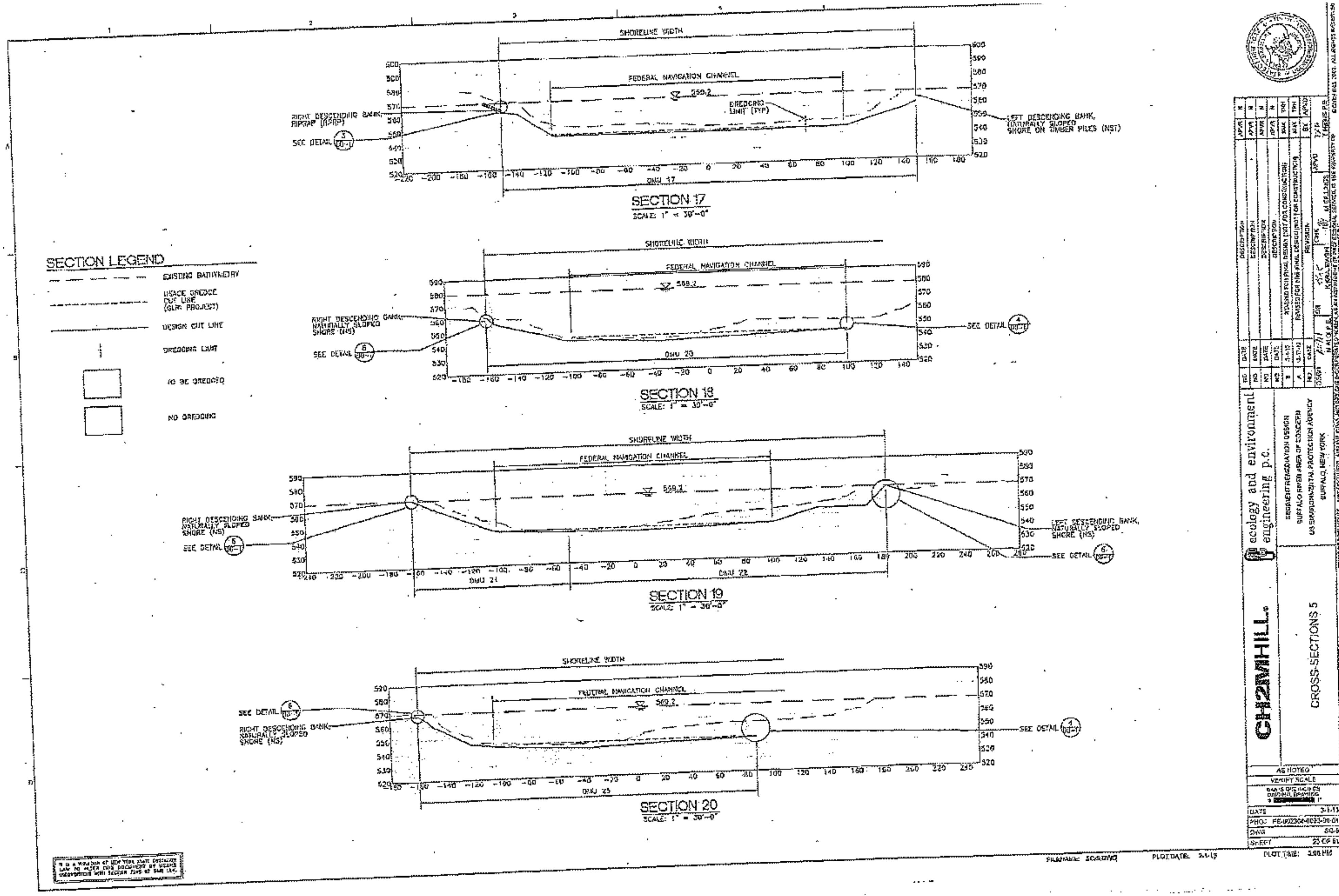
IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 71(70A) of 111



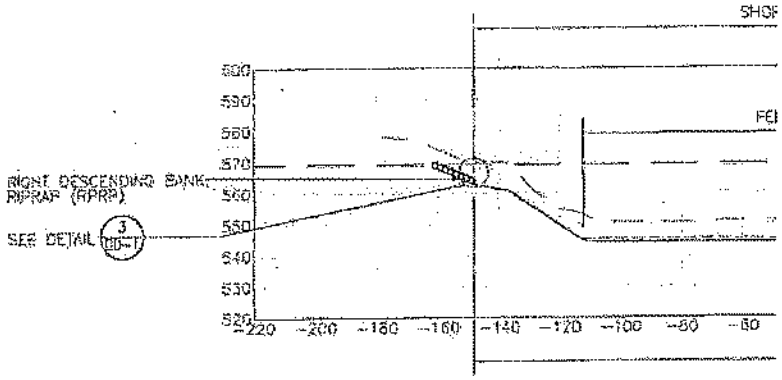


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 72(70B) of 111


SECTION 17
SCALE: 1" = 30'-0"
SHORELINE WIDTH
FEDERAL NAVIGATION CHANNEL
569.2
DREDGING LIMIT (TYP)
RIGHT DESCENDING BANK, RIPRAP (RPRP)
LEFT DESCENDING BANK, NATURALLY SLOPED SHORE ON TIMBER PILES (NST)
SEE DETAIL
DMU 17
SECTION 18
SCALE: 1" = 30'-0"
RIGHT DESCENDING BANK, NATURALLY SLOPED SHORE (NS)
DMU 20
SECTION 19
SCALE: 1" = 30'-0"
DMU 21
DMU 22
569.1
LEFT DESCENDING BANK, NATURALLY SLOPED SHORE (NS)
SECTION 20
SCALE: 1" = 30'-0"
DMU 23
SECTION LEGEND
EXISTING BATHYMETRY
USACE DREDGE CUT LINE (GLRI PROJECT)
DESIGN CUT LINE
DREDGING LIMIT
TO BE DREDGED
NO DREDGING
CH2MHILL
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
CROSS-SECTIONS 5
AS NOTED
VERIFY SCALE
DATE 3-1-13
PLOT TIME: 3:08 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 73 of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 74(73A) of 111



SECTION LEGEND

EXISTING BATHYMETRY

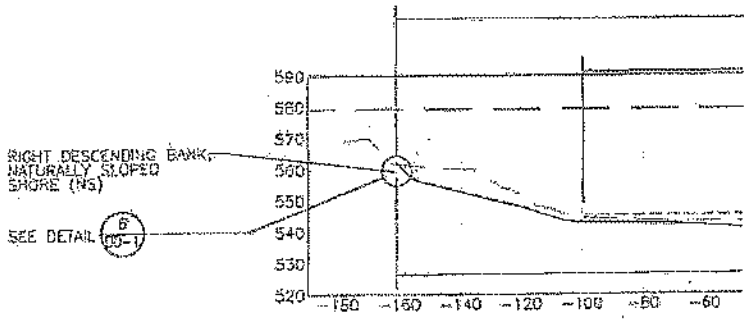
USACE DREDGE CUT LINE (GLRI PROJECT)

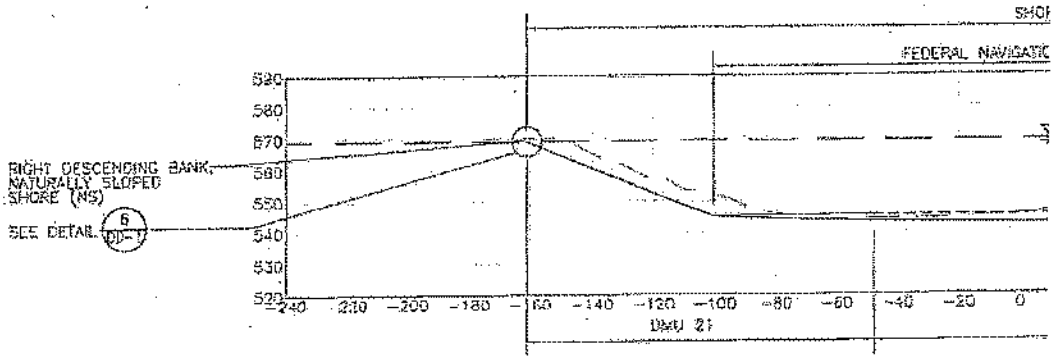
DESIGN CUT LINE

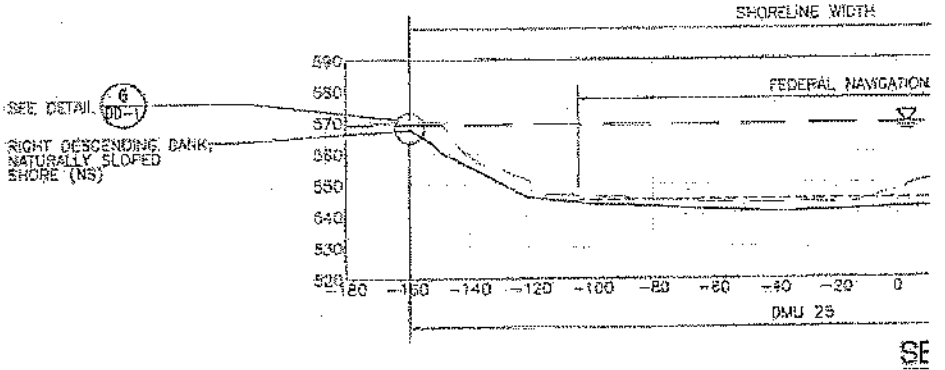
DREDGING LIMIT

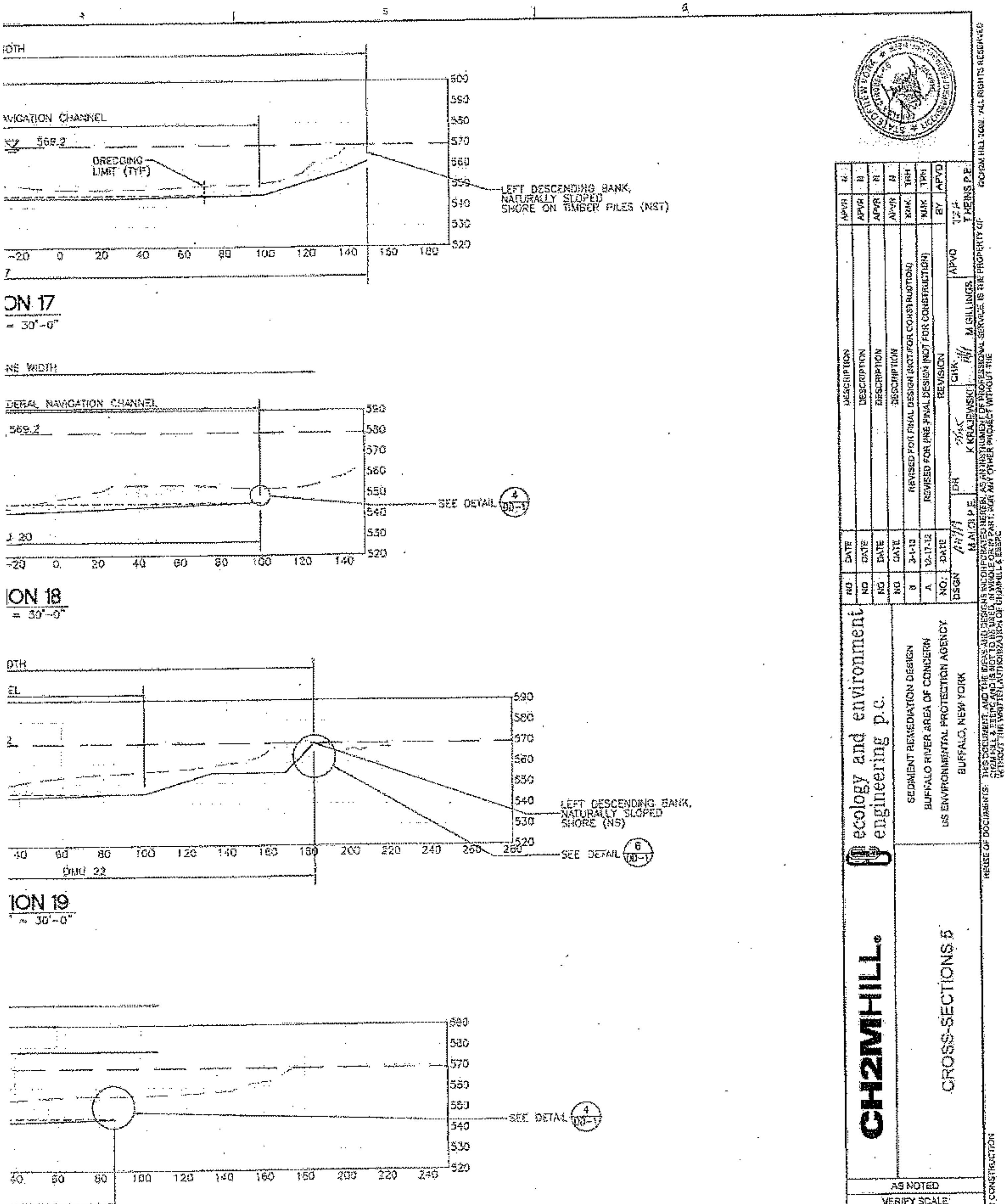
TO BE DREDGED

NO DREDGING

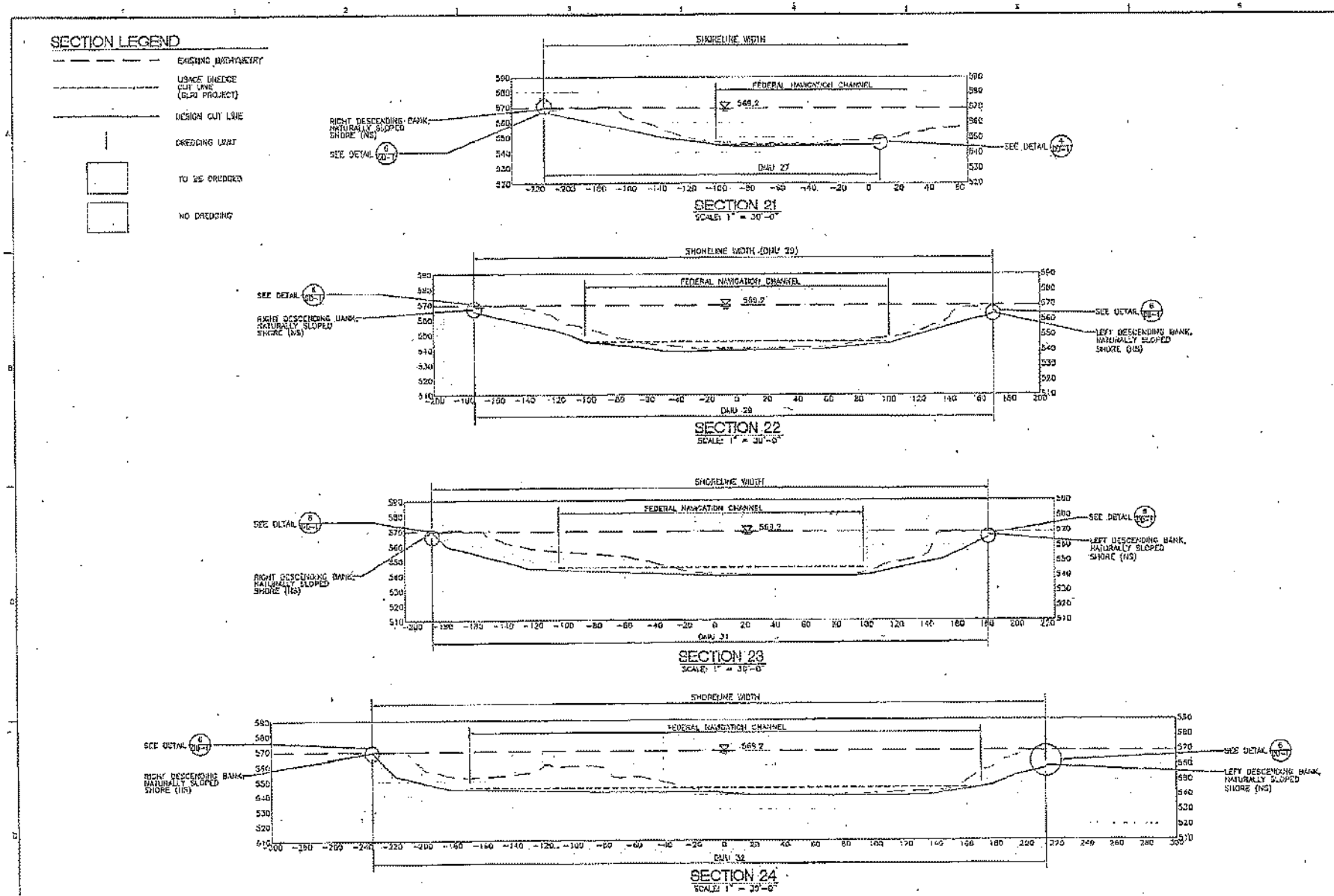







NAVIGATION CHANNEL
569.2
DREDGING LIMIT (TYP)
LEFT DESCENDING BANK, NATURALLY SLOPED SHORE ON TIMBER PILES (NST)
ON 17
= 30'-0"
FEDERAL NAVIGATION CHANNEL
SEE DETAIL
ION 18
= 30'-0"
LEFT DESCENDING BANK, NATURALLY SLOPED SHORE (NS)
SEE DETAIL
DMU 22
ION 19
= 30'-0"
SEE DETAIL
N 20
30'-0"
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)
REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)
K KRAJEWSKI
M GILLINGS
T HEINS P.E.
CH2MHILL
CROSS-SECTIONS 5
AS NOTED
VERIFY SCALE
PRELIMINARY - NOT FOR CONSTRUCTION

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 75(73B) of 111



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
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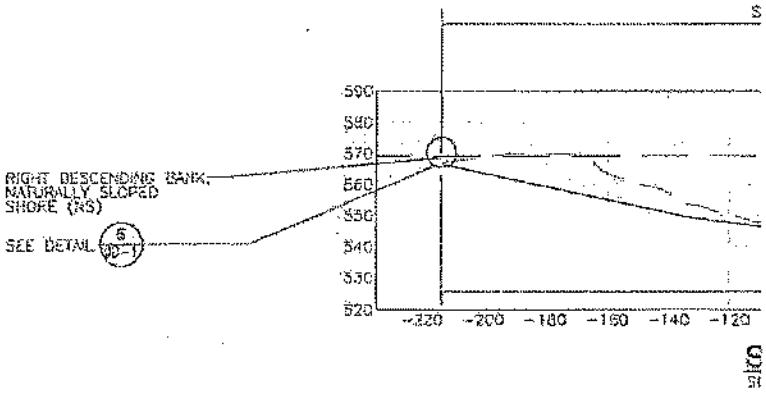
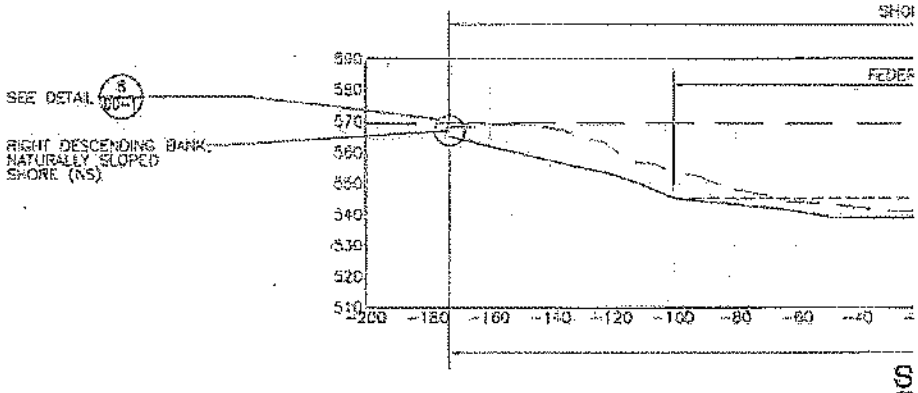
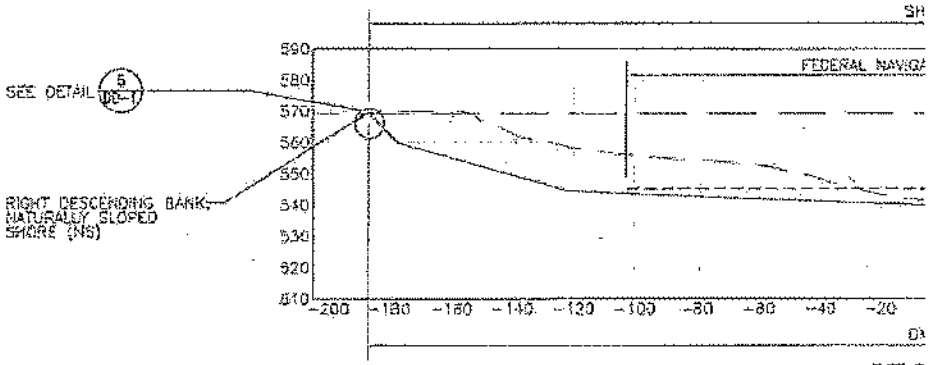
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 77(76A) of 111

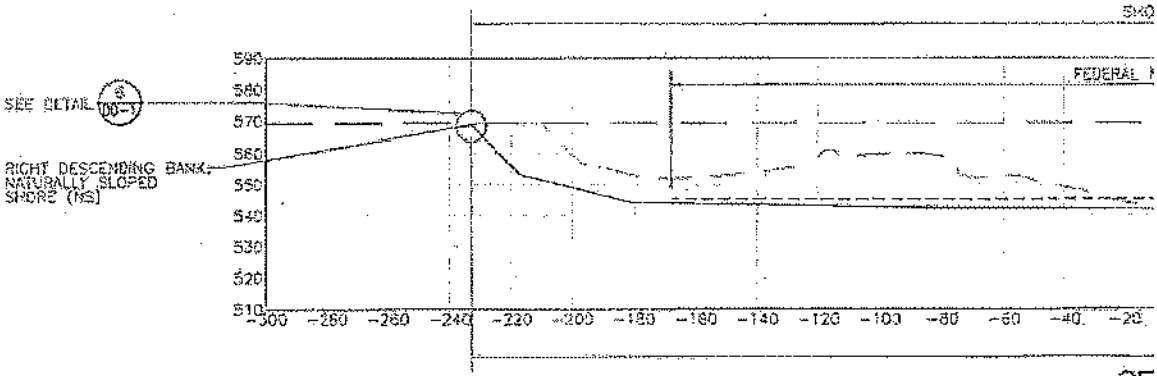
SECTION LEGEND

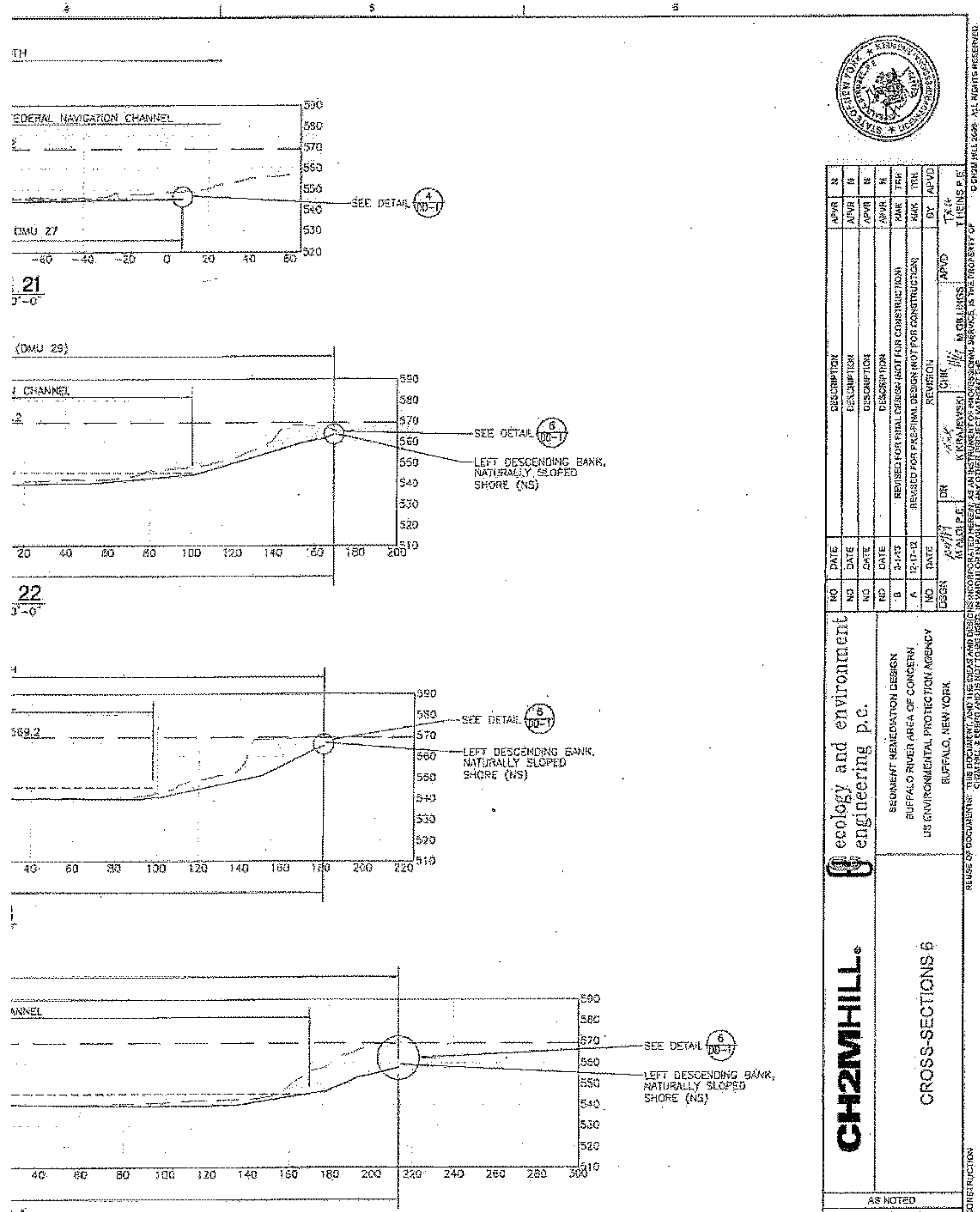
- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE (GLRI PROJECT)
- DESIGN CUT LINE
- DREDGING LIMIT
- TO BE DREDGED
- NO DREDGING







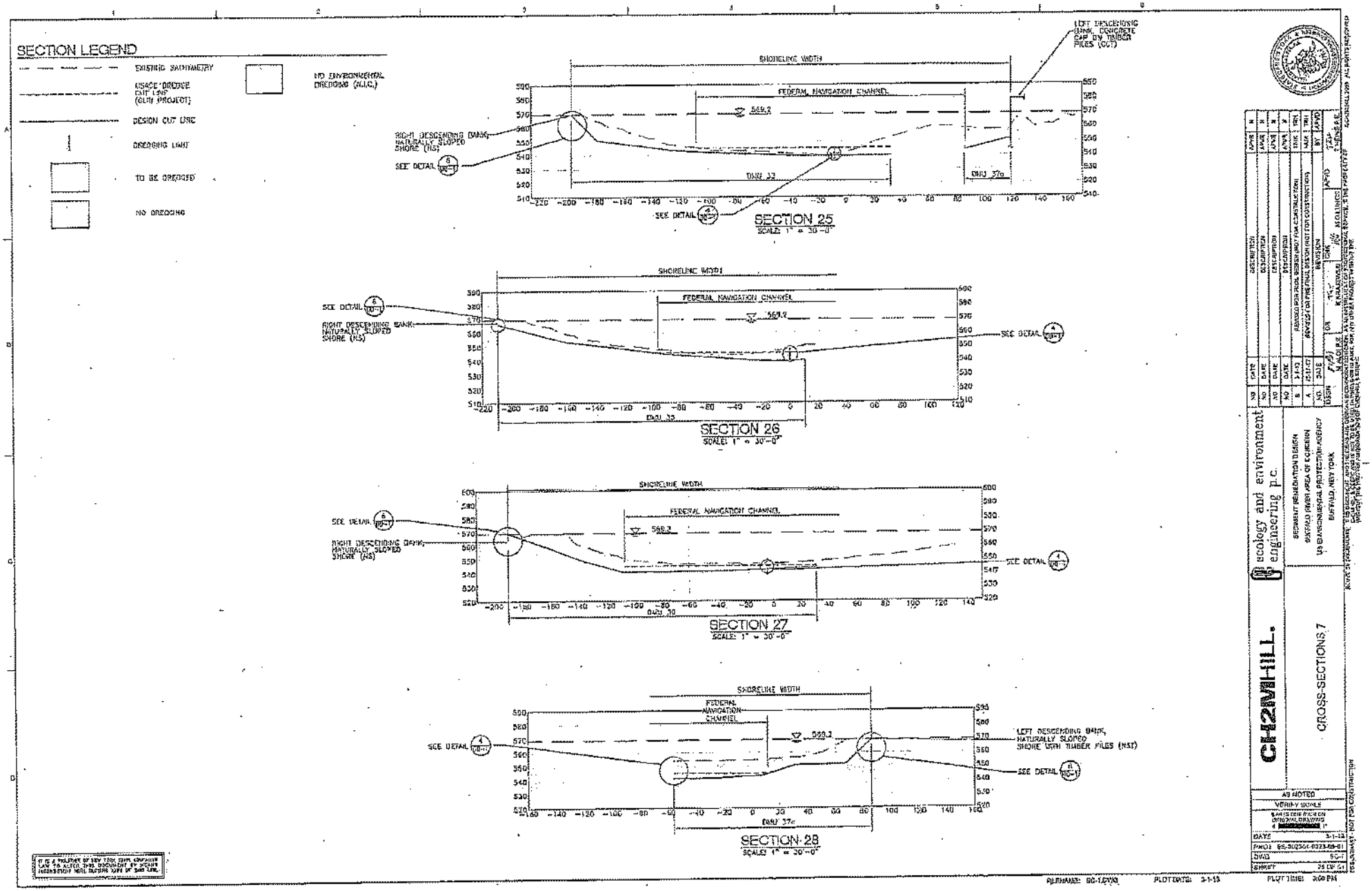




FEDERAL NAVIGATION CHANNEL
DMU 27
SEE DETAIL 4 DD-1
21
(DMU 29)
CHANNEL
SEE DETAIL 6 DD-1
LEFT DESCENDING BANK, NATURALLY SLOPED SHORE (NS)
22
SEE DETAIL 6 DD-1
LEFT DESCENDING BANK, NATURALLY SLOPED SHORE (NS)
SEE DETAIL 6 DD-1
LEFT DESCENDING BANK, NATURALLY SLOPED SHORE (NS)
24
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)
REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)
CH2MHILL
CROSS-SECTIONS 6
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE 3-1-13
DWG SC-6
SHEET 24 OF 51
PRELIMINARY - NOT FOR CONSTRUCTION

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 78(76B) of 111

FILENAME: SC-6.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM



Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 79 of 111

SECTION LEGEND

EXISTING BATHYMETRY

USACE DREDGE CUT LINE (GLRI PROJECT)

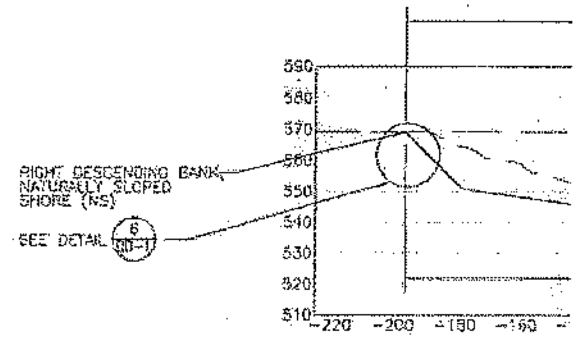
DESIGN CUT LINE

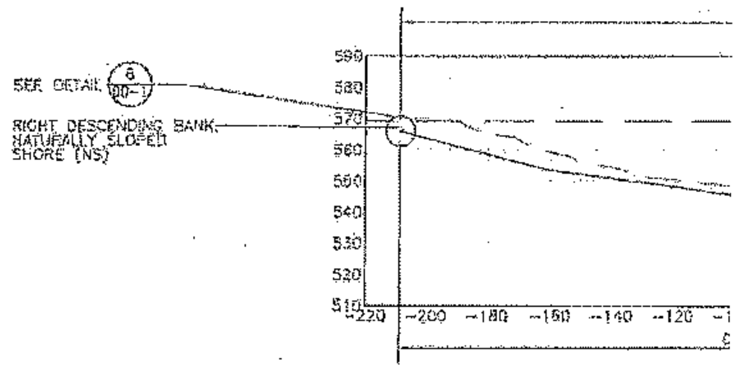
DREDGING LIMIT

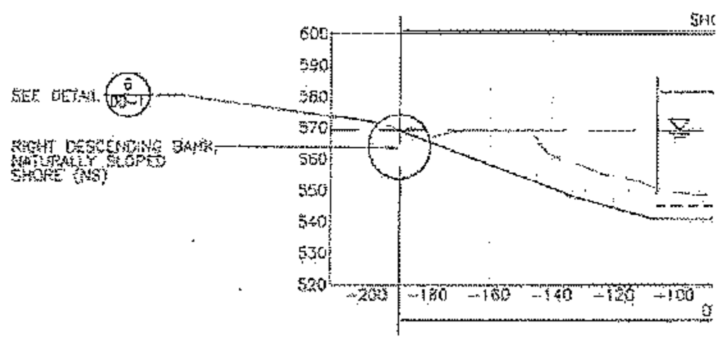
TO BE DREDGED

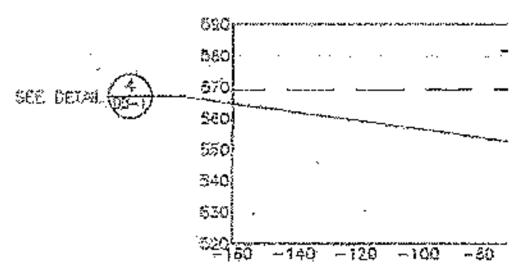
NO DREDGING

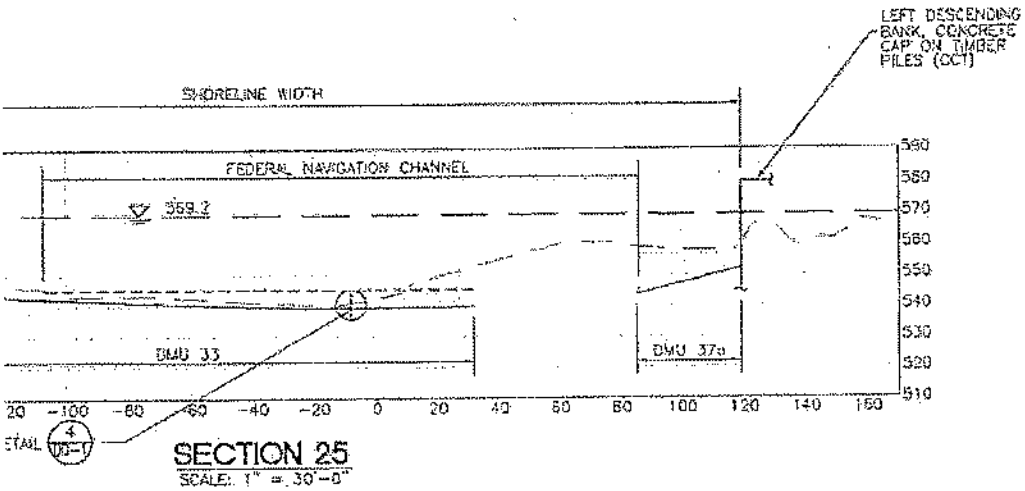
NO ENVIRONMENTAL DREDGING (N.I.C.)



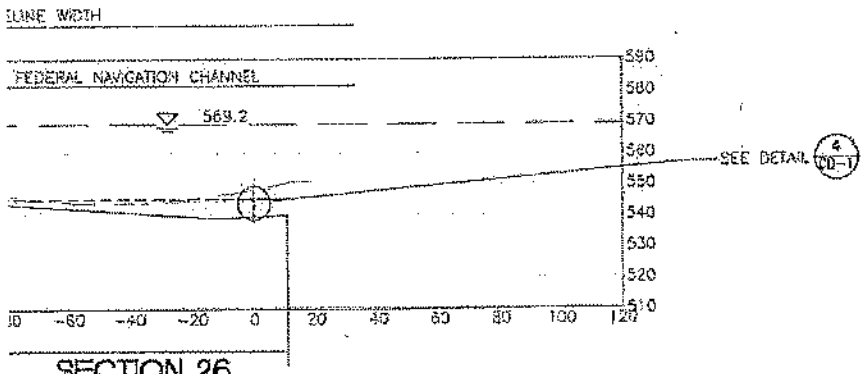




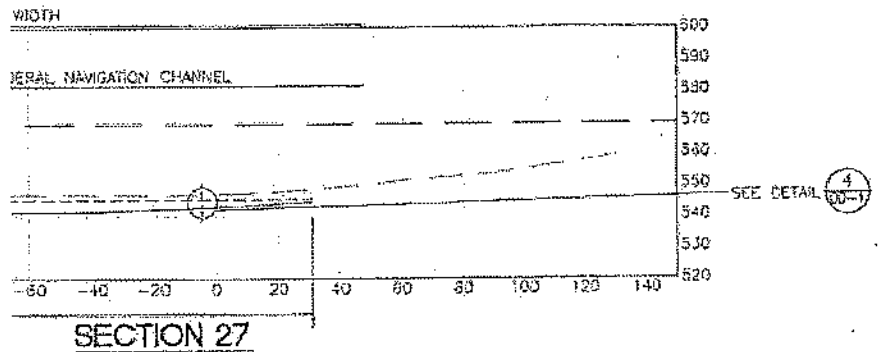




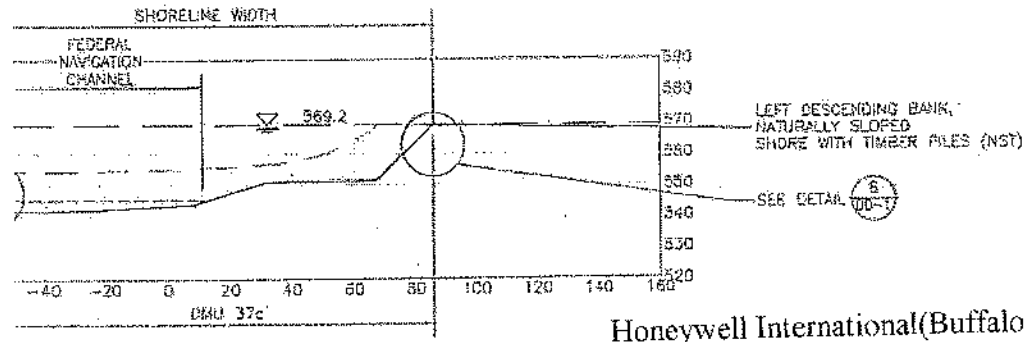
SECTION 25
SCALE: 1" = 30'-0"



SECTION 26
SCALE: 1" = 30'-0"



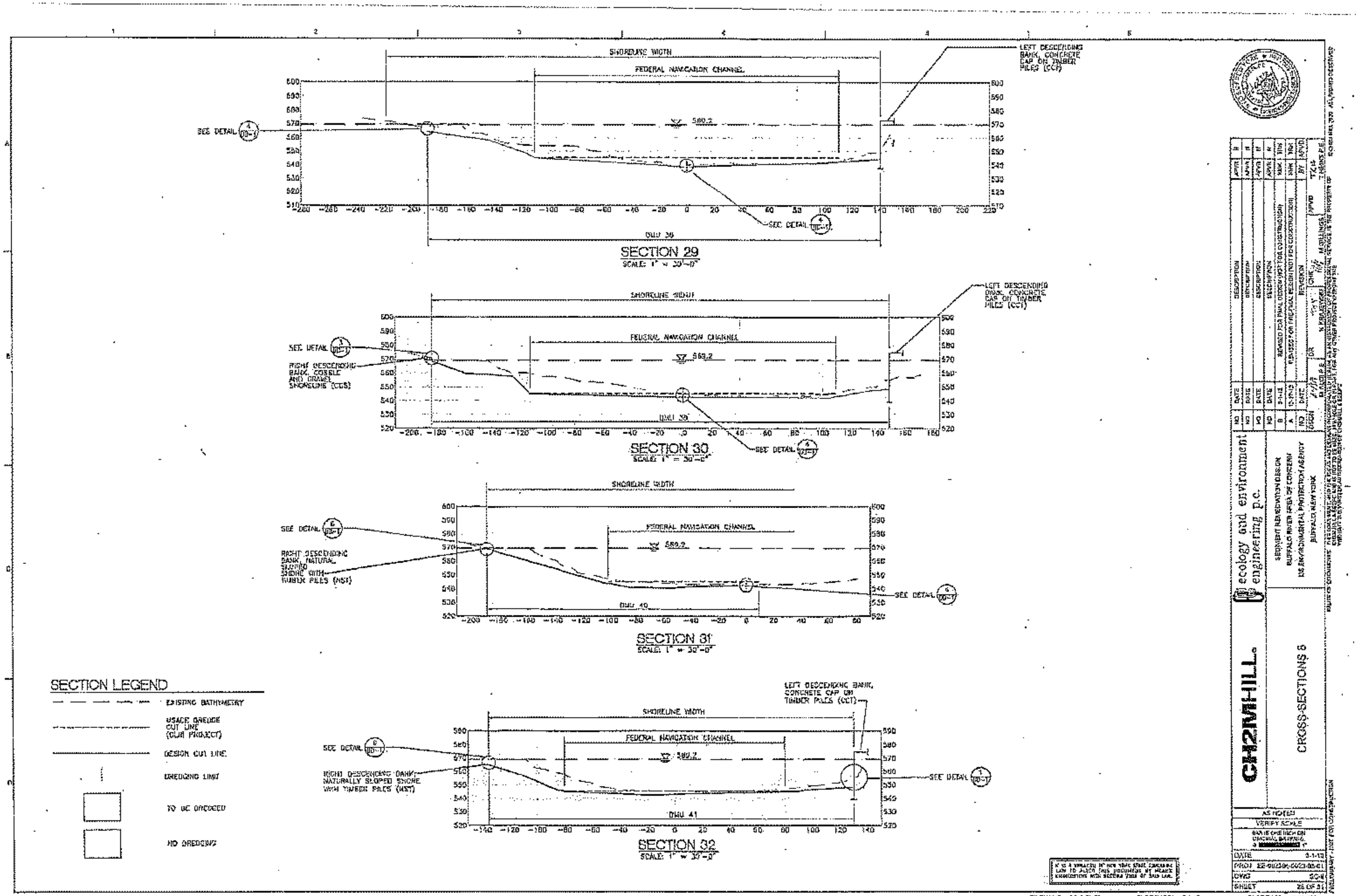
SECTION 27
SCALE: 1" = 30'-0"



SECTION 28
SCALE: 1" = 30'-0"

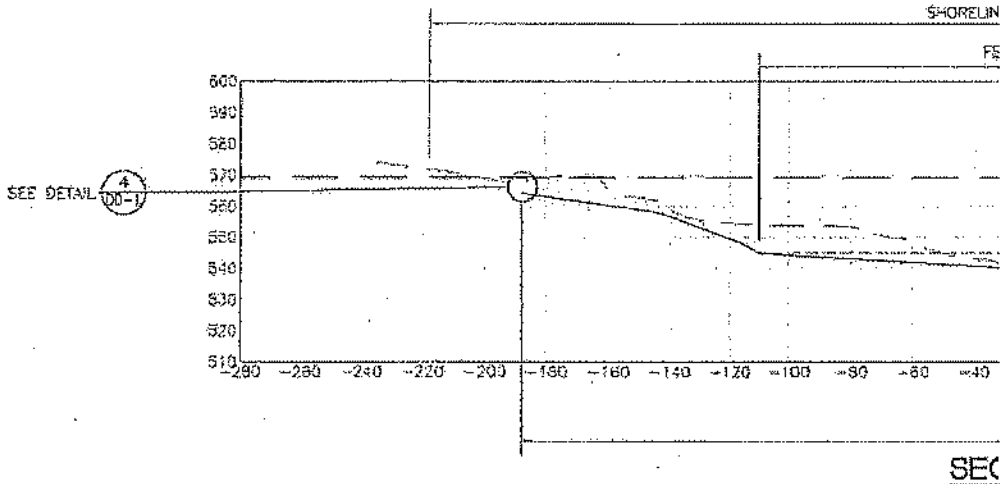
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 81(79B) of 111

CH2MHILL
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
CROSS-SECTIONS 7
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE 3-1-15
PROJ EE-002304-0023-09-01
DWG SC-7
SHEET 25 OF 51
PLOT TIME: 3:00 PM

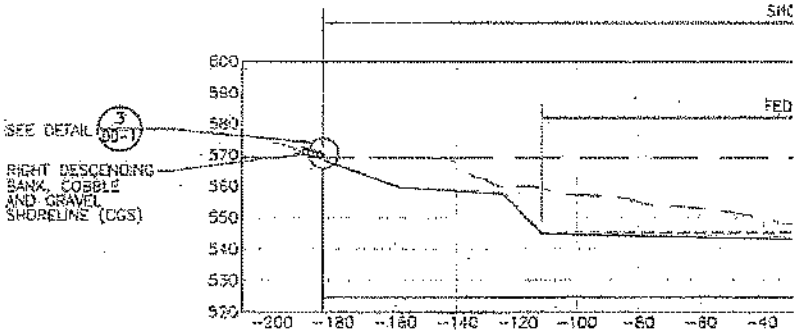

SECTION 29
SCALE: 1" = 30'-0"
SECTION 30
SCALE: 1" = 30'-0"
SECTION 31
SCALE: 1" = 30'-0"
SECTION 32
SCALE: 1" = 30'-0"
SHORELINE WIDTH
FEDERAL NAVIGATION CHANNEL
580.2
SEE DETAIL
LEFT DESCENDING BANK, CONCRETE CAP ON TIMBER PILES (CCT)
RIGHT DESCENDING BANK, COBBLE AND GRAVEL SHORELINE (CGS)
RIGHT DESCENDING BANK, NATURAL SLOPED SHORE WITH TIMBER PILES (NST)
RIGHT DESCENDING BANK, NATURALLY SLOPED SHORE WITH TIMBER PILES (NST)
SECTION LEGEND
EXISTING BATHYMETRY
USACE DREDGE CUT LINE (GLRI PROJECT)
DESIGN CUT LINE
DREDGING LIMIT
TO BE DREDGED
NO DREDGING
CH2MHILL.
ecology and environment engineering p.c.
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
CROSS-SECTIONS 8
REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)
REVISED FOR PREFINAL DESIGN (NOT FOR CONSTRUCTION)
DESCRIPTION
REVISION
AS NOTED
VERIFY SCALE
DATE
PROJ
DWG
SHEET
FILENAME
PLOT DATE
PLOT TIME

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW

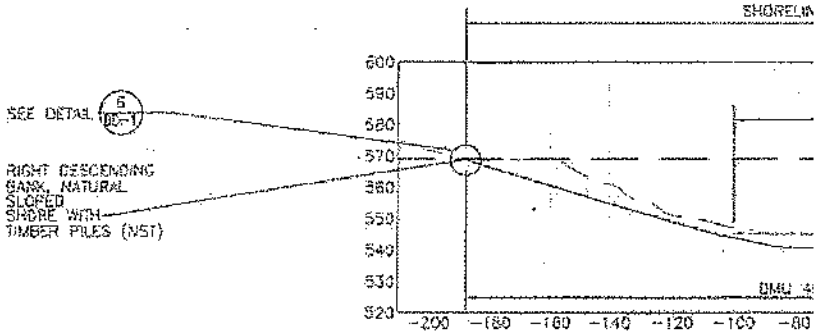
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 83(82A) of 111



SEC
SCALE



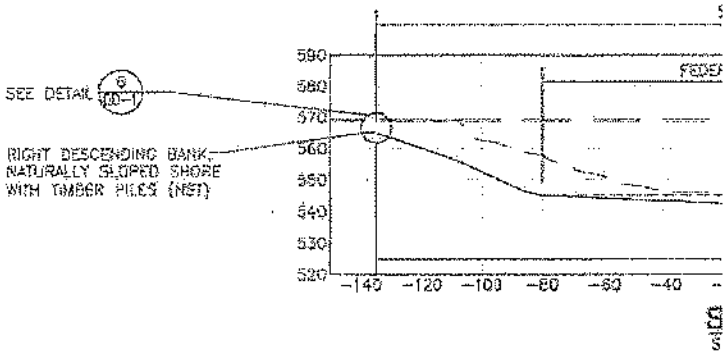
SE
SC

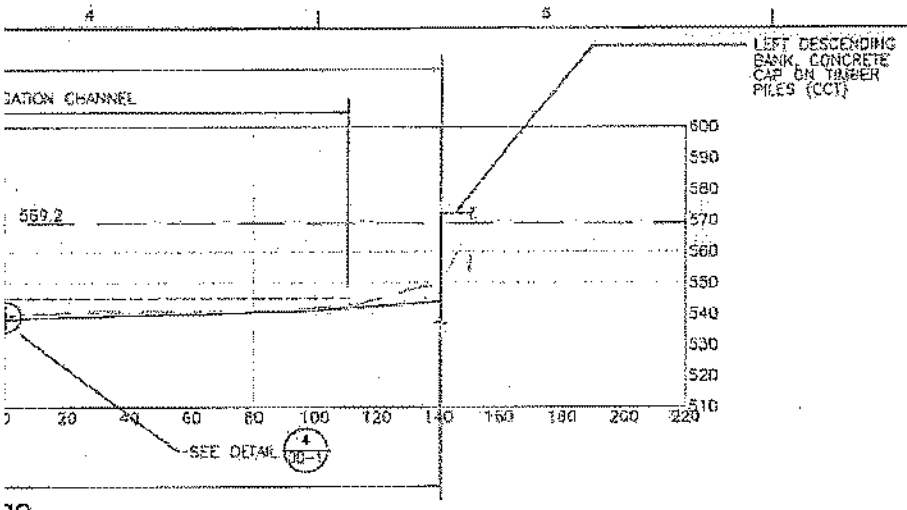


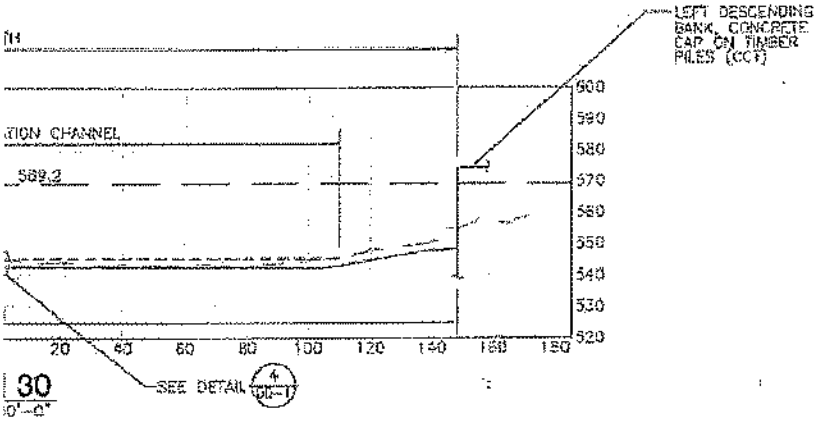
S
SC

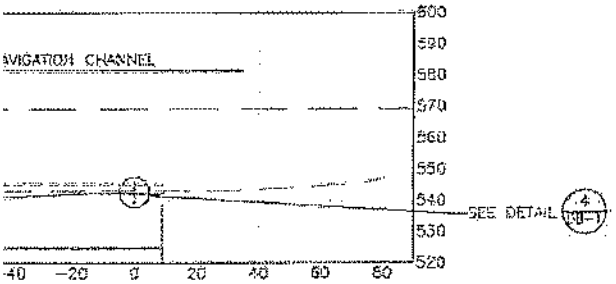
SECTION LEGEND

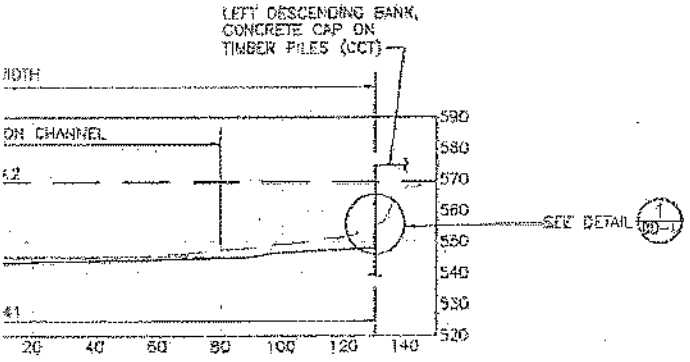
- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE (GLRI PROJECT)
- DESIGN CUT LINE
- DREDGING LIMIT
- TO BE DREDGED
- NO DREDGING











Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 84(82B) of 111

NO	DESCRIPTION	DATE	BY
4	REVISED PER	3-1-13	
3	REVISED FOR	12-17-12	
NO.		DATE	DSGN

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CH2MHILL

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
116 ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

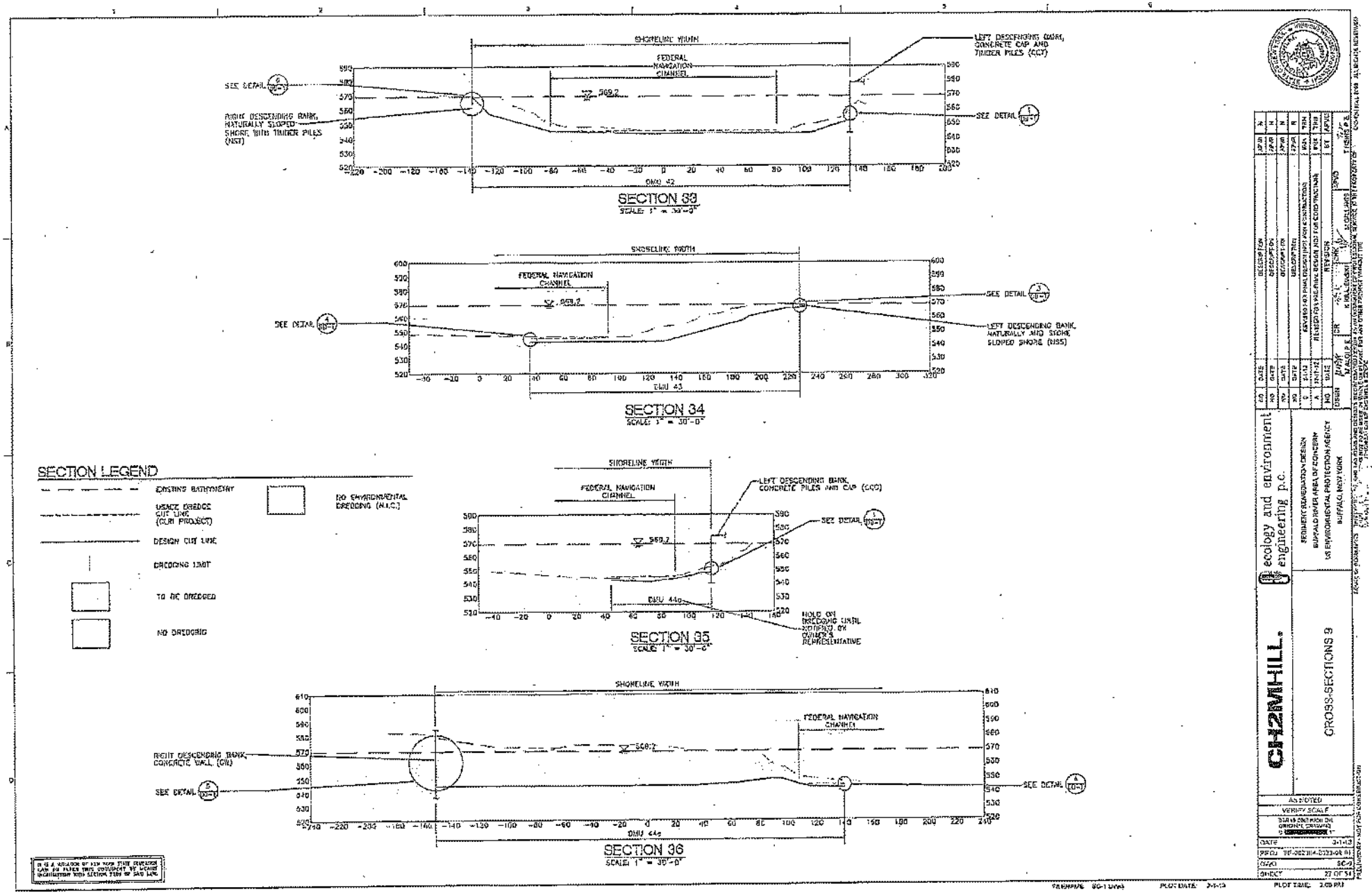
CROSS-SECTIONS 8

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE 3-1-13
PROJ. EE-002304-0023-08-01
DWG SC-8
SHEET 28 OF 91

PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME: SC-8.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM



Honeywell International(Buffalo River Dredge)
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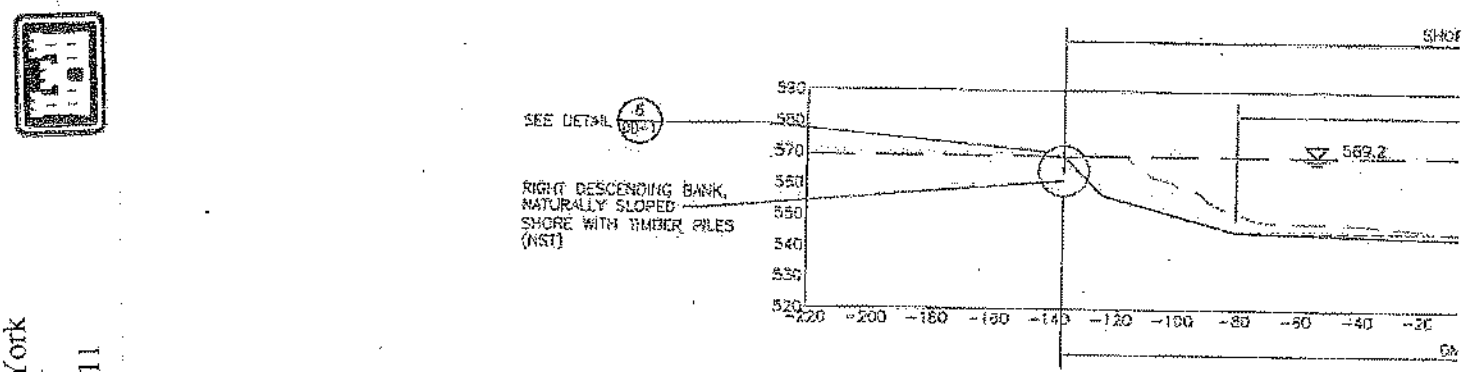
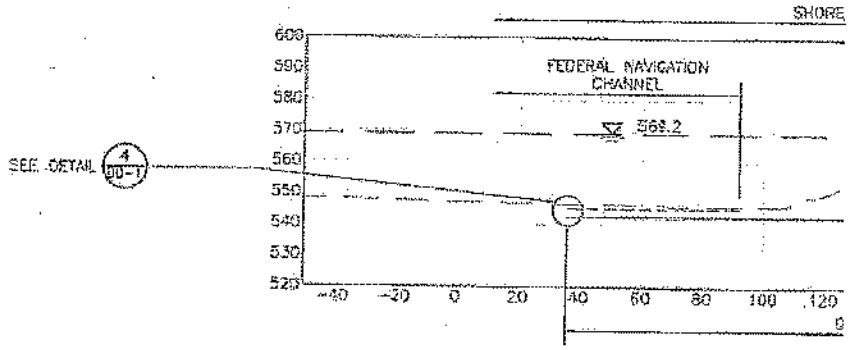
Sheet 85 of 111

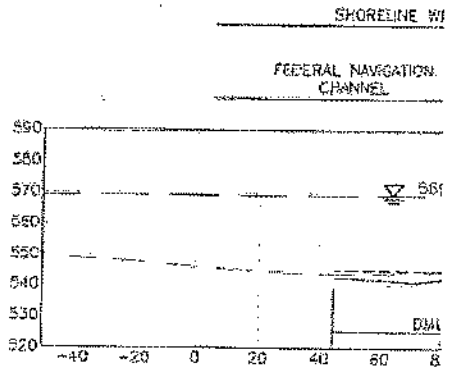
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 86(85A) of 111

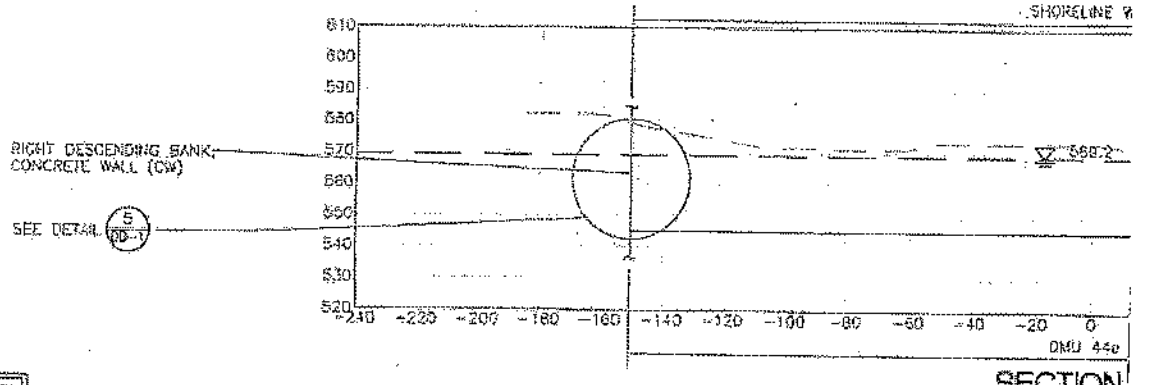


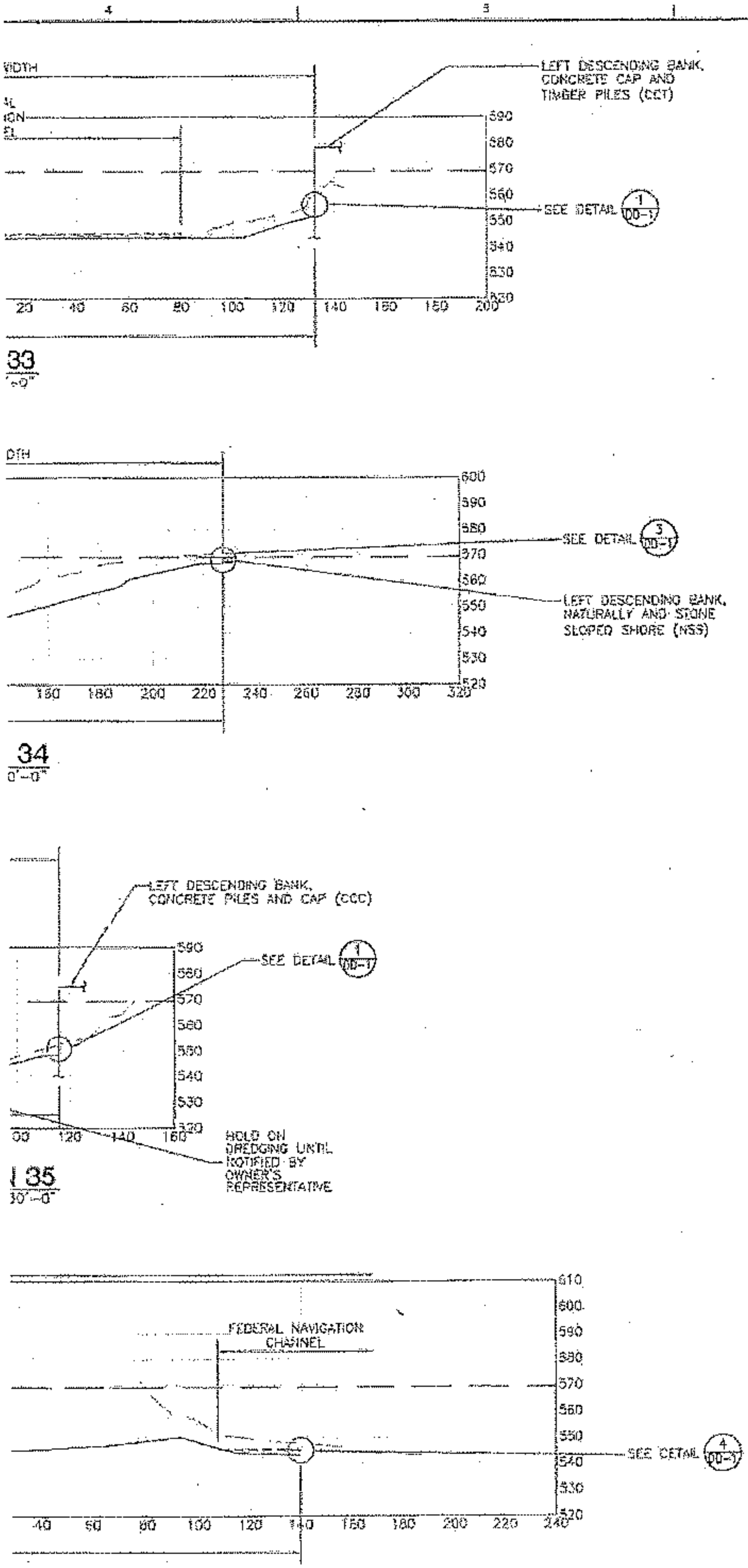


SECTION LEGEND

- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE (GLRV PROJECT)
- DESIGN CUT LINE
- DREDGING LIMIT
- TO BE DREDGED
- NO DREDGING
- NO ENVIRONMENTAL DREDGING (N.E.D.)







Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 87(85B) of 111

NO	DATE	
B	3-1-13	REVISED FO...
A	12-17-12	REVISED FOR P...

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL

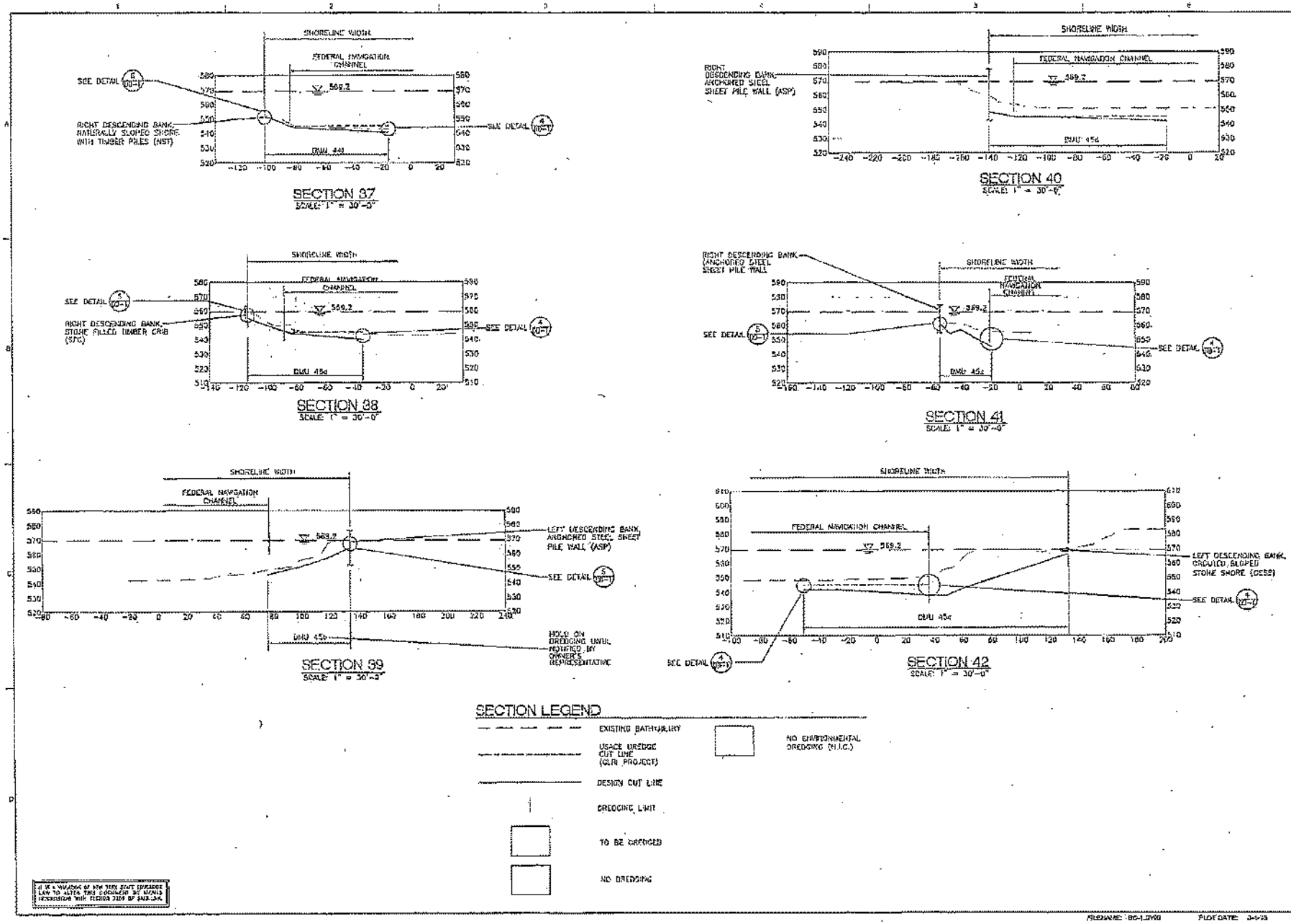
CROSS-SECTIONS 9

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DATE 3-1-13
PROJ EE-002304-0033-08-01
DWG SC-9
SHEET 27 OF 51

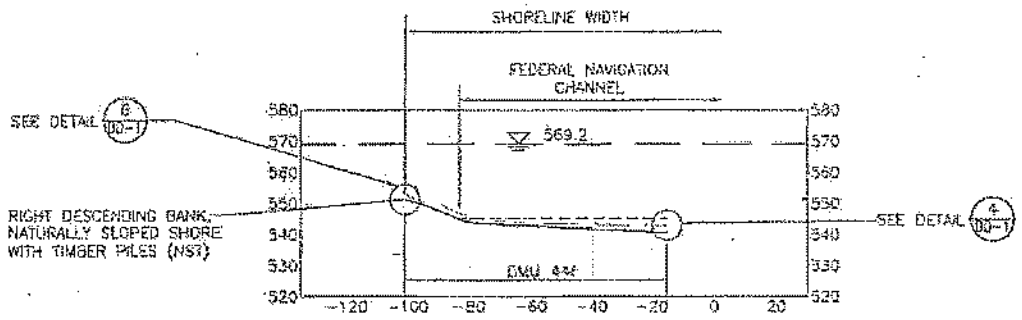
PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME SC-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

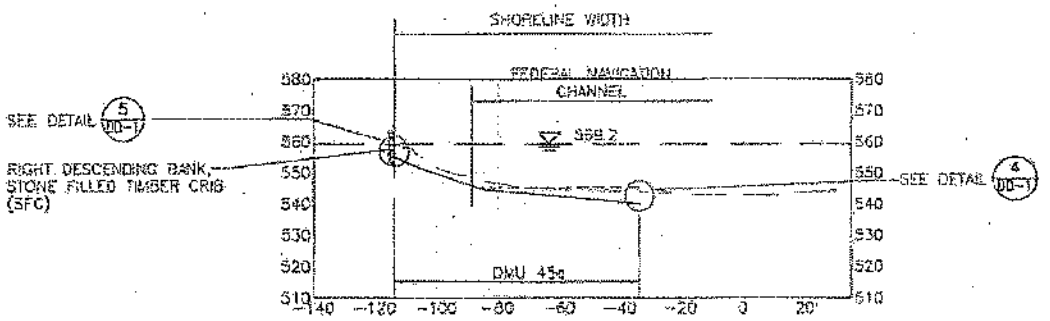


Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 88 of 111

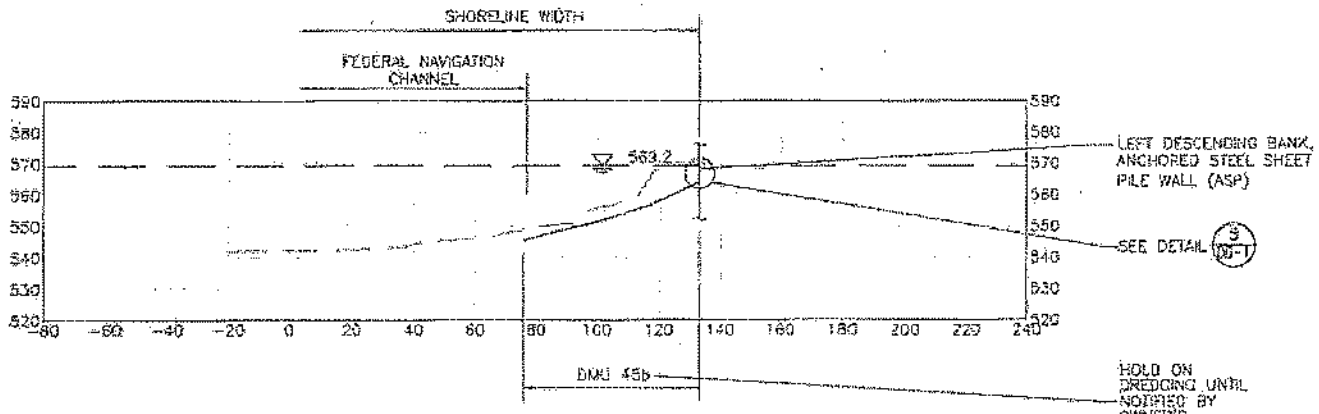
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 89(88A) of 111



SECTION 37
SCALE: 1" = 30'-0"



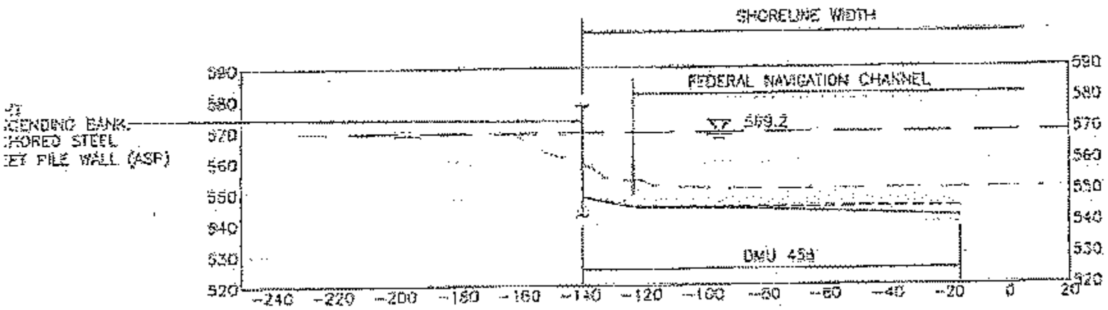
SECTION 38
SCALE: 1" = 30'-0"



SECTION 39
SCALE: 1" = 30'-0"

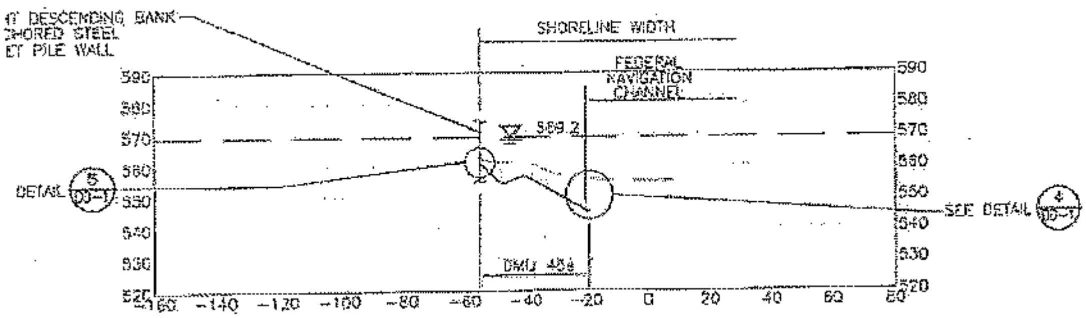
SECTION LEGEND

- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE (GLNI PROJECT)
- DESIGN CUT LINE
- DREDGING LIMIT
- TO BE DREDGED
- NO DREDGING



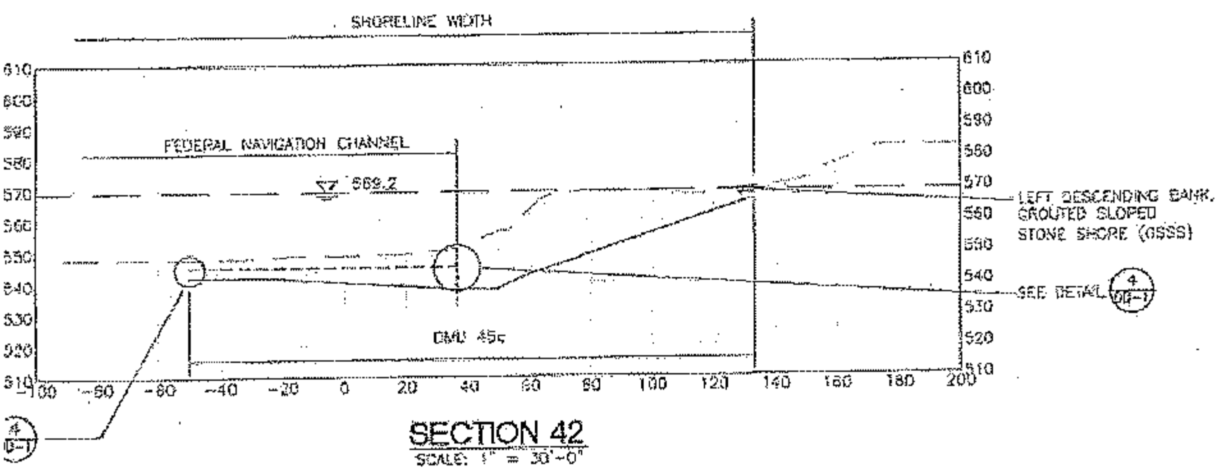
SECTION 40

SCALE: 1" = 30'-0"



SECTION 41

SCALE: 1" = 30'-0"



SECTION 42

SCALE: 1" = 30'-0"

NO ENVIRONMENTAL DREDGING (R.I.C.)

NO	DATE	DESCRIPTION	BY	APVR
NO	DATE	DESCRIPTION	N	APVR
NO	DATE	DESCRIPTION	N	APVR
NO	DATE	DESCRIPTION	N	APVR
B	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
NO.	DATE	REVISION	BY	APVD

DSGN M. ALCH P.E. | DR K. KRAJEWSKI | CHK M. GILLINGS | APVD T. HEINS P.E.

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL

CROSS-SECTIONS 10

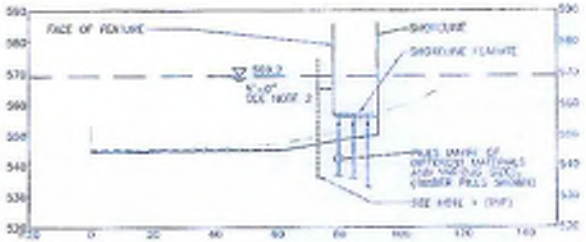
PRELIMINARY - NOT FOR CONSTRUCTION

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
DATE 3-1-13
PROJ EE-005504-0023-06-01
DWG SC-10
SHEET 28 OF 51

FILENAME: SC-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 90(88B) of 111

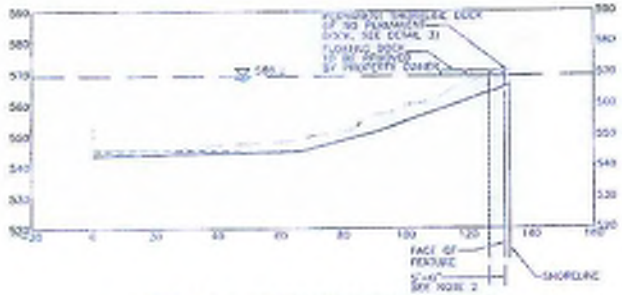
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 91 of 111



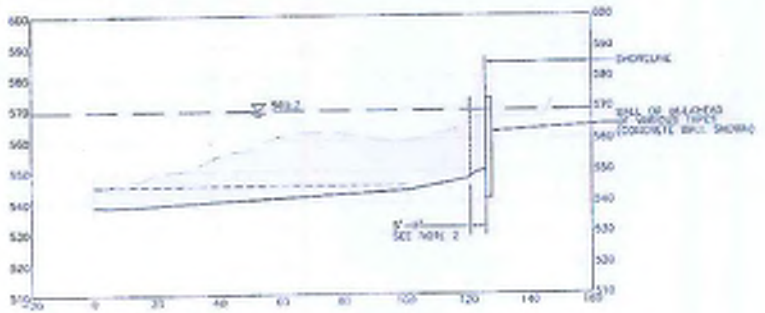
DETAIL 1 - DREDGING OPERATIONS AT SHORELINE TYPES TWTP, CCC, LD, SPC, SHPC, CPCW, AND CCT

DETAIL 4 - DREDGING OPERATIONS AT INTERFACE WITH SEDIMENT NOT TO BE DREDGED AT DMU BOUNDARY AND DREDGING LIMIT (SEE NOTE 6)

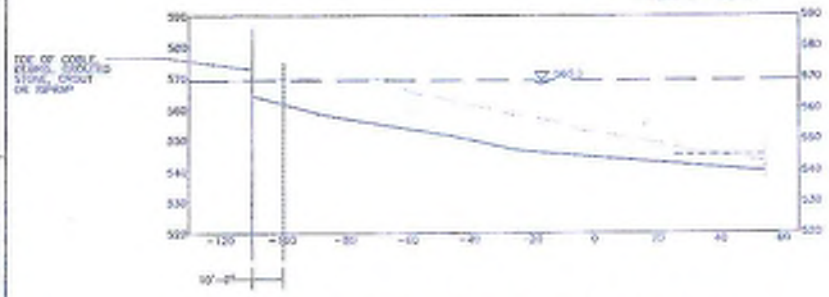
SECTION LEGEND



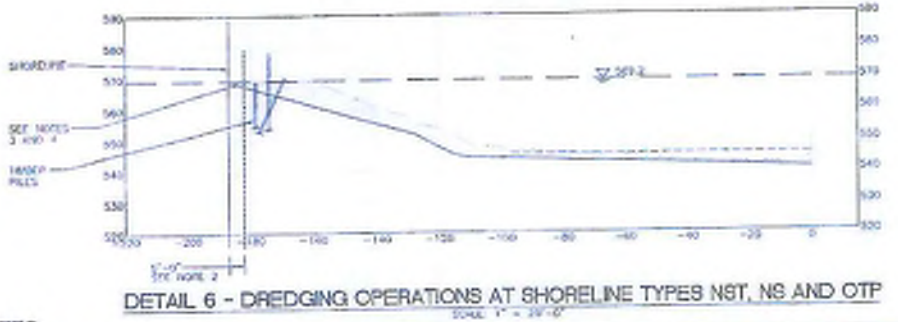
DETAIL 2 - DREDGING OPERATIONS AT SHORELINE TYPE AWB



DETAIL 5 - DREDGING OPERATIONS AT SHORELINE TYPES CW, ASP, SFC, SSPW, TB, RRA, AND AC



DETAIL 3 - DREDGING OPERATIONS AT SHORELINE TYPES NSS, GSS, GSSS, CGS, CGDS, BR AND RFRP



DETAIL 6 - DREDGING OPERATIONS AT SHORELINE TYPES NST, NS AND OTP

NOTES

1. DREDGING INCLUDES ANY SEDIMENT MATERIAL THAT SLOUGHS INTO THE AREA AT DESIGN CUT FACE.
2. 5' OFFSET IS FROM ALL THREE FACES OF ANY SHORELINE FEATURE THAT EXPOSES MORE THAN 5' INTO THE DMU.
3. FOR SHORELINE TYPES NS, NST & OTP, WHERE DEPTH OF CUT NEAR THE SHORELINES IS GREATER THAN 5' WHICH COULD CAUSE EROSION THE DREDGE PRISM PROVIDED BY THE CONTRACTOR HAS ESTABLISHED A 1H:1V MODIFIED DESIGN CUT LINE FROM START OF CUT TO INTERSECT WITH ORIGINAL DESIGN CUT LINE. DETAIL 7 (M-DC-1 SERIES) THIS ADJUSTED DREDGE PRISM.
4. CONTRACTOR TO TREAT FALLEN TIMBER PILES AS DEBRIS. UPRIGHT (INCLUDES LEANING) TIMBERS WILL BE EXCAVATED AROUND AS BEST AS BUCKET MANEUVERABILITY WILL ALLOW AND TIMBERS LEFT IN PLACE.
5. THE SHORELINE FEATURES DEPICTED IN THESE DETAILS ARE ONLY REPRESENTATIVE OF WHAT MAY ACTUALLY BE FOUND AT ANY GIVEN POINT ON ANY SHORELINE. THESE DETAILS WERE SHOWN HERE TO CONVEY THE INTENT OF THE DREDGING PROJECT AS THESE TYPES OF FEATURES.
6. DREDGING OF SEDIMENTS AT INTERFACE WITH SEDIMENTS NOT TO BE DREDGED OCCURS AT MORE THAN ONE DMU. SUCH AN INTERFACE CAN OCCUR AT A "CUT OF DREDGING" LINE WITHIN A DMU OR AT A DMU BOUNDARY THAT IS NOT AT A "SHORELINE" AS DEPICTED IN DETAIL 5.

ecology and environment engineering p.c.

CH2MHILL

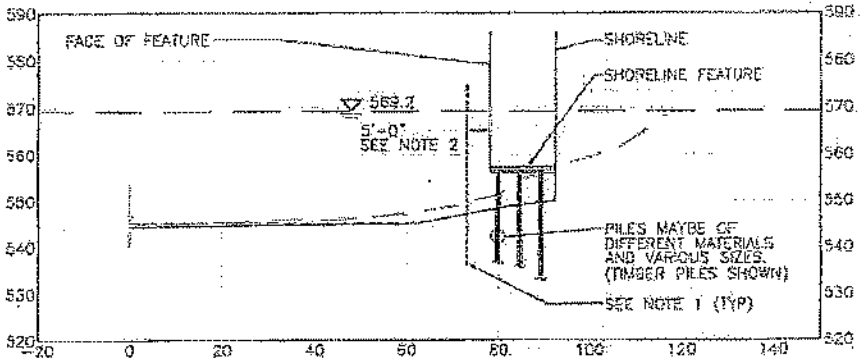
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

DREDGING OPERATIONS DETAILS 1

AS NOTED
VERIFY SCALE

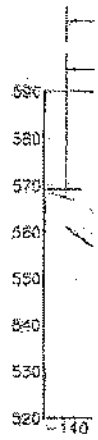
DATE 3-1-13
PROJ 686304-0021-08-99
DWG DD-1
SHEET 29 OF 31

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW



DETAIL 1 - DREDGING OPERATIONS AT SHORELINE TYPES TWTP, CCC, LD, SPC, SHPC, CPCW, AND CCT

SCALE: 1" = 20'-0"



DE

SECTION LEGEND

EXISTING BATHYMETRY

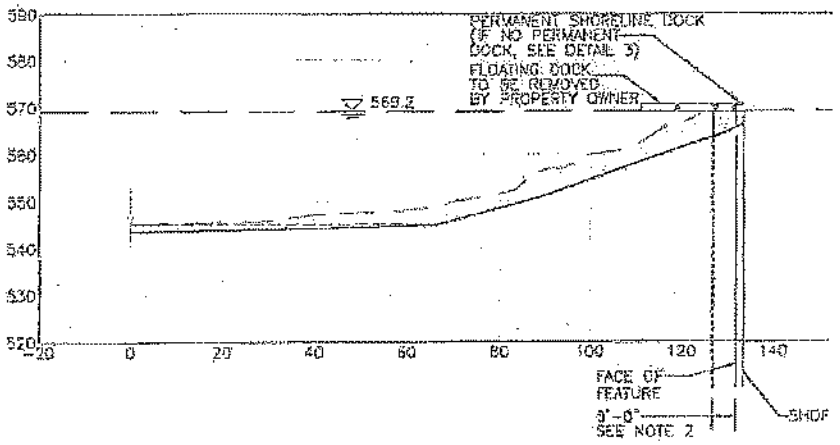
USACE DREDGE CUT LINE (OLD PROJECT)

DESIGN CUT LINE

DREDGING LIMIT

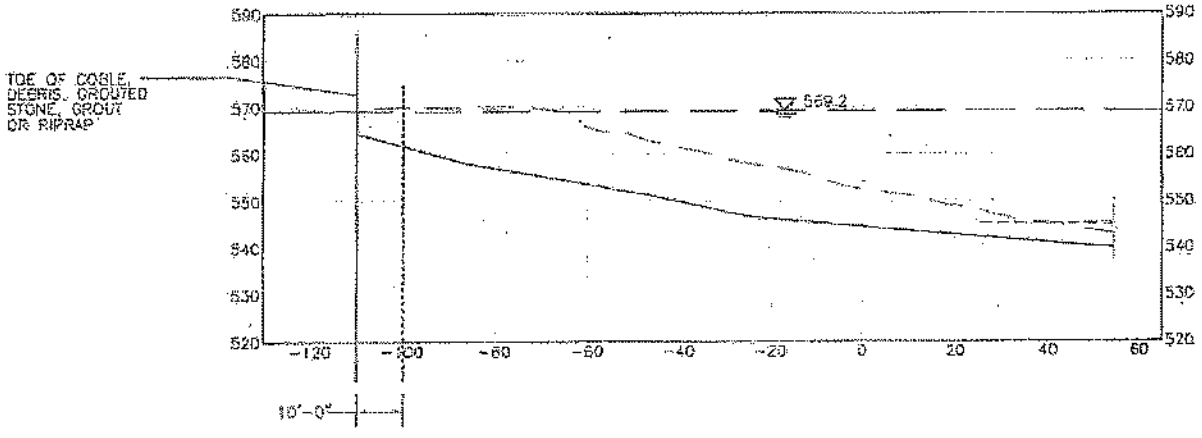
TO BE DREDGED

NO DREDGING



DETAIL 2 - DREDGING OPERATIONS AT SHORELINE TYPE AWB

SCALE: 1" = 20'-0"



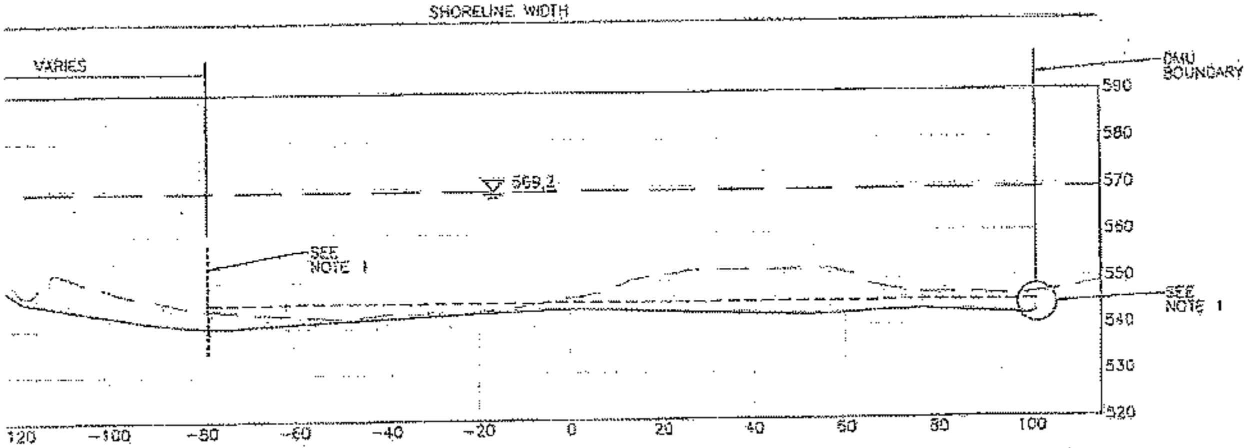
DETAIL 3 - DREDGING OPERATIONS AT SHORELINE TYPES NSS, GSS, GSSS, CGS, CGDS, BR AND RPRP

SCALE: 1" = 20'-0"

NOTES

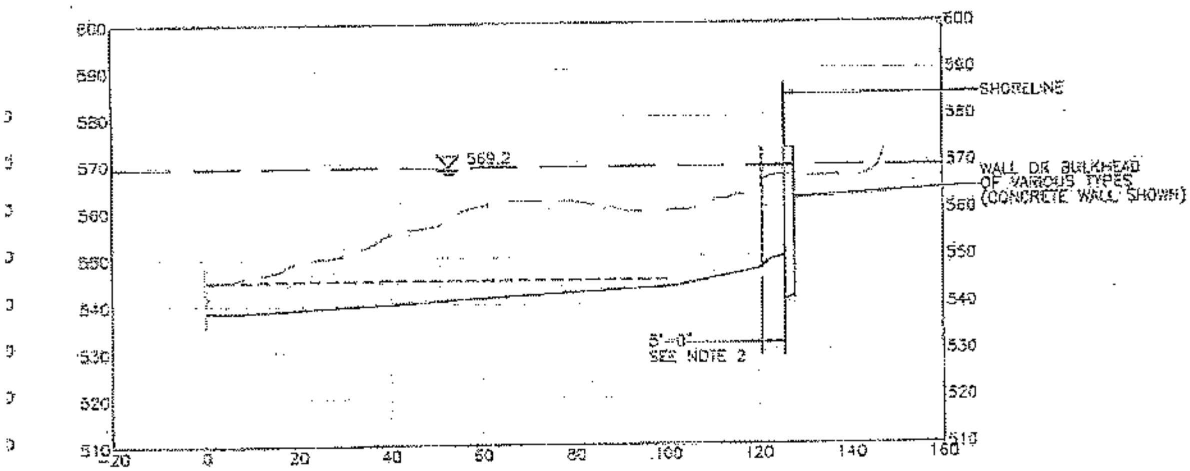
1. DREDGING T
2. 5' OFFSET
3. FOR SHORE PRISM PRO DETAIL 7 O
4. CONTRACTO MANEUVERA
5. THE SHORE SHORELINE.
6. DREDGING A "LIMIT OF

4 5 6



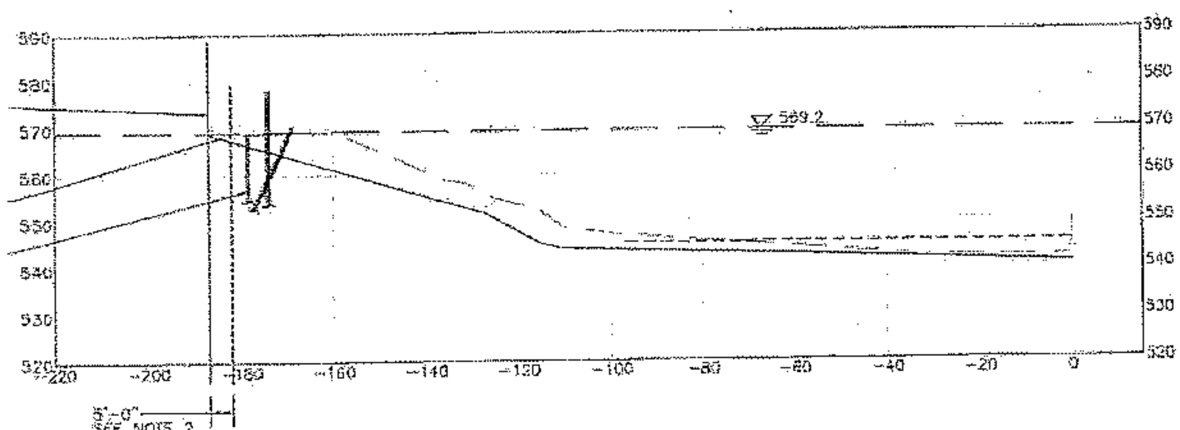
4 - DREDGING OPERATIONS AT INTERFACE WITH SEDIMENT NOT TO BE DREDGED AT DMU BOUNDARY AND DREDGING LIMIT (SEE NOTE 6)

SCALE: 1" = 20'-0"



DETAIL 5 - DREDGING OPERATIONS AT SHORELINE TYPES CW, ASP, SFC, SSPW, TB, RRA, AND AC

SCALE: 1" = 20'-0"



DETAIL 6 - DREDGING OPERATIONS AT SHORELINE TYPES NST, NS AND OTP

SCALE: 1" = 20'-0"

S ANY SEDIMENT MATERIAL THAT SLOUGHS INTO THE AREA AT DREDGE CUT FACE.

ALL THREE FACES OF ANY SHORELINE FEATURE THAT EXTENDS MORE THAN 5' INTO THE DMU.

PES NS, NST & OTP, WHERE DEPTH OF CUT NEAR THE SHORELINES IS GREATER THAN 5' WHICH COULD CAUSE EROSION THE DREDGE
THE CONTRACTOR HAS ESTABLISHED A 1H:1V MODIFIED DESIGN CUT LINE FROM START OF CUT TO INTERSECT WITH ORIGINAL DESIGN CUT LINE.
DEPICTS THIS ADJUSTED DREDGE PRISM.

EAT FALLEN TIMBER PILES AS DEBRIS. UPRIGHT (INCLUDES LEANING) TIMBERS WILL BE EXCAVATED AROUND AS BEST AS BUCKET
ILL ALLOW AND TIMBERS LEFT IN PLACE.

ATURES DEPICTED IN THESE DETAILS ARE ONLY REPRESENTATIVE OF WHAT MAY ACTUALLY BE FOUND AT ANY GIVEN POINT ON ANY
DETAILS AREA SHOWN HERE TO CONVEY THE INTENT OF THIS DREDGING PROJECT AT THESE TYPES OF FEATURES.

MENTS AT INTERFACE WITH SEDIMENTS NOT TO BE DREDGED OCCURS AT MORE THAN ONE DMU, SUCH AN INTERFACE CAN OCCUR AT
ING" LINE WITHIN A DMU OR AT A DMU BOUNDARY THAT IS NOT AT A SHORELINE AS DEPICTED IN DETAIL 4.

FILENAME: DD-1.DWG PLOT DATE: 3-1-13

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 93(91B) of 111

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL

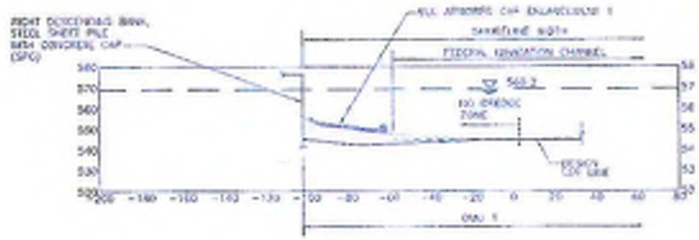
DREDGING OPERATIONS DETAILS 1

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE 3-1-13
PROJ EE-002304-0023-00-01
DWG DD-1
SHEET 29 OF 51

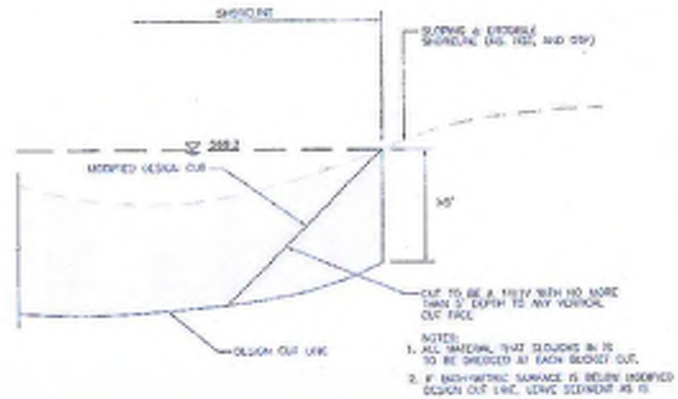
PLOT TIME: 3:00 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 94 of 111



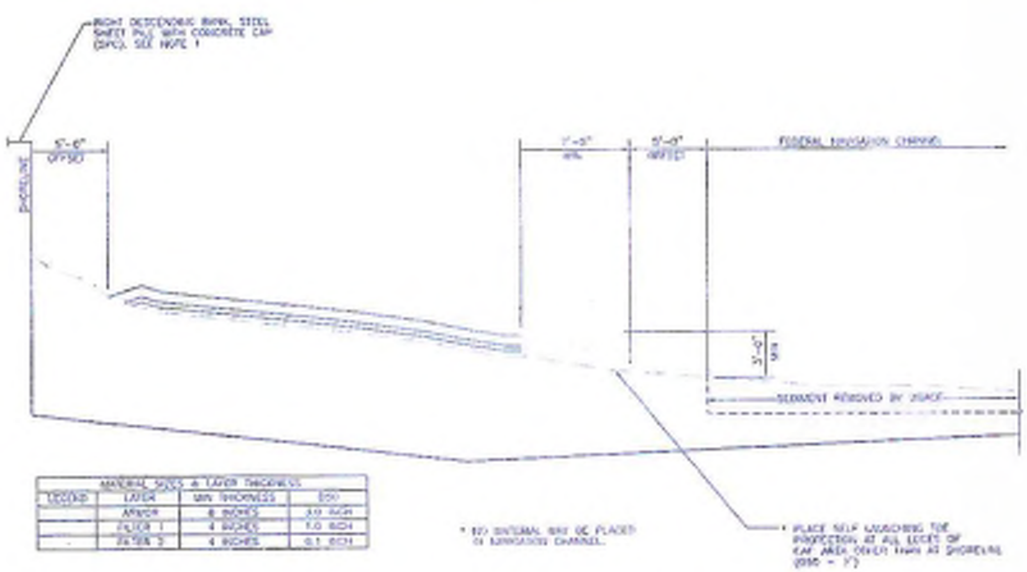
DETAIL 1 - SECTION AT ARMOR CAP

SCALE: 1" = 30'-0"



DETAIL 7 - DREDGE OPERATIONS MODIFIED SHORELINE APPROACH

SCALE: 1" = 8'-0"



MATERIAL SIZES & LAYER THICKNESS			
LEGEND	LAYER	MIN THICKNESS	D50
	ARMOR	8 INCHES	[illegible]
	FILTER 1	4 INCHES	1.0 INCH
	FILTER 2	4 INCHES	0.1 INCH

ARMOR CAP ENLARGEMENT 1

SCALE: 1" = 4'-0"

NOTE

1. SHORELINE ALONG ARMOR CAP AREA IS EITHER STEEL "H" PILES WITH CONCRETE CAP, STEEL SHEET PILE WITH CONCRETE CAP, OR LARGE DIAMETER STEEL SHEET PILE CELLS.

SECTION LEGEND

- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE (EUM PROJECT)
- DESIGN CUT LINE
- DREDGING UNIT
- TO BE DREDGED
- NO DREDGING

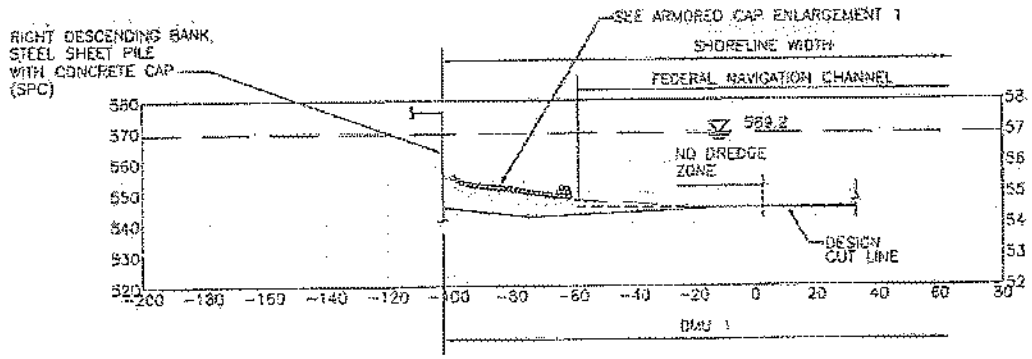
CH2MHILL.

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

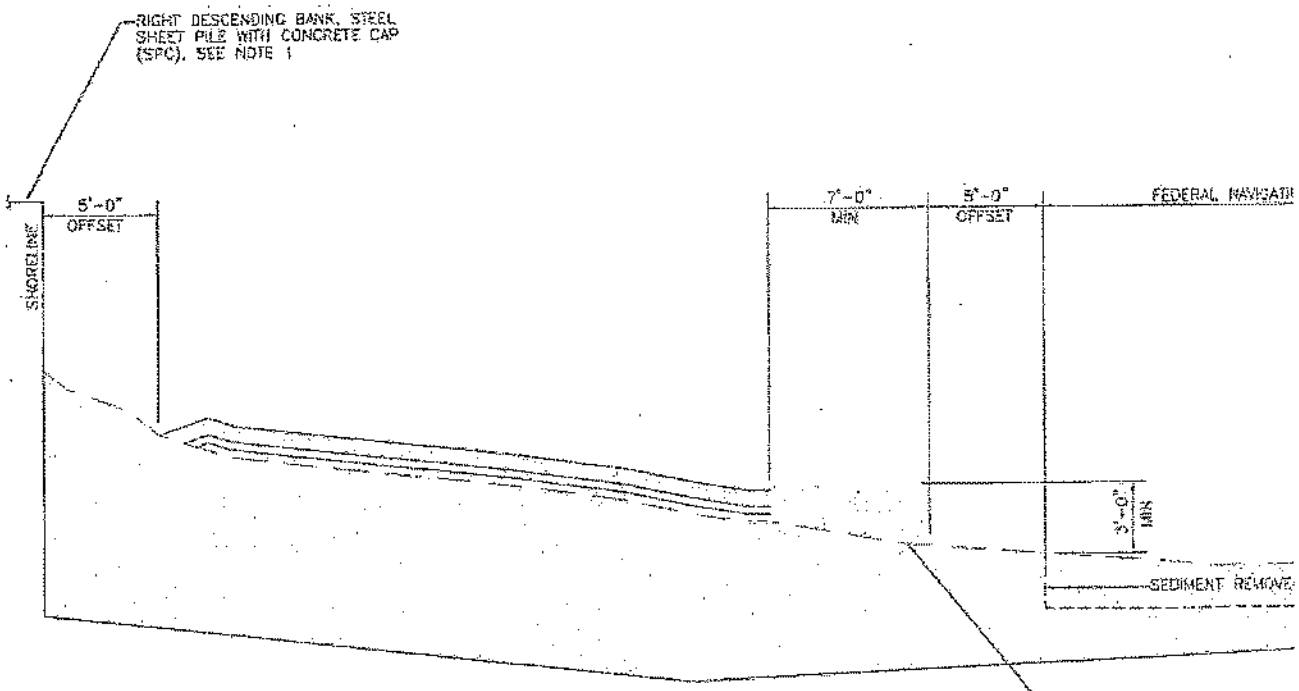
DREDGING OPERATIONS DETAILS 2

AS NOTED
VERIFY SCALE



DETAIL 1 - SECTION AT ARMOR CAP

SCALE: 1" = 30'-0"

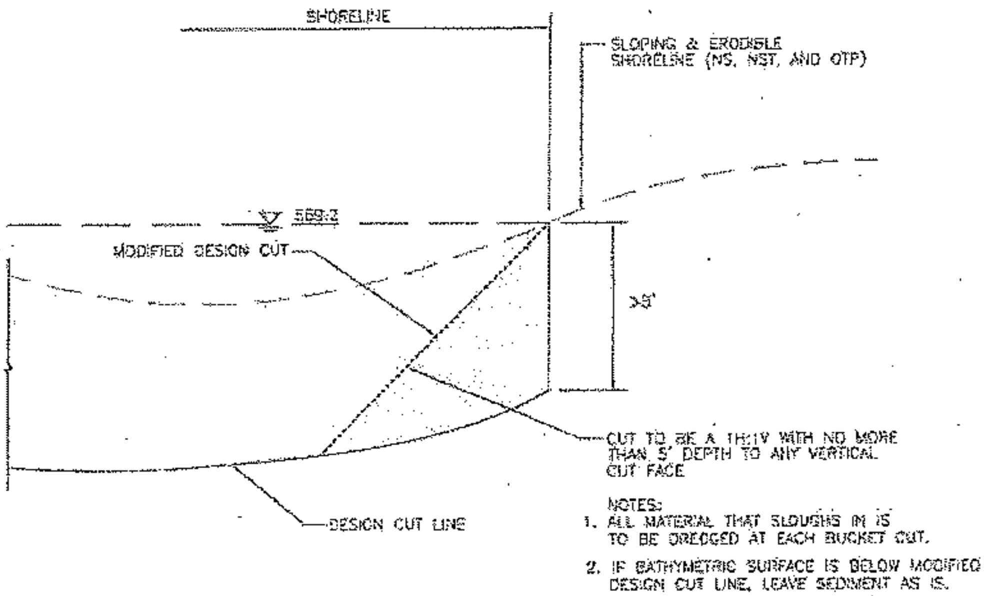


MATERIAL SIZES & LAYER THICKNESS			
LEGEND	LAYER	MIN THICKNESS	D50
	ARMOR	8 INCHES	3.0 INCH
	FILTER 1	4 INCHES	1.0 INCH
	FILTER 2	4 INCHES	0.1 INCH

* NO MATERIAL MAY BE PLACED IN NAVIGATION CHANNEL

ARMOR CAP ENLARGEMENT 1

SCALE: 1" = 4'-0"



DETAIL 7 - DREDGE OPERATIONS MODIFIED SHORELINE APPROACH

SCALE: 1" = 8'-0"

NOTE

1. SHORELINE ALONG ARMOR CAP AREA IS EITHER STEEL "H" PILES WITH CONCRETE CAP, STEEL SHEET PILE WITH CONCRETE CAP, OR LARGE DIAMETER STEEL SHEET PILE CELLS.

SECTION LEGEND

- EXISTING BATHYMETRY
- USACE DREDGE CUT LINE (GLRI PROJECT)
- DESIGN CUT LINE
- DREDGING LIMIT
- TO BE DREDGED
- NO DREDGING

OF SHORELINE

CH2MHILL

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

DREDGING OPERATIONS DETAILS 2

NO.	DATE	REVISION	BY	APVD
B	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M ALOI P.E. DR K KRAJEWSKI CHK M GILLINGS APVD T HEINS P.E.

PRELIMINARY - NOT FOR CONSTRUCTION

AS NOTED

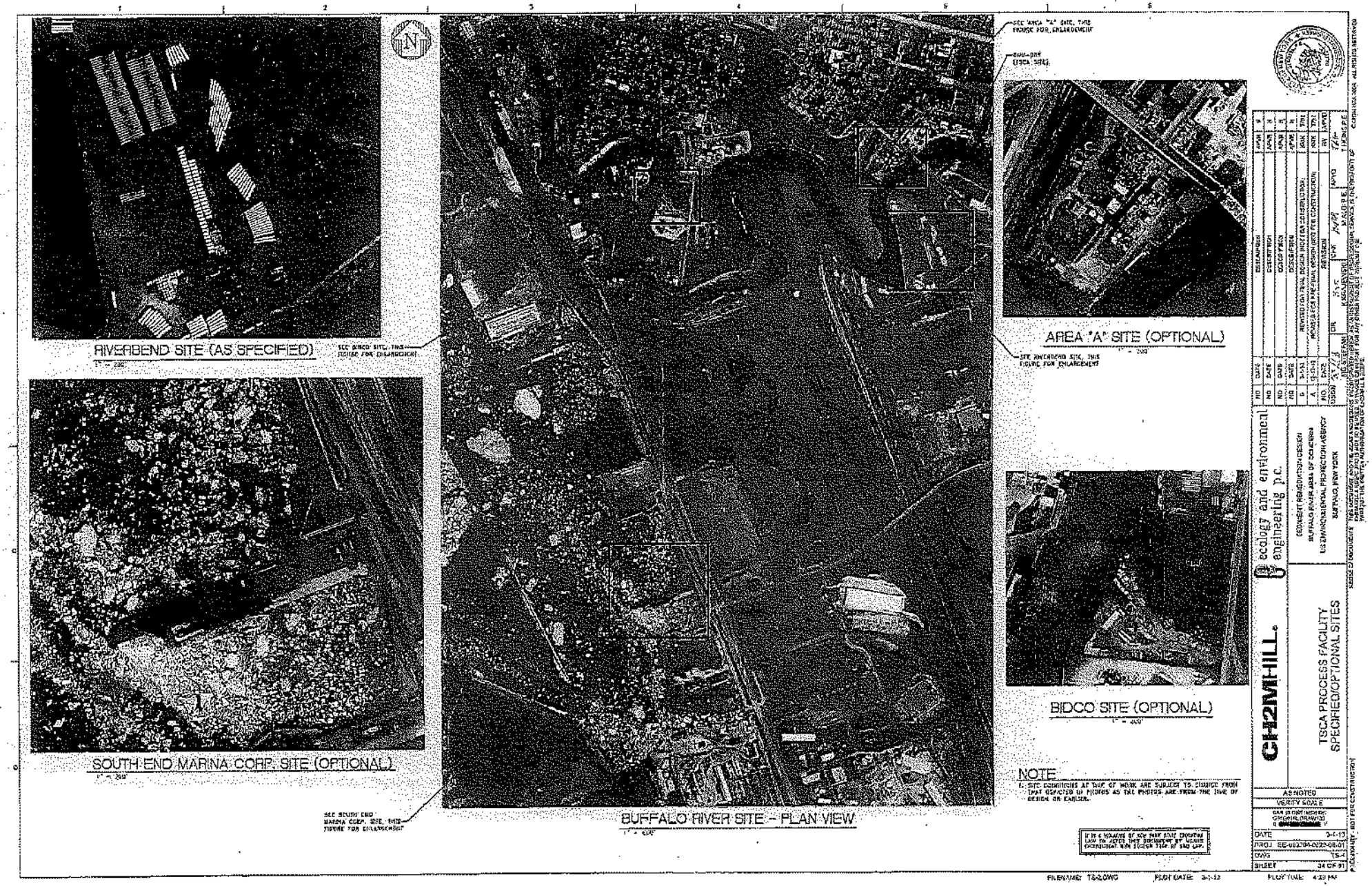
VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE 3-1-13
PROJ EE-002504-0023-09-01
DWG DD-2
SHEET 30 OF 51

FILENAME: DD-2.DWG PLOT DATE: 3-1-13 PLOT TIME: 3:00 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 96(94B) of 111



Honeywell International(Buffalo River Dredge)
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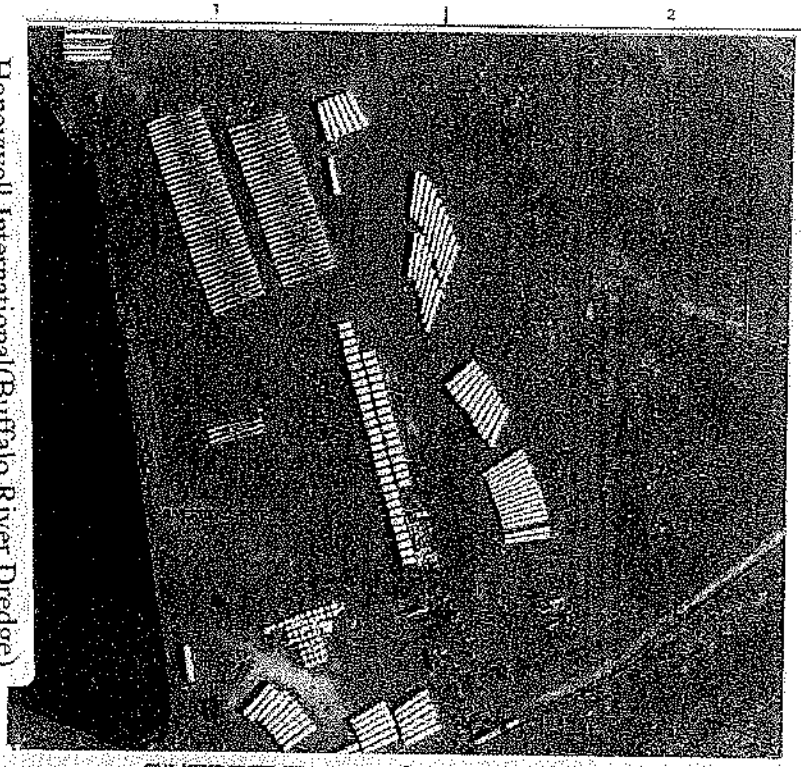
Erie County, New York
Quad: Buffalo NW
Sheet 97 of 111

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW



RIVERBEND SITE (AS SPECIFIED)
1" = 200'

SEE RIVERBEND SITE, THIS FIGURE FOR ENLARGEMENT

SOUTH END MARINA CORP. SITE (OPTIONAL)
1" = 200'

SEE SOUTH END MARINA CORP. SITE, THIS FIGURE FOR ENLARGEMENT

BUFF
1" = 200'

RIVER SITE - PLAN VIEW

AREA "A" SITE (OPTIONAL)

1" = 200'

BIDCO SITE (OPTIONAL)

1" = 200'

NOTE

1. SITE CONDITIONS AT TIME OF WORK ARE SUBJECT TO CHANGE FROM THAT DEPICTED IN PHOTOS AS THE PHOTOS ARE FROM THE TIME OF DESIGN OR EARLIER.

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
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NO	DATE	DESCRIPTION
NO.	DATE	
NO.	DATE	
NO.	DATE	REVISED
0	3-1-13	ISSUED
A	12-17-13	RELEASED
NO.	DATE	BY
DSGN: MG STEFFAN		

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL®

TSCA PROCESS FACILITY
SPECIFIED/OPTIONAL SITES

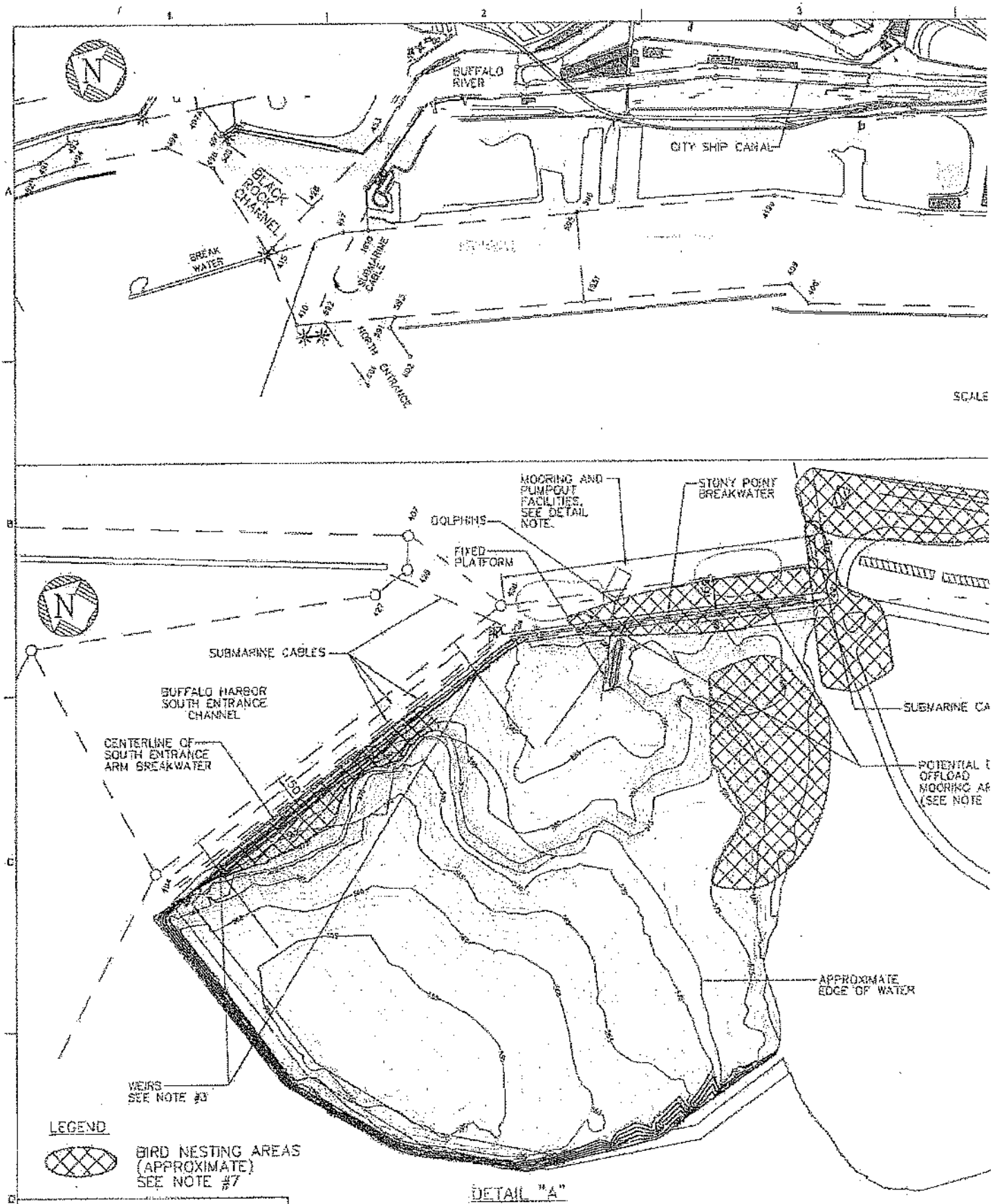
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET ADJUST SCALE ACCORDINGLY

DATE	3-1-13
PROJ	EE-002304-0023-05-01
DWG	TS-4
SHEET	34 OF 51

PRELIMINARY - NOT FOR CONSTRUCTION

FILENAME: TS-4.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:30 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 100 of 111

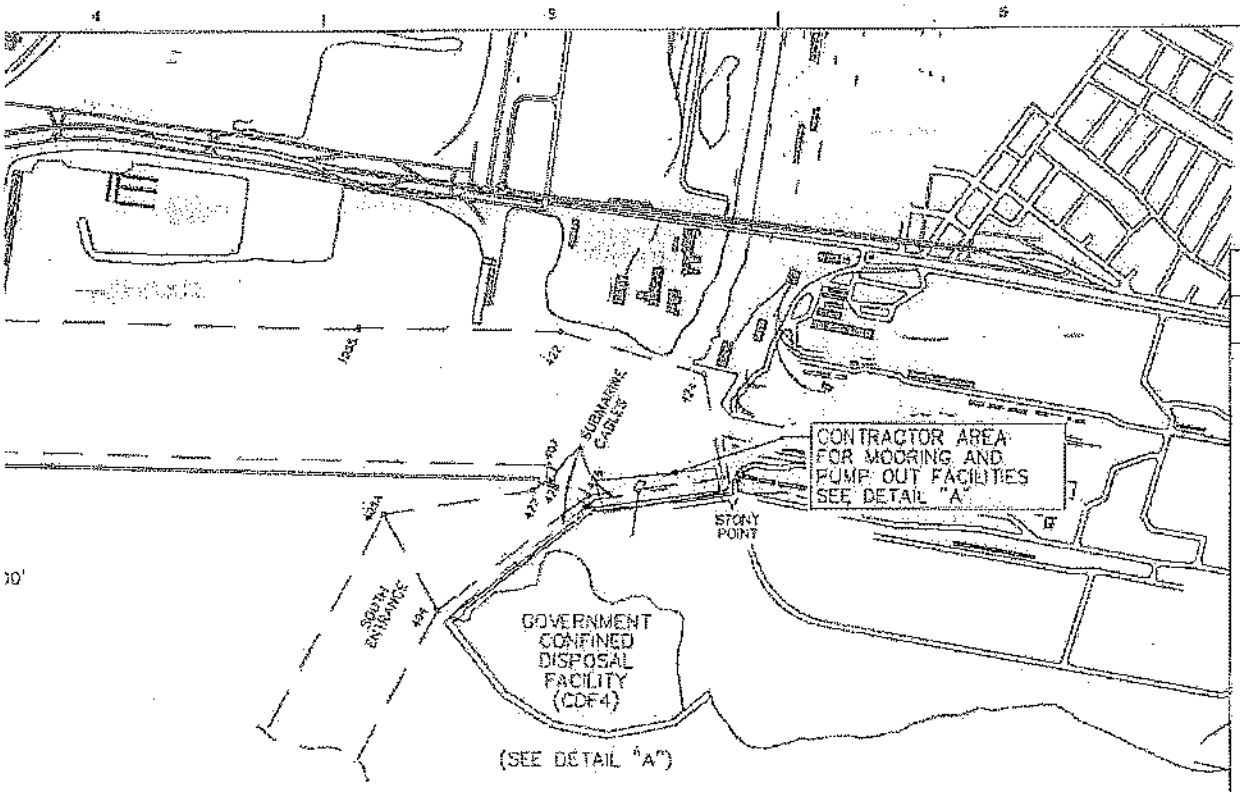


DETAIL "A"

DETAIL NOTE:
THE GOVERNMENT MOORING AND PUMPOUT FACILITIES ARE AVAILABLE FOR USE BY THE CONTRACTOR. USE OF THE FACILITIES SHALL BE AT THE RISK OF THE CONTRACTOR.

CONFINED DISPOSAL FACILITY (CDF4)
SCALE: 1" = 300'

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 101(100A) of 111



GENERAL NOTES:

1. THIS DRAWING IS BASED UPON A DRAWING OBTAINED FROM USACE BUFFALO DISTRICT (C-103, JUNE 2010).
2. AS STATED IN THE USACE BUFFALO DISTRICT FILE, BASE MAP WAS TAKEN FROM NOAA CHART NO. 14830. APPROXIMATE LOCATIONS OF SUBMERGED CROSSINGS ALONG RIVER AND SHIP CANAL ARE SHOWN AS DASHED LINES.
3. THE STONY POINT BREAKWATER CONTAINS A CRIB STRUCTURE. DETAILS OF CONSTRUCTION ARE AVAILABLE AT THE USACE BUFFALO DISTRICT OFFICE. DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED AT NO ADDITIONAL EXPENSE AND TO THE SATISFACTION OF THE USACE.
4. CONTOURS WITHIN THE GOVERNMENT'S CONFINED DISPOSAL FACILITY ARE FROM A SURVEY TAKEN IN JUNE, 2006. THEY DO NOT REFLECT MATERIAL PLACED IN SUBSEQUENT DREDGING EVENTS.
5. THE CONTRACTOR SHALL NOT ALLOW WATER TO EXIT THE CDF THROUGH THE EXISTING WEIRS (INVERT ELEVATION 579.6; IGLD 1985).
6. REFER TO THE CURRENT USACE PERMIT OR APPLICATION (SEE BODR APPENDIX J) FOR USE OF THE CDF FOR ANY FURTHER RESTRICTIONS AT THE CDF.
7. MATERIAL PLACED IN THE CDF PRIOR TO JULY 1, OF ANY YEAR, SHALL NOT IMPACT ANY BIRD NESTS LOCATED WITHIN THE FACILITY. FOR PLANNING PURPOSES, IT SHOULD BE ASSUMED THAT BIRD NESTS ARE LOCATED NO LOWER THAN ELEVATION 575.0.
8. SEE FIGURE 2B FROM THE APPLICATION FOR UTILIZING THE FEDERAL CONFINED DISPOSAL FACILITY FOR ADDITIONAL INFORMATION REGARDING THE CDF. SEE SUPPLEMENT TO SPECIFICATION SECTION 35 20 23.13 ENVIRONMENTAL DREDGING.

NO	DATE	REVISION	BY	APVD
B	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH

DSGN M ALDI P.E. | DR K KRAJEWSKI | CHK M GILLINGS | APVD T HEINS P.E.

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

CH2MHILL®

CONFINED DISPOSAL FACILITY
OFF LOADING AREA

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
IF NOT ONE INCH ADJUST SCALE ACCORDINGLY

DATE 3-1-13
PROJ EE-002304-0023-03-01
DWG CD-1
SHEET 35 OF 51

FILENAME: CD-1.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:39 PM

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Erie County, New York
Quad: Buffalo NW
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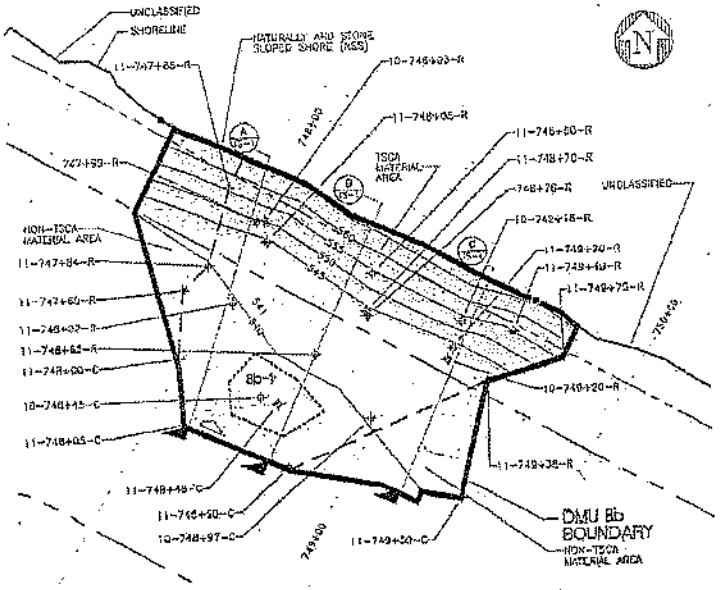


TSCA AREA DREDGING FINAL GRADE PLAN

SCALE: 1" = 30'-0"

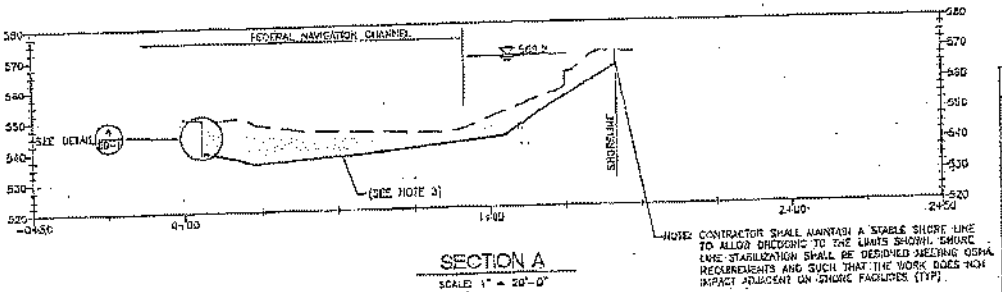
NOTE: SEE TS-2 FOR POST DREDGING CONFIRMATION SAMPLE LOCATIONS.

PLAN LEGEND

- TSCA MATERIAL AREA
- SUB DMU AREA (SEE NOTE 3)
- MAJOR DREDGE CUT CONTOUR
- MINOR DREDGE CUT CONTOUR
- FEDERAL NAVIGATION CHANNEL
- CORING LOCATION
- CHANNEL
- STATION
- YEAR CORING WAS PERFORMED

SECTION LEGEND

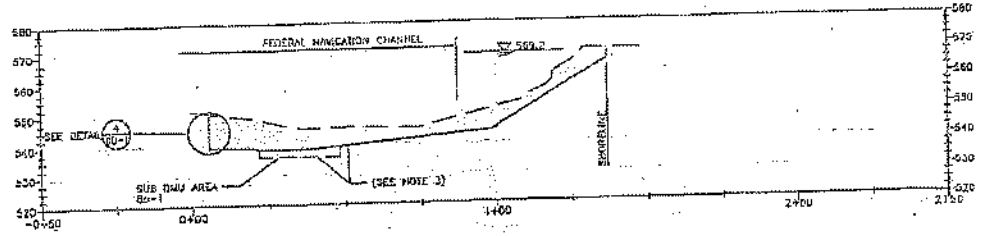
- EXISTING BATHYMETRY
- DESIGN CUT LINE
- TSCA SEDIMENT REMOVAL LIMITS (VERTICALLY)
- NON-TSCA SEDIMENT REMOVAL LIMITS (VERTICALLY)
- LOW WATER DATUM ELEVATION



SECTION A

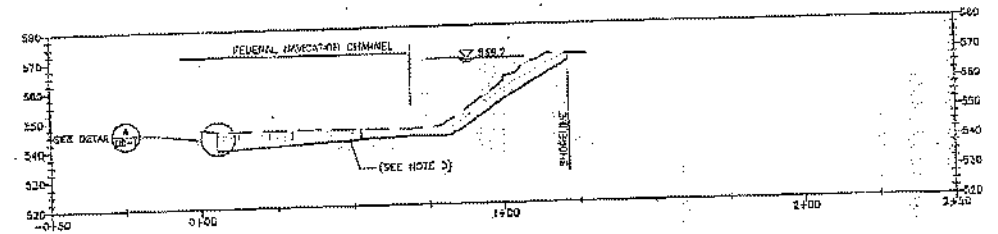
SCALE: 1" = 20'-0"

NOTE: CONTRACTOR SHALL MAINTAIN A STABLE SHORE LINE TO ALLOW DREDGING TO THE LIMITS SHOWN. ENSURE LANE STABILIZATION SHALL BE DESIGNED ASSURING OSHA REQUIREMENTS AND SUCH THAT THE WORK DOES NOT IMPACT ADJACENT ON-SHORE FACILITIES (TYP.)



SECTION B

SCALE: 1" = 20'-0"



SECTION C

SCALE: 1" = 20'-0"

NOTES

1. THE DESIGN CUT LINE IS TO THE MUD ELEVATIONS EXCEPT IN THE SUB DMU 8b-1 AREA WHERE THE DESIGN CUT LINE IS TO ELEVATION 530 FEET.
2. THE MATERIAL IN DMU 8b THAT IS OUTSIDE OF THE TSCA MATERIAL AREA SHALL BE DREDGED AS NON TSCA SEDIMENT AND PLACED AT THE USACE CDF NO 4 (SEE DWG CD-1). THE TSCA MATERIAL SHALL BE HANDLED AS INDICATED ON TS-2 AND TS-3.

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TSCA AREA SITE PLAN AND PROFILES

NOT TO SCALE

VERIFY SCALE

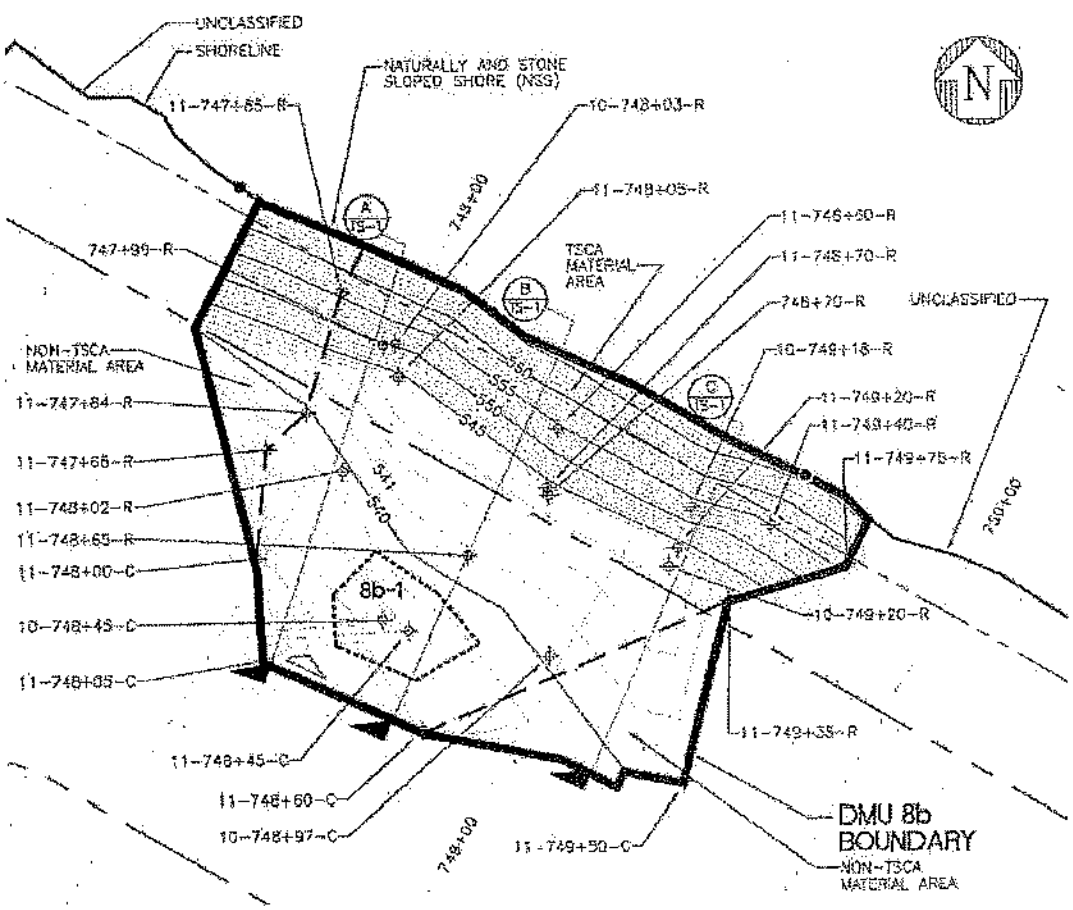
DATE 2-1-13

DWG TS-1

SHEET 31 OF 91

FILENAME: TS-1.DWG PLOT DATE: 2-1-13 PLOT TIME: 4:30 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 103 of 111



TSCA AREA DREDGING FINAL GRADE PLAN

SCALE: 1" = 30'-0"

NOTE: SEE TS-2 FOR POST DREDGING CONFIRMATION SAMPLE LOCATIONS.

PLAN LEGEND

- TSCA MATERIAL AREA
- SUB DMU AREA (SEE NOTE 3)
- 540 MAJOR DREDGE CUT CONTOUR
- 541 MINOR DREDGE CUT CONTOUR
- FEDERAL NAVIGATION CHANNEL
- 10-748+97-C CORING LOCATION
  - CHANNEL
  - STATION
  - YEAR CORING WAS PERFORMED

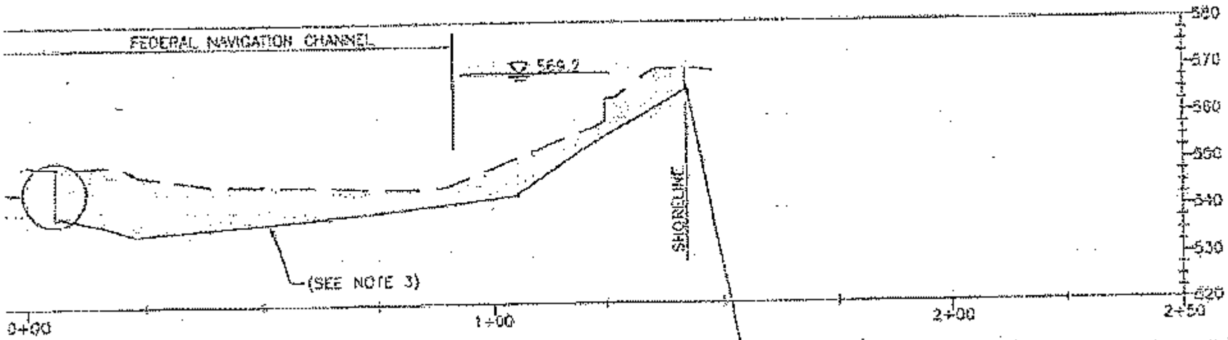
SECTION LEGEND

- EXISTING BATHYMETRY
- DESIGN CUT LINE
- TSCA SEDIMENT REMOVAL LIMITS (VERTICALLY)
- NON-TSCA SEDIMENT REMOVAL LIMITS (VERTICALLY)
- ▽ 569.2 LOW WATER DATUM ELEVATION

NOTE

1. THE
2. THE
THE

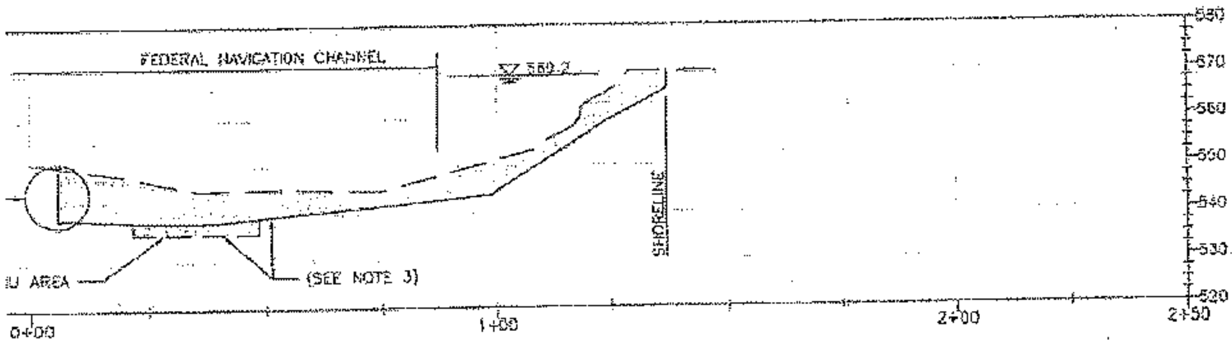
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 104(103A) of 111



NOTE: CONTRACTOR SHALL MAINTAIN A STABLE SHORE LINE TO ALLOW DREDGING TO THE LIMITS SHOWN. SHORE LINE STABILIZATION SHALL BE DESIGNED MEETING OSHA REQUIREMENTS AND SUCH THAT THE WORK DOES NOT IMPACT ADJACENT ON SHORE FACILITIES (TYP)

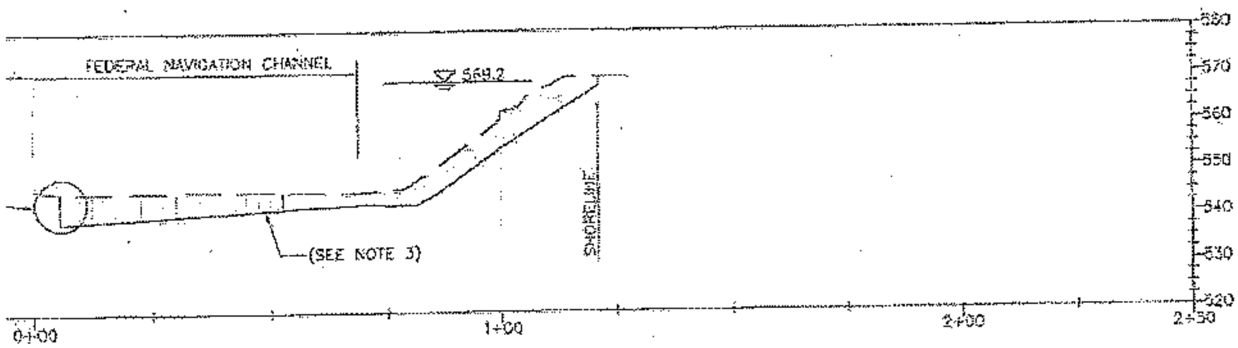
SECTION A

SCALE: 1" = 20'-0"



SECTION B

SCALE: 1" = 20'-0"



SECTION C

SCALE: 1" = 20'-0"

CUT LINE IS TO THE TILL ELEVATIONS EXCEPT IN THE SUB DMU 85-1 AREA WHERE THE DESIGN CUT LINE IS TO ELEVATION 536 FEET.

L IN DMU 85 THAT IS OUTSIDE OF THE TSCA MATERIAL AREA SHALL BE DREDGED AS NON TSCA SEDIMENT AND PLACED AT CDF NO 4 (SEE DWG CD-1). THE TSCA MATERIAL SHALL BE HANDLED AS INDICATED ON TS-2 AND TS-3.

NO.	DATE	DESCRIPTION	BY	APVD
D	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	NWS	TRH
C	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
B	12-9-11	REVISED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-2-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	KMK	TRH

REVISION

DSGN M. ALOI P.E. | DR K. KRAJEWSKI | CHK M. STEFFAN | APVD T. HEINS P.E.

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SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

TSCA AREA SITE PLAN AND PROFILES

NOT TO SCALE
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE 3-1-13
PROJ EE-002304.0023.04.01
DWG TS-1
SHEET 31 OF 81

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Quad: Buffalo NW
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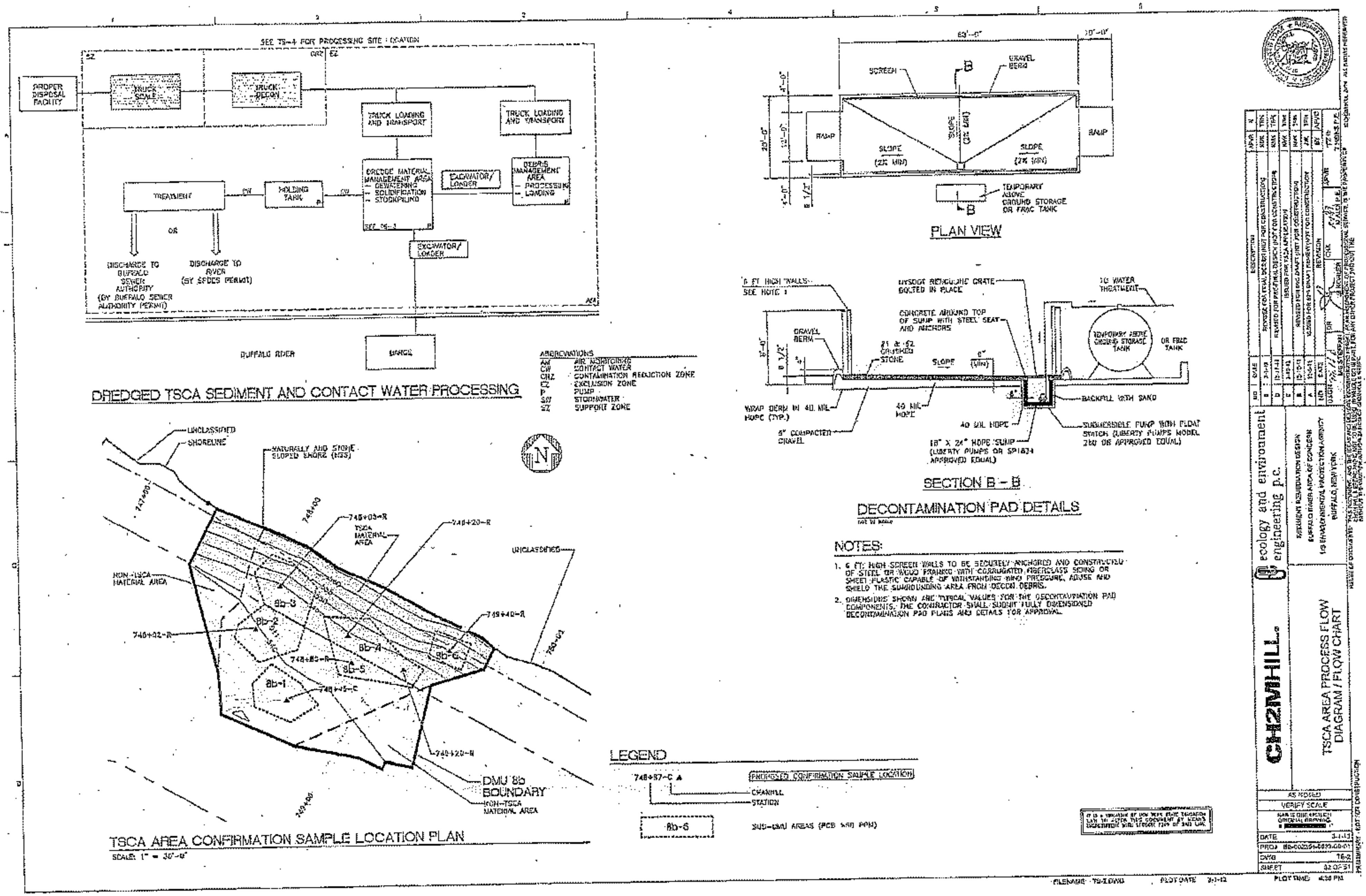
SEE TS-4 FOR PROCESSING SITE LOCATION
PROPER DISPOSAL FACILITY
TRUCK SCALE
TRUCK DECON
TRUCK LOADING AND TRANSPORT
TRUCK LOADING AND TRANSPORT
DREDGE MATERIAL MANAGEMENT AREA
- DEWATERING
- SOLIDIFICATION
- STOCKPILING
EXCAVATOR/ LOADER
DEBRIS MANAGEMENT AREA
- PROCESSING
- LOADING
TREATMENT
HOLDING TANK
OR
DISCHARGE TO BUFFALO SEWER AUTHORITY (BY BUFFALO SEWER AUTHORITY PERMIT)
DISCHARGE TO RIVER (BY SPDES PERMIT)
EXCAVATOR/ LOADER
BUFFALO RIVER
BARGE
DREDGED TSCA SEDIMENT AND CONTACT WATER PROCESSING
ABBREVIATIONS
AM AIR MONITORING
CW CONTACT WATER
CRZ CONTAMINATION REDUCTION ZONE
EZ EXCLUSION ZONE
P PUMP
SW STORMWATER
SZ SUPPORT ZONE
PLAN VIEW
SCREEN
GRAVEL BERM
RAMP
SLOPE (2% MIN)
TEMPORARY ABOVE GROUND STORAGE OR FRAC TANK
6 FT HIGH WALLS SEE NOTE 1
GRAVEL BERM
#1 & #2 CRUSHED STONE
CONCRETE AROUND TOP OF SUMP WITH STEEL SEAT AND ANCHORS
SLOPE
40 MIL HDPE
18" X 24" HDPE SUMP (LIBERTY PUMPS OR SP1824 APPROVED EQUAL)
SUBMERSIBLE PUMP WITH FLOAT SWITCH (LIBERTY PUMPS MODEL 280 OR APPROVED EQUAL)
BACKFILL WITH SAND
TO WATER TREATMENT
TEMPORARY ABOVE GROUND STORAGE TANK
OR FRAC TANK
WRAP BERM IN 40 MIL HDPE (TYP.)
6" COMPACTED GRAVEL
SECTION B - B
DECONTAMINATION PAD DETAILS
NOTES:
1. 6 FT HIGH SCREEN WALLS TO BE SECURELY ANCHORED AND CONSTRUCTED OF STEEL OR WOOD FRAMING WITH CORRUGATED FIBERGLASS SIDING OR SHEET PLASTIC CAPABLE OF WITHSTANDING WIND PRESSURE, ABUSE AND SHIELD THE SURROUNDING AREA FROM DECON DEBRIS.
2. DIMENSIONS SHOWN ARE TYPICAL VALUES FOR THE DECONTAMINATION PAD COMPONENTS. THE CONTRACTOR SHALL SUBMIT FULLY DIMENSIONED DECONTAMINATION PAD PLANS AND DETAILS FOR APPROVAL.
UNCLASSIFIED
SHORELINE
NATURALLY AND STONE SLOPED SHORE (NSS)
TSCA MATERIAL AREA
NON-TSCA MATERIAL AREA
8b-1
8b-2
8b-3
8b-4
8b-5
8b-6
DMU 8b BOUNDARY
NON-TSCA MATERIAL AREA
TSCA AREA CONFIRMATION SAMPLE LOCATION PLAN
SCALE: 1" = 30'-0"
LEGEND
PROPOSED CONFIRMATION SAMPLE LOCATION
CHANNEL STATION
SUB-DMU AREAS (PCB >50 PPM)
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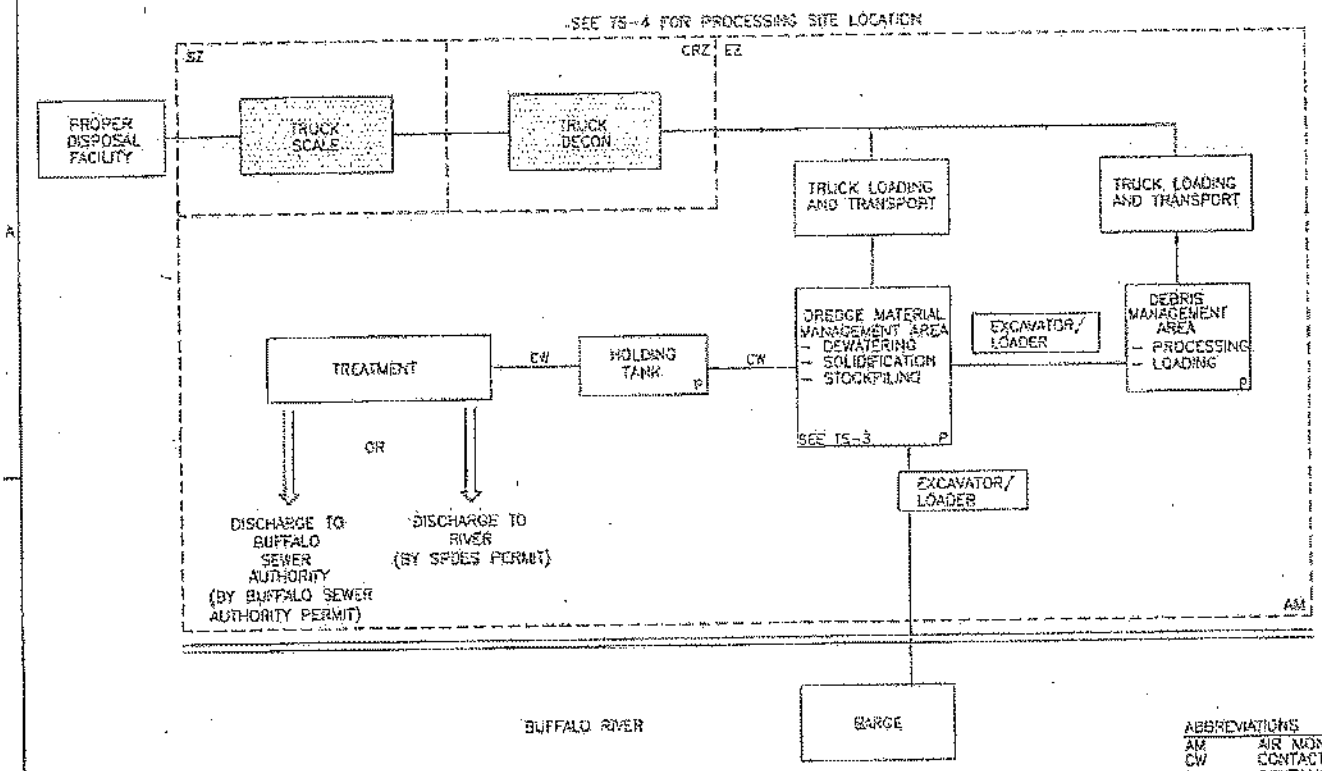
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK
TSCA AREA PROCESS FLOW DIAGRAM / FLOW CHART
AS NOTED
VERIFY SCALE
DWG TS-2
SHEET 32 OF 51

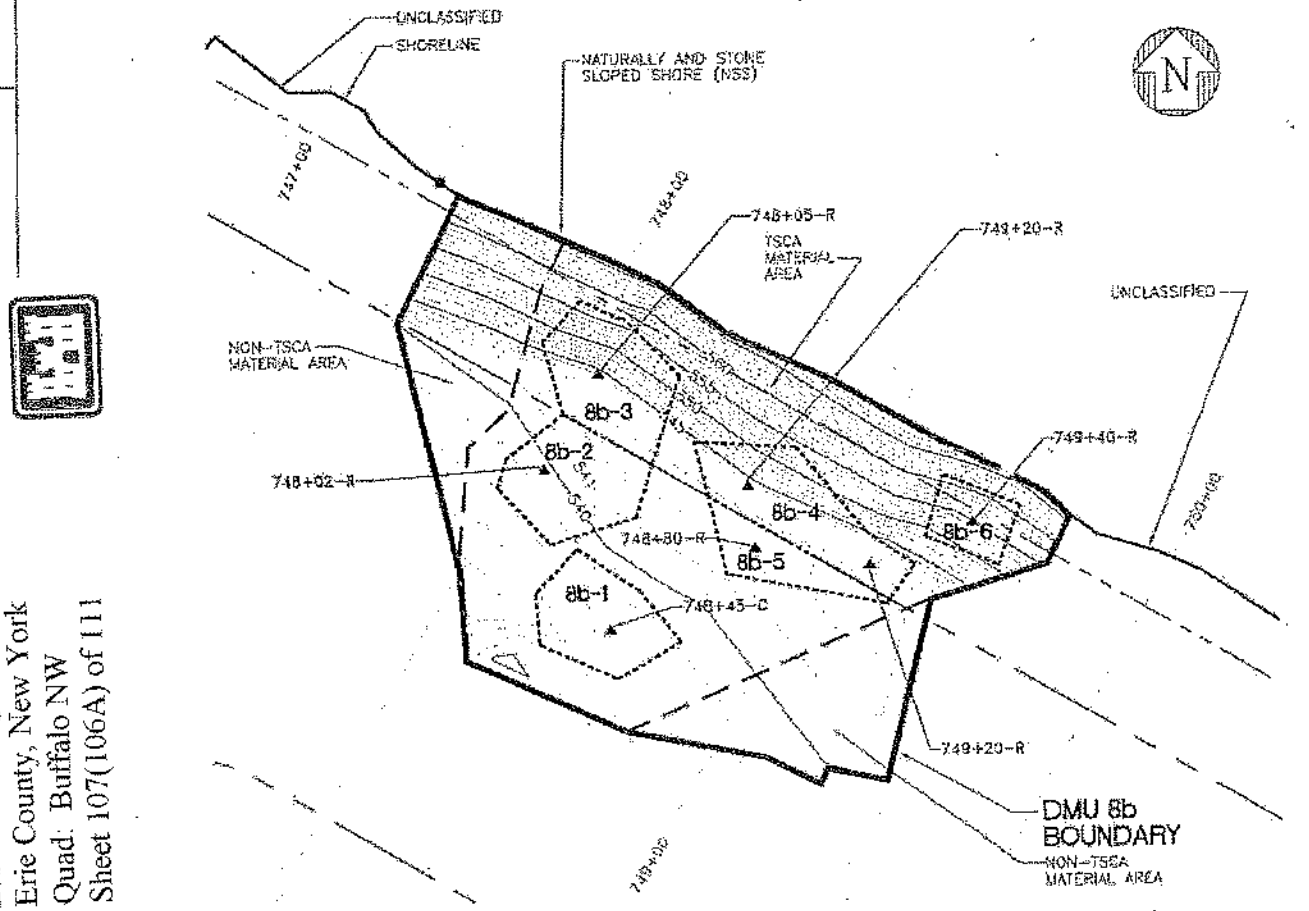
Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 106 of 111



ABBREVIATIONS

AM	AIR MONITORING
CW	CONTACT WATER
CRZ	CONTAMINATION REDU
EZ	EXCLUSION ZONE
P	PUMP
SW	STORMWATER
SZ	SUPPORT ZONE

DREDGED TSCA SEDIMENT AND CONTACT WATER PROCESSING



TSCA AREA CONFIRMATION SAMPLE LOCATION PLAN

SCALE: 1" = 30'-0"

LEGEN

748+

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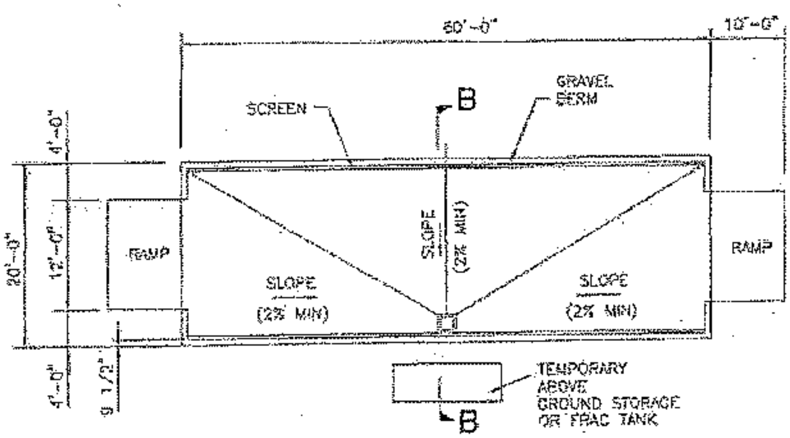
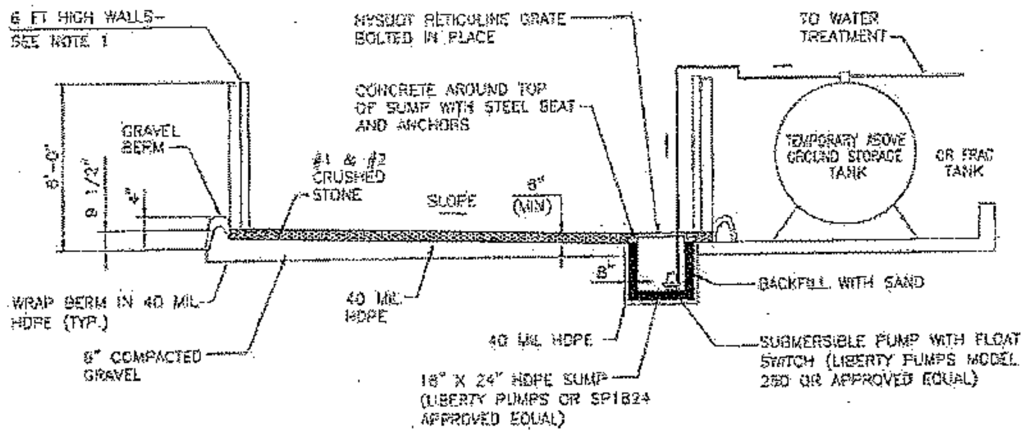
Quad: Buffalo NW
Sheet 107(106A) of 111



PLAN VIEW



SECTION B - B

DECONTAMINATION PAD DETAILS

NOT TO SCALE

NOTES:

1. 6 FT. HIGH SCREEN WALLS TO BE SECURELY ANCHORED AND CONSTRUCTED OF STEEL OR WOOD FRAMING WITH CORRUGATED FIBERGLASS SIDING OR SHEET PLASTIC CAPABLE OF WITHSTANDING WIND PRESSURE, ABUSE AND SHIELD THE SURROUNDING AREA FROM DECON DEBRIS.
2. DIMENSIONS SHOWN ARE TYPICAL VALUES FOR THE DECONTAMINATION PAD COMPONENTS. THE CONTRACTOR SHALL SUBMIT FULLY DIMENSIONED DECONTAMINATION PAD PLANS AND DETAILS FOR APPROVAL.

PROPOSED CONFIRMATION SAMPLE LOCATION

CHANNEL

STATION

SUB-DMU AREAS (PCB >50 PPM)

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

FILENAME: TS-2.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:30 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
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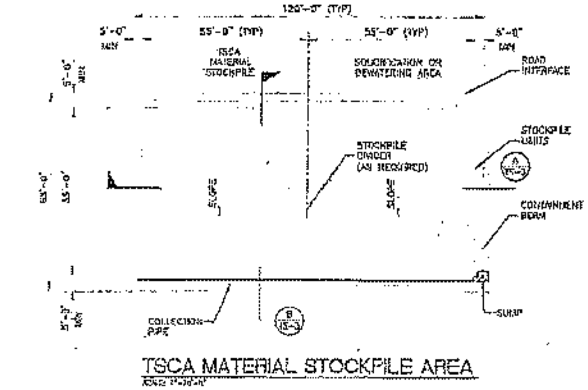
SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

TSCA AREA PROCESS FLOW DIAGRAM / FLOW CHART

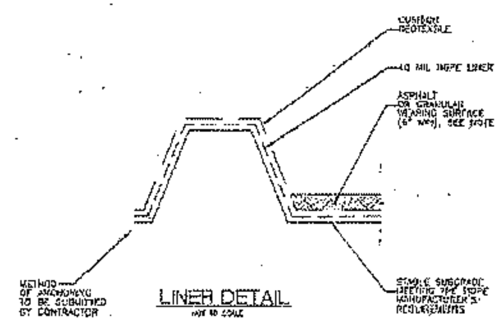
AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE	3-1-13
PROJ	EE-002204-0023-08-01
DWG	TS-2
SHEET	32 OF 51

PRELIMINARY - NOT FOR CONSTRUCTION

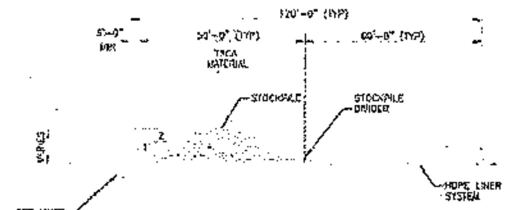


TSCA MATERIAL STOCKPILE AREA

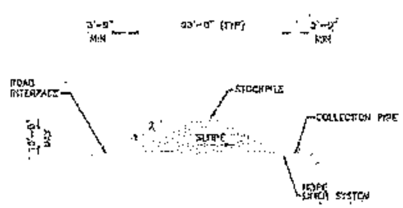


LINER DETAIL

NOT TO SCALE



SECTION A



SECTION B

NOTES

1. CONTRACTOR TO SELECT SIZE OF AREAS BASED ON WORK FLOW. SIZES SHOWN ARE MINIMUM VALUES UNLESS LABELED TYP. TYPICAL DIMENSIONS ARE FOR EXAMPLE ONLY. THE CONTRACTOR SHALL SUBMIT SOLIDIFICATION PLANS AND DETAILS INCLUDING WORK AREA SIZES WHICH SHALL MEET THE MINIMUM REQUIREMENTS.
2. CONTAINMENT BERM HEIGHT AND CONTAINMENT VOLUME SHALL BE DESIGNED BY THE CONTRACTOR TO CONTAIN THE 25 YEAR, 24 HOUR RAIN FALL STORM EVENT W/O THE SUMP PUMP BEING OPERATIONAL.
3. CONTRACTOR SHALL ADD ASPHALT OR GRANULAR FILL MATERIAL AS NEEDED OR AT DIRECTION OF ENGINEER TO PROVIDE FOR SEPARATION BETWEEN WASTE MATERIALS AND LINER SYSTEM.

CH2MHILL.

ecology and environment engineering, p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

TSCA AREA PROCESS
DETAILS AND SECTIONS

AS NOTED

VERIFY SCALE

DATE 3-1-13

FILENAME: TS-G.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:30 PM

Honeywell International(Buffalo River Dredge)
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Quad: Buffalo NW
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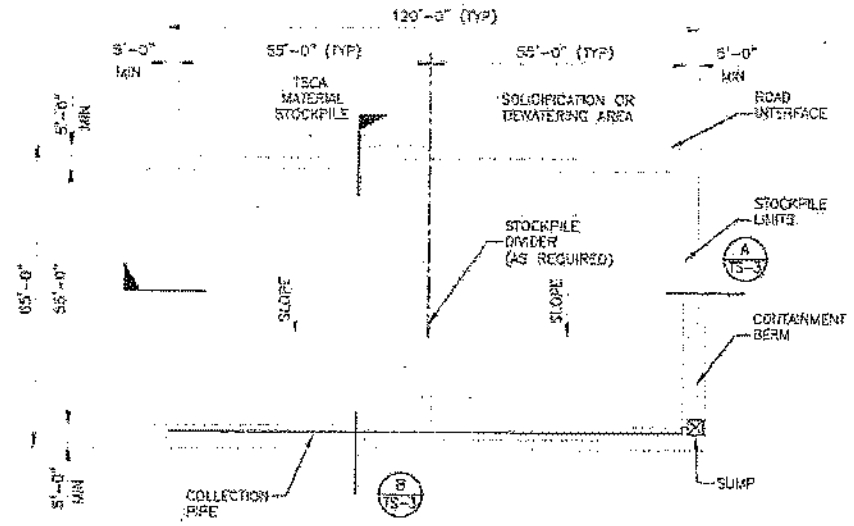
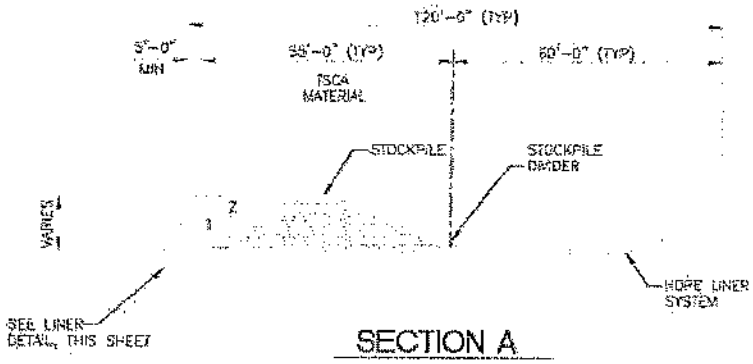
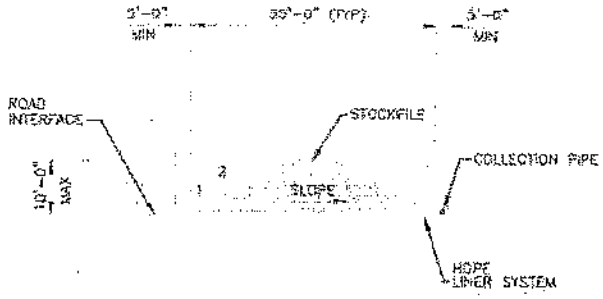


TSCA MATERIAL STOCKPILE AREA

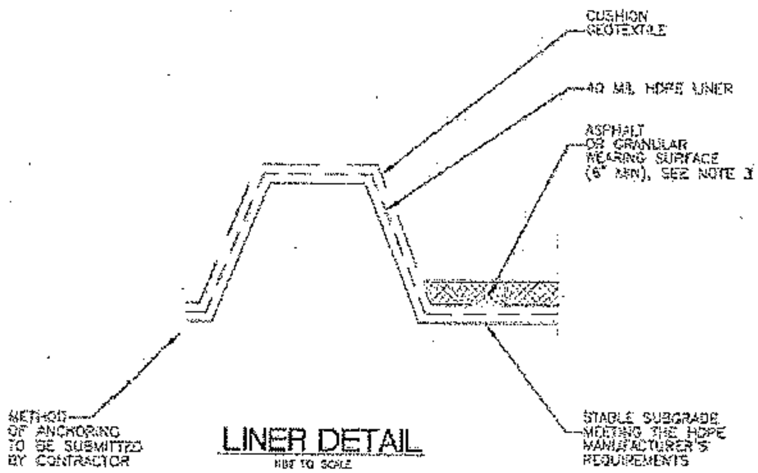


SECTION A



SECTION B

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 110(109A) of 111



LINER DETAIL
NOT TO SCALE

NOTES

1. CONTRACTOR TO SELECT SIZE OF AREAS BASED ON WORK FLOW. SIZES SHOWN ARE MINIMUM VALUES UNLESS LABELED TYP. TYPICAL DIMENSIONS ARE FOR EXAMPLE ONLY. THE CONTRACTOR SHALL SUBMIT SOLIDIFICATION PLANS AND DETAILS INCLUDING WORK AREA SIZES WHICH SHALL MEET THE MINIMUM REQUIREMENTS.
2. CONTAINMENT BERM HEIGHT AND CONTAINMENT VOLUME SHALL BE DESIGNED BY THE CONTRACTOR TO CONTAIN THE 25 YEAR, 24 HOUR RAIN FALL STORM EVENT W/O THE SUMP PUMP BEING OPERATIONAL.
3. CONTRACTOR SHALL ADD ASPHALT OR GRANULAR FILL MATERIAL AS NEEDED OR AT DIRECTION OF ENGINEER TO PROVIDE FOR SEPARATION BETWEEN WASTE MATERIALS AND LINER SYSTEM.

CH2MHILL

ecology and environment engineering p.c.

SEDIMENT REMEDIATION DESIGN
BUFFALO RIVER AREA OF CONCERN
US ENVIRONMENTAL PROTECTION AGENCY
BUFFALO, NEW YORK

TSCA AREA PROCESS DETAILS AND SECTIONS

NO	DATE	DESCRIPTION	BY	APVD
B	3-1-13	REVISED FOR FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
C	12-17-12	REVISED FOR PRE-FINAL DESIGN (NOT FOR CONSTRUCTION)	KMK	TRH
B	12-12-11	REVISED FOR 60% DRAFT (NOT FOR CONSTRUCTION)	KMK	TRH
A	12-3-11	ISSUED FOR 60% DRAFT REVIEW (NOT FOR CONSTRUCTION)	JJK	TRH

DSGN M.G. STEFFAN | DR J.J. KOHLER | CHK M.A. DIPE, P.E. | APVD T.J. HEINS P.E.

REUSE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL & EEEPC AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL & EEEPC

PRELIMINARY - NOT FOR CONSTRUCTION

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"

DATE 3-1-13
PROJ EE-002304-0023-08-01
DWG TS-3
SHEET 33 OF 51

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

FILENAME: TS-3.DWG PLOT DATE: 3-1-13 PLOT TIME: 4:30 PM

Honeywell International(Buffalo River Dredge)
D/A Processing No. 2013-00814
Erie County, New York
Quad: Buffalo NW
Sheet 111(109B) of 111

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

REPLY TO
ATTENTION OF:

October 16, 2015

Regulatory Branch

SUBJECT: Transmittal of Department of the Army Permit No. 2013-00814, Nationwide Permit No. 38 as Published in the Federal Register, Volume 77, No. 34, on Tuesday, February 21, 2012, New York State Department of Environmental Conservation No. 9-1402-01094

Mr. Rich Galloway
Honeywell International, Inc.
101 Columbia Road
Morristown, New Jersey 07962

Dear Mr. Galloway:

I am writing to you in regards to the recent request by Honeywell International, Inc to dredge approximately 40,000 cubic yards of contaminated sediment throughout the Buffalo River and install approximately 220-linear feet sheet piling to prevent destabilization of a section of bank lined with concrete aprons during dredging. This dredging is additional to what was previously authorized by the Corps to dredge within the Buffalo River Area of Concern (AOC) under the U.S. EPA's Great Lakes Legacy Act (GLLA) on August 14, 2013 (Reaffirmed September 17, 2013). All dredging will take place within 6.2 miles from the mouth of the Buffalo River up to Cazenovia/Buffalo Creeks, including the 1.4 mile City Ship Canal, in the City of Buffalo, Erie County, New York.

I have evaluated the impacts associated with your proposal, and have concluded that they are authorized by the enclosed Nationwide Permit (NWP) provided that the attached conditions are satisfied.

Verification of the applicability of this NWP is valid until March 19, 2017 unless the NWP is modified, suspended, revoked, or the activity complies with any subsequent permit modification. Please note in accordance with 33 CFR part 330.6(b), that if you commence or are under contract to commence an activity in reliance of the permit prior to the date this Nationwide permit expires, is suspended or revoked, or is modified such that the activity no longer complies with the terms and conditions, you have twelve months from the date of permit modification, expiration, or revocation to complete the activity under the present terms and conditions of the permit, unless the permit has been subject to the provisions of discretionary authority.

It is your responsibility to remain informed of changes to the NWP program. A public notice announcing any changes will be issued when they occur and will be available for viewing at our website: http://www.lrb.usace.army.mil/Missions/Regulatory.aspx. Finally, note that if your activity is not undertaken within the defined period or the project specifications have changed, you must immediately notify this office to determine the need for further approval or reverification.

This affirmation is limited to the attached NWP and associated WQC, and does not obviate the need to obtain any other project specific Federal, state, or local authorization. Specifically, you may need to obtain Article 15 (Protection of Water), Article 24 (Freshwater Wetland), and/or Article 34 (Coastal Erosion Management) authorization from the New York State DEC.

In addition to the general conditions attached to the NWP, your attention is directed to the following Special Conditions which are also appended at the end of the NWP General Conditions:

Administrative

1. At the request of an authorized representative of the Buffalo District, U.S. Army Corps of Engineers, the permittee shall allow access to the project site and all restoration areas to determine compliance with the conditions of this permit.

2. You are responsible for ensuring that all contractors and/or workers executing the activity(s) authorized by this permit have knowledge of the terms and conditions of the authorization and that a copy of the permit document is at the project site throughout the period that the authorized work is underway. You shall also inform all contractors of liabilities associated with non-compliance of this permit.

3. If any historic or archeological artifacts or remains are discovered while conducting work authorized by this permit, you must notify the Corps of Engineers in accordance with General Condition 21 and all work in the vicinity of the discovery must be stopped immediately, pending initiation of any required consultation under the National Historic Preservation Act.

4. Should human remains be encountered during any phase of the proposed project, such person or persons encountering the human remains must immediately cease work in the vicinity of the discovery and must not disturb or remove the remains, must protect the exposed portions of the remains from inclement weather and vandalism, and immediately notify the permittee. Continuing work on the project may result in adverse effects to the remains, which may be contrary to the National Historic Preservation Act. After discovery, the permittee must immediately notify (within 24 hours) Joseph Rowley, USACE Buffalo District, 1776 Niagara Street, Buffalo New York 14207 at (716) 879-4279 or email:

joseph.m.rowley@usace.army.mil and the New York State Office of Parks, Recreation, and Historic Preservation, Peebles Island State Park, P.O. Box 189, Waterford, New York 12188-0189, (518) 237-8643.

5. Please note, dredging in DMU-45c should be monitored by a qualified archaeologist to identify and record any structural remains that are encountered.

6. Please note, contractor is directed to keep all spuds and anchors at least 25 feet from the center of the locator point that is meant to represent sonar target BF-5. This area is adjacent to DMU-11.

7. The permittee is authorized to discharge only clean fill material that is free of fines, oil and grease, debris, wood, general refuse, plaster, broken asphalt, or other potential pollutants.

8. The Section 401 Water Quality Certification issued for this project by the State of New York is hereby part of this Department of the Army permit pursuant to Section 401(d) of the Clean Water Act. Noncompliance with any limitations or requirements stated in the certification may be a basis for suspension, revocation or modification of this permit.

Dredging

1. The permittee, including their contractors, must ensure the dredged material is not temporarily or permanently placed in Waters of the U.S., including wetlands.

2. The permitte must notify Mr. Joseph Rowley, USACE Buffalo District, 1776 Niagara Street, Buffalo New York 14207, in writing, at least two (2) weeks prior to initiating any dredging activities authorized by this permit.

3. The permittee or their contractors must have a copy of this permit on the vessel used for the authorized transportation and disposal of dredged material.

4. The permittee must install and maintain, at their expense, any safety lights and signals prescribed by the United States Coast Guard (USCG), through regulations or otherwise, on the structures or vessels being utilized for the dredging operation. The USCG may be reached at the following address: Commander (OAN), U.S. Coast Guard, Ninth Coast Guard District, 1240 East Ninth Street, Cleveland, Ohio 44199-2060, Telephone: (216) 902-6069; FAX: (216) 902-6059

5. Dredging operations must be strictly controlled to minimize spillage and re-suspension of bottom sediments.

Confined Disposal Facility

1. The permitte is responsible for abiding by the terms and conditions of the signed Memorandum of Agreement (MOA) with the Buffalo District for use of the Confined Disposal Facility (CDF). Questions in regards to the MOA should be directed to Mr. Robert Remmers, Chief, Operations and Technical Support Section, who may be contacted by calling (716) 879-4277, by e-mail: robert.w.remmers@usace.army.mil, or by writing to: Mr. Robert Remmers, Chief, Operations and Tech Support, U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207-3199.

2. Immediately upon completion of disposal operations (within 30 days) the permittee is required to submit to this office a copy of an itemized contractor's bill or statement showing the total cubic yardage deposited into the Federal Disposal Site and a description of the method used to calculate the yardage (e.g., before and after depth soundings within the dredge area). Backup information (including soundings or other survey data) must also be submitted to this office. The information must be sent to Mr. Robert Remmers as noted below and a second copy must be sent to: Mr. Harold Keppner, Chief, Monitoring and Enforcement Section, U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207-3199.

Finally, this letter contains an approved JD for the subject parcel. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form within 60 days of the date on this letter to the Great Lakes/Ohio River Division Office at the following address:

Attn: Appeal Review Officer
Great Lakes and Ohio River Division
CELRD-PD-REG
550 Main Street, Room 10032
Cincinnati, OH 45202-3222
Phone: 513-684-6212;FAX(513) 684-2460

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by December 17, 2015.

It is not necessary to submit an RFA to the Division office if you do not object to the determination in this letter.

A copy of this correspondence has been sent to Ms. Mary Beth Giancarlo of the U.S. Environmental Protection Agency Great Lakes National Program Office.

Regulatory Branch
SUBJECT: Transmittal of Department of the Army Permit No. 2013-00814, Nationwide Permit No. 38 as Published in the Federal Register, Volume 77, No. 34, on Tuesday, February 21, 2012, New York State Department of Environmental Conservation No. 9-1402-01094

Questions pertaining to this matter should be directed to me at 716-879-4279, by writing to the following address: U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207, or by e-mail at: joseph.m.rowley@usace.army.mil

Sincerely,

Joseph Rowley
Physical Scientist

Enclosures

COMPLETION FORM / COMPLIANCE CERTIFICATION

Each permittee who receives a Nationwide Permit (NWP) verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any compensatory mitigation.

APPLICANT:	POINT OF CONTACT:	File No.: 2013-00814
Honeywell International, Inc.	Mr. Rich Galloway	File Closed: October 16, 2015
Honeywell	Honeywell	NWP No.: 38
115 Tabor Road	115 Tabor Road	
Morris Plains, NJ 07950	Morris Plains, NJ 07950	

Upon completion of the activity authorized by this permit and any required compensatory mitigation sign this certification and return it to the address listed below within 30 days of project completion.

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, revocation, and/or assessment of administrative penalties.

The permittee shall certify the completion of the authorized work and mitigation:

a. The authorized work was done in accordance with the NWP authorization, including any general, regional, or activity specific conditions.

b. The implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, this certification must include the documentation required by 33 CFR 332.3(1)(3) to confirm that the permittee secured the appropriate number and resource type of credits.

_____ _____

APPLICANTS NAME Date

Permittee Telephone Number: _____

Project location: 6.2 miles from the mouth of the Buffalo River up to Cazenovia/Buffalo Creeks, including the 1.4 mile City Ship Canal, in the City of Buffalo, Erie County, New York.

Project Description: dredge approximately 40,000 cubic yards of contaminated sediment; 220-linear feet of Steel Sheet Piling

Authorized Impacts (Waters of the U.S. Impacted by Project): 6.2 miles of the Buffalo River/City Ship Canal

Waterway and/or Project Setting: Buffalo River/City Ship Canal

Return completed form to:
Mr. David Leput
Regulatory Branch
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Honeywell International, Inc.		File Number: 2013-00814	Date: Oct 9, 2015
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
X	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Joseph Rowley United States Army Corps of Engineers Buffalo District 1776 Niagara Street Buffalo, NY 14207 716-879-4279 joseph.m.rowley@usace.army.mil	Attn: Appeal Review Officer Great Lakes and Ohio River Division CELRD-PD-REG 550 Main Street, Room 10032 Cincinnati, OH 45202-3222 (513) 684-6212;FAX(513) 684-2460

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

New York State Department of Environmental Conservation
Division of Environmental Permits, Region 9
270 Michigan Avenue, Buffalo, New York 14203-2915
Phone: (716) 851-7165 · **Fax:** (716) 851-7168
Website: www.dec.ny.gov

Joe Martens
Commissioner

August 22, 2013

Honeywell International Inc.
101 Columbia Road
Morristown, New Jersey 07962

Attention: Mr. John Morris

Dear Permittee:

PERMIT TRANSMITTAL LETTER
BUFFALO RIVER AOC SEDIMENT
REMEDIATION & HABITAT RESTORATION
PERMIT NO. 9-1402-01094/00001

Enclosed is your permit which was recently modified in accordance with applicable provisions of the Environmental Conservation Law. The permit is valid for only that project, activity or operation expressly authorized. Please note that this permit replaces, in its entirety, the permit issued July 24, 2013.

The DEC permit number and Program ID number, if applicable, should be retained for your records and should be referenced on all future correspondence and applications related to the permit. If modifications are desired after permit issuance, you must submit the proposed revisions and receive written approval from the Permit Administrator prior to initiating any change. If the Department determines that the modification represents a material change in the scope of the authorized project, activity, operation or permit conditions, you will be required to submit a new application for permit.

Please note the expiration date of the permit. Applications for permit renewal should be made well in advance of the expiration date (minimum of 30 days) and submitted to the Regional Permit Administrator at the above address.

PLEASE REVIEW ALL PERMIT CONDITIONS CAREFULLY. IN PARTICULAR, IDENTIFY YOUR INITIAL RESPONSIBILITIES UNDER THIS PERMIT IN ORDER TO ASSURE TIMELY ACTION IF REQUIRED. SINCE FAILURE TO COMPLY PRECISELY WITH PERMIT CONDITIONS MAY BE TREATED AS A VIOLATION OF THE ENVIRONMENTAL CONSERVATION LAW, **YOU ARE REQUESTED TO PROVIDE A COPY OF THE PERMIT TO THE PROJECT CONTRACTOR, FACILITY OPERATOR, AND OTHER PERSONS DIRECTLY RESPONSIBLE FOR PERMIT IMPLEMENTATION (IF ANY).**

If you have any questions, please contact this office at the above address.

Respectfully,
David S. Denk
Regional Permit Administrator

Enclosure
ecc: Captain Frank Lauricella, NYSDEC, Division of Law Enforcement
Mr. Martin Doster, NYSDEC, Division of Environmental Remediation
Mr. Timothy DePriest, NYSDEC, Division of Fish, Wildlife and Marine Resources
Mr. Damianos Skaros, NYSDEC, Great Lakes Programs
U.S. Department of the Army Corps of Engineers, Buffalo District Office
Honorable Bryon Brown, City of Buffalo, Mayor
Mr. Steven Stepniak, City of Buffalo, Commissioner of Public Works
Mr. David Comerford, City of Buffalo, Buffalo Sewer Authority
Mr. Brendan Mehaffy, City of Buffalo, Office of Strategic Planning
Mr. Richard Galloway, Honeywell International Inc.

PERMIT

Under the Environmental Conservation Law (ECL)

Permittee and Facility Information

Permit Issued To:
HONEYWELL INTERNATIONAL INC

101 COLUMBIA RD
MORRISTOWN, NJ 07962

Facility:
BUFFALO RIVER AOC SEDIMENT REMEDIATION & HABITAT RESTORATION
BUFFALO RIVER AND CITY SHIP CANAL
BUFFALO, NY

Facility Location: in BUFFALO in ERIE COUNTY
Facility Principal Reference Point: NYTM-E: 183.073 NYTM-N: 4754.248
Latitude: 42°52'30.2" Longitude: 78°52'48.7"

Authorized Activity: Dredge approximately 500,000 cubic yards of contaminated sediments from portions of the Buffalo River and City Ship Canal. Sediment disposal will be at the U.S. Army Corps of Engineers Confined Disposal Facility. Approximately 4,200 cubic yards of sediments regulated under the Toxic Substance Control Act will be specially handled and properly disposed. Dredge and TSCA regulated sediment volumes may change during construction. Actual volumes will be recorded and reported at the completion of the work. Some capping of sediments will be done at the head of the ship canal and in areas where dredging could compromise shoreline structures. The final phase of activities associated with the dredging and capping operation is habitat restoration at five sites as shown in the referenced plans.

Permit Authorizations

Excavation & Fill in Navigable Waters - Under Article 15, Title 5
Permit ID 9-1402-01094/00001

New Permit	Effective Date: 7/24/2013	Expiration Date: 7/23/2018
Modification # 1	Effective Date: 8/22/2013	Expiration Date: 7/23/2018

Water Quality Certification - Under Section 401 - Clean Water Act
Permit ID 9-1402-01094/00003

Modification # 0	Effective Date: 8/22/2013	Expiration Date: 7/23/2018

NYSDEC Approval

By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this permit.

Permit Administrator: DAVID S DENK, Regional Permit Administrator
Address: NYSDEC REGION 9 HEADQUARTERS
270 MICHIGAN AVE
BUFFALO, NY 14203 -2915

Authorized Signature: _____ Date 8 / 22 / 2013

Distribution List

Law Enforcement
Mr. John Morris, Honeywell International Inc
Mr. Rich Galloway, Honeywell International Inc
Honorable Byron Brown, City of Buffalo
Mr. Steven Stepniak, City of Buffalo Commissioner of Public Works
Mr. David Comerford, Buffalo Sewer Authority
Mr. Brendan Mehaffy, City of Buffalo Office of Strategic Planning
US ARMY CORP OF ENGINEEERS - BUFFALO DISTRICT
Mr. Martin Doster
Mr. Timothy DePriest
Mr. Damianos Skaros

Permit Components

NATURAL RESOURCE PERMIT CONDITIONS

WATER QUALITY CERTIFICATION SPECIFIC CONDITION

GENERAL CONDITIONS, APPLY TO ALL AUTHORIZED PERMITS

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

NATURAL RESOURCE PERMIT CONDITIONS - Apply to the Following Permits: EXCAVATION & FILL IN NAVIGABLE WATERS; WATER QUALITY CERTIFICATION

1. **Conformance With Plans** All activities authorized by this permit must be in strict conformance with the approved plans submitted by the applicant or applicant's agent as part of the permit application. Such approved plans were prepared by CH2M HILL and Ecology and Environment Engineering, P.C.

2. **Environmental Window for Dredging** Dredging in the following areas shall be scheduled during the following time frames ("environmental window") to avoid adverse impacts to fishing resources in those areas:

Buffalo River	-	June 15 - December 30
Buffalo Ship Canal	-	July 1 - December 30

3. **Design and Use of Dredging Bucket** The dredging method used for silty material must minimize sediment resuspension no less efficiently than an environmental bucket with the following specifications and operational restrictions. The bucket shall:

- Provide a level cut during the closing cycle.
- Completely enclose the dredged sediment and water captured.
- Be fitted with escape valves or vents that close when the bucket is withdraw from the water.
- Have a smooth-cut surface, with no digging teeth unless otherwise approved in writing by the Department.
- Be operator controlled using a global positioning system.
- Have integrated software that allows the bucket position to be monitored in real time and a horizontal accuracy of one foot and vertical accuracy of +0 inch to -six inches.
- Have operator control of bucket penetration to avoid overfilling and minimize sediment resuspension.
- Allow the operator to mark the presence of obstructions encountered prior to reaching target dredge elevation.
- If excessive loss of water and/or sediments from the bucket is observed from the time of its breaking the water surface to crossing the barge gunwale, the inspector shall halt dredging operations and inspect the bucket for defects. Operations shall be suspended until all necessary repairs or replacements are made.

4. **Inspection of Dredging Bucket** Dredging is not to commence until the Inspector has examined said bucket and determined that it is constructed as described and properly functioning.

5. **Silt Curtains** Silt curtains must be placed around the dredging locations (DMUs: 6, 8, 9, 10, 16, 17, 37, 41 and 44) as required by the River Water Monitoring Plan dated 2013 and extend at least halfway down in the water column. Silt curtain must not be allowed to contact or drag on the bottom. Silt curtains must be used in other dredging locations if is determined that Best Management Practices are not being met.

6. **Control Turbidity** Turbidity must be monitored at the dredging locations as defined in the River Water Monitoring Plan dated March 2013. If excess turbidity outside the curtain is observed, the Department must be notified and dredging stopped until the situation is corrected.

7. **Prevent Spillage of Sediment** During the dredging operation, the permittee and his contractor shall prevent spillage of sediment during excavation and haulage. Dredging shall be accomplished with a clam shell or other closed bucket equipment.

8. **Handling of Sediment** Excavated sediment shall be placed directly into the approved disposal/dewatering site or conveyance vehicle. No side-casting (double dipping) or temporary storage of dredged material is authorized (other than TSCA sediment).

9. **Non-sediment Materials at the CDF** Non-sediment materials (solid waste) which have been removed from the river and canal will be separated from sediments at the CDF and be properly disposed of at the CDF or an off-site location authorized to accept such materials.

10. **Water Treatment of TSCA Material** There shall be special measures for dealing with excess water from TSCA-level sediment. An on-site water treatment unit will be installed at the TSCA waste handling site. Following treatment, this water will be tested prior to disposal or retreatment. If treated waters meet discharge limits, the water will be discharged either to the sanitary sewer system under a Buffalo Sewer Authority permit or to the Buffalo River under a DEC State Pollutant Discharge Elimination System (SPDES) permit. Water which does not meet discharge limits will be retreated until it meets limits.

11. **Approval Needed** Department approval is needed if it becomes necessary to change the location from the specified site known as "Riverbend" where the TSCA regulated material will be handled/stabilized.

12. **Control of Dust in TSCA Handling Areas** Air monitoring will be conducted as described in the TSCA monitoring plan. Measures for the control of dust will be implemented if air quality standards are exceeded.

13. **Construction of Habitat Restoration Projects and Replacement of Plantings** The habitat restoration projects at the City Ship Canal and Katherine Street Peninsula must be constructed if the dredging and capping project authorized in this permit is undertaken. The plantings must be monitored yearly for at least four years. The permittee must ensure a minimum of 80% vegetative cover at each habitat restoration project site by the end of five growing seasons. Additional planting for replacement must be put in place by the end of the following planting season. The other three habitat restoration projects are authorized under this permit.

14. **Control of Invasive Species** The aquatic habitat restoration areas must monitored for exotic invasive species, and if necessary treated, on an annual basis for four growing seasons after initial restoration. The monitoring and treatment must result in no more than 10 percent of areal cover of exotic species in each restoration area at the end of the monitoring period.

15. **Final Residuals Monitoring Plan** The two year and five year monitoring plans detailed in The Final Residuals Monitoring Plan dated March 2013 must be completed as described in the plan if the dredging and capping project authorized in this permit is undertaken.

16. **Overflow Weir Configuration** The dredge material overflow weir and return water discharge must be configured so that water with the lowest possible turbidity is returned to the waterway. The discharge outfall shall be monitored by the permittee or his agent and, if a visible plume becomes evident, the discharge shall cease immediately until the problem is corrected.

17. **No Interference With Navigation** There shall be no unreasonable interference with navigation by the work herein authorized.

18. **State Not Liable for Damage** The State of New York shall in no case be liable for any damage or injury to the structure or work herein authorized which may be caused by or result from future operations undertaken by the State for the conservation or improvement of navigation, or for other purposes, and no claim or right to compensation shall accrue from any such damage.

19. **State May Order Removal or Alteration of Work** If future operations by the State of New York require an alteration in the position of the structure or work herein authorized, or if, in the opinion of the Department of Environmental Conservation it shall cause unreasonable obstruction to the free navigation of said waters or flood flows or endanger the health, safety or welfare of the people of the State, or cause loss or destruction of the natural resources of the State, the owner may be ordered by the Department to remove or alter the structural work, obstructions, or hazards caused thereby without expense to the State, and if, upon the expiration or revocation of this permit, the structure, fill, excavation, or other modification of the watercourse hereby authorized shall not be completed, the owners, shall, without expense to the State, and to such extent and in such time and manner as the Department of Environmental Conservation may require, remove all or any portion of the uncompleted structure or fill and restore to its former condition the navigable and flood capacity of the watercourse. No claim shall be made against the State of New York on account of any such removal or alteration.

20. **State May Require Site Restoration** If upon the expiration or revocation of this permit, the project hereby authorized has not been completed, the applicant shall, without expense to the State, and to such extent and in such time and manner as the Department of Environmental Conservation may lawfully require, remove all or any portion of the uncompleted structure or fill and restore the site to its former condition. No claim shall be made against the State of New York on account of any such removal or alteration.

21. **Precautions Against Contamination of Waters** All necessary precautions shall be taken to preclude contamination of any wetland or waterway by suspended solids, sediments, fuels, solvents, lubricants, epoxy coatings, paints, concrete, leachate or any other environmentally deleterious materials associated with the project.

WATER QUALITY CERTIFICATION SPECIFIC CONDITIONS

1. **Water Quality Certification** The NYS Department of Environmental Conservation hereby certifies that the subject project will not contravene effluent limitations or other limitations or standards under Sections 301, 302, 303, 306 and 307 of the Clean Water Act of 1977 (PL 95-217) provided that all of the conditions listed herein are met.

GENERAL CONDITIONS - Apply to ALL Authorized Permits:

1. **Facility Inspection by The Department** The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71- 0301 and SAPA 401(3).

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

2. **Relationship of this Permit to Other Department Orders and Determinations** Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

3. **Applications For Permit Renewals, Modifications or Transfers** The permittee must submit a separate written application to the Department for permit renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing. Submission of applications for permit renewal, modification or transfer are to be submitted to:

Regional Permit Administrator
NYSDEC REGION 9 HEADQUARTERS
270 MICHIGAN AVE
BUFFALO, NY14203 -2915

4. **Submission of Renewal Application** The permittee must submit a renewal application at least 30 days before permit expiration for the following permit authorizations: Excavation & Fill in Navigable Waters, Water Quality Certification.

5. **Permit Modifications, Suspensions and Revocations by the Department** The Department reserves the right to exercise all available authority to modify, suspend or revoke this permit. The grounds for modification, suspension or revocation include:

a. materially false or inaccurate statements in the permit application or supporting papers;

b. failure by the permittee to comply with any terms or conditions of the permit;

c. exceeding the scope of the project as described in the permit application;

d. newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit;

e. noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

6. **Permit Transfer** Permits are transferrable unless specifically prohibited by statute, regulation or another permit condition. Applications for permit transfer should be submitted prior to actual transfer of ownership.

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification
The permittee, excepting state or federal agencies, expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees, and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under Article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

Item B: Permittee's Contractors to Comply with Permit
The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

Item C: Permittee Responsible for Obtaining Other Required Permits
The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

Item D: No Right to Trespass or Interfere with Riparian Rights
This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 9
270 Michigan Avenue, Buffalo, NY 14203-2915
P: (716) 851-7165 | F: (716) 851-7168
www.dec.ny.gov

November 12, 2015

John J. Morris, P.E., Remediation Director
Honeywell International Inc.
101 Columbia Road
Morristown, New Jersey 07962

Dear Mr. Morris:

MODIFICATION OF PERMIT
BUFFALO RIVER AOC SEDIMENT REMEDIATION AND HABITAT RESTORATION
DEC NO. 9-1402-01094/00001

The Department has received the permit modification request and follow-up submittals from your consultant, Anchor QEA LLC for proposed changes to the above referenced Protection of Waters Permit / Water Quality Certification. The Department hereby modifies the subject authorization to include the Buffalo River AOC 2015 Additional Dredging construction drawings (35 sheets) dated November 6, 2015. The authorized work includes dredging within DMUs 1, 2, 5, 6a, 9, 10, 17, 18, 19, 27, 28, 38a, and 44e, backfilling following dredging in 44e, and a submerged sheetpile kneewall installation to support the removal of sediments in DMUs 9 and 10, with additional backfill following installation. In addition, turbidity monitoring shall be conducted as described in the September 4, 2015 memorandum from Mark Reemts and Ram Mohan, Anchor QEA, PLLC to Chad Staniszewski and Damianos Skaros, NYSDEC.

This letter shall be considered an official amendment to the original permit, and as such, a copy of this letter must be available along with the original permit and previous modifications at the work site to produce if requested by a DEC representative.

If you have any questions or comments about this letter or the New York State Environmental Conservation Law, please contact me at (716) 851-7165.

Sincerely,

David S. Denk
Regional Permit Administrator

DSD/dsd

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

ecc: Capt. Frank Lauricella, NYSDEC Division of Law Enforcement
Mr. Chad Staniszewski, NYSDEC DER
Mr. Damianos Skaros, NYSDEC
Ms. Mary Beth Giancarlo, USEPA GLNPO
Mr. Scott Cieniawski, USEPA GLNPO
Mr. Joseph Rowley, USACE
Mr. Rich Galloway, Honeywell
Mr. Mark Reemts, Anchor QEA, LLC

ANCHOR QEA

290 Elwood Davis Road, Suite 340
Liverpool, NY 13088
Phone 315.453.9009
Fax 315.453.9010
www.anchorqea.com

MEMORANDUM

To:	Chad Staniszewski and Damianos Skaros, NYSDEC	**Date:**	September 4, 2015
From:	Mark Reemts and Ram Mohan, Anchor QEA Engineering, PLLC	**Project:**	E50287-03.01
Cc:	Rich Galloway, Honeywell International Inc. Scott Cieniawski and Mary Beth Giancarlo, USEPA GLNPO		
Re:	Proposed Changes to Dredging Monitoring – 2015 USACE and Honeywell Contract DMUs		

Anchor QEA Engineering, PLLC (Anchor QEA), in support of the Project Coordination Team for the Great Lakes Legacy Act (GLLA) Buffalo River Area of Concern Remediation and Restoration Project, is currently developing revised dredge prisms for select Dredge Management Units (DMUs) for additional dredging to occur in 2015. In an effort to reduce potential schedule and river logistical conflicts, the United States Environmental Protection Agency (USEPA) is coordinating with the United States Army Corps of Engineers (USACE) to potentially contract a portion of the dredging under a USACE maintenance dredging contract. The proposal of work for USACE operations includes sediment removal within DMUs 1, 2, 5, 6a, 38a, and 101. Dredging of DMU 101 is contingent on BIDCO executing the GLLA Project Agreement by September 15, 2015. Additionally, Honeywell is proposing to perform the dredging of sediments within the DMUs at 9, 10, 17, 18, 19, 27, 28, 29, and 44e. The dredging and/or placement of a cap in DMUs 17, 18, 19, 27, 28 and 29 is contingent on CSX executing the GLLA Project Agreement by September 15 2015. Remaining sediments in DMU 8b, both non-TSCA and TSCA, will be addressed through the USEPA GLNPOCS contract. Given the differences in contract requirements between the USACE, USEPA GLNPO and Honeywell contracts, small quantities and shorter durations of work, and in an attempt to reduce potential change orders to perform the work, Anchor QEA and USACE ERDC personnel have been evaluating requirements for dredge operations to develop an optimal operations plan.

An initial evaluation was completed by USACE ERDC in June, 2015, to determine the need for silt curtain usage and dredging production modifications at DMU 6a. Previously established restrictions from the Final Design (CH2M 2013) required the use of silt curtains during dredging within select DMUs, including 6a, as well as restricted dredging rates in select areas. DMU 6a was initially restricted to a maximum of 164 cubic yards per day from a single dredge plant operating less than 3 hours per day. Following re-evaluation of the remaining sediments, and expected operations for the remaining work in DMU 6a, USACE ERDC analysis indicated that the use of silt curtains would not be required, and that production restrictions are not required in this area as well. For additional information, please see the USACE ERDC memorandum (USACE 2015). Dredging restrictions, including silt curtain usage and production rate limitations, at the remaining DMUs would remain as previously established. Accordingly, dredging in DMUs 9, 10, 17, and 44e will utilize silt curtains, and DMU 17 dredging will be limited to daily maximum of 5,038 cubic yards.

Additional monitoring requirements for dredging operations are outlined in the Final River Water Monitoring Plan, included as an appendix to the Final Design (CH2M 2013). To support evaluation of these requirements for the proposed 2015 dredging work, historical records from the previous dredging activities, including records of turbidity, Total Suspended Solids (TSS), and analytical data from water column samples, were reviewed. Records included daily, weekly, and other records spanning the duration of dredging from 2013 through 2014. Data included records from all completed DMUs, and include all but one of the proposed 2015 DMUs. Since DMU 101 was added following the 2013 and 2014 dredging operations, it has not yet been dredged; the remainder of the proposed 2015 DMUs included various levels of partial dredging during previous operations.

DISCUSSION OF OBSERVED TRENDS

During dredging operations in 2013 and 2014, infrequent spikes in turbidity measurements occurred, all associated with high flow events following storm conditions. Generally, turbidity monitoring kept within the 100 NTU upstream to downstream difference during the individual 15 minute frequency measurements, with only a single instance exceeding the 4 hour rolling average restriction outlined in the Water Monitoring Plan. Analytical results collected identified only a single TSS exceedance which did not occur at the time of the single turbidity exceedance. Outside of these two occasions, turbidity and TSS sampling did

not exceed monitoring restrictions during all remaining non-TSCA dredging. In addition to the lack of turbidity and TSS exceedances, no exceedances of targeted chemicals of concern were identified in analytical sampling during all non-TSCA dredging activities, and only trace concentrations of individual PCBs were recorded during TSCA dredging of DMU 8b.

Throughout the dredging operations, only a single exceedance of the turbidity 4 hour rolling average difference occurred on August 3, 2014, which was attributed to storm related turbidity, and not dredging operations. Occasional short term spikes in turbidity readings occurred during operations, identified in the 15 minute interval sampling, as well as some instances of debris or equipment impacting readings. These short duration events typically resulted from passing boat wakes or other short term effects, and did not cause significant rise in the rolling average. Except for the single rolling average exceedance event, the work was within turbidity criteria during all dredging operations.

A single exceedance of the TSS criteria (100 parts per million above ambient background condition) was recorded on December 12, 2013 during dredging within the City Ship Canal. The 'upstream' location, located within the City Ship Canal, recorded a TSS level of 54.4 mg/l while the 'downstream' location, located at the confluence of the Buffalo River and City Ship Canal at DMU 45c, recorded a TSS level of 426 mg/l. This single exceedance occurred following a storm event, and is likely attributable to the location of the two buoys and the effects of the backwater canal versus the more turbid flow on the main river exacerbating the difference in values, rather than direct dredging related impacts.

Recorded data provided correlation between turbidity records and TSS results; evaluations illustrated that the originally proposed and utilized 1:1 correlation for turbidity (NTU) to TSS (mg/l) was conservative and protective based on the data collected, as outlined in the summary memorandum on turbidity/TSS correlation (AECOM 2013).

SUMMARY

Given the limited scope of the 2015 dredging, the documented lack of historical exceedances of water quality criteria (specifically the lack of TSS and analytical exceedances), and the good empirical correlation between turbidity and TSS, it is proposed to utilize turbidity monitoring for water quality assessments during remaining dredging activities. Turbidity

monitoring will occur as outlined in the Final River Water Monitoring Plan, and include the use of real time buoys staged upstream and downstream of operations. Considering the small volume dredge areas proposed for 2015, and per the request of NYSDEC and GLNPO, it is proposed to implement a tiered monitoring program for 2015, consisting of an "alert level", and an "action level". Data will be recorded in 15 minute intervals, and utilize rolling 2 hour averages as the driver for implementation of BMPs to manage turbidity generation, if incurred. This two hour value will not be a compliance value, rather an early warning system, to "alert" the site staff and managers about a potential for exceedance in water quality criteria. Upon notification of exceedance of the 2-hour alert level, field crew will immediately investigate the cause of the exceedance, and implement corrective steps, as necessary. Any such exceedance shall also be promptly notified to Honeywell, GLNPO and NYSDEC, along with Anchor QEA's analysis of the situation, and summarizing the investigative/corrective measures undertaken, as appropriate.

Historic data trends indicate that current BMPs through operational restrictions will be sufficient to control the release of contaminants during dredging, if needed. Therefore, for all non-TSCA DMUs dredged under the USACE contract and Honeywell contract, no additional aliquot sampling would occur; existing correlations for TSS would be utilized to determine if dredging operations are meeting NYSDEC guidance values.

The compliance, or formal "action level" shall remain as the 4-hour rolling average value. This is the level, upon exceedance of which, formal regulatory notification and immediate corrective measures will be required.

The proposed modification would be applicable to all non-TSCA dredging under the USACE contract= (applicable to DMUs 1, 2, 5, 6a, 38a, and 101), and the Honeywell contract (applicable to DMUs 9, 10, 17, 18, 19, 27, 28, 29, and 44e). Dredging operations under the USEPA contract for DMU 8b dredging would utilize the originally outlined monitoring approach, unless further modifications are requested at a later date.

REFERENCES

AECOM, 2013. Memorandum, *Buffalo River Turbidity/TSS Correlation*. Buffalo, NY. November 2013.

CH2M, 2013. *Basis of Design Report, Buffalo River Area of Concern, Buffalo, New York. Final Design for Sediment Remediation.* Buffalo, NY. March 2013.

USACE, 2015. Memorandum, *Evaluation of Dissolved Contaminant Releases Resulting from GLLA Cleanup Dredging Work at DMU 6a in the Buffalo Ship Canal*. Buffalo, NY. June 2015.