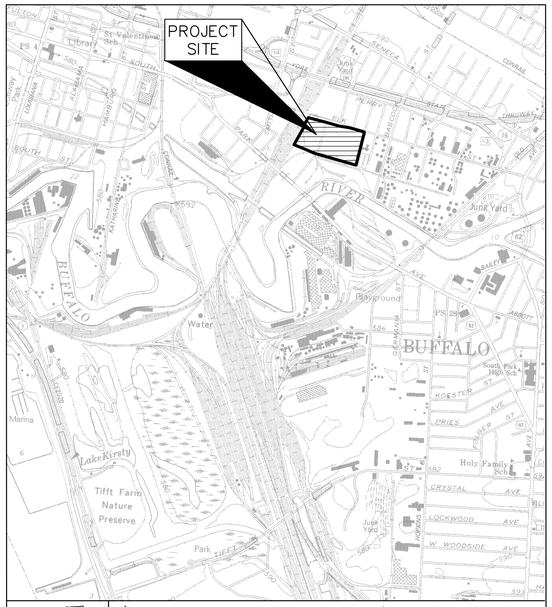
# APPENDIX S

# AREA E DESIGN DRAWINGS AND SPECIFICATIONS

# SOUTH BUFFALO DEVELOPMENT, L.L.C.
# REMEDIAL DESIGN FOR AREA C AND E EXCAVATIONS
# FORMER BUFFALO COLOR CORPORATION SITE
# BUFFALO, NEW YORK
# SEPTEMBER 2010




LOCUS MAP

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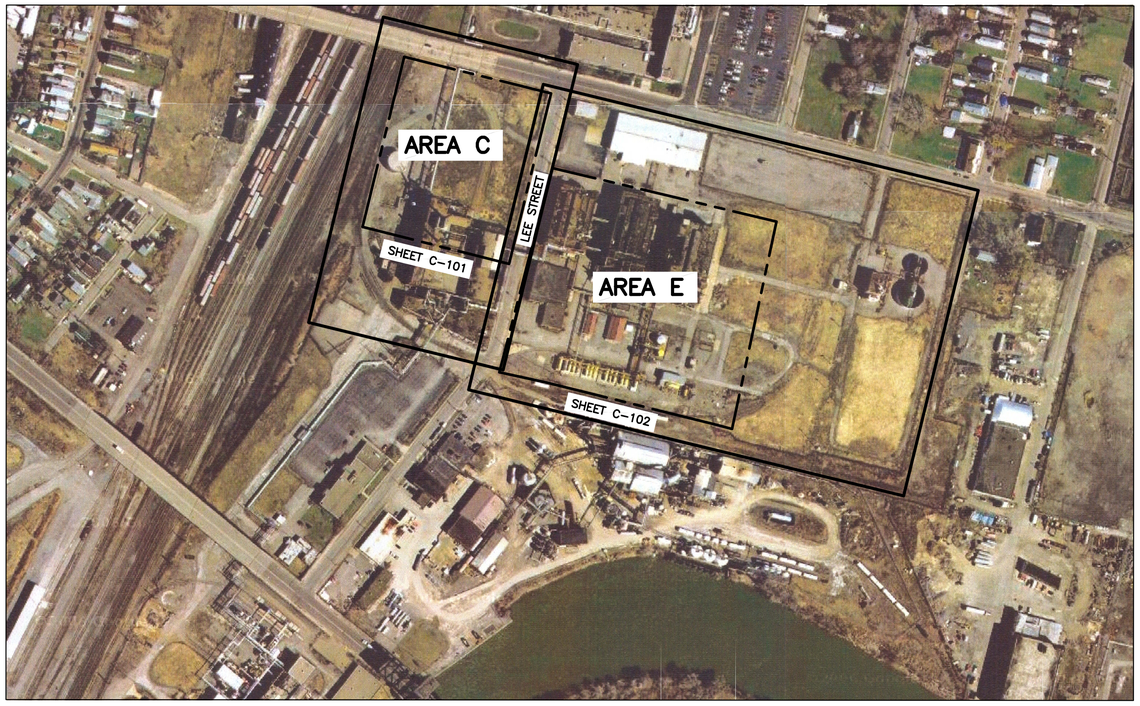
SCALE IN FEET




MAP SOURCE: GIS COLOR ORTHO IMAGE OF ERIE COUNTY N.Y.

KEY

0 100 200 400
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## DRAWING INDEX

| INCLUDED THIS SUBMITTAL | SHEET NUMBER | DRAWING TITLE | DISCIPLINE NUMBER |
|---|---|---|---|
| • | 1 | COVER SHEET | G–001 |
| • | 2 | LEGEND, ABBREVIATIONS, AND GENERAL NOTES | G–002 |
| • | 3 | AREA C EXCAVATION PLAN | C–101 |
| • | 4 | AREA E EXCAVATION PLAN | C–102 |

NOT FOR CONSTRUCTION

| NO. | DATE | REVISION | BY | APVD |
|---|---|---|---|---|
| B | 09/07/10 | 100% DESIGN FOR CLIENT REVIEW | RJR | RTB |
| A | 05/13/10 | ISSUED 50% DESIGN FOR CLIENT REVIEW | | |

DSGN R.T. BELTCHER DR M.R.STACEY CHK SCP APVD JMS



REMEDIAL DESIGN
FOR AREA C AND E EXCAVATIONS
FORMER BUFFALO COLOR CORP SITE
BUFFALO, NEW YORK

MACTEC Engineering and Consulting, Inc.
P.O. Box 1062, 511 Congress Street
Portland, Maine 04112–7050
(207) 775–5401

MACTEC

GENERAL
COVER SHEET

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

| | |
|---|---|
| DATE | 09/07/10 |
| PROJ | 3410090701 |
| DWG | G-001 |
| SHEET | 1 OF 4 |

FILE NAME: M:\Projects\HONEYWELL\BUFFALO COLOR\SBD AREA C & E RD EXCAVATION\SBD-RMD G-001.dwg PLOT DATE: Fri, 03 Sep 2010 PLOT TIME: 3:06 PM

## LEGEND

- PROPERTY LINE
- BUILDING/FORMER BUILDING (AREA E)
- TANK
- MAJOR CONTOUR (GRADE)
- MINOR CONTOUR (GRADE)
- GROUND SHOT (GRADE)
- FENCE LINE
- RAILROAD CENTER LINE
- DIKE
- SANITARY SEWER WITH FLOW DIRECTION
- STORM DRAIN WITH FLOW DIRECTION
- PROCESS SEWER WITH FLOW DIRECTION
- SPRINKLER
- WATER LINE
- SANITARY SEWER MANHOLE
- STORM DRAIN MANHOLE
- PROCESS SEWER MANHOLE
- SPRINKLER
- WATER VALVE
- FIRE HYDRANT
- RISER
- MONITORING WELL
- MONITORING WELL (PZ)
- MIP LOCATION (MIP)
- 2009 TEST BORING
- SOIL BORING/ SAMPLING LOCATIONS
- PDI BORING LOCATIONS
- MANHOLE SEDIMENT SAMPLE LOCATION
- CONFIRMATION SOIL SAMPLE
- STORM DRAIN INLET PROTECTION (NITC)
- STABILIZED CONSTRUCTION ENTRANCE (NITC)
- SILT FENCE (NITC)
- PROPOSED SHALLOW EXCAVATION
- PROPOSED DEEP EXCAVATION

## REFERENCE LEGEND

- DETAIL LETTER
- WHERE DETAIL APPEARS
- WHERE DETAIL TAKEN
- SECTION NUMBER
- WHERE SECTION APPEARS
- WHERE SECTION TAKEN

## ABBREVIATIONS:

| | |
|---|---|
| ACOE | ARMY CORPS OF ENGINEER |
| AVE | AVENUE |
| BSA | BUFFALO SEWER AUTHORITY |
| BLDG | BUILDING |
| CAB | CATCH BASIN IN A CONCRETE PAD |
| CIP | CAST IRON PIPE |
| ℄ | CENTER LINE |
| CONC | CONCRETE |
| ø | DIAMETER |
| E | EASTING, EAST |
| EL | ELEVATION |
| Z | ELEVATION |
| EW | EXTRACTION WELL |
| FF | FINISH FLOOR |
| FE | FLOW ELEMENT |
| HDPE | HIGH DENSITY POLYETHYLENE |
| ID | IDENTIFICATION |
| INV | INVERT |
| MH | MANHOLE |
| MIN | MINIMUM |
| MW | MONITORING WELL |
| NE | NORTHEAST |
| N | NORTHING, NORTH |
| NW | NORTHWEST |
| PT | POINT |
| PVC | POLYVINYL CHLORIDE |
| PI | PRESSURE INDICATOR |
| PS | PROCESS SEWER |
| RCP | REINFORCED CONCRETE PIPE |
| S | SOUTH, SAMPLE PORT |
| SB | SOIL BORING |
| SD | STORM DRAIN |
| SE | SOUTHEAST |
| SP | SAMPLE PORT |
| SS | SANITARY SEWER |
| SW | SOUTHWEST |
| TYP | TYPICAL |
| VT | VITRIFIED CLAY TILE |
| W16 | WATER VALVE AND NUMBER |

## GENERAL NOTES:

1. CONDITIONS BASE MAPPING WAS ESTABLISHED FROM A COMBINATION OF SEVERAL SURVEY AND DRAWING SOURCES. THOSE SOURCES INCLUDED:
   - TOPOGRAPHIC FIELD SURVEY OF AREAS A, B, C, AND E COMPLETED MARCH 2010 BY NIAGARA BOUNDARY & MAPPING SERVICES, 2475 MILITARY ROAD, NIAGARA FALLS, NY 14304.
   - LIMITED LOCATION AND TOPOGRAPHIC FIELD SURVEY OF AREA A AND AREA E COMPLETED BY LU ENGINEERS IN JULY 2005.
2. ABBREVIATIONS ON THIS SHEET ARE PROVIDED AS A CONSOLIDATED LIST AND SHOULD NOT BE PERCEIVED AS ALL INCLUSIVE.
3. KNOWN UNDERGROUND UTILITIES AND STRUCTURES ARE SHOWN ON THE DRAWINGS. THE LOCATION OF THESE EXISTING UNDERGROUND UTILITIES AND STRUCTURES SHOULD BE CONSIDERED APPROXIMATE. THEREFORE, PRIOR TO THE COMMENCEMENT OF SITE ACTIVITIES, THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES OR STRUCTURES IN THE AREAS OF WORK. IF UTILITIES ARE TO REMAIN IN PLACE, PROVIDE ADEQUATE MEANS OF PROTECTION. THE CONTRACTOR SHALL CONFIRM THAT ANY ABANDONED UTILITY LOCATED WITHIN THE LIMIT OF WORK HAS BEEN ABANDONED IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY OWNER.
4. TEMPORARY CONTAMINATION REDUCTION ZONES WILL BE PLACED AT EGRESS POINTS FROM EXCLUSION ZONES AS DEEMED NECESSARY BY THE SITE H&S OFFICER TO PREVENT TRACKING OF CONTAMINATED SOILS INTO THE SUPPORT ZONE.
5. CONSTRUCTION WATER MANAGEMENT AND DEWATERING WILL BE REQUIRED DURING EXCAVATION ACTIVITIES. GROUNDWATER DEPTH VARIES FROM APPROXIMATELY 3 FEET TO 5 FEET BELOW GROUND SURFACE. SOIL EXCAVATION WILL BE CONDUCTED TO A MAXIMUM OF 13 FEET BELOW GROUND SURFACE. WATER THAT IS REMOVED FROM AN EXCAVATION BY THE CONSTRUCTION WATER MANAGEMENT AND DEWATERING SYSTEM WILL BE PROCESSED AT A TEMPORARY ON–SITE WATER TREATMENT SYSTEM AND DISCHARGED TO THE BSA SEWER SYSTEM. TREATMENT AND DISCHARGE OF CONSTRUCTION WATER WILL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE BSA PERMIT REQUIREMENTS.
6. DURING SOIL EXCAVATION ACTIVITIES ADJACENT TO AND AT ELEVATIONS BELOW ACTIVE/OCCUPIED EXISTING UTILITIES OR STRUCTURES, THE UTILITIES OR STRUCTURES SHALL BE CONSTANTLY MONITORED FOR SIGNS OF SOIL DISPLACEMENT OR MOVEMENT THAT WOULD INDICATE LOSS OF SOIL SUPPORT OR SETTLEMENT. MONITORING OF THE STRUCTURES SHOULD BE CONDUCTED BY INSTRUMENT SURVEY BY ESTABLISHING MONITORING POINTS THAT WOULD BE PERIODICALLY MEASURED DURING THE WORK.
7. EXCAVATION STABILITY IS THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS.
8. THE CONTRACTOR SHALL INSTALL AND MAINTAIN SEDIMENT AND EROSION CONTROL MEASURES AS DETAILED IN THE NYSDEC–APPROVED SITE STORMWATER POLLUTION PREVENTION PLANS (SWPPPS) FOR EACH AREA OF THE SITE.

EXCAVATION:

9. MAINTAIN EQUIPMENT AND STOCKPILE OFFSET DISTANCES AS SHOWN ON THE DRAWINGS AND/OR SPECIFIED HEREIN.
10. SEGREGATE UNSATURATED OVERBURDEN, NON–HAZARDOUS SOIL, AND HAZARDOUS SOIL AS SPECIFIED HEREIN.

EXCAVATION BACKFILL:

11. EXCAVATION BACKFILL MATERIALS SHALL BE PLACED IN MAXIMUM LIFTS OF 1–FOOT AND COMPACTED BY A MINIMUM OF THREE PASSES OF A 12,000 POUND VIBRATORY DRUM COMPACTOR.
12. APPLY OXYGEN RELEASING AMENDMENT MATERIALS AS SPECIFIED FOLLOWING PLACEMENT AND PRIOR TO COMPACTION OF EACH LIFT OF BACKFILL.

FINAL GRADING AND SITE RESTORATION:

13. BACKFILL EXCAVATIONS TO MATCH ADJACENT/EXISTING GRADES.
14. GRADE SMOOTH AND RELATIVELY LEVEL TO PREVENT PONDING OF SURFACE WATER.
15. FINAL GRADING, TOPSOIL, SEEDING, AND RESTORATION SHALL BE IN ACCORDANCE WITH ONGOING REMEDIAL CONSTRUCTION (I.E., CAPPING) AND THE NYSDEC–APPROVED SWPPPS.

| NO. | DATE | REVISION | DR | CHK | APVD |
|---|---|---|---|---|---|
| 0 | 09/16/10 | ISSUED FOR CONSTRUCTION | M.R.STACEY | SCP | |
| B | 09/07/10 | 100% DESIGN FOR CLIENT REVIEW | | RJR | RTB |
| A | 05/13/10 | ISSUED 50% DESIGN FOR CLIENT REVIEW | | BY | APVD |
| DSGN | R.T. BELTCHER | | | | JMS |

REMEDIAL DESIGN
FOR AREA C AND E EXCAVATIONS
FORMER BUFFALO COLOR CORP SITE
BUFFALO, NEW YORK



MACTEC Engineering and Consulting, Inc.
P.O. Box 1000, 51 Comercial Street
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(207) 775–5401

MACTEC

GENERAL

LEGEND, ABBREVIATIONS, AND GENERAL NOTES

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

| | |
|---|---|
| DATE | 09/07/10 |
| PROJ | 3410090701 |
| DWG | G-002 |
| SHEET | 2 OF 4 |

FILE NAME: M:\Projects\HONEYWELL\BUFFALO COLOR\SBD AREA C & E RD EXCAVATION\SBD-RMD G-002.dwg PLOT DATE: Wed, 15 Sep 2010 PLOT TIME: 4:51 PM

EXCAVATION AREA C2
AREA=18,839. SF
DEPTH=TOP OF SOFT GRAY CLAY (APPROX 13 FT)

N: 1044962.5
E: 1078852.4

N: 1044925.4
E: 1078962.4

N: 1044878.0
E: 1078763.2

N: 1044810.4
E: 1078912.8

N: 1044846.6
E: 1078766.2

ABANDON MONITORING WELL (TYP)

REMOVE PROCESS SEWER AND CAP AT EXCAVATION LIMITS

EXISTING SILT FENCE (NITC)

EXISTING STORM DRAIN INLET PROTECTION (TYP) (NITC)

EXISTING STABILIZED CONSTRUCTION ENTRANCE (NITC)

EXCAVATION AREA C1
AREA=2,674. SF
DEPTH=TOP OF SOFT GRAY CLAY (APPROX 13 FT)

N: 1044678.6
E: 1078774.8

N: 1044675.5
E: 1078822.8

PROTECT EXISTING WELLS (TYP)

N: 1044617.6
E: 1078813.3

N: 1044625.3
E: 1078766.7

MW-C03

MW-C02

0 10 20 40
SCALE IN FEET

| NO. | DATE | DSGN | DR | CHK | APVD | BY |
|---|---|---|---|---|---|---|
| 0 | 09/16/10 | R.T. BELCHER | M.R.STACEY | SCP | APVD | JMS |
| B | 09/07/10 | | | | | RTB |
| A | 05/13/10 | | | | | RJR |

REVISION

ISSUED FOR CONTRUCTION
100% DESIGN FOR CLIENT REVIEW
ISSUED 50% DESIGN FOR CLIENT REVIEW



REMEDIAL DESIGN
FOR AREA C AND E EXCAVATIONS
FORMER BUFFALO COLOR CORP SITE
BUFFALO, NEW YORK

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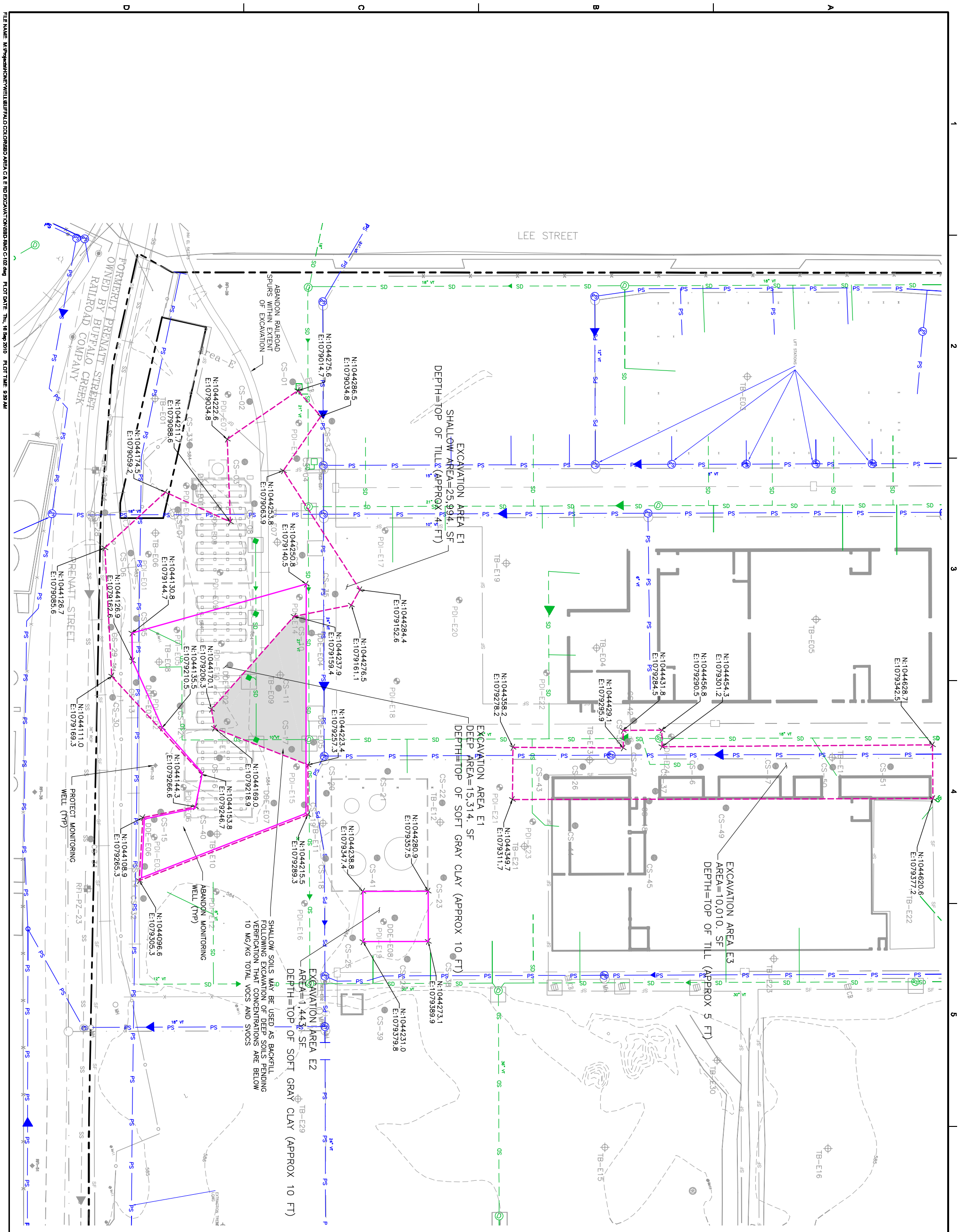
MACTEC

CIVIL
AREA C
EXCAVATION PLAN

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

| | |
|---|---|
| DATE | 09/07/10 |
| PROJ | 3410090701 |
| DWG | C-101 |
| SHEET | 3 OF 4 |

FILE NAME: M:\Projects\HONEYWELL\BUFFALO COLOR\SBD AREA C & E RD EXCAVATION\SBD-RMD C-101.dwg PLOT DATE: Wed, 15 Sep 2010 PLOT TIME: 5:14 PM




FILE NAME: M:\Projects\HONEYWELL\BUFFALO COLOR\SBD AREA C & E RD EXCAVATION\SBD-RMD C-102.dwg PLOT DATE: Thu, 16 Sep 2010 PLOT TIME: 9:39 AM

MACTEC

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P.O. Box 7050, 511 Congress Street
Portland, Maine 04112-7050
(207) 775-5401

CIVIL

AREA E
EXCAVATION PLAN

REMEDIAL DESIGN
FOR AREA C AND E EXCAVATIONS
FORMER BUFFALO COLOR CORP SITE
BUFFALO, NEW YORK

| NO. | DATE | REVISION | BY | APVD |
|---|---|---|---|---|
| 0 | 09/16/10 | ISSUED FOR CONSTRUCTION | | |
| B | 09/07/10 | 100% DESIGN FOR CLIENT REVIEW | RJR | RTB |
| A | 05/13/10 | ISSUED 50% DESIGN FOR CLIENT REVIEW | | |

| DSGN | DR | CHK | APVD |
|---|---|---|---|
| R.T. BELCHER | M.R.STACEY | SCP | MJS |

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

DATE 09/07/10
PROJ 3410090701
DWG C-102
SHEET 4 OF 4

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. The scope of work for Area E at the Buffalo Color Site (Site) involves remedial activities to address VOC contaminated soils. The Alternatives Analysis Report (AAR) submitted by Mactec Engineering and Consulting, Inc. (Mactec) in February 2009, specified the removal unsaturatedsoil with greater than 10 mg/kg of site related VOCs or SVOCs. The proposed excavation areas are identified as Areas E1, E2, and E3. In addition to unsaturated soil with greater that 10 mg/kg of site-related VOCs or SVOCs, all or portions the E1 and E2 excavations will extend to the top of the soft, gray glacial clay unit (encountered at an approximate depth of 10 feet below existing grade). The third location, E3, will extend to a depth of approximately 5 feet. Portions of shallow soil at Area E1 are below the 10 mg/kg criteria but will have to be excavated to access the deeper contaminated saturated soil. These soils, as indicated on the drawings, may be temporarily stockpiled and returned to the excavation as backfill provided that results of laboratory testing meet criteria for reuse as fill beneath the cover system. The work at each area will be completed as open cut excavations (i.e., without sheeting, shoring or bracing). Sidewalls will be sloped back as determined necessary by the Contractor to maintain excavation stability and protect adjacent structures/utilities. The work will be completed in segments, as determined appropriate by the Contractor, to minimize water handling and prevent sidewall sloughing.

B. The following summarizes the primary actions and anticipated construction sequence:

1. Survey layout of the excavation areas with white paint and stakes.
2. Field markout of utilities with appropriately colored paint based on utility owner records (via Dig Safely New York) and available historical data.
3. Implementation of erosion and sedimentation control measures in accordance with applicable regulations, plans and specifications (see Section 02370).
4. Establishment of on-site areas for equipment decontamination, waste staging, and soil stockpiling as approved by the Engineer.
5. Removal of concrete slabs, foundations, railroad spurs, and other surface features within excavation areas.
6. Properly abandon monitoring any wells within the excavation limits PS-13 in accordance with NYSDEC well abandonment guidance, prior to excavation.
7. Excavation of VOC-impacted soil to the specified depths, as indicated on the drawings and determined by the Engineer.
8. Collection and laboratory testing of record samples from the excavation sidewalls and bottoms, as specified herein.
9. Staging, characterization and proper disposal of impacted soils.
10. Removal and proper disposal of water collected in excavation as necessary to facilitate the soil removal activities.
11. Survey of the final horizontal and vertical limits of excavation by a NY-licensed professional land surveyor.

12. Restoration of the excavated areas with backfilled lifts of suitable material derived from the site (i.e., approved crushed demolition concrete/brick) and/or approved clean borrow material to generally match existing grades.
13. Application of a biostimulant amendment (oxygen releasing material) to the backfill material, as specified herein and on the design drawings.
14. Placement of a one-foot (12 inch) soil cover system consisting of a minimum of 10 inches clean borrow and 2 inches of topsoil material seeded with a native grass seed mixture, or other suitable cover material as approved by the Engineer.

1.02 DOCUMENTATION

A. The Engineer will document the completion of the VOC source removal (excavation) activities in the Final Engineering Report (FER) that will be prepared for Area E. The FER will include:
   1. A narrative description of the work.
   2. A table that summarizes the weight of soil shipments, and total amount of soil removed.
   3. Tables and laboratory reports for sidewall samples and waste characterization samples.
   4. Photographs of the work.
   5. Figures that document the final surveyed vertical and horizontal limits of excavation and locations of confirmation samples, in plan view and cross-sections.
   6. Disposal records, including copies of manifests and disposal facility scale receipts.
   7. Cross sections that depict the vertical limits of excavation.
   8. Other information as necessary to meet the requirements of DER-10 and the BCA.

1.03 OTHER GENERAL REQUIREMENTS

A. Obtain all necessary construction permits prior to the commencement of work. The Contractor will be responsible for obtaining all required permits.
B. Make arrangements for temporary storage of materials and supplies and for timely delivery to the job site.
C. Maintain up-to-date records.
D. Maintain the Project Site in a neat and safe condition.

PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

Not Applicable.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

## PART 1 GENERAL

### 1.01 DESCRIPTION

A. Required Submittals are identified in each technical specification section of the Contract Documents. A summary of Submittals is provided at the end of this section. Submittals shall be provided to the Engineer, as required, unless otherwise specified. Submittals may include:
   1. Data;
   2. Drawings;
   3. Instructions;
   4. Schedules;
   5. Statements;
   6. Reports;
   7. Plans;
   8. Certificates;
   9. Samples;
   10. Records; and
   11. Operation and Maintenance Manuals.

B. The Contractor shall make Submittals as required by the Contract and the individual specification sections but not limited to the summarized items in Table 01330-1: Submittal Summary provided at the end of this section.

## PART 2 PRODUCTS

Not Applicable.

## PART 3 EXECUTION

### 3.01 GENERAL

A. Submittals shall include items such as:
   1. Manufacturer's or fabricator's drawings;
   2. Descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves;
   3. Test reports;
   4. Samples;
   5. Operation and Maintenance Manuals (including parts list);
   6. Certifications;
   7. Warranties; and
   8. Other pertinent data.

### 3.02 SUBMITTAL REQUIREMENTS

A. Transmittal Form:
   1. A Transmittal form shall accompany all Submittals.
   2. The Transmittal form shall be developed and furnished by the Engineer.
   3. Transmittals shall include the following information, at a minimum:
      a. Submittal number in sequence, beginning with 1 (subsequent revised Submittals shall be identified with a number and letter);
      b. Date;
      c. Project title and project number;
      d. Contractor's name and address;
      e. Identification of each item submitted under the single Transmittal with a separate sequential number (e.g. 1.1, 1.2, etc.). Group only like items in a single Submittal;
      f. Reference to the specification section and sub-part number and/or Contract Drawing sheet and detail number (if applicable) pertinent to the data submitted.
      g. Notification of any deviations from Contract Documents;
      h. Return date required by Contractor; and
      i. Other pertinent data.

B. Contractor Certification: The Contractor's Certification that the Submittal meets contract requirements shall contain the following:
   1. Contractor firm name;
   2. Point of contact name, signature, and title;
   3. Date; and
   4. Contractor's corrections as noted on Submittal data and/or attached sheets(s).
   5. The certification may be provided as part of the Transmittal, on a separate sheet attached to the Transmittal, or as a stamp on the Submittal itself.

C. Procedures:
   1. The Contractor shall schedule submissions at least 14 days before Submittal approvals will be needed, except where different lead time is specified.
   2. The Contractor shall deliver to Engineer three copies of all Submittals and Transmittals that are sent in the mail. To expedite the review of smaller Submittals, the Contractor may provide a legible fax, if followed by the required number of original copies.
   3. The Contractor may deliver Submittals to the Engineer in electronic form by email. The Contractor-signed Transmittal shall be scanned and attached to the other electronic Submittal documents. The subject line of the email shall clearly note the project name and Submittal number.
   4. The Contractor shall maintain one copy of the Submittal and Transmittal on site.
   5. At the time of each submission, the Contractor shall call to the Engineer's attention, in writing, any deviations that the Submittal may have from the requirements of the Contract Documents.

D. Submittals shall include:
   1. Date and revision dates;
   2. Project title and number;
   3. The names of:
      a. Engineer;
      c. Subcontractor;
      d. Supplier;
      e. Manufacturer; and
      f. Separate detailer when pertinent.

4. Identification of product or material;
5. Field dimensions, clearly identified as such;
6. Specification section and sub-part number and/or Drawing sheet and detail number;
7. Applicable standards, such as ASTM or Federal Specification number;
8. For Submittals which include proposed deviations requested by the Contractor, "variation" shall be clearly indicated on the Transmittal. The Contractor shall state the reason for any deviations and annotate such deviations on the Submittal. The Engineer reserves the right to rescind inadvertent acceptance of Submittals containing unnoted deviations.

E. Submittals shall be of standardized sizes.
1. Approved standard sizes shall be:
   a. 24 inches by 36 inches;
   b. 11 inches by 17 inches; and
   c. 11 inches by 8 1/2 inches.
2. Provision shall be made in preparing Submittals to afford a binding margin on left hand side of sheet.
3. Submittals put forward other than as specified herein may be returned for resubmittal without being reviewed.

**Table 01330-1: Ammended Submittal Summary**

| No. | Specification Section | Specification Part | Submittal Item | Schedule |
|---|---|---|---|---|
| 1 | | | Construction Work Plan (Plan of Operations) | 5 days following Notice to Proceed |
| 2 | | | Copies of approved permits | Prior to commencing construction |
| 3 | 01351 | 1.04.A.1 | Site-Specific Health and Safety Plan (HASP) | 5 days following Notice to Proceed |
| 4 | 01351 | 1.04.A.2 | Evidence of medical monitoring and 40-hour HAZMAT training | Prior to commencing construction |
| 5 | 01450 | 1.04.A | Contractor Quality Control Plan (CQCP) | 5 days following Notice to Proceed |
| 6 | 01450 | 1.04.B | Weekly CQC Reports, Test Reports,, Deffiency Reports, Project Summaries | As soon as reports are complete |
| 7 | 01560 | 1.02.A | Odor Control Foam and Application Equipment | Prior to commencing excavation |
| 8 | 01720 | 1.03.A | Qualifications of Field Engineering and Surveying Personnel | At the request of the Engineer |
| 9 | 01720 | 1.03.B | Documentation verifying accuracy of work | At the request of the Engineer |
| 10 | 01720 | 1.03.C | Survey data supporting Record Documents | During construction at the request of the Engineer. All data within two weeks of completion of construction. |
| 11 | 01780 | 1.04.A | Project Record Documents | Within two weeks of completion |
| 12 | 02105 | 1.03.A.1.a | Quality Assurance Project Plan | 7 days prior to construction |
| 13 | 02105 | 1.03.A.1.b | Proposed Analytical Laboratory and Certifications | 7 days prior to construction |
| 14 | 02105 | 1.03.B.1 | Sampling and Analysis Reports with field records and data usability summary report | As soon as reports are complete |
| 15 | 02110 | 1.02.A | Work Plan - means and methods for management of waste material | Prior to commencing construction |
| 16 | 02110 | 1.02.B | Waste Characterization Laboratory Reports | As soon as reports are complete |
| 17 | 02120 | 1.02.A | Work Plan - means and methods for transporting and disposing of waste | Prior to commencing construction |

| | | | | |
|---|---|---|---|---|
| 18 | 02120 | 1.02.B | Profile of Treatment Storage and/or Disposal Facility | 14 Days prior to required approval |
| 19 | 02120 | 1.02.C | Bill of Lading and Manifests for all transported waste loads | Within 7 days of shipment |
| 20 | 02120 | 1.02.D | Certified Weight Slips for each load transported | Within 7 days of shipment |
| 21 | 02120 | 1.02.E | Survey data for excavation limits | As requested by Engineer or within 2 weeks of completion |
| 22 | 02140 | 1.03.A | Analytical results of water samples | As soon as reports are complete |
| 23 | 02315 | 1.04.A.1 | Borrow Source and Test Reports | 7 days following Notice to Proceed |
| 24 | 02315 | 1.04.A.2 | Name and Qualifications of Testing Laboratory | 7 days following Notice to Proceed |
| 25 | 02315 | 1.04.A.3 | Topsoil Source and Test Reports | 7 days following Notice to Proceed |
| 26 | 02315 | 1.04.A.4 | Grass Vendor's Seed Cerfificate | 7 days following Notice to Proceed |
| 27 | 02315 | 1.04.A.5 | Fertilizer manufacturer's product data and chemical analysis | 7 days following Notice to Proceed |
| 28 | 02315 | 1.04.A.6 | Biostimulant and proposed fertilizer | 7 days following Notice to Proceed |
| 28 | 02526 | 1.02.A.1 | Well Abandonment Completion Form | Upon completion |
| 29 | 02526 | 1.02.A.2 | Well Abandonment Record | Upon completion |

END OF SECTION

SECTION 01351

HEALTH AND SAFETY

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section covers the health and safety requirements to be followed for cleanup construction activities at the excavation of contaminated soils in Area E of the former Buffalo Color site in Buffalo, NY as specified herein, and as shown on the drawings.
B. The cleanup construction activities will require excavation and handling of existing VOC-impacted material and contaminated soil.
C. Portions of the project will require Contractor's field personnel to have current Occupational Safety and Health Administration (OSHA) training and certification for working on hazardous waste sites. This training will be required for workers during any work associated with waste excavation and/or consolidation, and any work completed in waste materials.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01330: Submittal Procedures
B. Section 02105: Chemical Sampling and Analysis
C. Section 02110: Waste Removal and Handling

1.03 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
    1. CODE OF FEDERAL REGULATIONS (CFR)
        a. 29 CFR 1910 Occupational Safety and Health Standards
        b. 29 CFR 1926 Safety and Health Regulations for Construction

1.04 SUBMITTALS

A. Submit to the Engineer the following in accordance with Section 01330, "Submittal Procedures":
    1. HASP: The Site Specific Health and Safety Plan (HASP) shall detail the health and safety procedures to be followed during completion of the work and shall be developed in accordance with this specification. The Contractor shall periodically review the plan during work operations to keep it current and technically correct.
    2. Medical and Training Records. Upon request, submit records for construction personnel demonstrating compliance with medical monitoring and training requirements for work at hazardous waste sites under OSHA.

1.05 REGULATORY REQUIREMENTS

A. Work performed under this contract shall comply with applicable Federal, state, and local safety and occupational health laws and regulations. This includes, but is not limited to, OSHA standards, 29 CFR 1910, especially Section .120, "Hazardous Waste Site Operations and Emergency Response" and 29 CFR 1926 for specific site activities.

1.06 SAFETY AND HEALTH PROGRAM

A. OSHA Standards 29 CFR 1910, Section .120 (b) and 29 CFR 1926, Section .65 (b) require employers to develop and implement a written Safety and Health Program for employees involved in hazardous waste operations. The site-specific program requirements of the OSHA Standards shall be integrated into one site-specific document. The Contractor shall prepare a site-specific Health and Safety Plan (HASP) that shall interface with the employer's (Contractor's) overall Safety and Health Program. Any portions of the overall Safety and Health Program that are referenced in the HASP shall be included as appendices to the HASP.

1.07 HAZARD/RISK ANALYSIS

A. The HASP shall include a safety and health hazard/risk analysis for site tasks and operations to be performed as part of the contract. The hazard/risk analysis shall provide information necessary for determining safety and health procedures, equipment, and training to protect on-site personnel, the environment, and the public. The following elements, at a minimum, shall be addressed.

1. Site Tasks and Operations (Workplan). The HASP shall summarize the tasks and objectives of the site operations of this project, and the logistics and resources required to achieve those tasks and objectives safely.
2. Hazards. The following potential hazards may be encountered during site work. They are not complete lists; therefore, they shall be expanded and/or revised as necessary during preparation of the HASP.
    a. Safety Hazards. Potential safety hazards associated with the work on the Project could be related to, operation of construction equipment, safety hazards associated with working near open excavations, and safety hazards from scattered debris.
    b. Chemical Hazards. Potential chemical hazards that may be encountered during Site work will be discussed in the HASP. The Hazard/Risk Analysis section of the HASP shall describe the chemical, physical, and toxicological properties of contaminants, sources and pathways of employee exposures, anticipated on-site and off-site exposure level potentials, and regulatory (including Federal, state, and local) or recommended protective exposure standards. The HASP shall also address employee exposure to hazardous substances brought on site, and shall comply with the requirements of 29 CFR 1910, Section .1200 and 29 CFR 1926, Section .59, Hazard Communication. A copy of the Engineer's Health and Safety Plan will be provided to the Contractor to assist in determining the potential hazards/risks associated with VOCs.
    c. Physical Agents. Potential physical hazards during work on the Site could include, heat stress and cold stress, noise related hazards, physical

strain from heavy lifting, and slips, trips, and falls from scattered debris on the site.

d. Biological Hazards. Potential biological hazards associated with the work on the Site could include insect and animal bites.

3. Emergency Response Plan. Action levels shall be established in the HASP for potential emergency situations at the Site.

1.08 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

A. An organizational structure shall be developed that sets forth lines of authority (chain of command), responsibilities, and communication procedures concerning site safety, health, and emergency response.

1.09 TRAINING

A. Personnel shall receive training in accordance with the Contractor's written safety and health training program and 29 CFR 1910 Section .120, 29 CFR 1926 Section .65, and 29 CFR 1926 Section .21.

1.10 PERSONAL PROTECTIVE EQUIPMENT

A. PPE Program. In accordance with 29 CFR 1910 Section .120 (g)(5) and 29 CFR 1926 Section .65 (g)(5), a written Personal Protective Equipment (PPE) program which addresses the elements listed in that regulation, and which complies with respiratory protection program requirements of 29 CFR 1910 Section .134, is to be included in the Contractor's Safety and Health Program. The HASP shall detail the minimum PPE ensembles (including any necessary respiratory protection) and specific materials from which the PPE components are constructed for each site-specific task and operation to be performed. On-site personnel shall be provided with appropriate personal protective equipment. Protective equipment and clothing shall be kept clean and well maintained. The PPE Section of the HASP shall include site-specific procedures to determine PPE program effectiveness and storage of PPE.

B. Levels of Protection. The Site Safety and Health Officer (SSHO) shall establish appropriate levels of protection for each work activity based on review of historical site information, existing data, and an evaluation of the potential for exposure (inhalation, dermal, ingestion) during each phase of the work.

1.11 MEDICAL SURVEILLANCE

A. The Contractor's medical surveillance program shall be detailed in the HASP.

1.12 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

A. The HASP shall describe the emergency and first aid equipment to be available on site, the specific locations of the equipment and identification of individuals trained in the use of such equipment who are first aid and /or CPR certified by a recognized training organization (e.g., American Red Cross).

1.13 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

A. An Emergency Response Plan, that meets the requirements of 29 CFR 1910 Section .120 (l) and 29 CFR 1926 Section .65 (l), shall be developed and implemented as a Section of the HASP. This plan/Section shall be formatted as a stand alone document.

B. In the event of any emergency associated with remediation activities, the Contractor shall, without delay, alert all on-site employees that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Owner and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Employees that are required to respond to hazardous emergency situations shall be trained in how to respond to such expected emergencies.

C. The Contractor shall meet and discuss with local emergency response personnel and dispatchers of the work in progress and provide documentation of such meetings.

PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

Not Applicable.

END OF SECTION

SECTION 01450

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

A. This section covers quality control (QC) procedures and testing to be completed by the Contractor during the Work. Prior to commencement of the Work, the Contractor shall comply with the QC procedures detailed in these specifications and elsewhere in the project Design Documents, as applicable. Quality control testing shall be executed as required in the Design Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01330: Submittal Procedures
B. Section 01780: Project Record Documents

1.03 REFERENCES AND STANDARDS

A. Conform to referenced standards with date of issue current on the date of the bid, except where stated otherwise or referenced differently by code.

1.04 SUBMITTALS

A. Pre-Construction Submittals:
   1. Contractor shall identify personnel, procedures, instructions, records, and forms to be used in carrying out the requirements of the Work and meeting Quality Control for construction, sampling, and testing activities.
B. Weekly QC Reports, Test Reports, Deficiency Reports, and Project Summaries shall be prepared and submitted to the Engineer, as applicable.

1.05 DEFINITIONS

A. Quality Control: Activities undertaken by the Contractor including observing, measuring, sampling, and testing undertaken by the Contractor to determine that work performed and/or products/materials provided and installed meet the requirements of the Design Documents and the quality specified therein.

1.06 QUALITY CONTROL SAMPLING AND TESTING

A. The Contractor shall notify the Engineer a minimum of 72 hours prior to any quality control sampling and testing activities. The Engineer reserves the right to collect duplicate quality control samples.

PART 2 PRODUCTS

Not applicable.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. The quality of all Work shall be the responsibility of the Contractor.
B. Perform sufficient inspections and tests of all items of work, on a continuing basis, including that of subcontractors, to ensure conformance to applicable specifications and drawings with respect to the quality of materials, workmanship, construction, and functional performance.
C. Provide qualified personnel, appropriate facilities, instruments, and testing devices necessary for the performance of the quality control function.
D. Controls shall be adequate to cover all construction operations, shall be keyed to the proposed construction sequence, and shall be coordinated by the Contractor's quality control personnel.

3.02 QC DOCUMENTATION

A. The Contractor shall document, at a minimum, the following:
    1. A description of the Quality Control Organization, including charts showing lines of internal Contractor authority, and external Contractor, subcontractor, and Engineer relationships. The Quality Control Organization shall include the names, qualifications, duties, and responsibilities of each person assigned to a quality control function. The Quality Control Organization chart shall identify a Contractor's Quality Control Manager whose responsibilities and qualifications are described in Sub-Part 3.04 - Contractor Quality Control Organization.
    2. Method of performing, documenting, and enforcing quality control operations of both Contractor and subcontract work including inspection and testing.
    3. Inspections as described in the Sub-Part 3.05 – Inspections.
    4. Provide a list of analytical or testing laboratories to be used by the Contractor for testing required by the Specifications with listed test methods to be performed by each laboratory indicated.
    5. Protocol describing corrective actions to be taken by the Contractor with specifically defined feedback systems. The Engineer will then decide what further corrective action, if any, shall be taken by the Contractor. Personnel responsible for initiating and carrying out corrective action shall be indicated in the protocol.
E. Submit Weekly QC Reports, Test Reports, Deficiency Reports and Project Summaries as required by this Specification.

3.03 CONTRACTOR QUALITY CONTROL ORGANIZATION

A. QC Manager:
    1. Identify an individual, within the Contractor's organization at the Site who shall be responsible for overall project QC and have the authority to act in all QC matters for the Contractor.
    2. The QC Manager for this project shall be a qualified construction manager/engineer or comparable individual with a minimum of 2 years of applicable experience, at the Project Manager, Project Engineer, Superintendent, or QC Manager level, whose responsibility is to ensure compliance with the

Design Documents. The QC Manager shall be independent of the Project Superintendent.

3. The QC Manager shall be on-site whenever work is in progress so that he/she may be in charge of QC for the project.
4. All submittals for approval shall be reviewed and modified or corrected as needed by the QC Manager or authorized assigns prior to forwarding to the Engineer.

## 3.05 INSPECTIONS

A. The Contractor shall conduct the following inspections and tests:
   1. The Contractor shall perform preparatory inspections prior to beginning each feature of work on any on-site construction conducted by the Contractor or a subcontractor. Preparatory inspections for the applicable feature of work shall include:
      a. review of submittal requirements and all other Contract requirements with the performance of the work;
      b. check to assure that provisions have been made to provide required field quality control testing;
      c. examine the work area to ascertain that all preliminary work has been completed;
      d. verify all field dimensions and advise the Engineer of any discrepancies;
      e. perform a physical examination of materials and equipment to assure that they conform to approved shop drawings or submittal data and that all required materials and/or equipment are on hand and comply with the Contract requirements.
   2. Perform initial inspection as soon as work begins on a representative portion of the particular feature of work, and include examination of the quality of workmanship as well as review of quality control testing for compliance with the Design Document requirements.
   3. Perform follow-up inspections continuously as any particular feature of work progresses to ensure compliance with Contract requirements, including quality control testing, until completion of that feature of work.

## 3.06 TESTING

A. The Contractor shall be responsible for all required testing, documentation, and corrective measures. The Contractor shall perform tests specified or required to verify that control measures are adequate to provide a product which conforms to Contract requirements.

## 3.07 CONSTRUCTION MONITORING

A. Prior to commencing invasive construction activities including but not limited to installing sheeting and shoring or excavating, complete an existing infrastructure assessment to record conditions of building and surrounding infrastructure. Record condition with video or photographs noting existing deficiencies or damage as observed prior to construction. The assessment shall at a minimum include the following components:
   1. Building façade;
   2. Building foundation wall;

3. Building doors and windows;
4. Building roof overhang, fascia, or general roofline;
5. Pavement and concrete surface treatments;
6. Prominent exterior site features within 50 feet of the limit of work including retaining walls, stairs, bollards, manhole frames and grates, etc.; and
7. Interior building finishes within 50 feet of the limit of work;

B. If directed by the Owner or Engineer, maintain continuous vibration monitoring (seismograph recording) during sheeting and shoring installation, excavation, backfilling and compaction, paving, and all other activities utilizing heavy construction equipment likely to cause strong vibrations.

END OF SECTION

# SECTION 01560

# DUST AND ODOR CONTROL

## PART 1 GENERAL

### 1.01 DESCRIPTION

A. The Contractor shall execute the Work by methods that minimize the generation of dust and nuisance odors. The Contractor shall employ dust control measures to minimize the creation of airborne dust during execution of the Work. At a minimum, standard dust control techniques shall be employed in areas of heavy equipment traffic such as watering down the site. The dust control measures will be such that, at a minimum, air quality is in compliance with applicable OSHA regulations.

B. The Contractor shall provide an odor control system to control odors as necessary to address complaints from property tenants and the local community. Odor control agents such as an odor-control foam, misting system, or other method selected by the Contractor and approved by the Engineer shall be available on site and shall be applied as needed to control nuisance odors. Other systems may be required as necessary to meet the project performance objectives.

C. The performance objective for odor control will be to control, eliminate, or mask any odors that generate complaints, from building tenants, neighboring residents, the public, state or local officials, or the Engineer.

D. If the initial emission controls are found to be inadequate, the Contractor shall provide additional measures.

E. Dust and odor control systems shall be implemented as necessary to meet local, state, and/or federal regulations for air emissions and dust and to control nuisance odors.

F. Sufficient volumes of water and/or odor control foam shall be readily available or stored on site to address continuous application as necessary.

### 1.02 SUBMITTALS

A. Submit proposed odor control foam and application equipment.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Water
   1. Water shall be free from oil, acid, and injurious alkali or vegetable matter, and other deleterious materials or contaminants.
   2. Water shall not be brackish or contain salts in concentrations greater than 500 mg/kg.

B. Odor control foam.
   1. Odor control foam shall be a biodegradable, non-flammable, and non-toxic water-based material designed for the control of VOCs, dust, and odor.
   2. It shall be capable of being spray applied to form a uniform encapsulating layer between contaminated materials and the environment, suppressing VOCs, dust, odors, and gas.

2.02 EQUIPMENT

A. Equipment for dust and odor control shall include appropriate measures (e.g., heat tape, tank heaters) to prevent freezing or impair operation due to temperatures below freezing.

PART 3 EXECUTION

3.01 SPRINKLING WATER

A. Apply by approved methods and with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.
B. Disperse through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.
C. Apply water until the surface is wet, but avoid ponding, run off, or muddy conditions.

3.02 PAVEMENT SWEEPING

A. Maintain clean pavement surfaces within the designated work area and Site egress route. Do not permit construction equipment to track soil outside of the work area or on public roads.
B. Sweep pavement surfaces daily during construction to prevent migration of soil outside of the work area and to prevent the generation of dust.
C. Sweep all paved surfaces within the work area and truck ingress/egress routes at the end of construction as a final cleanup task to remove any residual construction debris and soils.

3.03 STOCKPILE MANAGEMENT

A. Maintain on-site stockpiles in a manner that prevents wind-blown dust generation. During active use, provide periodic water sprinkling and during inactive periods, cover stockpiles with weighted tarps.

END OF SECTION

SECTION 01720

FIELD ENGINEERING AND SURVEYING

## PART 1 GENERAL

### 1.01 DESCRIPTION

A. Established survey control points are available on site for construction purposes. The Contractor shall verify locations of survey control points prior to starting work. The Contractor shall safeguard all survey control points. Should any of these points be damaged or destroyed, the Contractor shall replace the control point. The Contractor shall rectify work improperly constructed due to failure to maintain and protect such established survey control points.

B. The Contractor shall be responsible for the layout of the construction and any additional survey control points, grid coordinate locations, lines, grades, and levels necessary for the proper construction and testing of the work required in the Contract Documents. Survey control shall include, but not be limited to, maintaining appropriate slopes and specified thicknesses.

C. The Contractor shall employ a surveyor using standard practices and datum for the State of New York to provide the surveying functions necessary for the proper execution of the work, and to document and record the completed work.

D. The Contractor is responsible for scheduling the surveys to coincide with his construction activities. If the survey documentation shows improper slopes, elevations, locations, or layer thicknesses, the Contractor shall correct the deficiency and re-survey the re-work. Survey documentation may include, but not be limited to:

1. Initial excavation layout survey.
2. Excavation horizontal and vertical extents;
3. Location, rim elevation, and inverts of any encountered utilities.
4. Final constructed topography within the limit of disturbance based on a 10’ maximum grid pattern;
5. Location and elevation of Contractor established survey control points and/or benchmarks; and
6. Soil sample and monitoring well locations.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01110: Summary of Work
B. Section 01330: Submittal Procedures
C. Section 01450: Contractor Quality Control
D. Section 01770: Project Closeout Procedures

### 1.03 SUBMITTALS

A. On request, submit data demonstrating qualifications of persons providing field engineering and survey services.

B. On request, submit documentation verifying accuracy of survey work.

C. Survey data and measurements as the Work progresses for the project in support of establishing Record Documents as specified in Section 01770 - Project Closeout

### 1.04 FIELD ENGINEERING AND SURVEY REQUIREMENTS

A. Provide field engineering and survey services using appropriate construction practices. Use skilled persons, trained and experienced in the necessary tasks and techniques for the proper execution of the Work. Locate and layout the Work by survey instrumentation and similar appropriate means.

B. The Contractor shall sufficiently establish the existing ground elevations before earthwork is started.

C. The Contractor shall perform the layout and shall document completed construction on Record Drawings, including the features listed in Sub-part 1.01D.

D. Measure final excavated depth during construction to verify that excavation has occurred to the required limit.

F. Vertical and horizontal control shall be sufficient to assure work is constructed within 0.1 foot of proposed fill thickness requirements (or proposed grades as indicated where settlement is not a concern) and location. Project Record documentation shall be provided in electronic file format compatible with AutoCAD 2008 or later.

1.05 TECHNICAL REQUIREMENTS OF SURVEY

A. Horizontal ground control shall originate and terminate on New York State Plane North American Datum 1983 (NAD 83). Vertical control shall be tied to North American Vertical Datum 1988 (NAVD 88).

B. Map Accuracy - Ninety percent of the elevations determined from the solid-line contours for the topographic maps shall have accuracy with respect to true elevation of 0.5 contour interval (0.5 foot) or better, and the remaining 10 percent of such elevations shall not be in error by more than one contour interval (1 foot).

C. Vertical Control: Establish a permanent project benchmark for vertical control.

D. Horizontal Control: Each horizontal control point shall be plotted on the map within the coordinate grid in which it should lie to an accuracy of one one-hundredth foot (0.01 foot) of its true position as expressed by the plane coordinates computed for this point.

E. Spot Elevations: Survey shall be constructed to provide an accuracy of 0.1 feet vertically. No shots exceeding 500 feet shall be taken. Ninety percent of all spot elevations placed on the maps shall have an accuracy of at least 0.1 foot, and the remaining 10 percent shall not be in error by more than one-half (1/2) of the contour interval (0.5 foot).

F. Accuracies and accuracy tests apply to the stereo compilation scale of the original manuscript (i.e., if the manuscript is compiled at a scale of 1" = 100' and then reduced to 1"=200', then the accuracies will apply to the original 1"=100' scale). This is also true if the manuscript is enlarged to 1"=50' or some larger scale.

PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

Not Applicable

END OF SECTION

SECTION 01780

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 DESCRIPTION

A. The Contractor shall furnish all labor, equipment, and materials necessary to keep accurate record documents for additions, substitution of material, variations in Work, and other revisions to the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01010: Summary of Work
B. Section 01450: Contractor Quality Control
C. Section 01720: Field Engineering and Surveying
D. Section 02110: Chemical Sampling and Analysis
E. Section 02120: Off-Site Transportation and Disposal
F. Section 02315: Earthwork
G. Section 02526: Abandonment of Monitoring Wells

1.03 MAINTENANCE OF RECORD DOCUMENTS

A. The Contractor shall maintain one (1) copy of the following documents at the job site:
   1. Contract Drawings.
   2. Drawings showing progress of Work.
   3. Specifications.
   4. Addenda.
   5. Reviewed Submittals.
   6. Change Orders.
   7. Other modifications to the Contract.
   8. Health and Safety Plan.
   9. Contractor generated plans, as required by other Specification Sections or permits.
   10. Contractor's certifications.
   11. Progress payment quantity field notes and records.
   12. Deficiency reports.
   13. Contractor's daily reports, including:
      a. Records of site work.
      b. Inspection records.
      c. Reports on emergency response actions.
   14. Sampling documentation.
   15. Analytical laboratory data packages.
   16. Record drawings showing the Site as restored ("As-Builts"), including new aboveground and underground utilities, installed piping/conduit, the location of all soil/groundwater samples collected during construction, the final footprint and bottom elevation of all excavations, and the final limits of disturbance/restoration.

17. Remediation photographs.
18. Manifests and Bills of Lading.

B. The Contractor shall provide files and racks for storage of documents.
   1. Store documents in a dry, safe place available for inspection by the Engineer and/or Owner.

C. The record documents shall not be used for construction purposes.

D. Post-Excavation and Post-Construction Surveys shall be submitted to the Engineer in both printed and electronic form (AutoCAD 2010 format/compatible). The Surveys and As-Built Drawings shall correspond to the state plane coordinate system. Ground surface elevations shall be surveyed on a grid with points spaced no greater than 10 feet by 10 feet with suitable detail to provide one-foot elevation contours.

## 1.04 SUBMITTALS

A. At completion of field operations, the Contractor shall deliver the Project Record Documents to the Owner.

B. Accompany the Project Record Documents submittal with a transmittal letter containing:
   1. Date.
   2. Project title, project number, and Site name/location.
   3. Contractor's name and address.
   4. Title and number of each record.
   5. Certification that each document as submitted is complete and accurate.
   6. Signature of Contractor, or his/her authorized representative.

C. Documents must be submitted to Owner upon project completion.

## 1.05 RECORDING

A. Clearly label each document "PROJECT RECORD".

B. Keep record documents current.

C. Do not permanently conceal any Work until required information has been recorded.

D. Contract Drawings:
   1. Legibly mark to record actual construction as applicable:
      a. Depths of various elements of structure work in relation to survey datum.
      b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
      c. Field changes of dimension and detail.
      d. Changes made by Change Order or Field Order.
      e. Details not on original Contract Drawings.

E. Specifications and Addenda shall be legibly marked up to record the Manufacturer, trade name, catalog number, and Supplier of each product; changes made by Change or Field Orders, or other matters not originally specified, shall also be recorded.

# PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

Not Applicable.

END OF SECTION

SECTION 02105

CHEMICAL SAMPLING AND ANALYSIS

## PART 1 GENERAL

### 1.01 DESCRIPTION

A. The Contractor shall provide all necessary personnel, equipment, materials, and subcontracting required to perform the following chemical sampling and analysis for the purpose of:
   1. Conducting post-excavation soil sampling of the excavation extents prior to backfilling.
   2. Conducting waste characterization sampling to fulfill disposal facility requirements.

B. The sampling and analysis shall be conducted in accordance with USEPA and NYSDEC standards and requirements for environmental sampling and analysis.

### 1.02 REFERENCES

A. New York State Department of Environmental Conservation "Analytical Services Protocol." June 2000 - revised July 2005.

B. New York State Department of Environmental Conservation "Technical Guidance for Site Investigation and Remediation"; DER-10; December 2010.

C. Guidance for the Development of Data Usability Reports; Division of Environmental Remediation; September 1997.

### 1.03 SUBMITTALS

A. Sampling and Analysis Reports:
   1. Submit the following reports:
      a. Field sampling data records including copies of completed field sheets, chain-of-custodies, and field log book entries;
      b. Laboratory Data Deliverable;
      c. Data Usability Summary Report.

## PART 2 PRODUCTS

Not Applicable.

## PART 3 EXECUTION

## 3.01 POST-EXCAVATION RECORD SOIL SAMPLES:

A. Prior to placement of backfill, soil samples shall be collected from the sidewalls and floor of each excavation for laboratory testing. The sample results will serve as a record of remaining contaminant levels in site soil.

B. Sidewall samples shall be collected at a frequency not to exceed one sample for approximately every 50 lineal feet (LF) of sidewall. The sidewall sample locations will be determined by the Engineer and will be biased to areas that display evidence of contamination based on highest photoionization detector (PID) readings and visual indicators.

C. Soil samples will be collected from the floor or bottom of the excavation. The locations of the bottom samples will be consistent with the spacing of the sidewall samples (i.e., one sample approximately every 50 LF) unless otherwise specified by the Engineer.

D The sidewall and bottom samples will be collected at the locations specified by the Engineer's representative. Soil from the specified locations shall be obtained by the Contractor via the excavator bucket (for safety reasons, personnel will not be permitted to enter the excavation). The excavator bucket containing soil from the designated sample location shall be brought to rest on the ground a safe distance from the excavation, where the Engineer's representative will inspect the soil and place a representative amount of the material in appropriate laboratory jars or containers.

E. The Engineer's representative will pack and label the samples, prepare the chain-of-custody form, and place the samples in ice-chilled coolers for pickup or shipment to the Contractor's designated analytical laboratory.

F. Where appropriate, soil samples collected during 2009-2010 Pre-Design Investigation (PDI) work will be used as record samples or to supplement the record sample data.

F. The horizontal and vertical locations of the samples shall be surveyed and shown on the record drawing(s) that will be included in the Final Engineering Report (FER) for Area E.

G. The analytical reports for the record samples shall be submitted by the Contractor to the Engineer for use in the FER.

## 3.02 WASTE CHARACTERIZATION SAMPLES – EXCAVATED MATERIALS:

A. At the Owner's direction, the Contractor shall collect samples of the excavated materials for waste characterization tests. The specific number, location, and analytical parameters will be determined based on direction provided by the Contractor's subcontracted waste disposal facility. It is anticipated that the waste characterization samples will be analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs and metals, as well as other tests specified by the disposal facility.

## 3.03 LABORATORY ANALYSIS

A. The post-excavation soil samples shall be analyzed by the laboratory for the following parameters:

1. Target Compound List (TCL) volatile organic compounds (VOCs) via EPA Method 8260.
2. TCL semi-volatile organic compounds (SVOCs), plus aniline, via EPA Method 8270; and

3. Target Analyte List (TAL) metals via the EPA 6000/7000 series.

B. Off-site laboratory analysis of soil samples shall include Category B deliverables as defined in the NYSDEC ASP. Off-site laboratory analysis of waste characterization samples shall include deliverables as necessary to satisfy the disposal facility.

C. Contractor shall prepare a Data Usability Summary Report (DUSR) in accordance with the "Guidance for the Development of Data Usability Reports" (NYSDEC, 1997).

## 3.04 DISPOSAL OF INVESTIGATION DERIVED WASTES

A. Excess soil from the bucket used to collect the sample may be returned to the excavation near the point of removal.

B. Store generated decontamination fluids in DOT approved containers supplied by the Contractor or combine directly with dewatering water for treatment or disposal.

END OF SECTION

SECTION 02110

WASTE REMOVAL AND HANDLING

PART 1 GENERAL

1.01 SUMMARY

A. This section includes a description of responsibilities for proper on-site handling and management of excavated soil and borrow soil, fill, bedding, etc.; liquid waste (contaminated stormwater, decontamination water, construction dewatering, etc.); Site trash; and remediation waste (disposable PPE, plastic sheeting and sampling equipment).

1.02 SUBMITTALS

A. Waste Management and Disposal: Consistent with other sections of these Specifications, the Contractor shall maintain and submit to the Engineer documents pertaining to waste management and disposal, including manifests and bills of lading.

B. Laboratory Reports: Provide laboratory reports of analytical testing performed as required by the waste characterization program.

1.03 WASTE CONTAINERS

A. The Contractor shall provide:

1. Trucks for the loading of indigenous contaminated soils, concrete, metal, and other debris for off-site disposal.
2. Appropriate containers and/or trucks for the management and off-site disposal/recycling of non-contaminated material and debris from the excavation areas (e.g., asphalt pavement) and all other non-contaminated debris removed during site preparation.
3. Plastic bags for disposable personnel protection equipment.
4. Portable, temporary storage tanks (FRAC tanks, etc.) for the storage/treatment of collected liquids (i.e. decontamination fluids, construction dewatering, and contaminated stormwater). The Contractor is responsible for the rental of FRAC tanks or similar containers.
5. Containers (e.g., roll-off containers) for non-hazardous municipal trash and debris. Roll-off containers shall be utilized for storage of wastes generated during the site preparation activities, construction activities and waste materials from site cleanup activities.
6. DOT-approved, steel drums (55-gallon capacity) for possible storage of residual contaminated material and/or water.
7. Soil stockpile areas as specified in Section 02315, “Earthwork”.

1.04 ON-SITE MANAGEMENT AND STORAGE OF MATERIALS

A. The Contractor shall be responsible for proper on-site management of wastes generated in compliance with all Federal, State and local regulations. Management shall include handling, segregating, testing and storing all wastes generated during the Work.
B. The Contractor shall be responsible for movement of the containers, trucks, etc. into positions required for proper loading and management of material.
C. The Contractor shall segregate known or suspected contaminated materials from material that is not contaminated and known or suspected hazardous from non-hazardous materials as required for proper off-site disposal.
D. The Contractor shall be responsible for loading all waste containers, trucks, etc. with all removed soil, material, and debris.
E. The Contractor shall limit stockpiling of indigenous contaminated soil or contaminated material (concrete/masonry, metal, and all other debris) from the excavation areas unless approved by the Engineer.
F. The Contractor shall use only clean or decontaminated containers, trucks, etc. for storing or transporting of non-contaminated materials.
G. The Contractor shall be responsible for coordinating the schedule for delivery and pickup of supplied waste containers. The Contractor shall also be responsible for movement and storage of containers within the Site to allow the progress of the Work.
H. The Contractor shall cover any stockpiles with plastic sheeting to prevent erosion of the stockpiles or uncontrolled runoff while promoting runoff of precipitation. The plastic sheeting shall be weighted down or anchored as necessary.

1.05 SAMPLING AND TESTING OF WASTES

A. Testing shall not be required for non-contaminated wastes including:
   1. Removed asphalt pavement within the top one foot of the excavation area.
   2. General trash and rubbish from outside the Work Area (e.g., office waste).
B. The Contractor shall be responsible for the sample collection and laboratory testing of the wastes for characterization purposes as specified in Section 02105, “Chemical Sampling and Analysis.”

1.03 SOIL/MATERIAL HANDLING AND STORAGE

A. Refer to Section 02315, “Earthwork.”

PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

Not Applicable.

END OF SECTION

SECTION 02120

OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.01 SUMMARY

A. This section includes a description of responsibilities for proper transportation and disposal of excavated contaminated soil and borrow soil, fill, bedding, etc.; liquid waste (contaminated stormwater, decontamination water, construction dewatering, etc.); Site trash; and remediation waste (disposable PPE, plastic sheeting and sampling equipment).

1.02 SUBMITTALS

A. The Contractor shall provide a description of planned means and methods for transporting and disposing of all waste materials removed or generated as a component of the Work.
B. Profile of the Treatment Storage and/or Disposal Facility
C. Bill of Lading and/or Manifests for all transported waste loads.
D. Certified weight slips for each load transported to the disposal facility.

1.03 WASTE CONTAINERS

A. The Contractor shall provide waste containers specific to the individual waste as described in Section 02110, “Waste Removal and Handling.”

1.04 TRANSPORTATION OF WASTES

A. The Contractor shall be responsible for the transportation of all solid wastes specified or generated as a result of the Work off site. This includes materials generated by final Site cleanup activities including the dismantling of the temporary facilities and controls.
B. The Contractor shall be responsible for the transportation of all collected contaminated liquids as specified or generated as a result of the Work.
C. The Contractor shall be responsible for coordinating the number and schedule of vehicles required for off-site transportation of waste materials generated during the execution of the specified work.
D. The Contractor shall be responsible to inspect the transportation vehicles before and after loading to ensure compliance with all local, State, and Federal regulations for the safe transport of wastes from the Site to the receiving facility. The Contractor shall provide the necessary labor and materials to insure all trucks, containers, etc. are lined with plastic prior to filling, foamed or stabilized with an agent, if necessary, and covered prior to departure. Each truck shall go through a decontamination pad to remove soil and other contamination from the exterior prior to leaving the site.
E. The Contractor shall insure that the transporters arriving at the Site for loading do not cause undue congestion to local streets, and shall stage trucks either within the perimeter of the Site or at an off-site staging area approved by the Engineer. Transporters shall not

be accepted at the site before 7:00 AM and after 5:00 PM, unless approved by SBD and Honeywell.

F. The Contractor's transporters shall proceed directly from the Site to the designated receiving facility. Temporary staging or storage of material at intermediate locations between the Site and the receiving facility is prohibited.

G. The Contractor shall originate, sign, maintain, and provide the Engineer with a copy of each executed Manifest or Bill of Lading for all loads shipped off-site. In addition, the Contractor shall provide the Engineer, documentation and records verifying receipt of each truck load by the receiving facility. Such documentation shall indicate the actual weight of each load shipped.

H. Transporters shall proceed from the Site along traffic routes established by the Contractor and approved by the local municipality. Transporters shall call back weights after each load and modify loads accordingly. The Contractor shall ensure that trucks leaving the Site are within appropriate weight limitations for the local roads along the designated route.

1.05 DISPOSAL OF WASTES

A. The Contractor shall be responsible for the proper disposal of all solid and liquid wastes that are specified as a component of the Work or that are generated during the execution of the Work in conformance with all Federal, State, and local regulations and requirements. Proper disposal requires that the facility accepting the waste be a Honeywell-approved state licensed disposal/recycling facility that is approved for acceptance of the waste based on the results of the characterization testing and analysis.

B. The disposal facilities shall be approved by the Engineer and Honeywell prior to the transporting of waste. The Contractor shall not change facilities without prior consent of the Engineer/Honeywell.

PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

Not Applicable.

END OF SECTION

# SECTION 02140

# DEWATERING

## PART 1 GENERAL

### 1.01 DESCRIPTION

A. The Contractor shall furnish, operate, and maintain dewatering measures and/or equipment for the control, collection, and disposal of ground and surface water entering trenches, excavations, and proposed fill areas. Work activities will take place above the groundwater table. Water incurred during excavation activities that limits work will be pumped and containerized for sampling and proper disposal.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02110: Waste Removal and Handling
B. Section 02315: Earthwork

### 1.03 SUBMITTALS

A. Documentation of analytical results for collected water samples.

## PART 2 PRODUCTS

### 2.01 GENERAL

A. Provide, operate, and maintain a dewatering system to remove water from excavations and trenches using pumps, drains, well points, piping, and any other facilities necessary to keep the excavations free of water, as required by these Specifications or by the Engineer. Have spare units available for immediate use in the event of equipment breakdowns. All water collected from dewatering activities shall be containerized and sampled for proper disposal.

## PART 3 EXECUTION

### 3.01 PERFORMANCE

A. General:
   1. Provide, operate, and maintain a dewatering system to remove water from excavations using pumps, drains, well points, piping, and any other facilities necessary to keep the excavations free of water, as required by these Specifications or by the Engineer. Have spare units available for immediate use in the event of equipment breakdowns. Groundwater will need to be handled to dewater the excavation area during removal of soils. Assume the water can be discharged to the BSA via the Site process water/sanitary sewer system (under permit held by the Contractor) after any necessary filtering, oil/water separation, and carbon treatment to remove VOCs and non-aqueous phase liquids (NAPL). Contractor will be responsible for collection and testing of samples to

characterize the groundwater prior to discharge. In no case shall water from the work area be discharged or allowed to run off to the Site storm sewer system.

B. Disposal of Water:

1. Sampling, Analysis, and Containment. All collected water shall be sampled and analyzed both prior to and after treatment. Analysis for contaminated water to be discharged to BSA via an on-site sewer or taken to an off-site treatment facility shall conform to the requirements of the treatment facility with documentation of all analyses performed furnished to the Engineer. Contaminated water shall be contained, stored on site, and analyzed prior to being transported to the approved treatment, storage, and disposal facility. The Contractor shall dispose of all water (non-contaminated or contaminated) in accordance with applicable Federal and state disposal regulations. The Contractor shall provide approved containers, vehicles, equipment, labor, signs, labels, placards, manifests and associated land disposal notices and notifications, necessary for accomplishment of the Work.
2. Treatment. On-site treatment of contaminated water shall be approved by the Engineer. If contaminated water is to be treated on site, the proposed treatment shall be specified in the Work Plan and submitted for approval. Temporary storage and treatment equipment shall be installed at a location approved by the Owner. Treated effluent shall be sampled and analyzed and the results approved by the Engineer before discharge, as required by the BSA. Contractor shall be responsible for obtaining and complying with the all necessary permits.

C. Damage:

1. All damage resulting from the dewatering operations or the failure of the Contractor to maintain the Work in a suitable dry condition shall be repaired by the Contractor, at no additional cost.
2. Take all necessary precautions to protect new work from flooding during storms or from other causes.

## 3.02 DEWATERING THE CONSTRUCTION SITE

A. Keep free of standing water or excessively muddy conditions as needed for proper execution of the construction work.

B. Furnish, install, operate, and maintain all drains, sumps, pumps, and other equipment needed to perform the dewatering as specified.

C. Discharge of water pumped from excavations shall be limited to appropriate on-site storage containers. Discharge to other storm drain systems, sewer systems, or over land is not allowed.

END OF SECTION

SECTION 02315

EARTHWORK

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section covers excavation, filling/backfilling, compaction, and grading. The Work includes:
   1. Excavation of contaminated soils.
   2. Application of biostimulation amendments.
   2. Placement and compaction of backfill material:
   3. Finish grading of all disturbed areas;
   4. Placement of a 1-foot soil cover system over restored grade;
   5. Other miscellaneous earthwork activities.

B. Control of surface water run-off during construction shall be in accordance with Section 02370 - Erosion and Sedimentation Control.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01330: Submittal Procedures
B. Section 01450: Contractor Quality Control
C. Section 01560: Dust and Odor Control
D. Section 01720: Field Engineering and Surveying
E. Section 02105: Chemical Sampling and Analysis
F. Section 02110: Waste Removal and Handling
G. Section 02120: Off-Site Transportation and Disposal
H. Section 02140: Dewatering
I. Section 02370: Erosion and Sedimentation Control

1.03 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. Unless otherwise noted, the latest edition of the publications shall be used. The publications are referred to within the text by the basic designation only.
   1. American Society for Testing and Materials (ASTM):
      a. ASTM C 136 Sieve Analysis of Fine and Coarse Aggregates;
      b. ASTM D 422 Standard Test Method for Particle-Size Analysis of Soils;
      c. ASTM D 1140 Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve;
      d. ASTM D2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System);
      e. ASTM D 2974 Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils;
      f. ASTM D 4318 Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils;
      g. ASTM D 4972 Standard Test Method for pH of Soils;
      h. ASTM D 5268 Specification for Topsoil Used for Landscaping Purposes;

1.04 SUBMITTALS

A. Submit to the Engineer for approval the following in accordance with Section 01330, "Submittal Procedures":
   1. Borrow Source: The Contractor shall provide the proposed source(s) for off-site borrow material and all available test reports prior to initiation of work. At minimum provide grain size distribution, soil classification, and a certification of clean fill.
   2. Contractor Quality Control Testing Laboratory: The name and qualifications of an independent third-party commercial testing laboratory to be used for borrow source testing shall be submitted as soon as possible, but no later than 7 days following notice to proceed.
   3. Topsoil Source: The Contractor shall provide the proposed source of off-site topsoil material and all required testing reports (See Sub-Part 2.03).
   4. Grass Seed Vendor's Certificate: The Contractor shall provide the seed vendor's certified statement for the grass seed mixture required, showing common name, percentage of seed mix by weight, percentages of purity and germination, year of production, date of packaging, and location of packaging.
   5. Fertilizer: The Contractor shall provide the fertilizer manufacturer's product data showing chemical analysis and percent composition.
   6. Biostimulant amendment and proposed fertilizer product data

1.05 JOB CONDITIONS:

A. Site Information:
   1. Subsurface soil boring information is included in Remedial Investigation Report (MACTEC, August 2008), Alternatives Analysis Report (MACTEC, February 2009), and Area E Design Report (MACTEC, September 2010). However, variations may exist in the subsurface conditions between boring locations.
   2. Data provided on subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood the Engineer will not be responsible for interpretations or conclusions drawn there from by Contractor. Data will be made available for the convenience and information of the Contractor.
   3. Cover material including common borrow and topsoil will be placed over backfill material as part of the Site-wide cover system to be installed.

B. Existing Utilities:
   1. The Contractor shall locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
   2. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the Engineer immediately for directions. Cooperate with utility companies in keeping respective services and facilities in operation. The Contractor shall repair damaged utilities to satisfaction of the Utility Owner.
   3. Do not interrupt existing utilities serving facilities that are occupied and used, except when permitted in writing by the Owner and then only after acceptable temporary utility services have been provided.

C. Use of Explosives:
   1. Use of explosives shall not be allowed.

D. Protection of Persons and Property:

1. Barricade and mark open excavations occurring as part of this work in accordance with applicable standards.
2. Protect structures, utilities, sidewalks, pavements, manholes and other facilities designated to remain from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations and truck traffic.

1.06 DEFINITIONS

A. Contaminated Soil/Material:
   1. Contaminated soils/materials include but are not limited to materials that contain total VOC or SVOC concentrations greater than 10 mg/kg as noted by testing, and materials determined to be "grossly contaminated". "Grossly contaminated shall be defined as soil exihibiting one or more of the following characteristics:
      a. Visual indication of non-aqueous phase liquid (NAPL);
      b. Visual indication of other separate phase materials of concern, such as elemental mercury;
      c. Photoionization detector readings, as obtained in ambient air at the surface of the excavated material, of greater than 10 ppm and sustained for a minimum duration of 1 minute.
      d. Discolored soil will not be considered "grossly contaminated" if it does not exhibit any of the above characteristics.
   2. The proposed horizontal extent of materials to be removed was determined by a Pre-Design Investigation. The limits of excavation shown on the design drawings are based on that information.

B. Excavation Limits: The proposed horizontal and vertical limits are shown on the drawings. The final excavation limits may be modified based on conditions encountered in the field and as otherwise determined by the Engineer.

C. Unsatisfactory Soil/Material: Unsatisfactory soils/materials include but are not limited to peat and/or highly organic soils (classified as OL, OH, or PT by ASTM D 2487), stumps/brush, trash, refuse, debris, frozen soils, soils containing materials greater than the allowable size (see below), saturated soils, fine-grained soils above their liquid limit at the time of compaction, and soils which when left in place are either too wet or too dry to compact

D. Satisfactory Soil/Material: Satisfactory soils/materials shall meet the requirements specified in Part 2 of this Section and shall be used to backfill excavations for restoration activities in remediated areas.

1.07 QUALITY ASSURANCE:

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

B. Comply with Quality Control provisions specified in Section 01450 – "Contractor Quality Control".

1.08 DISPOSAL OF EXCAVATED MATERIALS

A. Contaminated Soil/Material:
   1. All Contaminated soils/materials obtained from on-site excavations shall be characterized for off-site transportation and disposal in accordance with Section 02120, "Off-Site Transportation and Disposal."
   2. No material within the limit of the excavation may be re-used on site for backfill unless sampling and analytical testing indicates that it meets the criteria for reuse as backfill.

PART 2 PRODUCTS

2.01 SUBGRADE FILL

A. Subgrade Fill shall be used, as necessary, to backfill excavation areas to generally match pre-excavation grades. Subgrade Fill shall consist of granular borrow or other approved material such as crushed brick/concrete, suitable for backfill. It shall be free from frozen materials, perishable rubbish, peat, and other Unsatisfactory Soil/Material.

B. Subgrade fill shall conform to the following gradation requirements unless approved otherwise by the Owner/Engineer:

| Sieve Designation | Percent Passing |
|---|---|
| 4 inch | 100 |
| 2 inch | 80-100 |
| 1 inch | 70-100 |
| No. 4 | 50-100 |
| No. 200 | 0-25 |

2.02 COMMON BORROW

A. Common Borrow shall be provided to construct a 1-foot soil cover system over backfilled excavation areas, as specified elsewhere in the Design Documents. The cover system shall consists of, at minimum, a 10-inch layer of common borrow covered by a 2-inch layer of topsoil. Common Borrow shall consist of the approved clay borrow material already stockpiled on the Site.

B. Common Borrow shall be free of trash, ice, snow, tree stumps, roots and excessive organic and deleterious materials.

C. Common Borrow shall not contain stones greater than 6 inches in any dimension. Oversized particles may be removed after placement as approved by the Engineer or Owner.

D. The moisture content shall be sufficient to provide a firm, compacted, and stable surface.

2.03 TOPSOIL

A. Topsoil shall consist of good quality friable soil consisting of a sandy loam, loam, or silty loam that is free of stones over 1-1/2-inches.
B. Topsoil shall have a minimum 15% and a maximum of 80% passing the No. 200 sieve and not more than 36% clay and not more than 5% gravel by volume.
C. Topsoil shall be reasonably free from subsoil, clay lumps, stones, brush, objectionable stumps, roots, litter, toxic substances, and other material or substances which may be harmful to plant growth or be a hindrance to grading, planting and maintenance operations.
D. The pH of the material is recommended to be between 5.5 and 7.6 as guidance.
E. The organic content shall be not less than 2 percent nor more than 10 percent.
F. Topsoil containing soluble salts greater than 500 ppm shall not be used.
G. Topsoil shall be certified clean from the borrow source of origin, based on analytical testing data.
H. Provide documentation proposed topsoil is a certified clean fill.

2.04 FERTILIZER(for topsoil application)

A. 10-20-20 grade containing at least 10 percent available nitrogen, 20 percent readily available phosphoric acid and 20 percent total available potash.
B. Supply in unopened bags with the weight, contents and guaranteed analysis shown thereon or on a securely attached tag.

2.05 SEED

A. Shall conform to the minimum requirements of the local Soil Erosion and Sediment Control Standards and the requirements specified in the Area E Storm Water Pollution Prevention Plan (MACTEC, February 2010).
B. The grass seed mixture shall include no "primary noxious weed seeds."
C. Furnish in fully-labeled, standard sealed containers.
D. Percentage and germination of each seed type in the mixture, purity, and weed seed content of the mixture shall be clearly stated on the label.
E. The weight of pure live seed (PLS) is computed by the labeled purity percent times the labeled germination percent times the weight.
    a. To illustrate the method of computing to PLS from the tag basis, the following example is given: Required: 20 pounds PLS of a particular variety--stock available is 99.41% pure and 92% germination--20 divided by the product of 0.9941 and 0.92 equals 21.8 pounds on the tag basis to furnish 20 pounds of PLS.
F. Subject to the testing provisions of the Association of Official Seed Analysis, with the month and year of test clearly stated on the label.
G. May be tested after it has been delivered to the project.
H. Seed which has become wet, moldy, or otherwise damaged will not be acceptable.

2.06 BIOSTIMULATION (OXYGEN RELEASING) AMENDMENT

A. The Contractor shall supply the oxygen releasing amendment.
B. The oxygen releasing amendment shall offer a controlled release technology with a documented track record for releasing oxygen into groundwater for period of time exceeding 12 months in environmental settings similar to the subject site.

B. The oxygen releasing amendment shall have a proven track record for stimulating in-situ aearobic bioremediation of contaminants and be acceptable for use in environmental remediation projects.

C. The specified product is Regenesis ORC-Advanced or approved equal. Note that alternative materials may require different application rates and total required pounds of reagent. Application rates and quantity calculation shall be submitted for alternate materials and shall be subject to approval by the Engineer.

## PART 3 EXECUTION

### 3.01 INSPECTION

A. Examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the Engineer, in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

### 3.02 EXCAVATION

A. General:
   1. Excavation consists of removal and disposal of material as shown on the drawings. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times.

B. Site Excavation:
   1. Conform to dimensions shown on the drawings. Total depth of excavation will be until the targeted geologic strata are encountered as follows (unless otherwise determined by the Engineer):
      a. Shallow excavations shall extend to the bottom of the unsaturated zone which is interpreted to coincide with the bottom of the fill layer/top of the till layer.
      b. Deep excavations shall extend to the bottom of the till layer / top of the glaciolucustrine clay layer.
   2. The excavation may extend beyond the limits described herein and shown on the drawings in order to remove “grossly contaminated” material as the term is defined above in Subpart 1.06.A.1.

### 3.03 STABILITY OF EXCAVATIONS

A. Slope sides of excavations to comply with applicable codes and ordinances. It is anticipated that excavation stability will be provided by using sloped side walls in accordance with OSHA and other applicable standards. If Contractor requires shoring and bracing where sloping is not possible because of space restrictions or stability of material excavated, Contractor must submit plans prior to starting work activities. Any engineered shoring system plan submitted shall be stamped by a licensed New York State Professional Engineer.

B. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

### 3.04 SOIL/MATERIAL HANDLING AND STORAGE:

A. If appropriate, direct load-out of excavated material is preferable to stockpiling the material on site. If stockpiling is necessary, the following requirements will apply

1. During daily excavation activities, locate and retain soil materials away from edge of excavations. All temporary/daily stockpiles shall be maintained a sufficient distance from the excavation to prevent loading of the slope and to provide for stability of the slope.
2. The Contractor shall store/stockpile excavated materials within the limits of the Work Area. Designated storage/stockpile areas shall be established for the following soils/materials, at a minimum:
    a. Contaminated Soil/Material excavated during execution of the Work.
    b. Imported soils and aggregates as required.
    c. Satisfactory excavated material that is not contaminated (based on appropriate testing) and may be reused as backfill.
3. The Contractor shall place, grade, and shape stockpiles to provide for proper drainage. Furthermore, stockpiles shall incorporate appropriate erosion and sedimentation controls in accordance with Erosion and Sedimentation Control, to prevent the off-site migration of sediments.
4. Storage of Contaminated Soils/Materials:
    a. Stockpiles of Contaminated Soil/Material shall be constructed to isolate contaminated material from the environment. The maximum pile size shall be 1,000 cubic yards unless approved otherwise by the Engineer. Stockpiles shall be constructed to include:
        1) A chemically resistant geomembrane liner. Non-reinforced geomembrane liners shall have a minimum thickness of 20 mils. Scrim reinforced geomembrane liners shall have a minimum weight of 40 lbs. per 1,000 square feet. The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other object which could damage the membrane.
        2) Geomembrane cover to prevent precipitation from entering the stockpile. Non-reinforced geomembrane covers shall have a minimum thickness of 10 mils. Scrim reinforced geomembrane covers shall have a minimum weight of 26 lbs. per 1,000 square feet. The cover material shall be anchored to prevent it from being removed by wind.
        3) Berms surrounding the stockpile, a minimum of 12 inches in height. Vehicle access points shall also be bermed.
    e. Storage and removal of liquid which collects in the stockpile shall be in accordance with Sub-Part 3.04A.6.
    f. Inspection of the stockpile areas shall be conducted on a weekly basis (at a minimum), or following a significant precipitation event and/or as requested by the Engineer.
5. Roll-Off Units:
    a. Water-tight roll-off units may be used to temporarily store Contaminated Soil/Material.
    b. An impermeable cover shall be placed over the units to prevent precipitation from contacting the stored material.
    c. The units shall be located in the staging/storage area, as directed by the Engineer.
    d. Liquid which collects inside the units shall be removed and stored for sampling and disposal by the Contractor.

6. Liquid Storage
    a. Liquid collected from excavations and stockpiles shall be temporarily stored in 55-gallon barrels or portable tanks.
    b. Liquid storage containers shall be water-tight and shall be located in the staging/storage area, as directed by the Engineer.

B. Dispose of excess soil material and waste materials as specified herein and in accordance with Section 02120, "Off-Site Transportation and Disposal."

## 3.05 COLD WEATHER PROTECTION

A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.

## 3.06 CLOSING ABANDONED UNDERGROUND UTILITIES

A. Close open ends of abandoned underground utilities, indicated to remain, permanently with closures sufficiently strong to withstand pressures which may result after closing.

B. Close open ends of metallic conduit and pipe with threaded galvanized metal caps or plastic plugs, or other suitable method for the type of material and size of pipe. Do not use wood plugs.

C. Close open ends of concrete and masonry utilities with not less than 8" thick brick masonry bulkheads, constructed to completely fill the opening.
    1. Wet brick before laying. Lay brick in mortar so as to form a full bed with ends and side joints in one operation. Joints shall not be more than three-eighths (3/8) of an inch wide. Protect fresh masonry from freezing or from rapid drying, as necessary, and maintain protection until mortar has set.

## 3.07 GRADING

A. The Contractor shall uniformly grade areas within the limits of work. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Finish surfaces to be free from irregular surface changes.

## 3.08 APPLICATION OF BIOSTIMULANT AMENDMENT

A. The Contractor shall supply all necessary equipment and services to apply the oxygen releasing amendment during backfilling.

B. The Contractor shall spread a dry mix of oxygen releasing amendment and fertilizer evenly within each 12-inch backfill lift.

C. Use a broadcast spreader or other equipment approved by the Engineer to apply the amendment during the course of backfilling to maximize distribution within the backfill material.

D. Use appropriate equipment, application techniques, and (if necessary) water mist/spray to minimize the creation of dust during application and spreading of the amendment.

E. Apply the amendment at the following application rate unless otherwise directed by the Engineer:
    1. Area E1: 599 pounds (0.35 pounds per square yard) per one-foot lift of backfill, with two applications applied to the first (bottom) lift.

2. Area E2: 59 pounds (0.37 pounds per square yard) per one-foot lift of backfill, with two applications applied to the first (bottom) lift.
3. Area E3: 2,642 pounds (1.2 pounds per square yard) to the first (bottom) lift.

F. Include an approved fertilizer product in the biostimulant amendment to provide nutrients (nitrogen and phosphorus) at the following applications rates unless otherwised directed by the Engineer.
1. Area E1: 2.49 pounds nitrogen and 0.25 pounds phosphorus per one-foot lift of backfill, with two applications applied to the first (bottom) lift.
2. Area E2 0.24 pounds nitrogen and 0.02 pounds phosphorus per one-foot lift of backfill, with two applications applied to the first (bottom) lift.
3. Area E3 5.5 pounds nitrogen and 0.55 pounds phosphorus per one-foot lift of backfill, with two applications applied to the first (bottom) lift.

G. Apply biostimulant amendment to backfill lifts at and below the first (upper) zone of saturation (typically encountered at the base of the fill layer/top of till at a depth of four or five feet below original ground surface).

## 3.09 BACKFILL AND FILL

A. Place acceptable soil material of the type in layers to required elevations. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

B. Backfill excavations as promptly as work permits, but not until completion of the following:
1. Acceptance by Engineer of construction below finish grade and completion of post-excavation sampling.
2. Removal of trash and debris.

C. Fill/Backfill Placement:
1. Place subgrade fill in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, unless otherwise specified.

D. Before compaction, moisten or aerate each layer as necessary to provide the necessary moisture content.

E. Place Common Borrow (clay) material, as directed by the Engineer, at locations of exposed sewer lines, to prevent preferential pathway groundwater flow along pipe bedding material.

## 3.10 COMPACTION

A. General:
1. Compact material in 12-inch lifts (maximum) using a minimum of three passes of a 12,000 pound vibratory drum compactor.
2. Compaction procedures must comply with City of Buffalo Building Department requirements, as applicable.

B. Moisture Control:
1. Where subgrade or a layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, in proper quantities to prevent free water appearing on surface during or subsequent to compaction operations.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit adequate compaction.
3. Backfill material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory level.

D. Method:

1. At depths greater than five (5) feet below final grade elevation, static methods of compaction may be employed using equipment capable of producing a kneading action applied with pressure (i.e. the bucket of the excavator may be used). The maximum compacted lift depth shall be 1 foot.

3.11 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

END OF SECTION

# SECTION 02370

# EROSION AND SEDIMENTATION CONTROL

## PART 1 GENERAL

### 1.01 DESCRIPTION

A. Work Included: Provide and install all materials, equipment, and labor necessary for the control of storm runoff/surface water and to place erosion and sedimentation control measures in accordance with the applicable erosion and sediment control regulatory requirements and standards. At the completion of the construction, provide all materials, equipment, and labor necessary for the removal, transport and disposal of temporary erosion and sediment control structures not specified to remain. Downgradient from disturbed areas, remove, transport, and dispose of sediment resulting from erosion control measures in a manner consistent with overall intent of this specification and which does not result in additional erosion.

B Contractor to provide and install all erosion and sediment control measures in accordance with the Area E SWPPP and NOI (MACTEC, February 2010) and all applicable erosion and sediment control regulatory requirements, standards and specifications and as required by field conditions during the execution of the Work.

C. Temporary erosion and sediment control measures shall be installed as the first step in construction, shall be continuously maintained, and shall not be removed until permanent surface stabilization of all disturbed areas to the Engineer's satisfaction.

### 1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02110: Waste Removal and Handling
B. Section 02140: Dewatering
C. Section 02315: Earthwork

### 1.03 REFERENCES AND GUIDELINES

A. New York Guidelines for Urban Erosion and Sediment Control, April 1997 by the Urban Soil Erosion and Sediment Control Committee which includes the following contributors: New York State Soil & Water Conservation Committee; Agronomy Department, Cornell University; Agricultural Engineering Department, Cornell University; New York State Department of Environmental Conservation; New York State Department of Transportation; New York Chapter of Land Improvement Contractors of America; O'Brien and Gere Engineers, Inc.; and USDA-Natural Resources Conservation Service (formerly the Soil Conservation Service).

B. New York Standards and Specifications for Erosion and Sediment Control, August 2005 by the NYS Soil and Water Conservation Committee.

C. New York State SPDES General Permit for Stormwater Discharges from Construction Activity – GP-0-10-001 (latest version).

D. Standards Specifications, State of New York Department of Transportation, May 4, 2006 by the New York State Department of Transportation (NYSDOT).

## PART 2 PRODUCTS

### 2.01 GENERAL

A. Silt fence, hay bales, and other materials used for erosion and sediment or stormwater runoff control shall be as specified in the Area E SWPPP (MACTEC, February 2010).

## PART 3 EXECUTION

### 3.01 PERFORMANCE

A. It is the Contractor's responsibility to implement and maintain erosion and sedimentation control measures which effectively prevent accelerated erosion and sedimentation.

B. Earth moving activities shall be conducted in such a manner as to prevent accelerated erosion and sedimentation.

C. Land disturbance shall be kept to a minimum. Stabilization activities shall be scheduled immediately after any disturbance

D. Diverting Surface Water:

1. Build, maintain, and operate any temporary berms, ditches channels, flumes, sumps, and other temporary diversion and protection works needed to divert surface water through or around the work area and away from Work until surface stabilization has occurred.
2. Storm runoff from disturbed areas must discharge through temporary erosion control measures prior to discharge from the Site.

E. Erosion Control Provisions:

1. Protect areas where existing banks are to be disturbed by constructing straw/hay bale or earth dikes at the top of slope to divert storm runoff from the disturbed area or at the toe of the slope to retain sediments, as conditions permit.
2. All discharge from any necessary pumping operations during dewatering operations shall be conveyed to an on-site storage tank or treatment in accordance with Section 02140, “Dewatering.”
3. Prior to removal of sediment barriers, remove retained silt or other materials and dispose of appropriately at no additional cost to the Contract.

F. Silt Fence: Install silt fence if required as a supplementary measure. The silt fence shall be installed on a level line to avoid concentrated flow areas along the fence. The area below the fence must be undisturbed or stabilized.

G. Temporary Protective Sheeting: Soil stockpiles shall be protected with sheeting prior to the completion of daily work activities or as conditions require based on observed slope conditions. Overlap adjacent sheets by a minimum of 12 inches and securely anchor sheeting with sand bags and/or soil pegs, staples or stakes.

H. Filter Berms: Sediment barriers constructed from berms of erosion control mix, compost/bark, or compost-filled filter socks maybe used at locations suitable for their use and as approved by the Engineer.

### 3.02 MAINTENANCE

A. The Contractor shall be held responsible for the implementation and maintenance of all erosion control measures on the Site.

B. Throughout construction and until the Site has been stabilized upon completion of the Work, all erosion and sediment control measures will require periodic inspection and maintenance to ensure that such measures are providing effective service. At a minimum, the inspection and maintenance program must meet the requirements of the Area E SWPPP (MACTEC, February 2010).

C. Maintain the integrity of all erosion control measures throughout construction period.

## 3.03 SPECIAL CONDITIONS

A. Prohibited Construction Practices - Prohibited construction practices include but shall not be limited to the following:

1. Dumping of spoil material into any stream corridor, any wetlands, any surface waters, storm water collection system, or at any other unspecified locations.
2. Pumping of silt-laden water from trenches or other excavations into any surface waters, any stream corridors, any wetlands, or any storm drain system.

## 3.04 ADJUSTMENT OF PRACTICES

A. If the planned measures do not result in effective control of erosion and sediment runoff to the satisfaction of the regulatory agencies having jurisdiction over the project, the Contractor shall immediately adjust their program and/or institute additional measures so as to eliminate excessive erosion and sediment runoff.

B. If the Contractor fails or refuses to comply promptly, Owner or the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor.

## 3.05 REMOVAL OF TEMPORARY WORKS

A. Remove or level and grade to the extent required to present a sightly appearance and to prevent any obstruction of the flow of water or any other interference with the operation of or access to the permanent works.

END OF SECTION

SECTION 02526

ABANDONMENT OF MONITORING WELLS

## PART 1 GENERAL

### 1.01 DESCRIPTION

A. This specification establishes the requirements for monitoring well abandonment.

B. No existing monitoring wells are within the current limits of work. Should the excavation limits be revised to include locations with existing monitoring wells, such wells will be abandoned in accordance with the procedures specified in this Section.

### 1.02 SUBMITTALS

A. Submit the following in accordance with Section 01330 "Submittal Procedures":

1. Well Abandonment Completion Form: Upon completion of abandonment of each well a Well Abandonment Completion Form must be completed and submitted. The Abandonment Form shall detail the material types, quantities, and methods used and any components of the well removed.
2. Well Abandonment Record for each abandoned monitoring well.

## PART 2 PRODUCTS

### 2.01 WELL PLUGGING MATERIALS

A. Type 1 cement/bentonite grout:
Type 1 cement/bentonite grout with 4% (by weight) powdered bentonite may be used in the riser pipe interval of screen and riser pipe wells.

B. Microfine cement grout:
Microfine cement grout will be used for screened sections of wells and may be used for riser sections. The microfine cement should be similar or equal to MC-500 microfine cement distributed by Geochemical Corporation, Ridgewood, New Jersey.

## PART 3 EXECUTION

### 3.01 WELL PLUGGING AND ABANDONMENT REQUIREMENTS

A. Monitoring wells shall be abandoned according to the latest NYSDEC Groundwater Monitoring Well Decommissioning Policy. Well abandonment includes the placement of well plugging materials by tremie methods from the bottom of the well to within 3 feet of existing grades and removal of riser and well material within 3 feet of existing grades. Well plugging materials shall not be pressure injected. Well plugging materials shall continue to be added to fill gaps created by settlement within the riser until the plugging material sets. Following removal of the top 3 feet of the well the hole shall be backfilled as in accordance with Section 02315, "Earthwork."

B. The Subcontractor shall maintain a well abandonment record. Groundwater levels shall be measured in all wells prior to abandonment. These water levels shall be included in the well abandonment records.

C. Locations of abandoned wells shall be surveyed as a requirement of the record drawing submission.

D. If the well construction is completely within the material to be excavated (i.e., no part of the well extends deeper than the bottom of the excavation), the well may be physically removed during excavation without plugging.

END OF SECTION

SECTION 02720

STORM DRAIN AND PROCESS SEWER SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. A portion of the work activities in the defined excavation area will take place around the main storm sewers and process sewer lines that must be preserved. Invert depths system lines reportedly range from less than 5 feet to more than 8 feet below ground surface within the vicinity of the three excavation areas. The system lines shall remain undisturbed during excavation activities. Excavation activities will not take place directly over the system lines without approval from the Engineer.

B. A 10 inch vitrified tile storm sewer line is located within the limits of excavation at Area E-1 as shown on the drawings. During excavation, if the storm sewer is encountered, the line shall be removed and managed for off-site disposal along with the excavated soil. Any exposed ends of the sewer at the limits of excavation shall be permanently plugged/sealed with cement.

D. During the course of excavation; take precautions to locate all manholes, grates, and, covers associated with the current storm and process sewer lines in the vicinity of the work. Following location of these manholes, care shall be taken to ensure that they are not damaged or destroyed by heavy equipment unless they are part of a system that can be removed. If these structures are damaged, the Contractor shall repair or replace as directed by the Owner to restore the sewer system to its original condition.

E. If confirmatory sample results indicate that the excavation of contaminated soils is required over the system lines, soil shall then be excavated over the top of the system lines with care to not damage the lines. Existing brick manholes shall remain in place and soils shall be sloped around the manholes to ensure that they are not disturbed.

PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

Not Applicable.

END OF SECTION