Justin Starr, P.G.
New York State Department of Environmental Conservation
Division of Environmental Remediation, Bureau C
625 Broadway, 11th Floor
Albany, NY 12233

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Phone: 315 446 9120
Fax: 315 449 0017
www.arcadis.com

Date: March 16, 2021
Our Ref: 30049425
Subject: OU-2 Remedial Design Revisions
NYSEG Cortland-Homer Former MGP Site
Site No. 7-12-005

Dear Mr. Starr,

On behalf of NYSEG, please find enclosed, revised final Design Drawings and Technical Specifications associated with the April 2020 Remedial Design Report (Remedial Design) for Operable Unit No. 2 (OU-2) of the NYSEG Cortland-Homer Former Manufactured Gas Plant (MGP) site located in Homer, New York (the site).

The Remedial Design was approved by the New York State Department of Environmental Conservation (NYSDEC) via an April 22, 2020 letter to NYSEG and Arcadis. Following NYSDEC approval, minor modifications have been made to the Remedial Design based on the following:

- The permit application and review process for the NYSDEC Article 16 permit
- Permit conditions included as part of the NYSDEC Water Quality Certification (WQC)
- Sediment grain size sampling (previously summarized in a June 22, 2020 letter to NYSDEC)

Revisions to the enclosed Remedial Design Drawings and Technical Specifications, based these and other minor modifications, are summarized below.

- Design Drawing G-501 – Turbidity curtain detail is revised to correctly indicate the sieve size and water flow rate that corresponds with percent open area. Additionally, Specification Section 01 57 05 – Temporary Controls is updated with turbidity curtain product details for an approved product.
- Design Drawings C-112 to C-114, C-303, and C-304 – In response to NYSDEC comments during the Article 16 permit process, the riverbed and riverbank restoration elevations at Area 2 are revised to be consistent with river elevations following completion of the United States Army Corps of Engineers (USACE) 1963 Cortland Flood Control Project. Additionally, per NYSDEC's request, woody vegetation will not be installed within the channel limits.
- Design Drawing C-304 – A note is added requiring river cobble material at Area 1. Additionally, Specification Section 31 05 05, Aggregates for Earthwork is updated to include the revised gradation requirements for river backfill and material requirements for river cobble.
- Design Drawing C-502 – A note is added requiring galvanized wire mesh cylinders (i.e., tree cages) around planted trees at Area 2. Additionally, Specification Section 32 90 00, Plantings and Restoration is updated to include requirements for tree cage installation.

Justin Starr, P.G.
New York State Department of Environmental Conservation
March 16, 2021

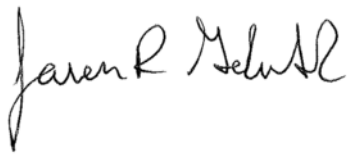
- Design Drawings C-504A through C-505 – Restoration planting tables are revised to include NYSDEC-approved tree species, as indicated in the WQC.
- Design Drawing S-201 – The minimum required sheet pile section modulus is corrected.

Note that the design drawings currently show the temporary river crossing constructed using steel caissons, as a conservative measure. However, the Remediation Contractor will likely construct the temporary crossing using a prefabricated bridge, with the temporary bridge and abutments located fully above the mean high-water level. Additional information regarding the temporary river crossing will be provided to NYSDEC under separate cover prior to installation.

Additionally, in accordance with the NYSDEC WQC, the spring/qualitative post-restoration vegetation monitoring events will be conducted in May (and not April or May, as indicated in the Preliminary Monitoring and Maintenance Plan, included as Appendix G of the Remedial Design).

Please contact Tracy Blazicek of NYSEG at 607.237.5325 or tlblazicek@nyseg.com with questions or comments.

Sincerely,
Arcadis of New York, Inc.



Jason Golubski, PE
Principal Environmental Engineer

Email: jason.golubksi@arcadis.com
Direct Line: 315.671.9437
Mobile: 716.597.7620

CC. Cynthia Hill, NYSDEC
Jean Foley, NYSDEC
Dan Fuller, NYSDEC
Nadine Little, NYSDEC
Tracy Blazicek, CHMM, NYSEG
Dave MacDougall, DAC
Dan Kopcow, GEI
Mark Gravelding, Arcadis

Enclosures:
Attachment 1 – Design Drawings
Attachment 2 – Technical Specifications

Attachment 1

Design Drawings

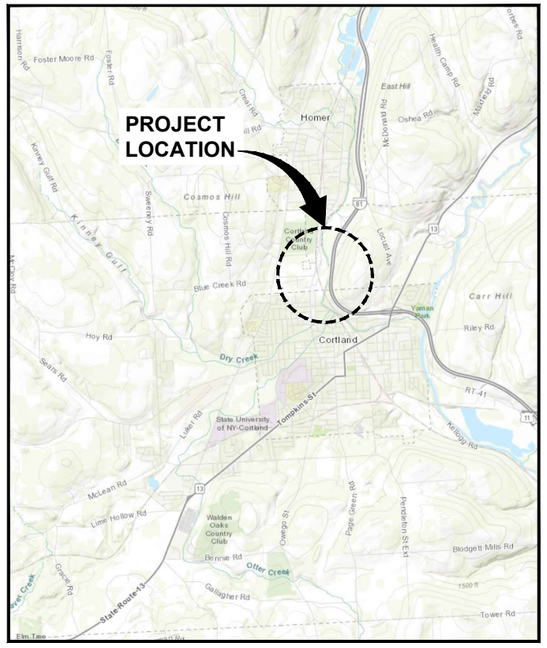
DESIGN DRAWINGS

CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2 REMEDIAL DESIGN REPORT

KEY CONTACTS:

OWNER:
NYSEG
JAMES A CARRIGG CENTER
18 LINK DRIVE, PO BOX 5224
BINGHAMTON, NEW YORK 13902–5224
TELEPHONE: 585.484.6839
CONTACT: TRACY BLAZICEK

DESIGN ENGINEER:
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315.432.1529



DATE ISSUED
MARCH 2021

NYSEG
HOMER, NEW YORK

NYSDEC SITE NUMBER 7-12-005

STATE OF NEW YORK
MARK OWEN GRATTAN
NO. 099986
LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

INDEX TO DRAWINGS

C:\Users\Ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021\01-DWG\RDR-DESIGN-DR00-G-001-COVER.dwg SAVED: 3/8/2021 1:17 PM BY: SARTORI, KATHERINE
XREFS: IMAGES:
NY_MGravelding.tif
Site Location.tif

GENERAL NOTES AND SPECIFICATIONS

GENERAL NOTES:

1. BASE MAP FOR OU-2 AREAS 1 AND 2 PROVIDED BY PJO SURVEYING OF SKANEATELES, NY ON MARCH 11, 2019. CONTOURS ARE BASED ON BASE MAP SURVEY PROVIDED AND ADJUSTED BY ARCADIS AS NECESSARY FOR HYDRAULIC MODELING PURPOSES.
2. MEAN HIGH WATER LINE (I.E., THE ORDINARY HIGH WATER LINE) IS BASED ON FIELD DELINEATION BY ARCADIS AND NYSDEC PERSONNEL COMPLETED IN OCTOBER 2017 AND 2019 AND HEC-RAS MODELING AND REPRESENTS A BASE FLOW OF APPROXIMATELY 660 CFS.
3. ELEVATIONS ARE IN US FEET AND ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD88).
4. HORIZONTAL COORDINATES ARE IN US FEET AND ARE REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, TRANSVERSE MERCATOR PROJECTION, NORTH AMERICAN DATUM 1983 (NAD83).
5. LOCATION OF EXISTING STRUCTURES DIGITIZED FROM AERIAL PHOTOGRAPHS DATED 4/22/2018 AND OBTAINED FROM ESRI ONLINE IMAGERY.
6. PROPERTY LINES TAKEN FROM CORTLAND COUNTY TAX MAPS AND PROVIDED BY PJO SURVEYING AS PART OF 2017 PRE-DESIGN INVESTIGATION ACTIVITIES.
7. ALL LOCATIONS, INCLUDING PROPERTY LINES AND ABOVE- AND UNDERGROUND UTILITIES, ARE APPROXIMATE, REFLECT AVAILABLE INFORMATION, ARE PROVIDED FOR REFERENCE ONLY, AND ARE SUBJECT TO FIELD VERIFICATION BY THE REMEDIATION CONTRACTOR, EASEMENTS AND RIGHTS-OF-WAY ARE NOT SHOWN.
8. PROMPTLY NOTIFY THE OWNER AND THE REMEDIATION ENGINEER, UPON DISCOVERY, AND BEFORE CONDITIONS ARE FURTHER DISTURBED, OF PHYSICAL CONDITIONS AT THE SITE WHICH DIFFER MATERIALLY FROM THOSE INDICATED ON THE CONSTRUCTION DOCUMENTS AND REFERENCE DOCUMENTS.
9. PROMPTLY, AFTER DISCOVERING, GIVE WRITTEN AND ORAL NOTICE TO THE REMEDIATION ENGINEER OF DELAYS IN PROJECT SCHEDULE DUE TO EQUIPMENT MALFUNCTION, WEATHER, OR GENERAL FAILURE TO MEET PRODUCTION STANDARDS.
10. COMPLY WITH ALL REQUIREMENTS OF ANY ISSUED PERMITS AND ANY APPLICABLE STATE AND FEDERAL LAWS AND REGULATIONS. IN-WATER WORK IS ANTICIPATED TO BE ALLOWED ONLY BETWEEN MAY 16 AND SEPTEMBER 30 EACH YEAR. WORK HOURS AND/OR TIME OF YEAR RESTRICTIONS WILL BE DICTATED BY ANY APPLICABLE PERMITS.
11. THE REMEDIATION CONTRACTOR SHALL MAKE BEST EFFORTS TO COMPLETE THE WORK WITHIN TWO CONSTRUCTION SEASONS.
12. PROTECT WORK IN PROGRESS, NO ADDITIONAL PAYMENTS WILL BE MADE FOR REPAIR OR REPLACEMENT OF PARTIALLY COMPLETED WORK DUE TO REMEDIATION CONTRACTOR'S FAILURE TO ADEQUATELY PROTECT THE WORK.
13. REFER TO THE REMEDIAL DESIGN REPORT AND TECHNICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE NOTES AND DETAILS PRESENTED ON THESE DESIGN DRAWINGS.

SITE PREPARATION:

1. PRIMARY SITE ACCESS FOR AREA 1 SHALL BE FROM ROUTE 11. SITE ACCESS FOR AREA 2 SHALL BE FROM FRONT STREET.
2. ESTABLISH, MAINTAIN, AND PROTECT THE PROJECT LIMITS, INCLUDING SUPPORT ZONES, EXCLUSION ZONES, AND CONTAMINATION REDUCTION ZONES.
3. PROTECT ABOVE- AND UNDERGROUND UTILITIES DURING CONSTRUCTION. THE LOCATION OF ALL ABOVE- AND UNDERGROUND UTILITIES MUST BE VERIFIED IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. THE REMEDIATION CONTRACTOR SHALL CONTACT "DIG SAFELY NEW YORK" (1-800-962-7962), A PRIVATE UTILITY LOCATOR, AND ALL APPLICABLE UTILITY COMPANIES FOR LOCATION OF UNDERGROUND UTILITIES. THE REMEDIATION CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY REMOVAL, RELOCATION, AND REPLACEMENT OF ANY UTILITY POLES, GUY WIRES, UNDERGROUND UTILITIES, AND/OR OVERHEAD WIRES THAT FALL WITHIN THE LIMITS OF CONSTRUCTION, OR THAT MAY INTERFERE WITH THE WORK.
4. PLACE TEMPORARY CONSTRUCTION FENCING AROUND ACCESSIBLE PORTIONS OF THE LIMITS OF WORK (WHETHER SHOWN ON DRAWINGS OR NOT).
5. CONSTRUCT SUPPORT FACILITIES (E.G., WATER TREATMENT FACILITY, ETC.) WITHIN THE AREA 1 OR AREA 2 UPLAND SUPPORT AREAS.
6. REMOVE AND PROPERLY DISPOSE OF ALL ABOVE-GROUND DEBRIS, BRUSH, LOGS, TREES, STUMPS, REFUSE, AND RUBBISH FROM WITHIN THE WORK LIMITS, AS REQUIRED TO PERFORM THE WORK.
7. PROTECT VEGETATION NOT IDENTIFIED FOR REMOVAL DURING CONSTRUCTION. PROTECTION SHALL CONSIST OF ORANGE CONSTRUCTION FENCING SURROUNDING THE AREA TO BE PROTECTED. FOR BROAD-CANOPIED TREES, CONSTRUCTION FENCING SHALL BE PLACED NO CLOSER THAN THE DRIPLINE OF THE TREE. FOR NARROW-CANOPIED TREES, CONSTRUCTION FENCING SHALL BE PLACED AT A DISTANCE EQUAL TO THE STEM DIAMETER IN INCHES, CONVERTED TO FEET, AND DOUBLED, SUCH THAT A 10-INCH DIAMETER TREE WOULD BE PROTECTED TO 20 FEET.

TEMPORARY EROSION, SEDIMENTATION, AND TURBIDITY CONTROL:

1. INSTALL AND MAINTAIN ALL NECESSARY UPLAND AND IN-RIVER TEMPORARY EROSION, SEDIMENTATION, AND TURBIDITY CONTROL (WHETHER SHOWN ON DRAWINGS OR NOT) THROUGHOUT CONSTRUCTION AND THE INSTALLATION AND ESTABLISHMENT OF ALL NECESSARY RESTORATION MEASURES UPON COMPLETION OF CONSTRUCTION ACTIVITIES.
2. IMPLEMENT APPROPRIATE DUST CONTROL MEASURES AT ALL TIMES TO MINIMIZE FUGITIVE DUST.
3. UTILIZE GOOD HOUSEKEEPING PRACTICES TO MAINTAIN A NEAT AND ORDERLY SITE AT ALL TIMES DURING CONSTRUCTION.
4. PREVENT TRACKING OF SOIL MATERIALS ONTO OFFSITE AREAS. CLEAN ANY SOIL MATERIALS ACCIDENTALLY TRACKED OR OTHERWISE SPILLED OR DROPPED ONTO OFFSITE AREAS IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER.
5. SURROUND ANY IMPORTED SOIL MATERIALS AND/OR EXCAVATED SOILS/SEDIMENTS REQUIRING TEMPORARY STOCKPILING ONSITE WITH APPROPRIATE TEMPORARY EROSION AND SEDIMENTATION CONTROLS (E.G., SILT FENCE, STRAW/HAY/STRAW BALES) TO CONTAIN ANY SEDIMENT-LADEN RUNOFF THAT COULD BE GENERATED FROM SUCH STOCKPILES.

SEDIMENT REMOVAL:

1. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, ACCESSORIES, AND APPURTENANCES NECESSARY TO COMPLETE REMOVAL OF SEDIMENTS AND RELATED WORK SHOWN ON THE DESIGN DRAWINGS.
2. TAKE APPROPRIATE STEPS TO PROTECT THE STABILITY OF STRUCTURES WITHIN AND AROUND THE REMOVAL AREAS. REPAIR ANY FEATURE DAMAGED AS A RESULT OF REMOVAL OPERATIONS, TRANSPORT OF EXCAVATED MATERIAL, OR OTHER CONSTRUCTION ACTIVITIES TO ITS ORIGINAL CONDITION (I.E., CONDITIONS THAT EXISTED PRIOR TO THE DAMAGE) AT NO ADDITIONAL COST TO THE OWNER.
3. TO REDUCE THE POTENTIAL FOR MIGRATION OF IMPACTS BEYOND THE LIMITS OF SEDIMENT REMOVAL AND POTENTIAL RECONTAMINATION OF RIVER SEDIMENTS DURING AN OVERTOPPING EVENT, COVER ALL IMPACTED SEDIMENT REMOVAL SURFACES WITH CLEAN MATERIAL OR POLY SHEETING. CONSIDERATION SHALL BE GIVEN TO THE TYPE OF COVER MATERIAL USED AND THE POTENTIAL FOR EROSION AND/OR LOSS OF THE COVER MATERIAL DURING AN OVERTOPPING EVENT. ALL COVER MATERIALS IN CONTACT WITH IMPACTED SEDIMENTS SHALL BE CONSIDERED IMPACTED AND DISPOSED IN ACCORDANCE WITH SPECIFICATION SECTION 02 61 15, HANDLING AND DISPOSAL OF IMPACTED MATERIALS.
4. IMPLEMENT APPROPRIATE MEASURES TO REDUCE THE POTENTIAL FOR GENERATION OF OIL SHEENS AND TO CATCH ANY SUCH OIL SHEENS THAT MAY OCCUR (E.G., VIA THE USE OF OIL ABSORBENT BOOMS AND/OR SIMILAR MEASURES).

WATER MANAGEMENT:

1. KNOWN OUTFALL STRUCTURES ARE PRESENT ADJACENT TO SEDIMENT REMOVAL AREAS. IMPLEMENT MEASURES (E.G., PUMP AND ASSOCIATED PIPING, FLUME, OR OTHER TECHNIQUES), AS NECESSARY, TO MANAGE FLOWS FROM EXISTING SURFACE WATER DISCHARGE POINTS ALONG THE RIVERBANK AROUND ACTIVE SEDIMENT REMOVAL AREAS, AND INTO THE BYPASS CHANNEL AND/OR THE RIVER DOWNSTREAM OF THE BACKWATER DAM, IN ACCORDANCE WITH SPECIFICATION SECTION 01 51 41, TEMPORARY PUMPING. COORDINATE WITH RESPECTIVE SURFACE WATER DISCHARGE POINT OWNERS TO DETERMINE ANTICIPATED DISCHARGE RATES AND NOTIFY SUCH OWNERS OF ANY POTENTIAL REDUCTIONS TO OUTFALL CAPACITIES RESULTING FROM REROUTING/DIVERSION ACTIVITIES.
2. COLLECT WATER COMING INTO CONTACT WITH IMPACTED SEDIMENTS DURING REMOVAL ACTIVITIES, INCLUDING BUT NOT NECESSARILY LIMITED TO, DEWATERING OF SEDIMENTS AND DECONTAMINATION FLUIDS, AND TREAT AT THE ONSITE TEMPORARY WATER TREATMENT SYSTEM PRIOR TO DISCHARGE. IF NO SHEENS ARE OBSERVED ON THE WATER COLUMN, SURFACE WATER WITHIN THE WORK AREA THAT IS GREATER THAN ONE FOOT ABOVE THE RIVERBED MAY BE PUMPED INTO THE RIVER. SURFACE WATER WITHIN ONE FOOT OF THE RIVERBED WITHIN THE ACTIVE WORK AREA (I.E., THE DEWATERED REMOVAL AREA) SHALL BE PUMPED FROM WITHIN THE WORK AREA TO THE ONSITE TEMPORARY WATER TREATMENT SYSTEM FOR TREATMENT PRIOR TO DISCHARGE.

RESTORATION AND DEMOBILIZATION:

1. RESTORE TO PRE-CONSTRUCTION CONDITIONS ALL SUPPORT AREAS THAT ARE IMPACTED BY CONSTRUCTION ACTIVITIES, INCLUDING BUT NOT LIMITED TO, EQUIPMENT AND MATERIALS STORAGE AREAS, MATERIAL LOADING AND STAGING AREAS, RIVER ACCESS AREAS, PARKING AREAS, AND LOCATIONS OF OFFICE TRAILERS, EXCEPT AS NOTED OTHERWISE.
2. UPON COMPLETION OF CONSTRUCTION EACH SEASON, LEAVE THE PROJECT AREA IN A CLEAN, NEAT, AND ORDERLY CONDITION.
3. COMMENCE DEMOBILIZATION OF ALL MATERIALS, EQUIPMENT, AND PERSONNEL BROUGHT TO THE SITE DURING MOBILIZATION AND CONSTRUCTION ACTIVITIES ONCE THE PROJECT IS COMPLETED AND ACCEPTED BY THE REMEDIATION ENGINEER. DECONTAMINATE ALL MATERIALS, EQUIPMENT, AND PERSONNEL AS SPECIFIED WITHIN THE REMEDIATION CONTRACTOR'S HASP. REMOVE ALL TEMPORARY FACILITIES.
4. BEAR ALL COSTS AND RESPONSIBILITY FOR REPAIRS TO ANY ONSITE AND/OR OFFSITE FEATURES (UTILITIES, SIDEWALKS, ROADS, ETC.) AND/OR SURFACES DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES.

SAFETY NOTES:

1. PROVIDE EVIDENCE OF ALL ONSITE PERSONNEL COMPLETING OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) 40-HOUR TRAINING AND 8-HOUR REFRESHER TRAINING PRIOR TO INITIATING REMEDIAL CONSTRUCTION ACTIVITIES.
2. THE REMEDIATION CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR IMPLEMENTING, MAINTAINING, AND SUPERVISING ALL SAFETY MEASURES AND PROGRAMS FOR THEIR EMPLOYEES, SUBCONTRACTORS, AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY, TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PRECAUTIONS TO PROTECT, SITE WORKERS, REMEDIATION ENGINEER PERSONNEL, AND SITE VISITORS, AND PREPARE A SITE-SPECIFIC HASP IN ACCORDANCE WITH SPECIFICATION SECTION 01 35 29, REMEDIATION CONTRACTOR'S HEALTH AND SAFETY PLAN (HASP), THAT SHALL BE REVIEWED BY THE REMEDIATION ENGINEER AND THE OWNER PRIOR TO THE START OF ANY WORK.
3. FURNISH AND PLACE, AS REQUIRED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARDS FOR THE SAFETY AND PROTECTION OF PERSONS AND PROPERTY, INCLUDING PROPER GUARDS FOR PREVENTION OF ACCIDENTS, AND PROVIDE ALL DUST/VAPOR/ODOR PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, PROPER WORKING EQUIPMENT WITH FUNCTIONING SAFETY MECHANISMS (E.G., LIFT GATE WARNING SIGNALS), ALL SITE SAFETY SIGNAGE, OR OTHER SAFETY FEATURES REQUIRED. AS NEEDED, THE REMEDIATION CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHT DURING NIGHT HOURS, IF NEEDED, TO SECURE SUCH PROTECTION.
4. COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS FOR PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER OSHA OF 1970 (PL 91-596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL-91-54) AND AMENDMENTS THERETO. COMPLY WITH REQUIREMENTS SET FORTH UNDER 29 CODE OF FEDERAL REGULATIONS (CFR) 1910 AND 29 CFR 1926. ERECT AND MAINTAIN, AS REQURED BY THE CONDITIONS AND PROGRESS OF THE WORK, ALL NECESSARY SAFEGAURDS FOR THE SAFETY AND PROTECTION OF PERSON AND PROPERTY AND COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA.
5. THE MATERIALS SUBJECT TO HANDLING AS PART OF THE PROJECT MAY CONTAIN HAZARDOUS CONSTITUENTS OR CHEMICALS AND SHOULD BE HANDLED IN ACCORDANCE WITH APPLICABLE REGULATIONS. THE REMEDIATION CONTRACTOR SHALL DEVELOP AND IMPLEMENT APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES, SUBCONTRACTORS, AND SITE VISITORS, AND FOR THE PROTECTION OF THE ENVIRONMENT AND SURROUNDING COMMUNITY.
6. THE REMEDIATION CONTRACTOR'S HASP SHALL RECOGNIZE THE TYPES OF ACTIVITIES TO BE PERFORMED, THE UNIQUE HAZARDS SPECIFIC TO THESE ACTIVITIES, AND SPECIAL PRECAUTIONS AND CONTROLS THAT ARE TO BE IMPLEMENTED. THE REMEDIATION CONTRACTOR SHALL CLEARLY IDENTIFY AND EVALUATE SPECIFIC INGRESS/EGRESS ROUTES AND PROVISIONS, PERSONNEL AND WORK AREA MONITORING, PERSONAL PROTECTIVE EQUIPMENT, COMMUNICATIONS, ETC.
7. SEVERAL REMEDIATION ACTIVITIES WILL BE PERFORMED ADJACENT TO, OR IN THE VICINITY OF, UTILITY POLES, OVERHEAD, UNDERGROUND ELECTRICAL LINES AND TRANSFORMERS OR ON WATER. THE REMEDIATION CONTRACTOR'S HASP SHALL RECOGNIZE THESE HAZARDS AND INCORPORATE SPECIAL PRECAUTIONS AND CONTROLS SPECIFIC TO WORKING NEAR SUCH HAZARDS OR ON THE WATER. PERSONNEL SHALL WEAR U.S. COAST GUARD-APPROVED (TYPE I OR II) PFD (E.G., LIFE JACKET) WHEN WORKING IN CLOSE PROXIMITY TO FAST-FLOWING WATER DEEPER THAN 4 FEET. ADDITIONALLY, USE OF LIFELINES MAY BE REQUIRED.
8. PROVIDE A LIST OF ALL CHEMICAL PRODUCTS AND AN SDS FOR ALL CHEMICAL PRODUCTS TO BE USED ONSITE. THE LIST MUST BE APPROVED BY THE OWNER PRIOR TO BEING BROUGHT ONSITE.

SURVEY REQUIREMENTS:

1. PROVIDE ALL SURVEY INFORMATION TO THE REMEDIATION ENGINEER IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
2. ALL SURVEYS WILL BE PREFORMED BY A NEW YORK STATE LICENSED LAND SURVEYOR, UNLESS OTHERWISE NOTED. HARD COPY OF FINAL RECORD SURVEY SHALL BE STAMPED AND SIGNED BY THE SAME.

GENERAL REMEDIAL CONSTRUCTION SEQUENCE:

1. SPRING 2021 – MOBILIZATION AND SITE PREPARATION AT AREA 1.
2. SUMMER 2021 – AREA 1 RIVER DIVERSION INSTALLATION; SEDIMENT EXCAVATION AND BACKFILLING; RIVER DIVERSION REMOVAL; AND RESTORATION AND DEMOBILIZATION.
3. FALL 2021 / WINTER 2022 – AREA 1 RESTORATION AND DEMOBILIZATION, AREA 2 RAILROAD CROSSING CONSTRUCTION; INITIAL TREE CLEARING (AFTER OCTOBER 31); RELOCATION OF PROJECT SUPPORT OPERATIONS TO AREA 2; UTILITY INSTALLATION.
4. SPRING 2022 – RE-MOBILIZATION AND SITE PREPARATION AT AREA 2; FINAL TREE CLEARING (BEFORE APRIL 1).
5. SUMMER 2022 – AREA 2 RIVER DIVERSION INSTALLATION; SEDIMENT EXCAVATION AND BACKFILLING; RIVER DIVERSION REMOVAL; AND RESTORATION.
6. FALL 2022 – AREA 2 RESTORATION AND DEMOBILIZATION.

GENERAL LEGEND

- PROPERTY LINE
- MEAN HIGH WATER LINE (SEE GENERAL NOTE 2)
- WATER FLOW DIRECTION
- EXISTING WETLAND
- 96 EXISTING CONTOURS (SEE GENERAL NOTE 1)
- x x EXISTING CHAIN LINK FENCE
- EXISTING RAILROAD
- ST STORM SEWER LINE
- OH OVERHEAD LINE
- OUTFALL
- UTILITY POLE
- CATCH BASIN
- TREE GREATER THAN 3-INCHES DIAMETER AT BREAST HEIGHT AS IDENTIFIED DURING 2017 AND 2019 HABITAT ASSESSMENTS
- 1+00 REFERENCE STATIONING

ABBREVIATIONS

AOS	APPARENT OPENING SIZE
BGS	BELOW GROUND SURFACE
	CENTERLINE
CFR	CODE OF FEDERAL REGULATIONS
CFS	CUBIC FOOT PER SECOND
CMP	CORRUGATED METAL PIPE
ø/DIA.	DIAMETER
DNAPL	DENSE NON-AQUEOUS PHASE LIQUID
EL.	ELEVATION
EPS	EXPANDED POLYSTYRENE
ESRI	ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE
FT	FEET/FOOT
FT^2	SQUARE FEET
GA.	GAUGE
GAC	GRANULAR ACTIVATED CARBON
GPM	GALLONS PER MINUTE
GPS	GLOBAL POSITIONING SYSTEM
HASP	HEALTH AND SAFELY PLAN
HDPE	HIGH DENSITY POLYETHYLENE
HEC-RAS	HYDROLOGIC ENGINEERING CENTER RIVER ANALYSIS SYSTEM
H:V	HORIZONTAL:VERTICAL
INV.	INVERT
MAX	MAXIMUM
MGP	MANUFACTURED GAS PLANT
MH	MANHOLE
MHWL	MEAN HIGH WATER LINE
MIL	MIL(ONE-THOUSANDTHS OF AN INCH)
MIN	MINIMUM
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NO.	NUMBER
NYSEG	NEW YORK STATE ELECTRIC & GAS CORPORATION
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OH	OVERHEAD
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OU	OPERABLE UNIT
OZ.	OUNCE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
RS	RIVER STATION
SAN	SANITARY
SCH.	SCHEDULE
SDS	SAFETY DATA SHEET
STA.	STATION
TYP.	TYPICAL
WTS	WATER TREATMENT SYSTEM

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 3/10/2021 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

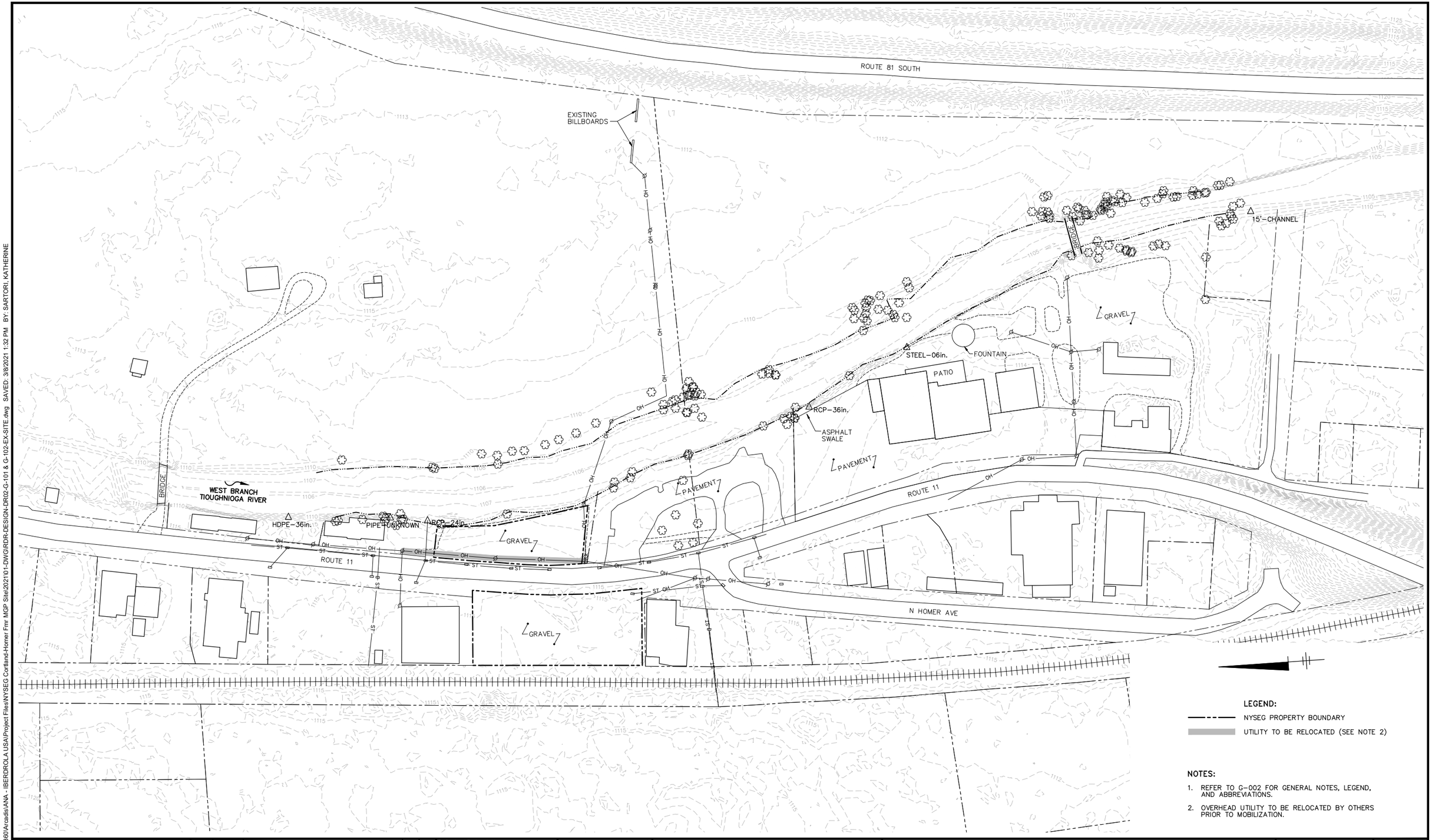
GENERAL NOTES, LEGEND, AND ABBREVIATIONS

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-002

C:\Users\Ksarton\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\20210101-DWG\RDR-DESIGN-DR01-G-002-NOTES.dwg SAVED: 3/8/2021 1:25 PM BY: SARTORI, KATHERINE



LEGEND:

NYSEG PROPERTY BOUNDARY

UTILITY TO BE RELOCATED (SEE NOTE 2)

NOTES:

1. REFER TO G-002 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. OVERHEAD UTILITY TO BE RELOCATED BY OTHERS PRIOR TO MOBILIZATION.

80' 0 80' 160'
1"=80'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXISTING SITE PLAN (AREA 1)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-101

C:\Users\ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\20210101-DWG\RDR-DESIGN-DR02-G-101 & G-102-EX-SITE.dwg SAVED: 3/8/2021 1:32 PM BY: SARTORI, KATHERINE

50' 0 50' 100'
1"=50'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name
MARK O. GRAVELDING
Professional Engineer's No.
069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by	Drawn by	Checked by
JJB	BKD	LJP

STATE OF NEW YORK MARK OWEN GRAVELDING LICENSED PROFESSIONAL ENGINEER NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

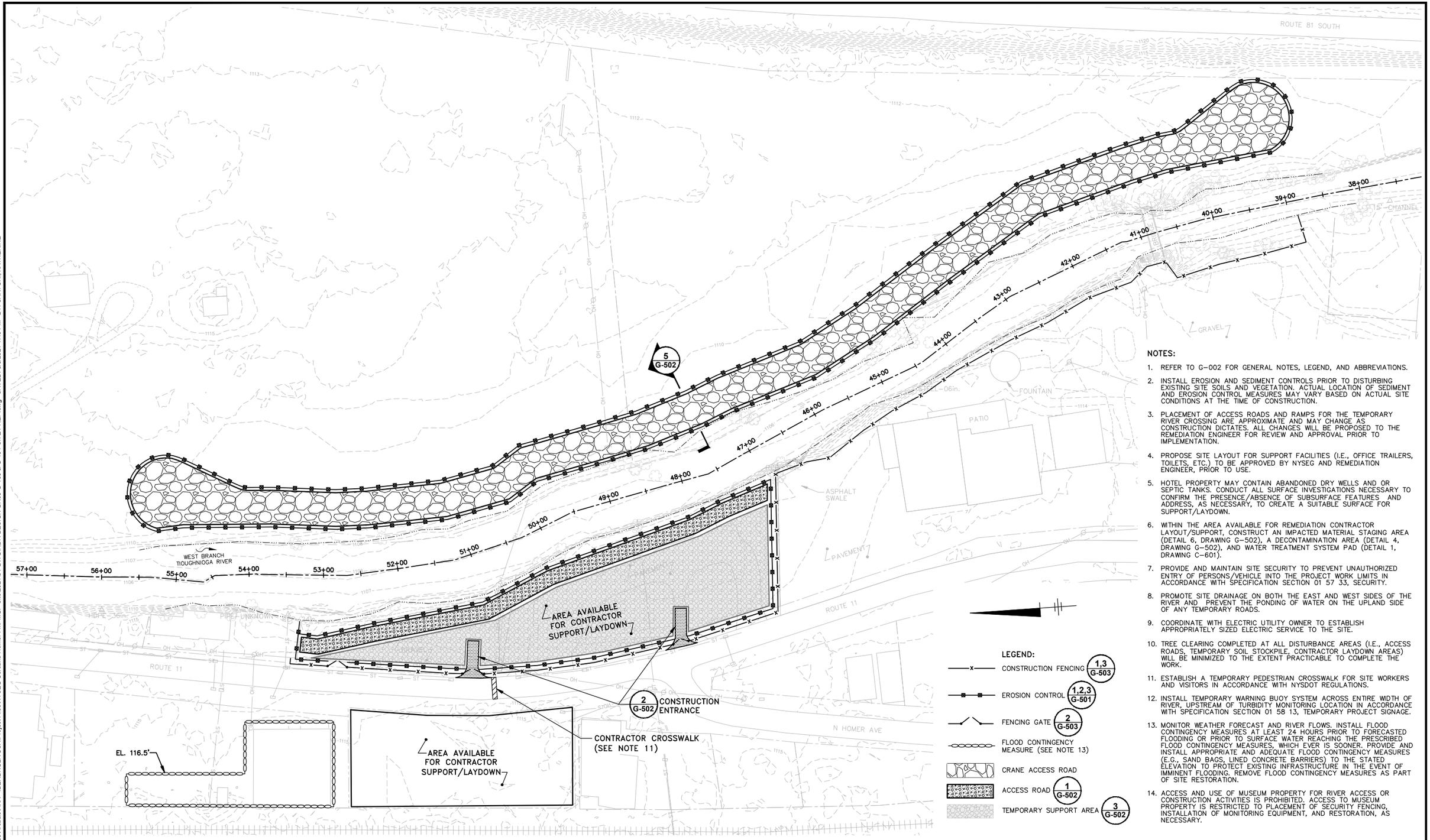
EXISTING SITE PLAN (AREA 2)

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-102



NOTES:

1. REFER TO G-002 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. INSTALL EROSION AND SEDIMENT CONTROLS PRIOR TO DISTURBING EXISTING SITE SOILS AND VEGETATION. ACTUAL LOCATION OF SEDIMENT AND EROSION CONTROL MEASURES MAY VARY BASED ON ACTUAL SITE CONDITIONS AT THE TIME OF CONSTRUCTION.
3. PLACEMENT OF ACCESS ROADS AND RAMPS FOR THE TEMPORARY RIVER CROSSING ARE APPROXIMATE AND MAY CHANGE AS CONSTRUCTION DICTATES. ALL CHANGES WILL BE PROPOSED TO THE REMEDIATION ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. PROPOSE SITE LAYOUT FOR SUPPORT FACILITIES (I.E., OFFICE TRAILERS, TOILETS, ETC.) TO BE APPROVED BY NYSEG AND REMEDIATION ENGINEER, PRIOR TO USE.
5. HOTEL PROPERTY MAY CONTAIN ABANDONED DRY WELLS AND OR SEPTIC TANKS. CONDUCT ALL SURFACE INVESTIGATIONS NECESSARY TO CONFIRM THE PRESENCE/ABSENCE OF SUBSURFACE FEATURES AND ADDRESS, AS NECESSARY, TO CREATE A SUITABLE SURFACE FOR SUPPORT/LAYDOWN.
6. WITHIN THE AREA AVAILABLE FOR REMEDIATION CONTRACTOR LAYOUT/SUPPORT, CONSTRUCT AN IMPACTED MATERIAL STAGING AREA (DETAIL 6, DRAWING G–502), A DECONTAMINATION AREA (DETAIL 4, DRAWING G–502), AND WATER TREATMENT SYSTEM PAD (DETAIL 1, DRAWING C–601).
7. PROVIDE AND MAINTAIN SITE SECURITY TO PREVENT UNAUTHORIZED ENTRY OF PERSONS/VEHICLE INTO THE PROJECT WORK LIMITS IN ACCORDANCE WITH SPECIFICATION SECTION 01 57 33, SECURITY.
8. PROMOTE SITE DRAINAGE ON BOTH THE EAST AND WEST SIDES OF THE RIVER AND PREVENT THE PONDING OF WATER ON THE UPLAND SIDE OF ANY TEMPORARY ROADS.
9. COORDINATE WITH ELECTRIC UTILITY OWNER TO ESTABLISH APPROPRIATELY SIZED ELECTRIC SERVICE TO THE SITE.
10. TREE CLEARING COMPLETED AT ALL DISTURBANCE AREAS (I.E., ACCESS ROADS, TEMPORARY SOIL STOCKPILE, CONTRACTOR LAYDOWN AREAS) WILL BE MINIMIZED TO THE EXTENT PRACTICABLE TO COMPLETE THE WORK.
11. ESTABLISH A TEMPORARY PEDESTRIAN CROSSWALK FOR SITE WORKERS AND VISITORS IN ACCORDANCE WITH NYSDOT REGULATIONS.
12. INSTALL TEMPORARY WARNING BUOY SYSTEM ACROSS ENTIRE WIDTH OF RIVER, UPSTREAM OF TURBIDITY MONITORING LOCATION IN ACCORDANCE WITH SPECIFICATION SECTION 01 58 13, TEMPORARY PROJECT SIGNAGE.
13. MONITOR WEATHER FORECAST AND RIVER FLOWS. INSTALL FLOOD CONTINGENCY MEASURES AT LEAST 24 HOURS PRIOR TO FORECASTED FLOODING OR PRIOR TO SURFACE WATER REACHING THE PRESCRIBED FLOOD CONTINGENCY MEASURES, WHICH EVER IS SOONER. PROVIDE AND INSTALL APPROPRIATE AND ADEQUATE FLOOD CONTINGENCY MEASURES (E.G., SAND BAGS, LINED CONCRETE BARRIERS) TO THE STATED ELEVATION TO PROTECT EXISTING INFRASTRUCTURE IN THE EVENT OF IMMINENT FLOODING. REMOVE FLOOD CONTINGENCY MEASURES AS PART OF SITE RESTORATION.
14. ACCESS AND USE OF MUSEUM PROPERTY FOR RIVER ACCESS OR CONSTRUCTION ACTIVITIES IS PROHIBITED. ACCESS TO MUSEUM PROPERTY IS RESTRICTED TO PLACEMENT OF SECURITY FENCING, INSTALLATION OF MONITORING EQUIPMENT, AND RESTORATION, AS NECESSARY.

60' 0 60' 120'
1"=60'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd.

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

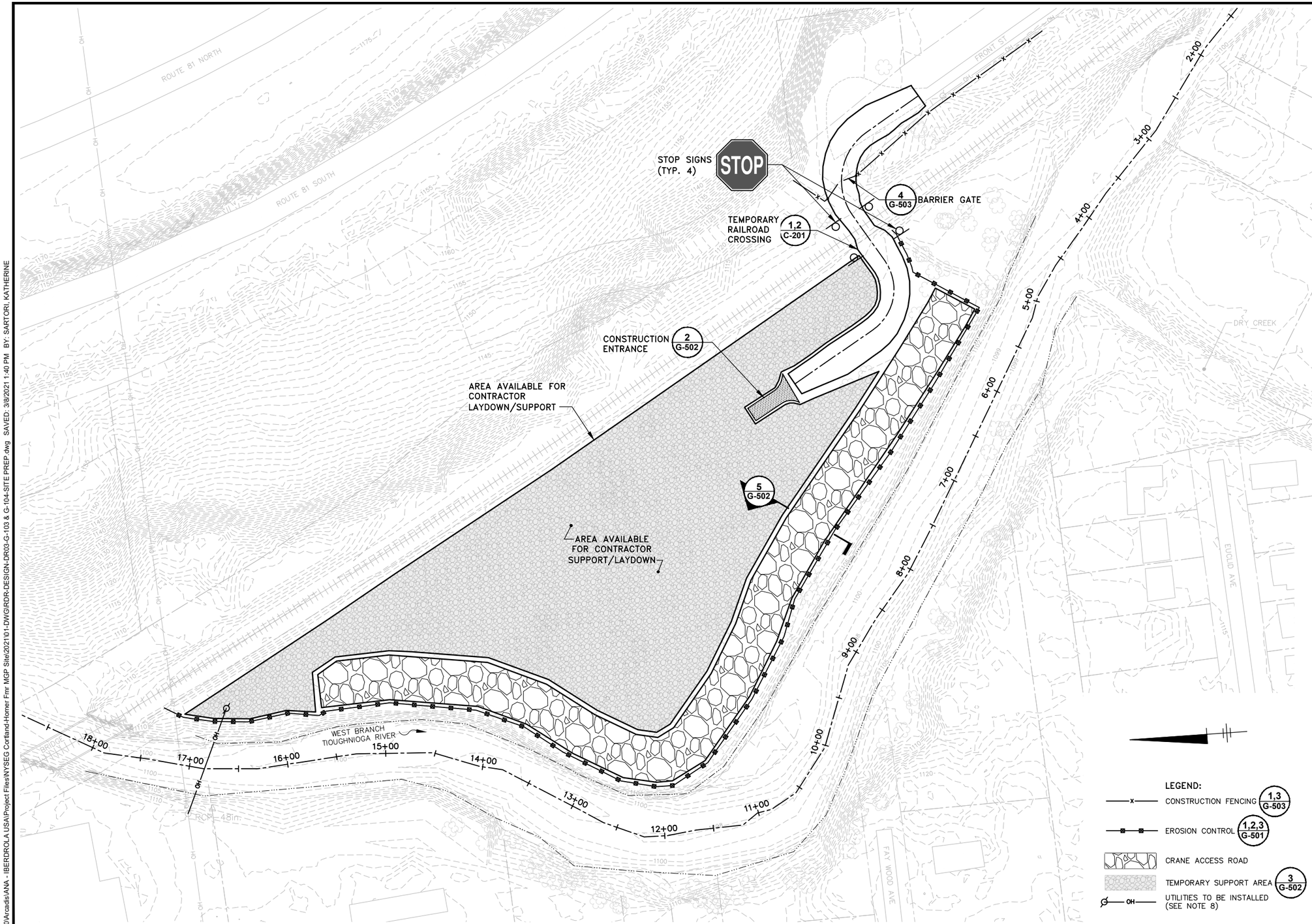
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

SITE PREPARATION PLAN (AREA 1)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-103



NOTES:

1. REFER TO G–002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. INSTALL EROSION AND SEDIMENT CONTROLS PRIOR TO DISTURBING EXISTING SITE SOILS AND VEGETATION. ACTUAL LOCATION OF SEDIMENT AND EROSION CONTROL MEASURES MAY VARY BASED ON ACTUAL SITE CONDITIONS AT THE TIME OF CONSTRUCTION.
3. PLACEMENT OF ACCESS ROADS AND RAMPS FOR THE TEMPORARY RIVER CROSSING ARE APPROXIMATE AND MAY CHANGE AS CONSTRUCTION DICTATES. ALL CHANGES WILL BE PROPOSED TO THE REMEDIATION ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. PROPOSE SITE LAYOUT FOR SUPPORT FACILITIES (I.E., OFFICE TRAILERS, TOILETS, ETC.) TO BE APPROVED BY NYSEG AND REMEDIATION ENGINEER, PRIOR TO USE.
5. WITHIN THE AREA AVAILABLE FOR REMEDIATION CONTRACTOR LAYOUT/SUPPORT, CONSTRUCT A TEMPORARY SUPPORT AREA (DETAIL 3, DRAWING G–502), AN IMPACTED MATERIAL STAGING AREA (DETAIL 6, DRAWING G–502), A DECONTAMINATION AREA (DETAIL 4, DRAWING G–502), AND WATER TREATMENT SYSTEM PAD (DETAIL 1, DRAWING C–601).
6. PROVIDE AND MAINTAIN SITE SECURITY TO PREVENT UNAUTHORIZED ENTRY OF PERSONS/VEHICLE INTO THE PROJECT WORK LIMITS IN ACCORDANCE WITH SPECIFICATION SECTION 01 57 33, SECURITY.
7. PROMOTE SITE DRAINAGE AND PREVENT THE PONDING OF WATER ON THE UPLAND SIDE OF ANY TEMPORARY ROADS.
8. COORDINATE WITH ELECTRIC UTILITY OWNER TO ESTABLISH APPROPRIATELY SIZED ELECTRIC SERVICE TO THE SITE
9. TREE CLEARING COMPLETED AT ALL DISTURBANCE AREAS (I.E., ACCESS ROADS, TEMPORARY SOIL STOCKPILE, CONTRACTOR LAYDOWN AREAS) WILL BE MINIMIZED TO THE EXTENT PRACTICABLE TO COMPLETE THE WORK.
10. INSTALL TEMPORARY WARNING BUOY SYSTEM ACROSS ENTIRE WIDTH OF RIVER, UPSTREAM OF TURBIDITY MONITORING LOCATION IN ACCORDANCE WITH SPECIFICATION SECTION 01 58 13, TEMPORARY PROJECT SIGNAGE.

LEGEND:

- CONSTRUCTION FENCING — 1,3 G-503
- EROSION CONTROL — 1,2,3 G-501
- CRANE ACCESS ROAD
- TEMPORARY SUPPORT AREA — 3 G-502
- UTILITIES TO BE INSTALLED (SEE NOTE 8) — OH

50' 0 50' 100'
1"=50'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · DATE · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK

CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

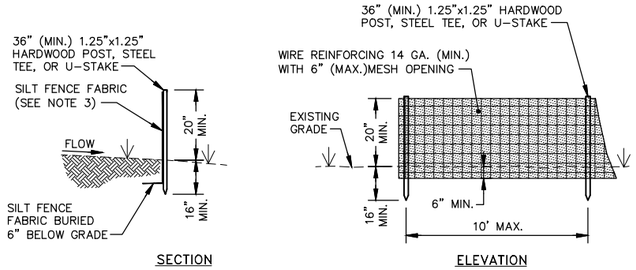
SITE PREPARATION PLAN (AREA 2)

ARCADIS Project No.: B0013137.0008.00016

Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-104



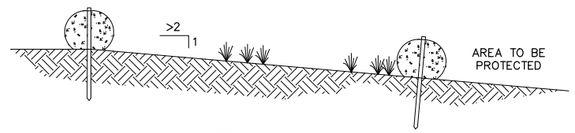
SECTION ELEVATION

NOTES:

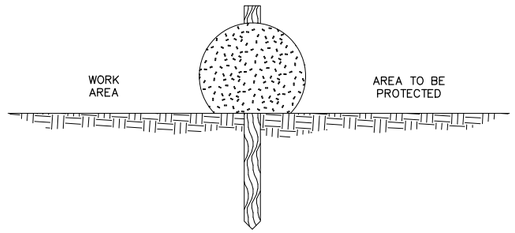
1. ACCUMULATIONS OF SEDIMENT/SILT ADJACENT TO SILT FENCES WILL BE PERIODICALLY REMOVED THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE SILT FENCE.
2. THE INTEGRITY OF SILT FENCING WILL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.
3. SILT FENCE MATERIALS WILL MEET THE REQUIREMENTS OF THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR SEDIMENT AND EROSION CONTROL.

SILT FENCE 1

NOT TO SCALE



INSTALLED ON SLOPE >2:1



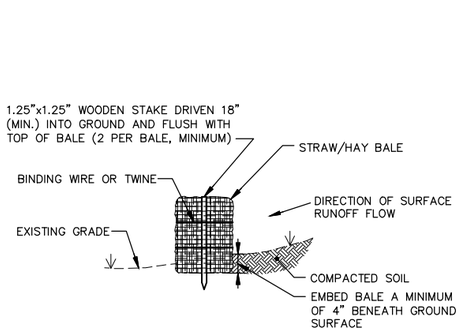
INSTALLED ON SOIL

NOTES:

1. OVERLAP FIBER ROLL SECTIONS BY 18 INCHES (MIN.) TO FORM A CONTINUOUS BARRIER.
2. FIBER ROLL WILL BE SECURED WITH 2-INCH X 2-INCH HARDWOOD STAKES INSTALLED THROUGH THE MIDDLE OF THE FIBER ROLL ON 10 FOOT CENTERS. IN THE EVENT STAKING IS NOT POSSIBLE, (i.e., WHEN FIBER ROLL IS USED ON PAVEMENT), CONCRETE BLOCKS OR SAND BAGS SHALL BE USED BEHIND THE FIBER ROLL TO STABILIZE.
3. IF SLOPE IS GREATER THAN 2:1 INSTALL SECOND FIBER ROLL BARRIER AT TOP OF SLOPE.
4. FIBER ROLL WILL MEET MINIMUM STANDARDS OF NORTH AMERICAN GREEN SEDIMAX-SWB9 (MINIMUM 9" DIAMETER) OR EQUIVALENT.
5. FIBER ROLL WILL BE 100% BIODEGRADABLE, INCLUDING WOVEN NETTING.

FIBER ROLL 3

NOT TO SCALE

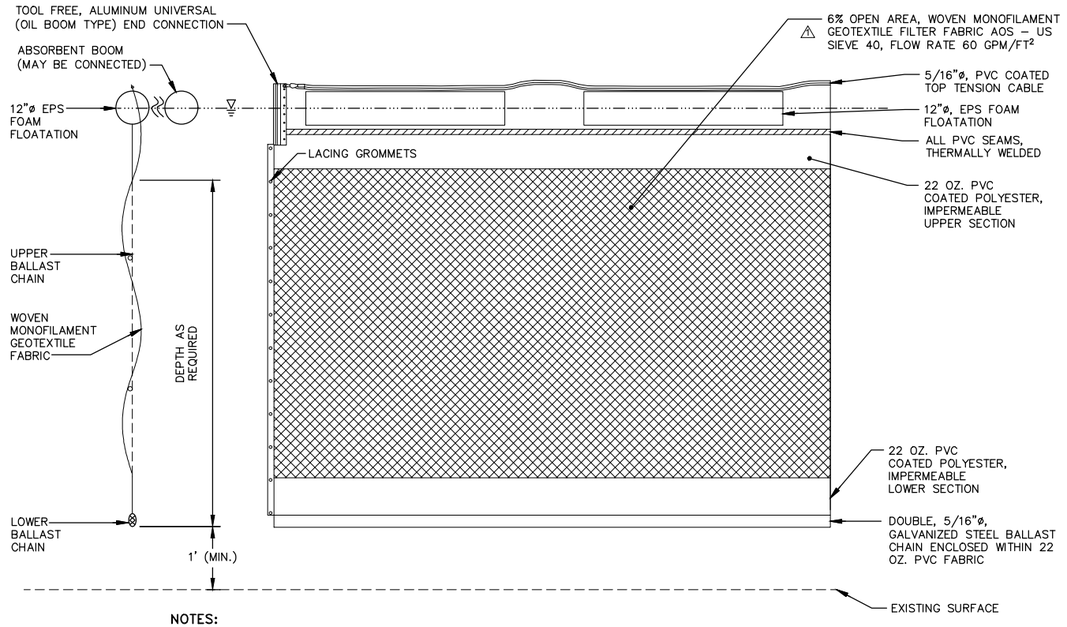


NOTES:

1. USE OF STRAW/HAY BALES WILL BE MINIMIZED.
2. BALES WILL BE PLACED TIGHTLY TOGETHER, END TO END, TO FORM A CONTINUOUS BARRIER IN SELECTED AREAS.
3. THE INTEGRITY OF THE STRAW/HAY BALES WILL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.
4. STOCKPILE ANY EXCAVATED MATERIAL ONSITE FOR USE AS BACKFILL UPON COMPLETION.

STRAW/HAY BALE 2

NOT TO SCALE

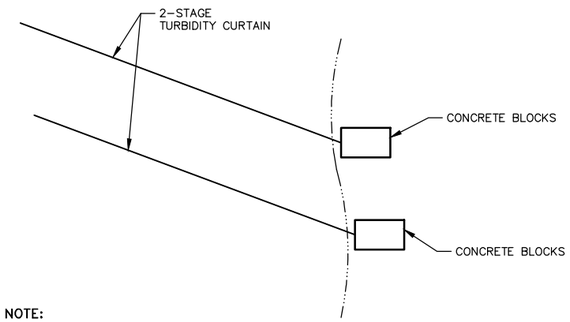


NOTES:

1. THE TURBIDITY CURTAIN DETAIL PROVIDED HEREON IS CONCEPTUAL. THE REMEDIATION CONTRACTOR MAY PROPOSE AN ALTERNATE TURBIDITY CURTAIN OR OTHER APPROPRIATE TURBIDITY CONTROL SYSTEM AT THE REVIEW AND APPROVAL OF THE DESIGN ENGINEER. THE REMEDIATION CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEETING THE PERFORMANCE CRITERIA FOR A TURBIDITY CONTROL SYSTEM AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
2. INSTALL TURBIDITY CURTAIN PRIOR TO INITIATION OF IN-WATER CONSTRUCTION ACTIVITIES.
3. INSTALL ABSORBENT BOOMS ALONG THE INTERIOR PERIMETER OF THE TURBIDITY CURTAIN IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.
4. ANCHOR CURTAIN SYSTEM TO SHORE USING THE LACING GROMMETS IN ACCORDANCE WITH METHODS SUGGESTED BY THE MANUFACTURER. POTENTIAL ATTACHMENT METHODS COULD INCLUDE CABLE CLAMPS, ATTACHED RINGS AND CABLE ETHERS OR FLOATING CABLE RING CONNECTORS. FINAL ANCHOR/CONNECTION DETAILS TO BE DETERMINED BY THE REMEDIATION CONTRACTOR.

TURBIDITY CURTAIN 4

NOT TO SCALE



NOTE:

1. ANCHORING DETAIL IS CONCEPTUAL. FINAL ANCHOR/CONNECTION DETAILS TO BE DETERMINED BY REMEDIATION CONTRACTOR.

TURBIDITY CURTAIN ANCHOR SYSTEM 5

NOT TO SCALE

C:\Users\ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021101-DWG\RDR-DESIGN-DR04-G-501-DETAILS.dwg SAVED: 3/11/2021 8:47 AM BY: SARTORI, KATHERINE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	3/10/2021	REVISED CALLOUT	JJB	KLS

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by	Drawn by	Checked by
JJB	BKD	LJP

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

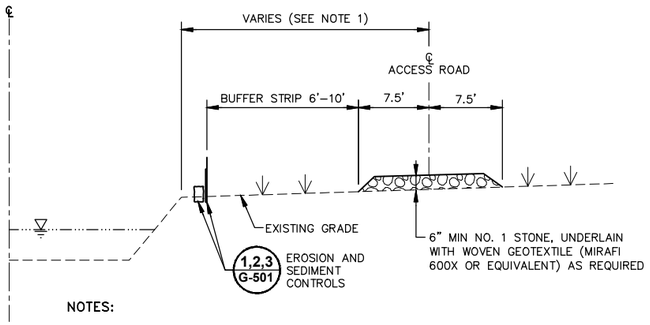
EROSION, SEDIMENT, AND TURBIDITY CONTROL DETAILS

ARCADIS Project No. B0013137.0008.00016

Date MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-501

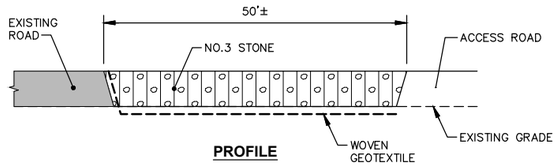


NOTES:

1. DIMENSION VARIES TO ACCOMMODATE EXISTING FEATURES AND TOPOGRAPHY.
2. PLACEMENT OF FILL FOR ACCESS ROADS WILL BE AS REQUIRED TO SUPPORT CONSTRUCTION EQUIPMENT.
3. THE EXISTING GRADE SURFACE WILL BE UNIFORM AND FREE OF DELETERIOUS MATERIALS (E.G. WOOD/METAL DEBRIS, ETC.) THAT COULD AFFECT THE STABILITY OF THE ACCESS ROAD.
4. COMPACTION OF NO. 1 STONE WILL BE SUFFICIENT DENSITY TO PROVIDE A FIRM AND UNIFORM SURFACE USING APPROPRIATE EQUIPMENT.

TEMPORARY ACCESS ROAD 1

NOT TO SCALE



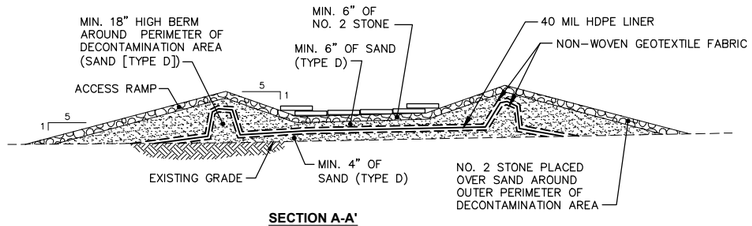
PROFILE

NOTES:

1. CONSTRUCTION ENTRANCE/EXIT PAD WILL BE APPROXIMATELY 50' LONG, 15' WIDE, AND 6" THICK.
2. INSTALL CONSTRUCTION ENTRANCE/EXIT PAD AT ALL ACCESS POINTS TO PAVED ROADS.

CONSTRUCTION ENTRANCE PAD 2

NOT TO SCALE



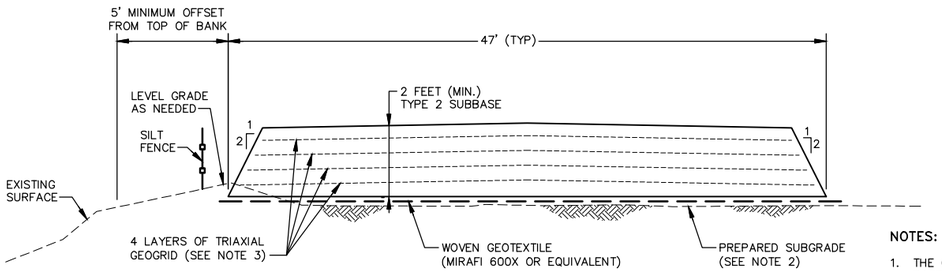
SECTION A-A'

NOTES:

1. DECONTAMINATION AREA WILL HAVE A GENERAL SLOPE TOWARD A COLLECTION SUMP TO FACILITATE THE COLLECTION OF WASH FLUIDS. FLUIDS WILL BE PUMPED FROM COLLECTION SUMP INTO 55 GALLON DRUMS OR A TEMPORARY STORAGE TANK (IF NECESSARY).
2. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, REMOVE THE DECONTAMINATION AREA, INCLUDING HDPE LINER, FOR DISPOSAL.
3. ALTERNATE DESIGN FOR TEMPORARY IMPACTED MATERIAL STAGING AREA MAY BE USED IN PLACE OF THIS DETAIL, WITH APPROVAL FROM THE REMEDIATION ENGINEER.
4. CONSTRUCT DECONTAMINATION AREA WITH MINIMUM DIMENSIONS OF 40 FEET BY 20 FEET.

DECONTAMINATION AREA 4

NOT TO SCALE

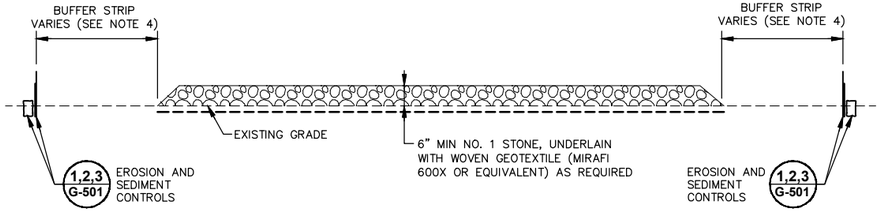


NOTES:

1. THE CRANE ACCESS ROAD DESIGN PRESENTED IS CONCEPTUAL AND BASED ON MAXIMUM LOADING OF 5,300 POUNDS PER SQUARE FOOT (PSF) AT AREA 1 AND 4,100 PSF AT AREA 2 . FINAL CRANE ROAD DESIGN TO BE DETERMINED BY REMEDIATION CONTRACTOR IN COORDINATION WITH THE DESIGN ENGINEER, INCLUDING MEANS OF DRAINGE TO PREVENT PONDING.
2. LEVEL EXISTING GRADE AS NEEDED.
3. GEOGRID WILL BE TENSAR UX1700 OR APPROVED EQUAL. INSTALL 4 LAYERS OF GEOGRID WITH 6–INCHES OF STONE BACKFILL BETWEEN LAYERS. PLACE GEOGRID LAYERS IN ALTERNATING DIRECTIONS ACROSS THE FULL WIDTH AND LENGTH OF THE PLATFORM.
4. PLACE STONE BACKFILL FOR CRANE ACCESS ROAD ON MAXIMUM 6–INCH LIFTS AND COMPACTED TO 95% STANDARD PROCTOR.
5. COMPACT SUBGRADE TO THE EXTENT POSSIBLE WITH NO FEWER THAN 5 PASSES WITH HEAVY EQUIPMENT PRIOR TO PLACEMENT OF GEOTEXTILE.

TYPICAL CRANE ACCESS ROAD CONFIGURATION 5

NOT TO SCALE

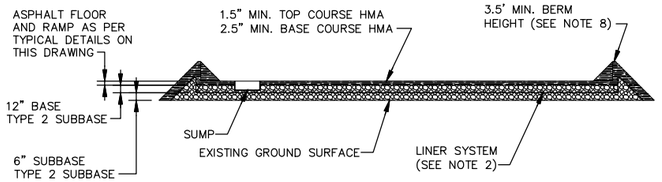


NOTES:

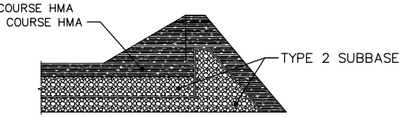
1. THE EXISTING GRADE SURFACE WILL BE UNIFORM AND FREE OF DELETERIOUS MATERIALS (E.G. WOOD/METAL DEBRIS, ETC.) THAT COULD AFFECT THE STABILITY OF THE PAD.
2. COMPACTION OF NO. 1 STONE WILL BE SUFFICIENT DENSITY TO PROVIDE A FIRM AND UNIFORM SURFACE USING APPROPRIATE EQUIPMENT.
3. DIMENSIONS OF TEMPORARY SUPPORT AREA FOR AREAS 1 AND 2 WILL VARY TO ACCOMMODATE REMEDIATION CONTRACTOR'S NEEDS AND EXISTING FEATURES AND TOPOGRAPHY. TEMPORARY SUPPORT AREA FOR AREAS 1 AND 2 SHALL BE WITHIN THE LIMITS ILLUSTRATED ON DRAWINGS G–103 THROUGH G–104.
4. PLACE STRAW/HAY BALE OR SILT FENCE ALONG THE OUTSIDE EDGE OF THE CONSTRUCTED TEMPORARY SUPPORT AREA. DIMENSION OF BUFFER STRIP VARIES TO ACCOMMODATE EXISTING FEATURES AND TOPOGRAPHY.

TEMPORARY SUPPORT AREA 3

NOT TO SCALE



SECTION A-A'



TYPICAL ASPHALT RAMP DETAIL

NOTES:

1. PROOF ROLL LOCATION OF IMPACTED MATERIAL STAGING AREA PRIOR TO CONSTRUCTION. ROLLER TO HAVE MINIMUM LOADED WEIGHT OF 25 TONS.
2. PLACE LINER SYSTEM (CONSISTING OF 16 OZ. NON–WOVEN GEOTEXTILE FABRIC, 40 MIL HDPE LINER, AND 16 OZ. NON–WOVEN GEOTEXTILE FABRIC) OVER THE SUBBASE.
3. CONSTRUCT IMPACTED MATERIAL STAGING AREA SUCH THAT AREA HAS A GENERAL SLOPE TOWARDS A COLLECTION SUMP TO FACILITATE COLLECTION OF FLUIDS FOR TREATMENT.
4. CONCRETE BIN BLOCKS MAY BE USED TO SEPARATE STOCKPILES. PROVIDE PROPOSED METHODS TO SEGREGATE AND STABILIZE MATERIAL.
5. SUBBASE MATERIAL BETWEEN EXISTING GRADE AND BOTTOM OF NON–WOVEN GEOTEXTILE FABRIC MAY NOT BE REQUIRED IF CONSTRUCTED ON ASPHALT.
6. IMPACTED MATERIAL STAGING AREA WILL BE 100 FEET BY 70 FEET MINIMUM.
7. INSTALL ASPHALT PAVEMENT IN ACCORDANCE WITH SPECIFICATION SECTION 32 12 00, FLEXIBLE PAVING.
8. MINIMUM BERM HEIGHT CORRESPONDS TO AN APPROXIMATE FLOOD ELEVATION FOR A 5–YEAR STORM, PLUS 6 INCHES OF FREE–BOARD. IF LARGER STORM IS IMMINENT, INCREASE BERM HEIGHT TO 6 FEET (FOR 100–YEAR STORM) OR REMOVE ALL STAGED IMPACTED MATERIAL FROM THE SITE PRIOR TO FLOODING.

IMPACTED MATERIAL STAGING AREA 6

NOT TO SCALE

C:\Users\ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021\01-DWG\RDR-DESIGN-DR05-G-502-DETAILS.dwg SAVED: 3/8/2021 1:48 PM BY: SARTORI, KATHERINE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

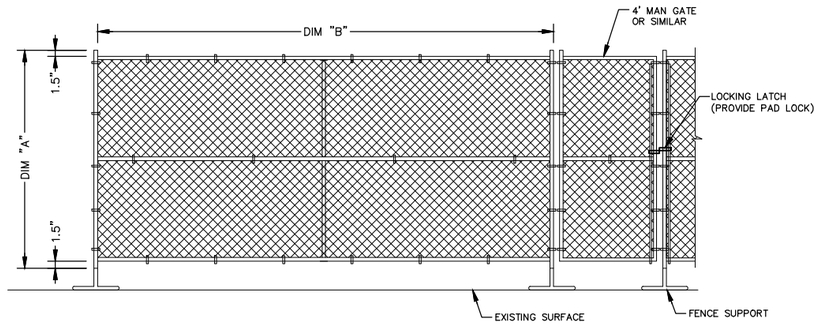
MISCELLANEOUS DETAILS

ARCADIS Project No.: B0013137.0008.00016

Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-502

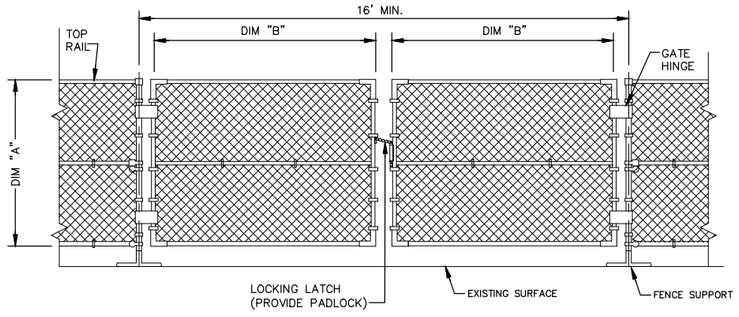


NOTES:

1. INSTALL MAN GATES, AS NECESSARY, TO PROVIDE ACCESS AND EGRESS TO SUBCONTRACTORS, SUPPLIERS, AND SITE WORKERS.
2. INSTALL A WOVEN GEOTEXTILE VISUAL BARRIER MEETING THE SPECIFICATIONS OF US FABRIC INC. FENCE SCREEN 130 SERIES PRIVACY AIR OR EQUIVALENT.
3. WIRE TIES OR CLIPS WILL BE A MINIMUM OF 6 GAUGE. HOG RINGS MAY BE USED TO TIE FABRIC TO FENCE SUPPORTS.
4. UNLESS STATED OTHERWISE, DIMENSIONS AND WEIGHTS SHALL BE AS LISTED IN TABLE G–503–A.

TEMPORARY SECURITY FENCE AND MAN GATE DETAIL 1

NOT TO SCALE

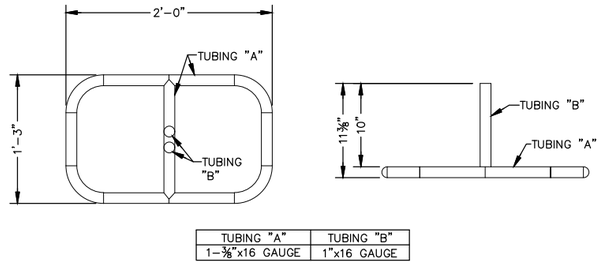


NOTES:

1. INSTALL VEHICLE GATES, AS NECESSARY, TO PROVIDE VEHICLE ACCESS AND EGRESS TO SUBCONTRACTORS, SUPPLIERS, AND SITE WORKERS.
2. INSTALL A WOVEN GEOTEXTILE VISUAL BARRIER MEETING THE SPECIFICATIONS OF FENCE SCREEN 130 SERIES PRIVACY AIR OR EQUIVALENT.
3. WIRE TIES OR CLIPS WILL BE A MINIMUM OF 6 GAUGE. HOG RINGS MAY BE USED TO TIE FABRIC TO FENCE SUPPORTS.
4. UNLESS STATED OTHERWISE, DIMENSIONS AND WEIGHTS SHALL BE AS LISTED IN TABLE G–503–A.

TEMPORARY SECURITY FENCE AND VEHICLE ACCESS GATE DETAIL 2

NOT TO SCALE



TUBING "A"	TUBING "B"
1–⅜"x16 GAUGE	1"x16 GAUGE

NOTES:

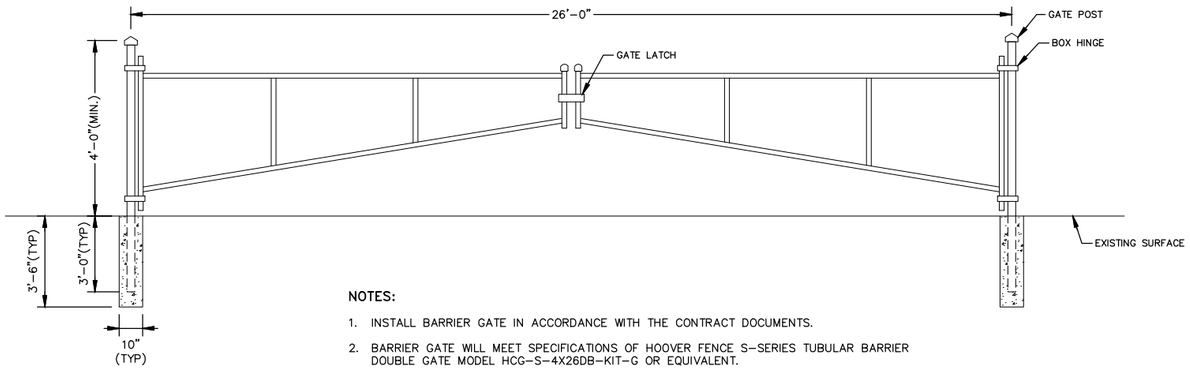
1. ALTERNATE SECURITY FENCE SUPPORTS MAY BE USED WITH NYSEG/REMEDIATION ENGINEER APPROVAL.
2. SECURITY FENCE SUPPORTS SHALL BE WEIGHED DOWN WITH SAND BAGS AS NECESSARY.

SECURITY FENCE SUPPORT DETAIL 3

NOT TO SCALE

TABLE G-503-A – MINIMUM FENCING CONSTRUCTION MATERIALS

OUTSIDE DIAMETER (INCHES)		WEIGHT/FOOT (POUNDS)		
DIM "A"	DIM "B"	TUBING MATERIAL	CHAIN LINK WIRE	
			GAUGE	DIAMOND SIZE
6'	10'	1 3/8" x 16 GAUGE	11.5	2 3/8"
6'	12'	1 5/8" x 16 GAUGE	11.5	2 3/8"



NOTES:

1. INSTALL BARRIER GATE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. BARRIER GATE WILL MEET SPECIFICATIONS OF HOOVER FENCE S–SERIES TUBULAR BARRIER DOUBLE GATE MODEL HCG–S–4X26DB–KIT–G OR EQUIVALENT.
3. CONCRETE MIX FOR FOOTINGS WILL BE MINIMUM 3,000 POUNDS PER SQUARE INCH (AT 28 DAYS).

BARRIER GATE 4

NOT TO SCALE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

MISCELLANEOUS DETAILS

ARCADIS Project No.
B0013137.0008.00016

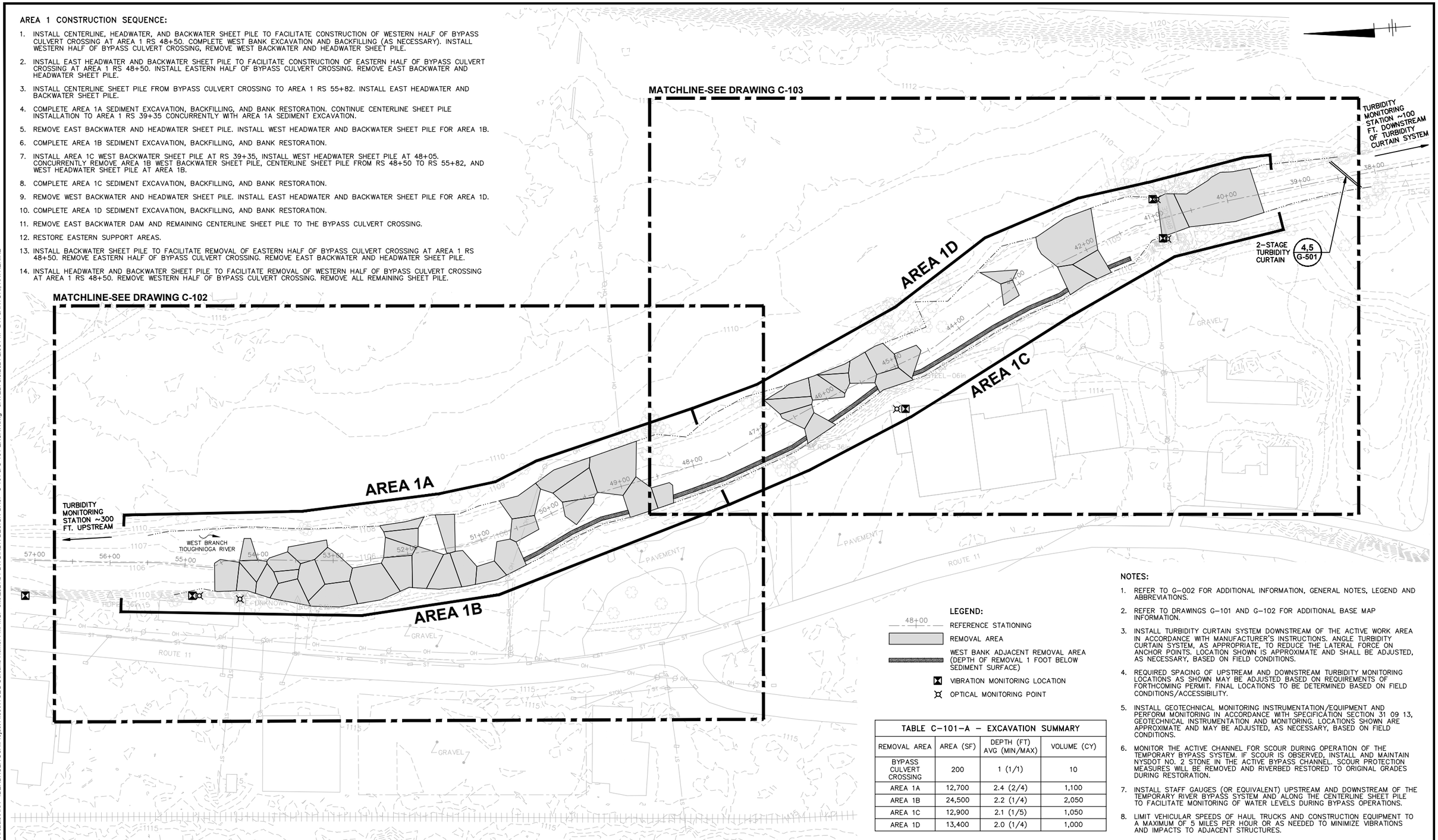
Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

G-503

AREA 1 CONSTRUCTION SEQUENCE:

1. INSTALL CENTERLINE, HEADWATER, AND BACKWATER SHEET PILE TO FACILITATE CONSTRUCTION OF WESTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. COMPLETE WEST BANK EXCAVATION AND BACKFILLING (AS NECESSARY). INSTALL WESTERN HALF OF BYPASS CULVERT CROSSING, REMOVE WEST BACKWATER AND HEADWATER SHEET PILE.
2. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE TO FACILITATE CONSTRUCTION OF EASTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. INSTALL EASTERN HALF OF BYPASS CULVERT CROSSING. REMOVE EAST BACKWATER AND HEADWATER SHEET PILE.
3. INSTALL CENTERLINE SHEET PILE FROM BYPASS CULVERT CROSSING TO AREA 1 RS 55+82. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE.
4. COMPLETE AREA 1A SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION. CONTINUE CENTERLINE SHEET PILE INSTALLATION TO AREA 1 RS 39+35 CONCURRENTLY WITH AREA 1A SEDIMENT EXCAVATION.
5. REMOVE EAST BACKWATER AND HEADWATER SHEET PILE. INSTALL WEST HEADWATER AND BACKWATER SHEET PILE FOR AREA 1B.
6. COMPLETE AREA 1B SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION.
7. INSTALL AREA 1C WEST BACKWATER SHEET PILE AT RS 39+35, INSTALL WEST HEADWATER SHEET PILE AT 48+05. CONCURRENTLY REMOVE AREA 1B WEST BACKWATER SHEET PILE, CENTERLINE SHEET PILE FROM RS 48+50 TO RS 55+82, AND WEST HEADWATER SHEET PILE AT AREA 1B.
8. COMPLETE AREA 1C SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION.
9. REMOVE WEST BACKWATER AND HEADWATER SHEET PILE. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE FOR AREA 1D.
10. COMPLETE AREA 1D SEDIMENT EXCAVATION, BACKFILLING, AND BANK RESTORATION.
11. REMOVE EAST BACKWATER DAM AND REMAINING CENTERLINE SHEET PILE TO THE BYPASS CULVERT CROSSING.
12. RESTORE EASTERN SUPPORT AREAS.
13. INSTALL BACKWATER SHEET PILE TO FACILITATE REMOVAL OF EASTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. REMOVE EASTERN HALF OF BYPASS CULVERT CROSSING. REMOVE EAST BACKWATER AND HEADWATER SHEET PILE.
14. INSTALL HEADWATER AND BACKWATER SHEET PILE TO FACILITATE REMOVAL OF WESTERN HALF OF BYPASS CULVERT CROSSING AT AREA 1 RS 48+50. REMOVE WESTERN HALF OF BYPASS CULVERT CROSSING. REMOVE ALL REMAINING SHEET PILE.



LEGEND:

- 48+00 — REFERENCE STATIONING
- REMOVAL AREA
- WEST BANK ADJACENT REMOVAL AREA (DEPTH OF REMOVAL 1 FOOT BELOW SEDIMENT SURFACE)
- VIBRATION MONITORING LOCATION
- OPTICAL MONITORING POINT

TABLE C-101-A – EXCAVATION SUMMARY

REMOVAL AREA	AREA (SF)	DEPTH (FT) AVG (MIN/MAX)	VOLUME (CY)
BYPASS CULVERT CROSSING	200	1 (1/1)	10
AREA 1A	12,700	2.4 (2/4)	1,100
AREA 1B	24,500	2.2 (1/4)	2,050
AREA 1C	12,900	2.1 (1/5)	1,050
AREA 1D	13,400	2.0 (1/4)	1,000

NOTES:

1. REFER TO G-002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASE MAP INFORMATION.
3. INSTALL TURBIDITY CURTAIN SYSTEM DOWNSTREAM OF THE ACTIVE WORK AREA IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ANGLE TURBIDITY CURTAIN SYSTEM, AS APPROPRIATE, TO REDUCE THE LATERAL FORCE ON ANCHOR POINTS. LOCATION SHOWN IS APPROXIMATE AND SHALL BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
4. REQUIRED SPACING OF UPSTREAM AND DOWNSTREAM TURBIDITY MONITORING LOCATIONS AS SHOWN MAY BE ADJUSTED BASED ON REQUIREMENTS OF FORTHCOMING PERMIT. FINAL LOCATIONS TO BE DETERMINED BASED ON FIELD CONDITIONS/ACCESSIBILITY.
5. INSTALL GEOTECHNICAL MONITORING INSTRUMENTATION/EQUIPMENT AND PERFORM MONITORING IN ACCORDANCE WITH SPECIFICATION SECTION 31 09 13, GEOTECHNICAL INSTRUMENTATION AND MONITORING. LOCATIONS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
6. MONITOR THE ACTIVE CHANNEL FOR SCOUR DURING OPERATION OF THE TEMPORARY BYPASS SYSTEM. IF SCOUR IS OBSERVED, INSTALL AND MAINTAIN NYSDOT NO. 2 STONE IN THE ACTIVE BYPASS CHANNEL. SCOUR PROTECTION MEASURES WILL BE REMOVED AND RIVERBED RESTORED TO ORIGINAL GRADES DURING RESTORATION.
7. INSTALL STAFF GAUGES (OR EQUIVALENT) UPSTREAM AND DOWNSTREAM OF THE TEMPORARY RIVER BYPASS SYSTEM AND ALONG THE CENTERLINE SHEET PILE TO FACILITATE MONITORING OF WATER LEVELS DURING BYPASS OPERATIONS.
8. LIMIT VEHICULAR SPEEDS OF HAUL TRUCKS AND CONSTRUCTION EQUIPMENT TO A MAXIMUM OF 5 MILES PER HOUR OR AS NEEDED TO MINIMIZE VIBRATIONS AND IMPACTS TO ADJACENT STRUCTURES.

60' 0 60' 120'
1"=60'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

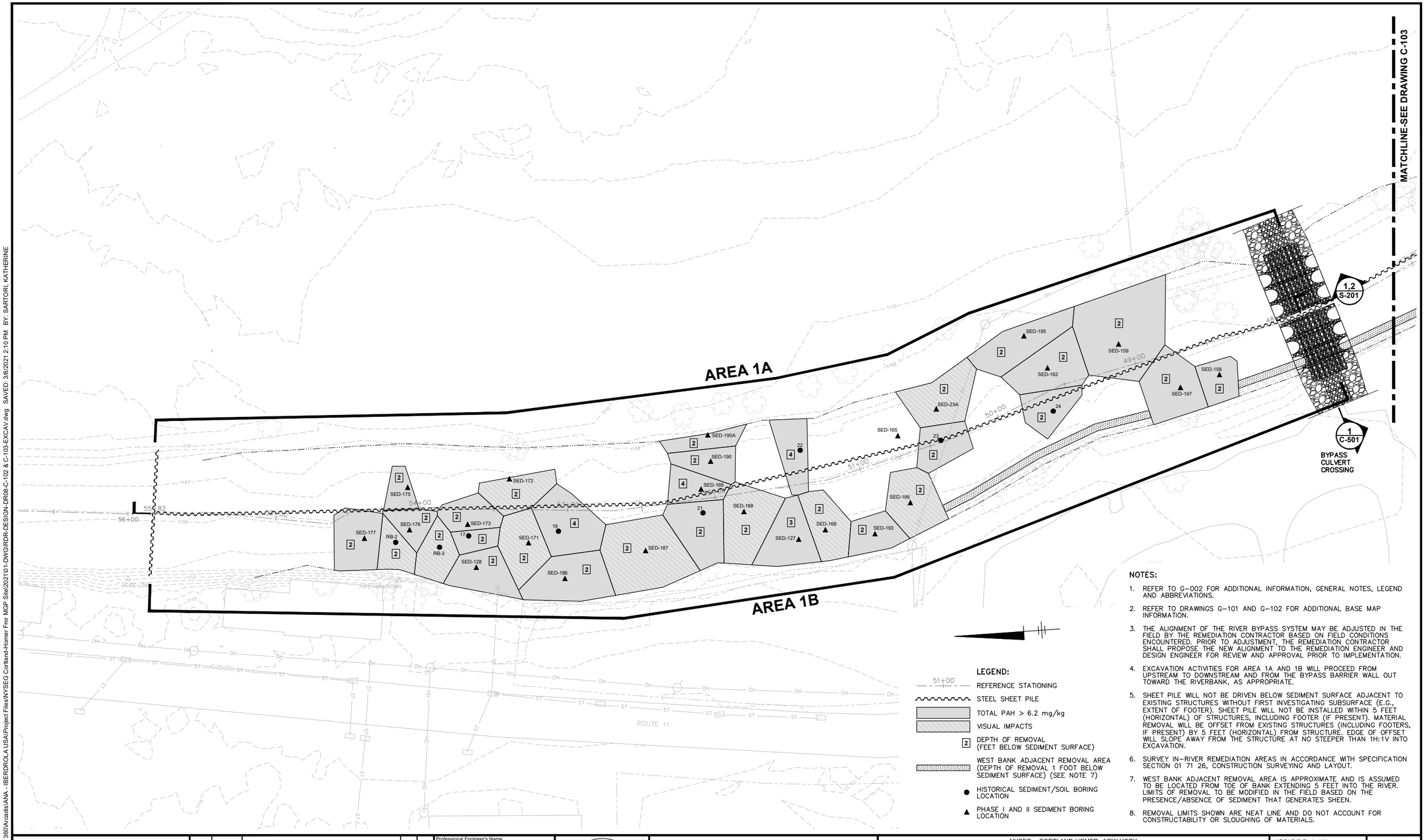
EXCAVATION PLAN (AREA 1)

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-101



LEGEND:

- 51+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- WEST BANK ADJACENT REMOVAL AREA (DEPTH OF REMOVAL 1 FOOT BELOW SEDIMENT SURFACE) (SEE NOTE 7)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

NOTES:

1. REFER TO G-002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASE MAP INFORMATION.
3. THE ALIGNMENT OF THE RIVER BYPASS SYSTEM MAY BE ADJUSTED IN THE FIELD BY THE REMEDIATION CONTRACTOR BASED ON FIELD CONDITIONS ENCOUNTERED. PRIOR TO ADJUSTMENT, THE REMEDIATION CONTRACTOR SHALL PROPOSE THE NEW ALIGNMENT TO THE REMEDIATION ENGINEER AND DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. EXCAVATION ACTIVITIES FOR AREA 1A AND 1B WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER WALL OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
5. SHEET PILE WILL NOT BE DRIVEN BELOW SEDIMENT SURFACE ADJACENT TO EXISTING STRUCTURES WITHOUT FIRST INVESTIGATING SUBSURFACE (E.G., EXTENT OF FOOTER). SHEET PILE WILL NOT BE INSTALLED WITHIN 5 FEET (HORIZONTAL) OF STRUCTURES, INCLUDING FOOTER (IF PRESENT). MATERIAL REMOVAL WILL BE OFFSET FROM EXISTING STRUCTURES (INCLUDING FOOTERS, IF PRESENT) BY 5 FEET (HORIZONTAL) FROM STRUCTURE. EDGE OF OFFSET WILL SLOPE AWAY FROM THE STRUCTURE AT NO STEEPER THAN 1H:1V INTO EXCAVATION.
6. SURVEY IN-RIVER REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
7. WEST BANK ADJACENT REMOVAL AREA IS APPROXIMATE AND IS ASSUMED TO BE LOCATED FROM TOE OF BANK EXTENDING 5 FEET INTO THE RIVER. LIMITS OF REMOVAL TO BE MODIFIED IN THE FIELD BASED ON THE PRESENCE/ABSENCE OF SEDIMENT THAT GENERATES SHEEN.
8. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.

30' 0 30' 60'
1" = 30'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Cko

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

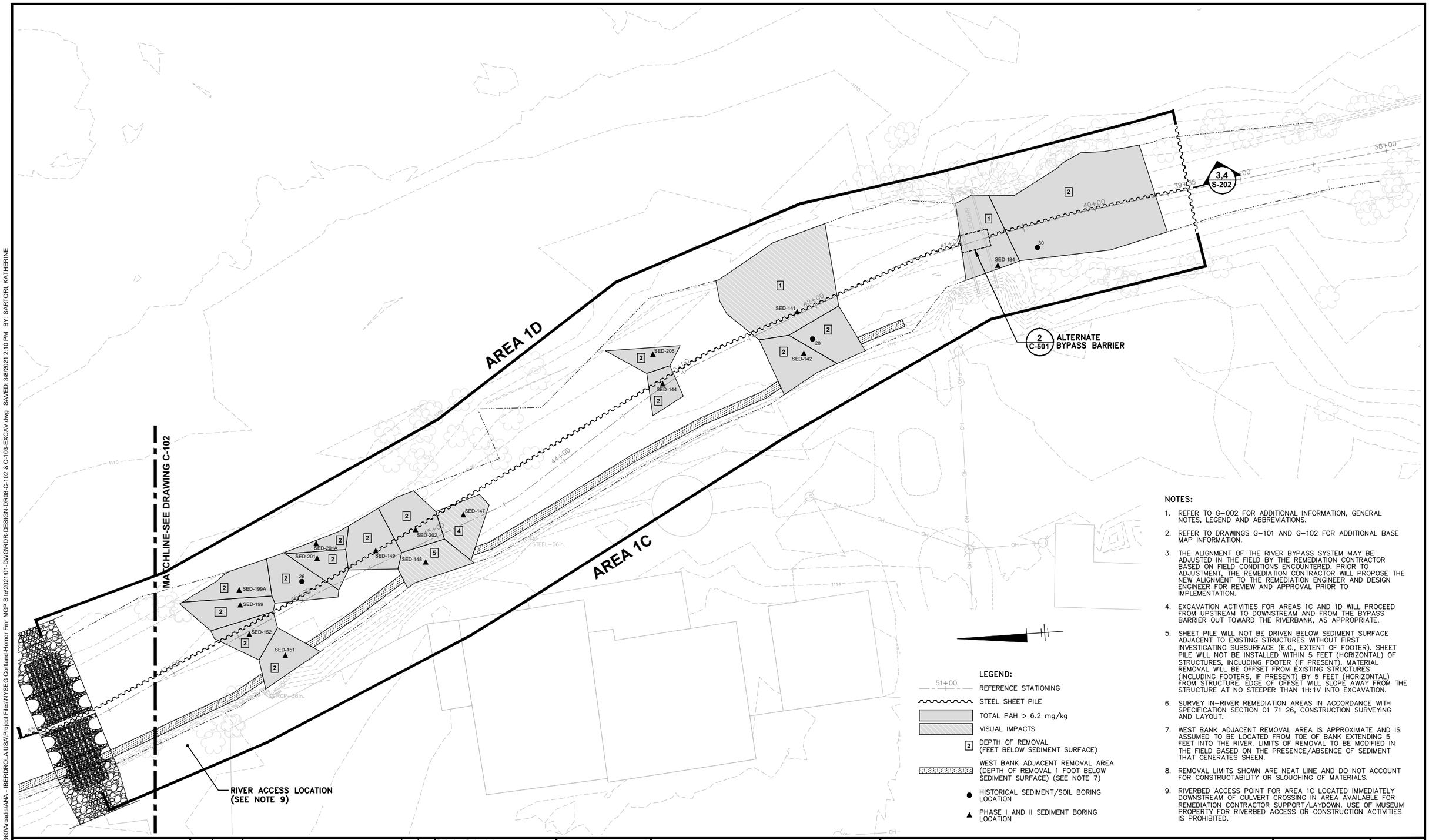
EXCAVATION PLAN (AREA 1A &1B)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-102

C:\Users\Ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021\01-DWG\RDR-DESIGN-DR08-C-102 & C-103-EXCAV.dwg SAVED: 3/8/2021 2:10 PM BY: SARTORI, KATHERINE



LEGEND:

- 51+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- WEST BANK ADJACENT REMOVAL AREA (DEPTH OF REMOVAL 1 FOOT BELOW SEDIMENT SURFACE) (SEE NOTE 7)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

NOTES:

1. REFER TO G–002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G–101 AND G–102 FOR ADDITIONAL BASE MAP INFORMATION.
3. THE ALIGNMENT OF THE RIVER BYPASS SYSTEM MAY BE ADJUSTED IN THE FIELD BY THE REMEDIATION CONTRACTOR BASED ON FIELD CONDITIONS ENCOUNTERED. PRIOR TO ADJUSTMENT, THE REMEDIATION CONTRACTOR WILL PROPOSE THE NEW ALIGNMENT TO THE REMEDIATION ENGINEER AND DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. EXCAVATION ACTIVITIES FOR AREAS 1C AND 1D WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
5. SHEET PILE WILL NOT BE DRIVEN BELOW SEDIMENT SURFACE ADJACENT TO EXISTING STRUCTURES WITHOUT FIRST INVESTIGATING SUBSURFACE (E.G., EXTENT OF FOOTER). SHEET PILE WILL NOT BE INSTALLED WITHIN 5 FEET (HORIZONTAL) OF STRUCTURES, INCLUDING FOOTER (IF PRESENT). MATERIAL REMOVAL WILL BE OFFSET FROM EXISTING STRUCTURES (INCLUDING FOOTERS, IF PRESENT) BY 5 FEET (HORIZONTAL) FROM STRUCTURE. EDGE OF OFFSET WILL SLOPE AWAY FROM THE STRUCTURE AT NO STEEPER THAN 1H:1V INTO EXCAVATION.
6. SURVEY IN–RIVER REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
7. WEST BANK ADJACENT REMOVAL AREA IS APPROXIMATE AND IS ASSUMED TO BE LOCATED FROM TOE OF BANK EXTENDING 5 FEET INTO THE RIVER. LIMITS OF REMOVAL TO BE MODIFIED IN THE FIELD BASED ON THE PRESENCE/ABSENCE OF SEDIMENT THAT GENERATES SHEEN.
8. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.
9. RIVERBED ACCESS POINT FOR AREA 1C LOCATED IMMEDIATELY DOWNSTREAM OF CULVERT CROSSING IN AREA AVAILABLE FOR REMEDIATION CONTRACTOR SUPPORT/LAYDOWN. USE OF MUSEUM PROPERTY FOR RIVERBED ACCESS OR CONSTRUCTION ACTIVITIES IS PROHIBITED.

30' 0 30' 60'
1"=30'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 1C & 1D)

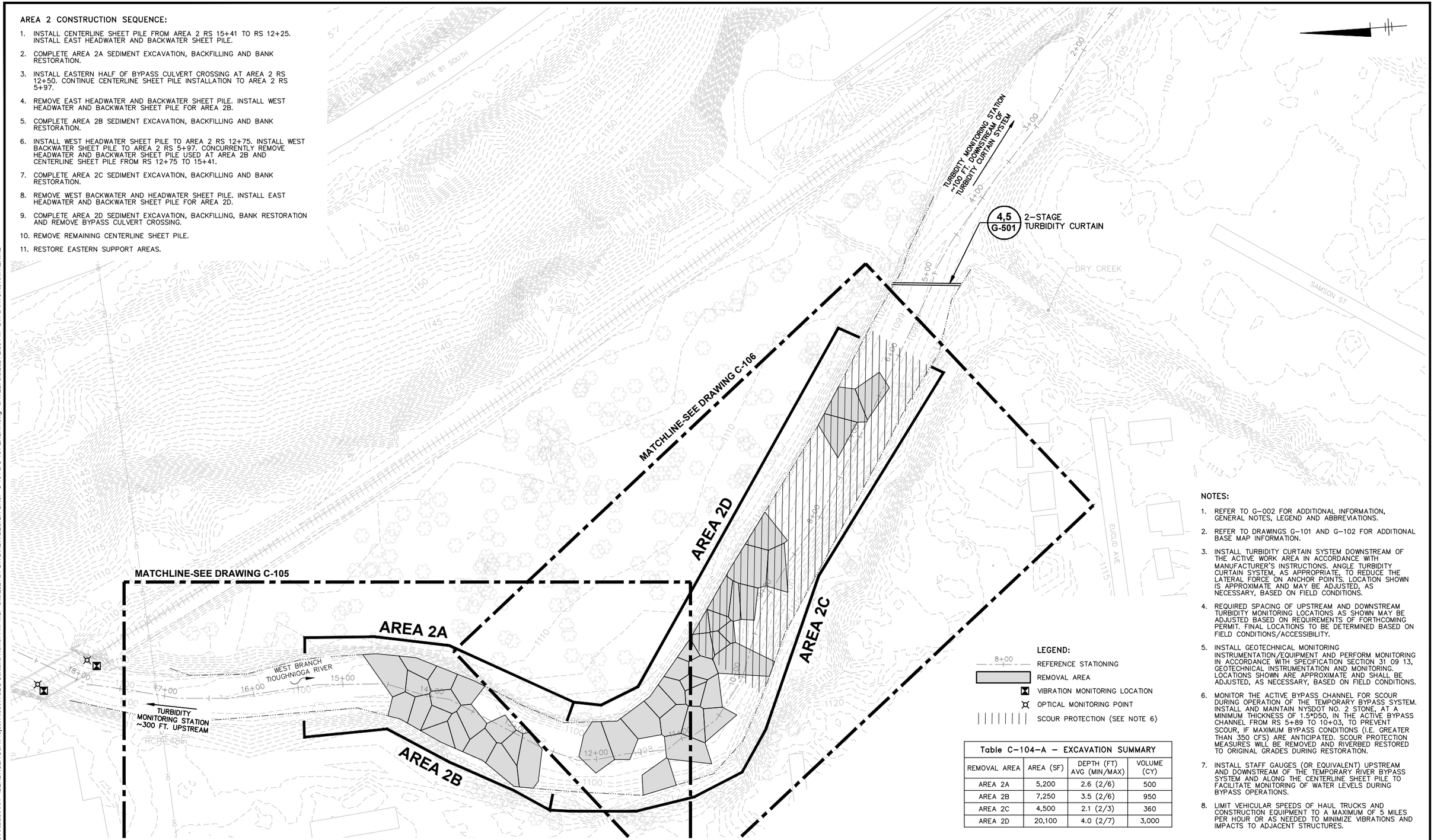
ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-103

AREA 2 CONSTRUCTION SEQUENCE:

1. INSTALL CENTERLINE SHEET PILE FROM AREA 2 RS 15+41 TO RS 12+25. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE.
2. COMPLETE AREA 2A SEDIMENT EXCAVATION, BACKFILLING AND BANK RESTORATION.
3. INSTALL EASTERN HALF OF BYPASS CULVERT CROSSING AT AREA 2 RS 12+50. CONTINUE CENTERLINE SHEET PILE INSTALLATION TO AREA 2 RS 5+97.
4. REMOVE EAST HEADWATER AND BACKWATER SHEET PILE. INSTALL WEST HEADWATER AND BACKWATER SHEET PILE FOR AREA 2B.
5. COMPLETE AREA 2B SEDIMENT EXCAVATION, BACKFILLING AND BANK RESTORATION.
6. INSTALL WEST HEADWATER SHEET PILE TO AREA 2 RS 12+75. INSTALL WEST BACKWATER SHEET PILE TO AREA 2 RS 5+97. CONCURRENTLY REMOVE HEADWATER AND BACKWATER SHEET PILE USED AT AREA 2B AND CENTERLINE SHEET PILE FROM RS 12+75 TO 15+41.
7. COMPLETE AREA 2C SEDIMENT EXCAVATION, BACKFILLING AND BANK RESTORATION.
8. REMOVE WEST BACKWATER AND HEADWATER SHEET PILE. INSTALL EAST HEADWATER AND BACKWATER SHEET PILE FOR AREA 2D.
9. COMPLETE AREA 2D SEDIMENT EXCAVATION, BACKFILLING, BANK RESTORATION AND REMOVE BYPASS CULVERT CROSSING.
10. REMOVE REMAINING CENTERLINE SHEET PILE.
11. RESTORE EASTERN SUPPORT AREAS.



LEGEND:

- 8+00 — REFERENCE STATIONING
- REMOVAL AREA
- VIBRATION MONITORING LOCATION
- OPTICAL MONITORING POINT
- SCOUR PROTECTION (SEE NOTE 6)

Table C-104-A – EXCAVATION SUMMARY

REMOVAL AREA	AREA (SF)	DEPTH (FT) AVG (MIN/MAX)	VOLUME (CY)
AREA 2A	5,200	2.6 (2/6)	500
AREA 2B	7,250	3.5 (2/6)	950
AREA 2C	4,500	2.1 (2/3)	360
AREA 2D	20,100	4.0 (2/7)	3,000

NOTES:

1. REFER TO G-002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASE MAP INFORMATION.
3. INSTALL TURBIDITY CURTAIN SYSTEM DOWNSTREAM OF THE ACTIVE WORK AREA IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ANGLE TURBIDITY CURTAIN SYSTEM, AS APPROPRIATE, TO REDUCE THE LATERAL FORCE ON ANCHOR POINTS. LOCATION SHOWN IS APPROXIMATE AND MAY BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
4. REQUIRED SPACING OF UPSTREAM AND DOWNSTREAM TURBIDITY MONITORING LOCATIONS AS SHOWN MAY BE ADJUSTED BASED ON REQUIREMENTS OF FORTHCOMING PERMIT. FINAL LOCATIONS TO BE DETERMINED BASED ON FIELD CONDITIONS/ACCESSIBILITY.
5. INSTALL GEOTECHNICAL MONITORING INSTRUMENTATION/EQUIPMENT AND PERFORM MONITORING IN ACCORDANCE WITH SPECIFICATION SECTION 31 09 13, GEOTECHNICAL INSTRUMENTATION AND MONITORING. LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.
6. MONITOR THE ACTIVE BYPASS CHANNEL FOR SCOUR DURING OPERATION OF THE TEMPORARY BYPASS SYSTEM. INSTALL AND MAINTAIN NYSDOT NO. 2 STONE, AT A MINIMUM THICKNESS OF 1.5*D50, IN THE ACTIVE BYPASS CHANNEL FROM RS 5+89 TO 10+03, TO PREVENT SCOUR, IF MAXIMUM BYPASS CONDITIONS (I.E. GREATER THAN 350 CFS) ARE ANTICIPATED. SCOUR PROTECTION MEASURES WILL BE REMOVED AND RIVERBED RESTORED TO ORIGINAL GRADES DURING RESTORATION.
7. INSTALL STAFF GAUGES (OR EQUIVALENT) UPSTREAM AND DOWNSTREAM OF THE TEMPORARY RIVER BYPASS SYSTEM AND ALONG THE CENTERLINE SHEET PILE TO FACILITATE MONITORING OF WATER LEVELS DURING BYPASS OPERATIONS.
8. LIMIT VEHICULAR SPEEDS OF HAUL TRUCKS AND CONSTRUCTION EQUIPMENT TO A MAXIMUM OF 5 MILES PER HOUR OR AS NEEDED TO MINIMIZE VIBRATIONS AND IMPACTS TO ADJACENT STRUCTURES.

C:\Users\Ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Finr MGP Site\2021\01-DWG\RDR-DESIGN-DR07 - C-101 & C-104-EXCAV.dwg SAVED: 3/6/2021 2:06 PM BY: SARTORI, KATHERINE

1"=50' (50' 0 50' 100')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Chk

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

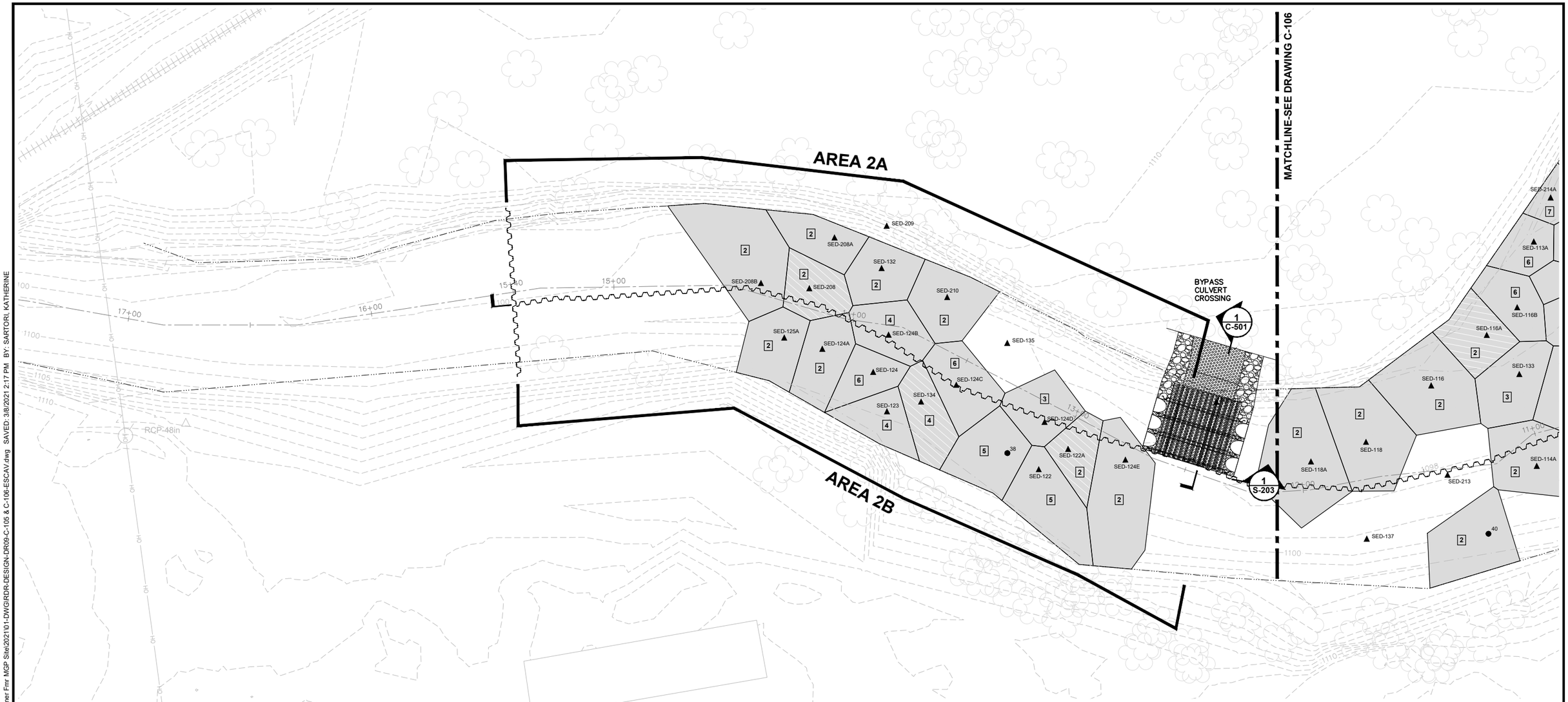
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 2)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-104



LEGEND:

- 1+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

NOTES:

1. REFER TO G–002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G–101 AND G–102 FOR ADDITIONAL BASE MAP INFORMATION.
3. THE ALIGNMENT OF THE RIVER BYPASS SYSTEM MAY BE ADJUSTED IN THE FIELD BY THE REMEDIATION CONTRACTOR BASED ON FIELD CONDITIONS ENCOUNTERED. PRIOR TO ADJUSTMENT, THE REMEDIATION CONTRACTOR WILL PROPOSE THE NEW ALIGNMENT TO THE REMEDIATION ENGINEER AND DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. EXCAVATION ACTIVITIES FOR AREA 2A AND 2B WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER WALL OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
5. SHEET PILE WILL NOT BE DRIVEN BELOW SEDIMENT SURFACE ADJACENT TO EXISTING STRUCTURES WITHOUT FIRST INVESTIGATING SUBSURFACE (E.G., EXTENT OF FOOTER). SHEET PILE WILL NOT BE INSTALLED WITHIN 5 FEET (HORIZONTAL) OF STRUCTURES, INCLUDING FOOTER (IF PRESENT). MATERIAL REMOVAL WILL BE OFFSET FROM EXISTING STRUCTURES (INCLUDING FOOTERS, IF PRESENT) BY 5 FEET (HORIZONTAL) FROM STRUCTURE. EDGE OF OFFSET WILL SLOPE AWAY FROM THE STRUCTURE AT NO STEEPER THAN 1H:1V INTO EXCAVATION.
6. SURVEY IN–RIVER REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
7. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

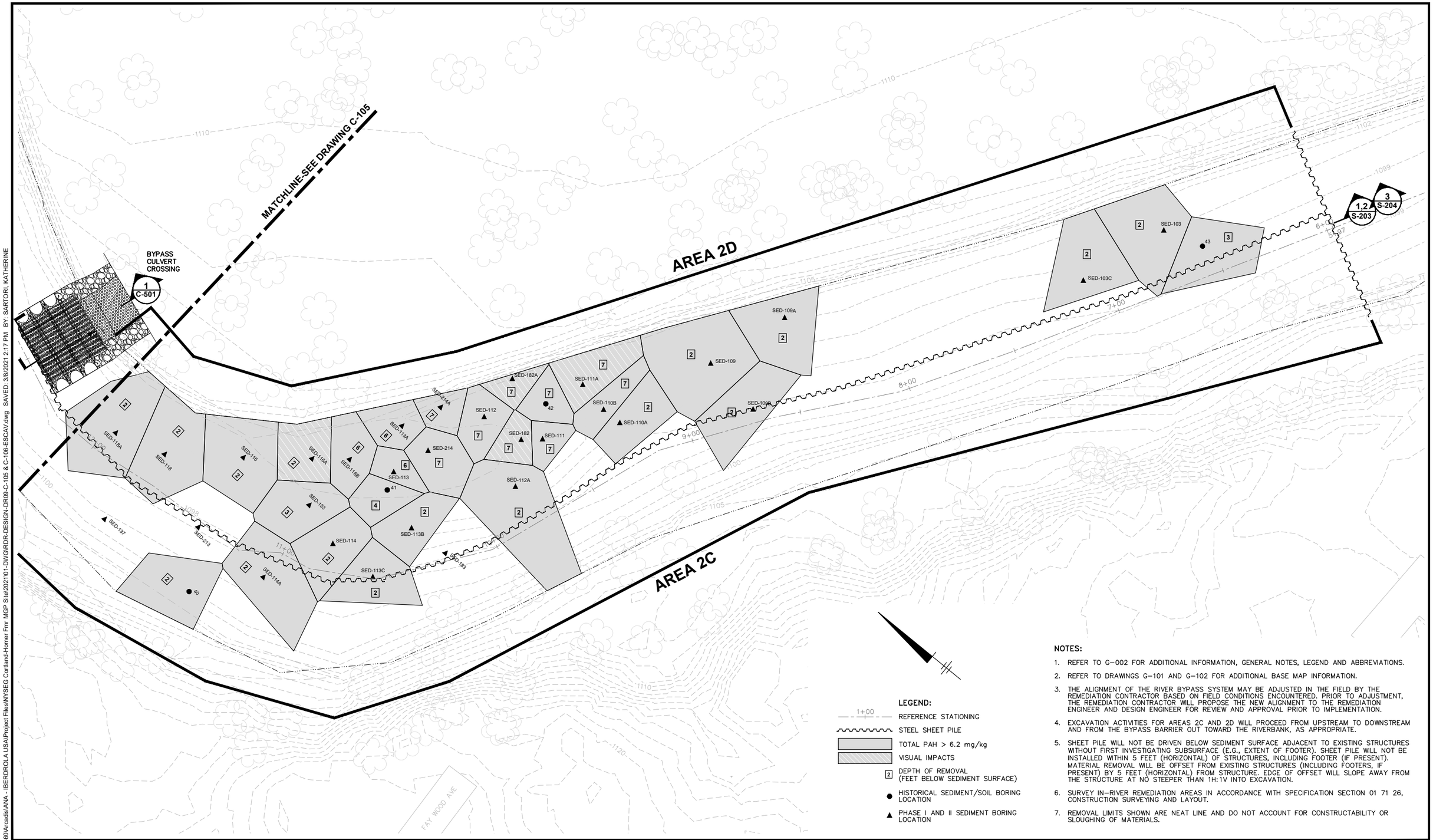
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 2A & 2B)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-105



LEGEND:

- 1+00 — REFERENCE STATIONING
- STEEL SHEET PILE
- TOTAL PAH > 6.2 mg/kg
- VISUAL IMPACTS
- [2] DEPTH OF REMOVAL (FEET BELOW SEDIMENT SURFACE)
- ● HISTORICAL SEDIMENT/SOIL BORING LOCATION
- ▲ PHASE I AND II SEDIMENT BORING LOCATION

NOTES:

1. REFER TO G–002 FOR ADDITIONAL INFORMATION, GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G–101 AND G–102 FOR ADDITIONAL BASE MAP INFORMATION.
3. THE ALIGNMENT OF THE RIVER BYPASS SYSTEM MAY BE ADJUSTED IN THE FIELD BY THE REMEDIATION CONTRACTOR BASED ON FIELD CONDITIONS ENCOUNTERED. PRIOR TO ADJUSTMENT, THE REMEDIATION CONTRACTOR WILL PROPOSE THE NEW ALIGNMENT TO THE REMEDIATION ENGINEER AND DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
4. EXCAVATION ACTIVITIES FOR AREAS 2C AND 2D WILL PROCEED FROM UPSTREAM TO DOWNSTREAM AND FROM THE BYPASS BARRIER OUT TOWARD THE RIVERBANK, AS APPROPRIATE.
5. SHEET PILE WILL NOT BE DRIVEN BELOW SEDIMENT SURFACE ADJACENT TO EXISTING STRUCTURES WITHOUT FIRST INVESTIGATING SUBSURFACE (E.G., EXTENT OF FOOTER). SHEET PILE WILL NOT BE INSTALLED WITHIN 5 FEET (HORIZONTAL) OF STRUCTURES, INCLUDING FOOTER (IF PRESENT). MATERIAL REMOVAL WILL BE OFFSET FROM EXISTING STRUCTURES (INCLUDING FOOTERS, IF PRESENT) BY 5 FEET (HORIZONTAL) FROM STRUCTURE. EDGE OF OFFSET WILL SLOPE AWAY FROM THE STRUCTURE AT NO STEEPER THAN 1H:1V INTO EXCAVATION.
6. SURVEY IN–RIVER REMEDIATION AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01 71 26, CONSTRUCTION SURVEYING AND LAYOUT.
7. REMOVAL LIMITS SHOWN ARE NEAT LINE AND DO NOT ACCOUNT FOR CONSTRUCTABILITY OR SLOUGHING OF MATERIALS.

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by JJB	Drawn by BKD	Checked by LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · DATE · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

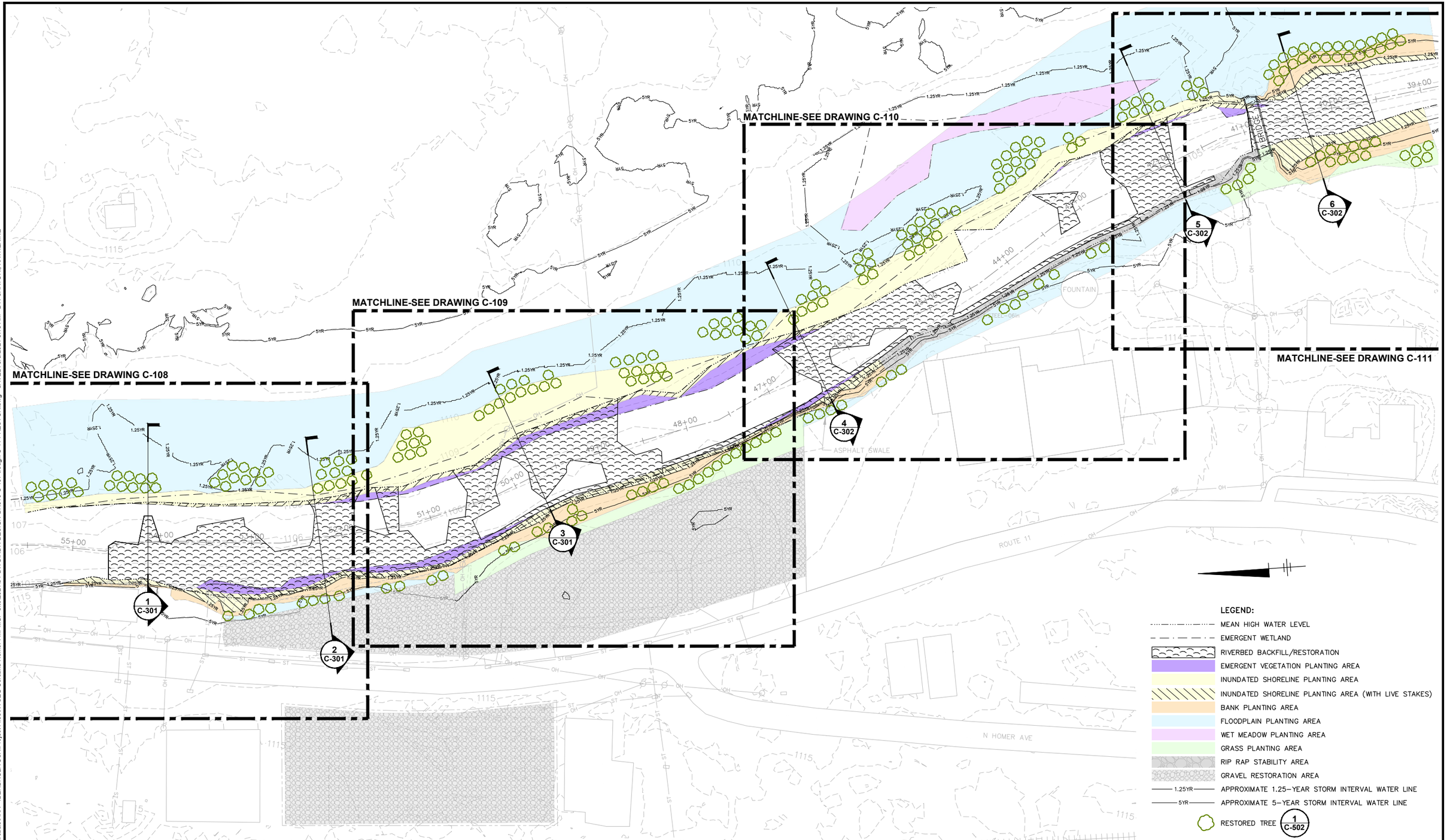
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

EXCAVATION PLAN (AREA 2C & 2D)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-106



50' 0 50' 100'
1"=50'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · 069985 · PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

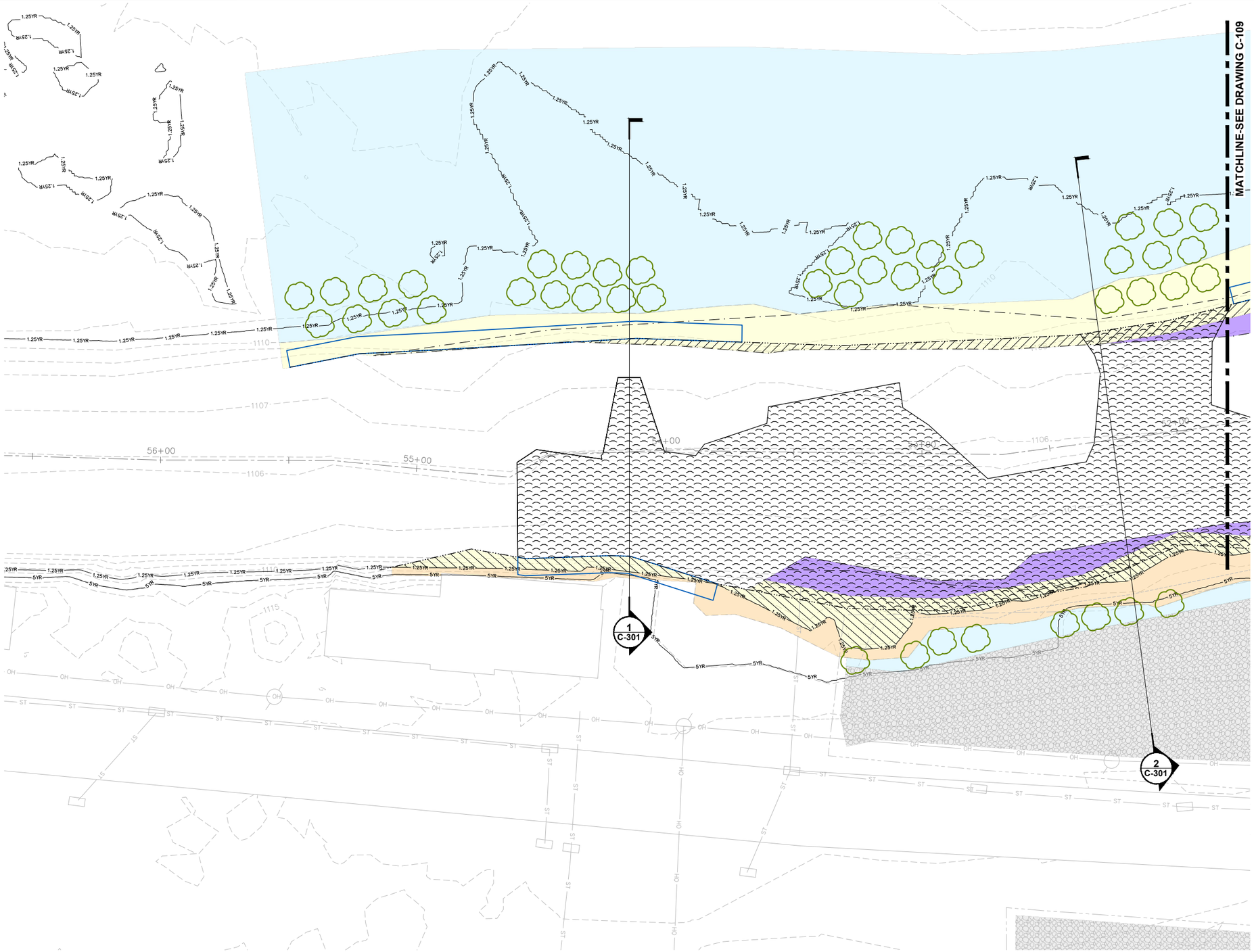
AREA 1 GENERAL RESTORATION PLAN

ARCADIS Project No.: B0013137.0008.00016

Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-107



LEGEND:

- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- FLOODPLAIN PLANTING AREA
- WET MEADOW PLANTING AREA
- GRASS PLANTING AREA
- GRAVEL RESTORATION AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE (1 / C-502)

NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWIGNS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRANCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
5. LIMITS OF EMERGENT VEGETATION PLANTING AREA WILL BE DETERMINED BY THE BASE FLOW ELEVATION AS DELINEATED IN THE FIELD FOLLOWING RIVERBED BACKFILL RESTORATION.
6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.

C:\Users\Ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\202101-DWG\RDR-DESIGN-DR010-C-107 trough C-114-RESTOR.dwg SAVED: 3/9/2021 8:13 AM BY: SARTORI, KATHERINE

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MARK O. GRAVELDING		
Professional Engineer's No.		
069985-1		
State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by	Drawn by	Checked by
JJB	BKD	LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

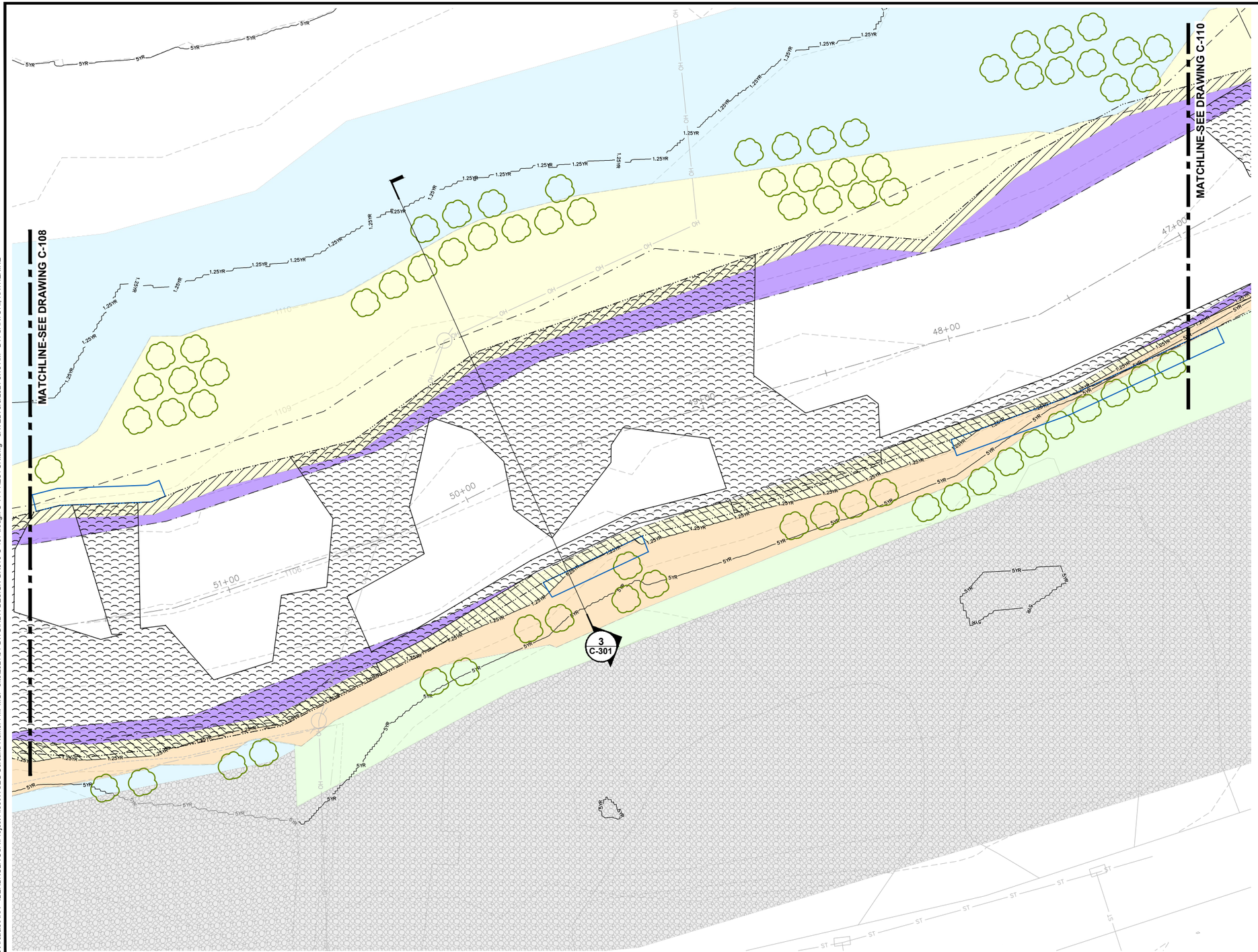
AREA 1 RESTORATION PLAN (STA.0+00 - STA.4+00)

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-108



LEGEND:

- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- FLOODPLAIN PLANTING AREA
- WET MEADOW PLANTING AREA
- GRASS PLANTING AREA
- GRAVEL RESTORATION AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE (1 / C-502)

NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRENCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
5. LIMITS OF EMERGENT VEGETATION PLANTING AREA WILL BE DETERMINED BY THE BASE FLOW ELEVATION AS DELINEATED IN THE FIELD FOLLOWING RIVERBED BACKFILL RESTORATION.
6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

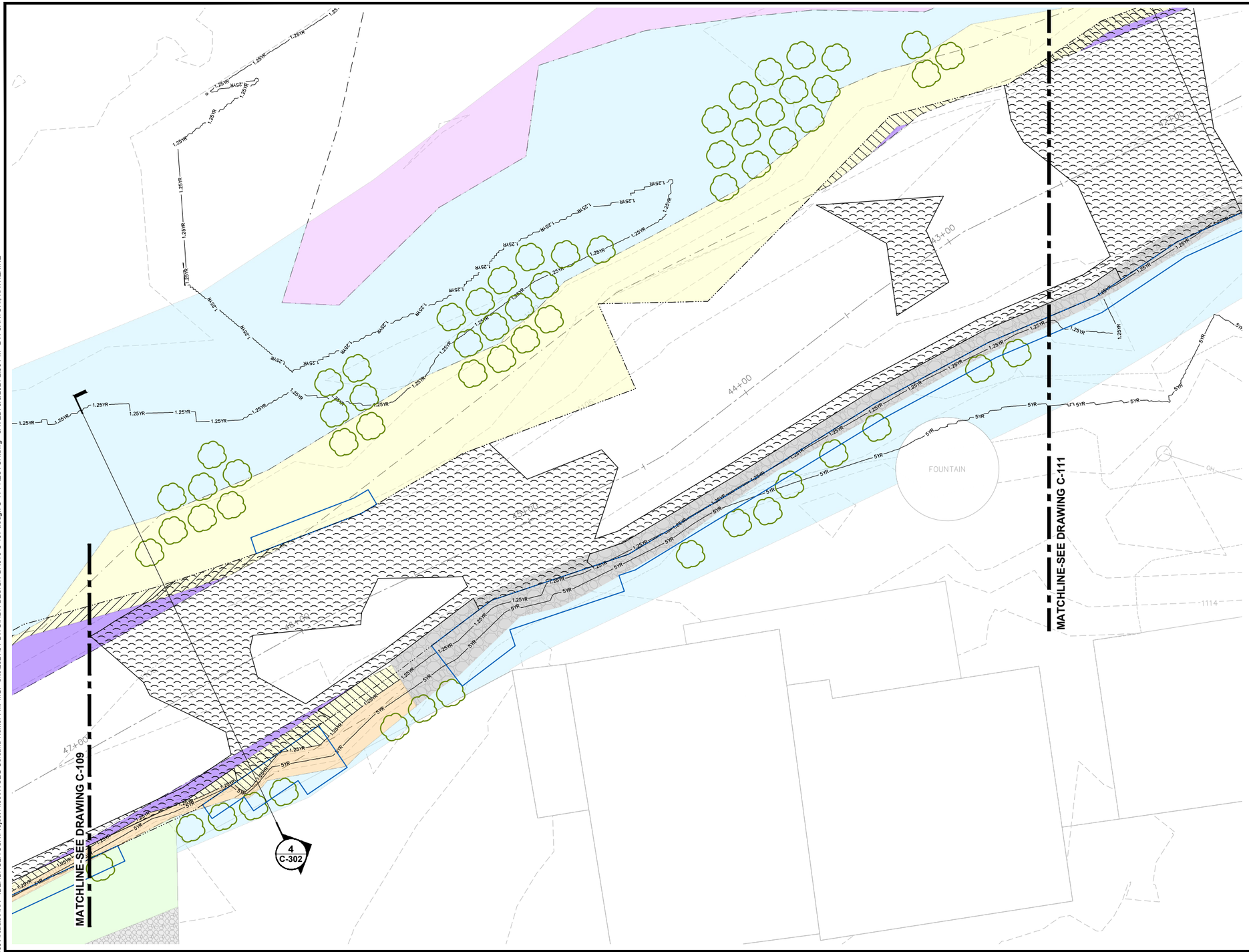
Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 RESTORATION PLAN (STA.4+00 - STA.8+73)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-109



LEGEND:

- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- FLOODPLAIN PLANTING AREA
- WET MEADOW PLANTING AREA
- GRASS PLANTING AREA
- RIP RAP STABILITY AREA
- GRAVEL RESTORATION AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE 1 / C-502

NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRENCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
5. LIMITS OF EMERGENT VEGETATION PLANTING AREA WILL BE DETERMINED BY THE BASE FLOW ELEVATION AS DELINEATED IN THE FIELD FOLLOWING RIVERBED BACKFILL RESTORATION.
6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.

C:\Users\Ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021\01-DWG\RDR-DESIGN-DR010-C-107 trough C-114-RESTOR.dwg SAVED: 3/8/2021 2:36 PM BY: SARTORI, KATHERINE

1"=20' 20' 0 20' 40'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OREN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

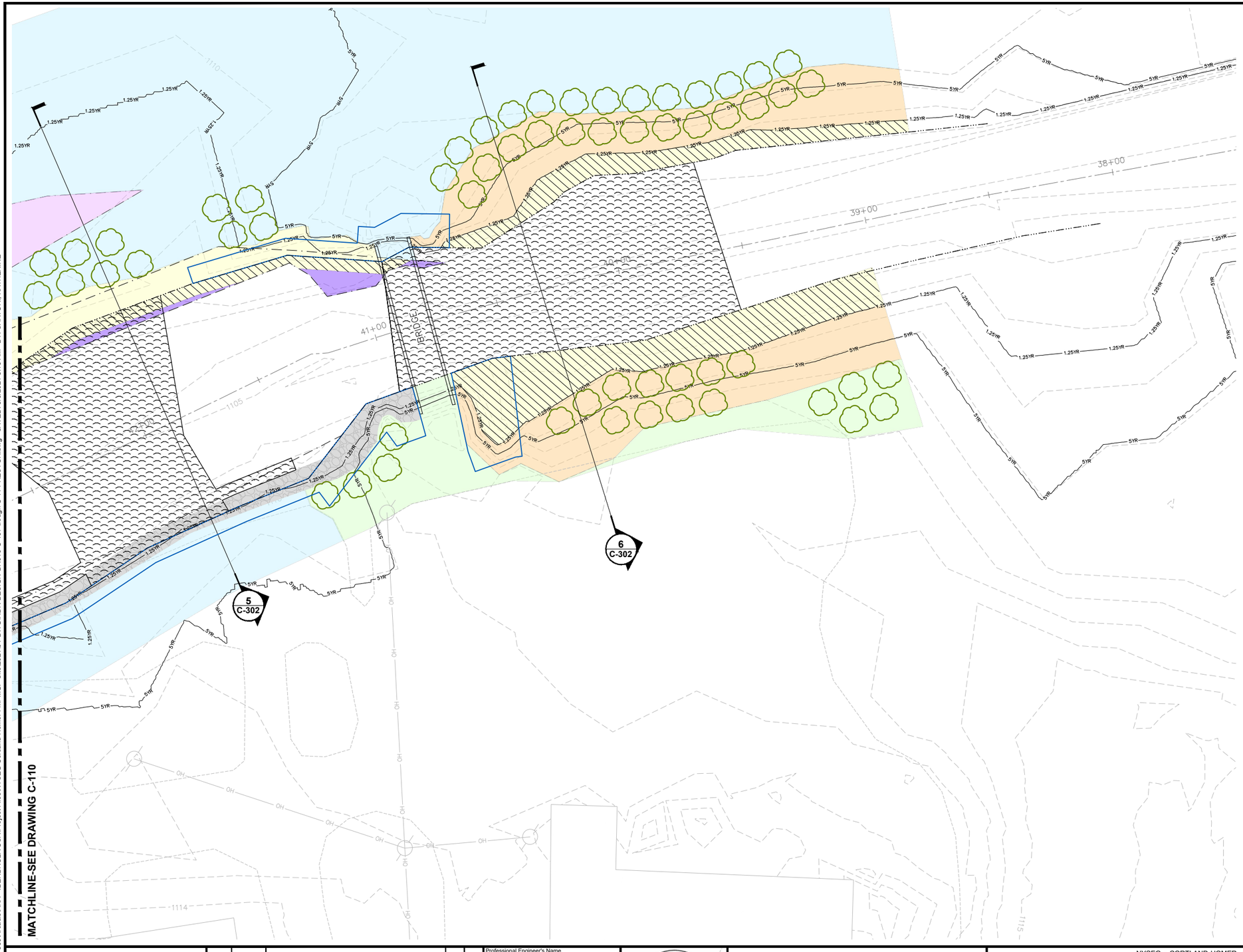
AREA 1 RESTORATION PLAN (STA.8+73 - STA.13+65)

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-110



LEGEND:

- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- FLOODPLAIN PLANTING AREA
- WET MEADOW PLANTING AREA
- GRASS PLANTING AREA
- RIP RAP STABILITY AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE (1 / C-502)

NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRENCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
5. LIMITS OF EMERGENT VEGETATION PLANTING AREA WILL BE DETERMINED BY THE BASE FLOW ELEVATION AS DELINEATED IN THE FIELD FOLLOWING RIVERBED BACKFILL RESTORATION.
6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.

C:\Users\Ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021\01-DWG\RDR-DESIGN-DR\010-C-107 trough C-114-RESTOR.dwg SAVED: 3/9/2021 8:13 AM BY: SARTORI, KATHERINE

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

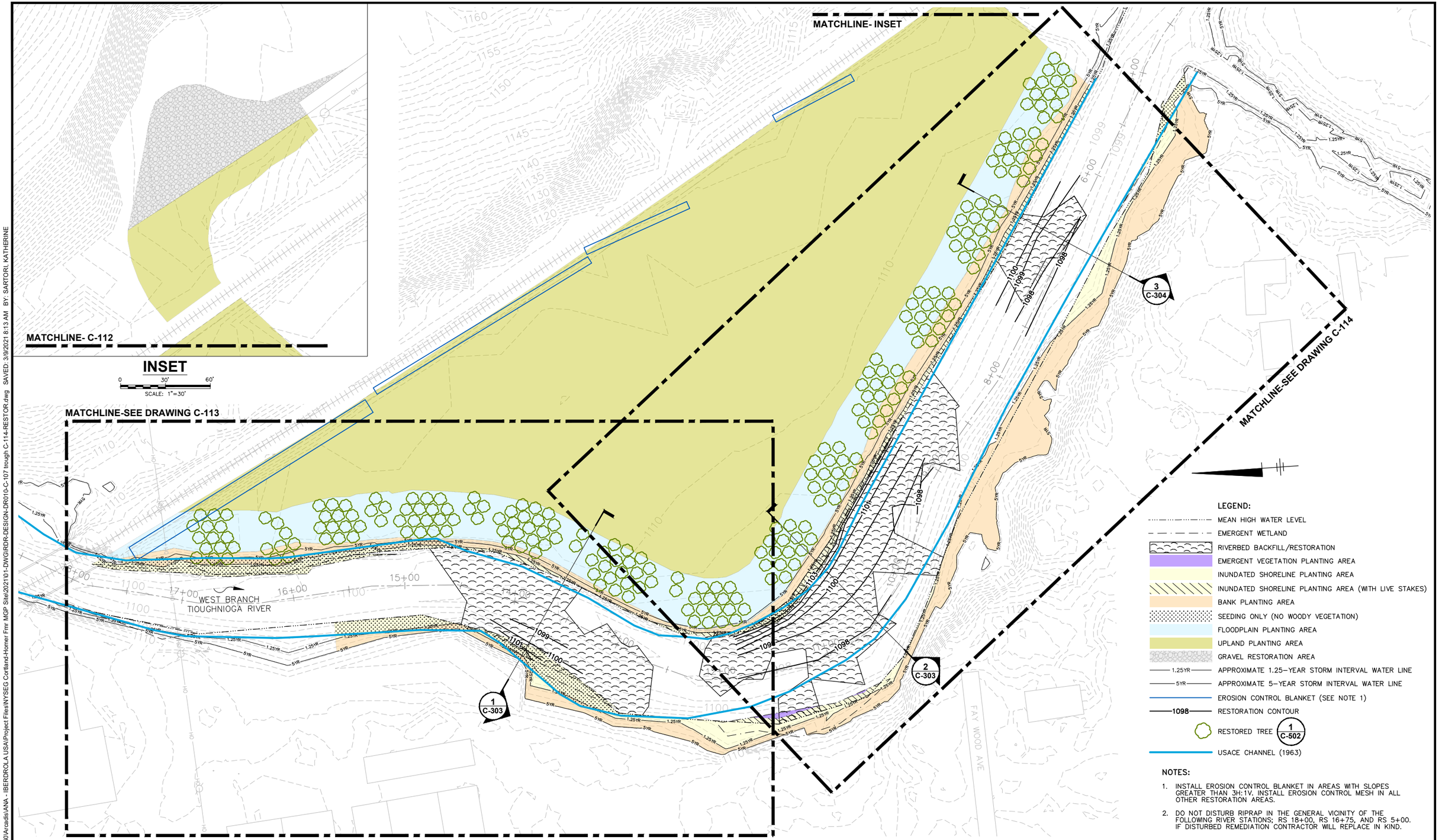
AREA 1 RESTORATION PLAN (STA.13+65 - STA.16+39)

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-111



NOTES:

1. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.
2. DO NOT DISTURB RIPRAP IN THE GENERAL VICINITY OF THE FOLLOWING RIVER STATIONS: RS 18+00, RS 16+75, AND RS 5+00. IF DISTURBED REMEDIATION CONTRACTOR WILL REPLACE IN KIND.

C:\Users\ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021\01-DWG\RDR-DESIGN-DR010-C-107 trough C-114-RESTOR.dwg SAVED: 3/9/2021 8:13 AM BY: SARTORI, KATHERINE

40' 0 40' 80'
1"=40'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	12/21/2020	RESTORATION MODIFICATIONS, USACE CHANNEL	BKD	JJB

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 3/10/2021 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

STATE OF NEW YORK MARK OWEN GRAVELDING LICENSED PROFESSIONAL ENGINEER NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

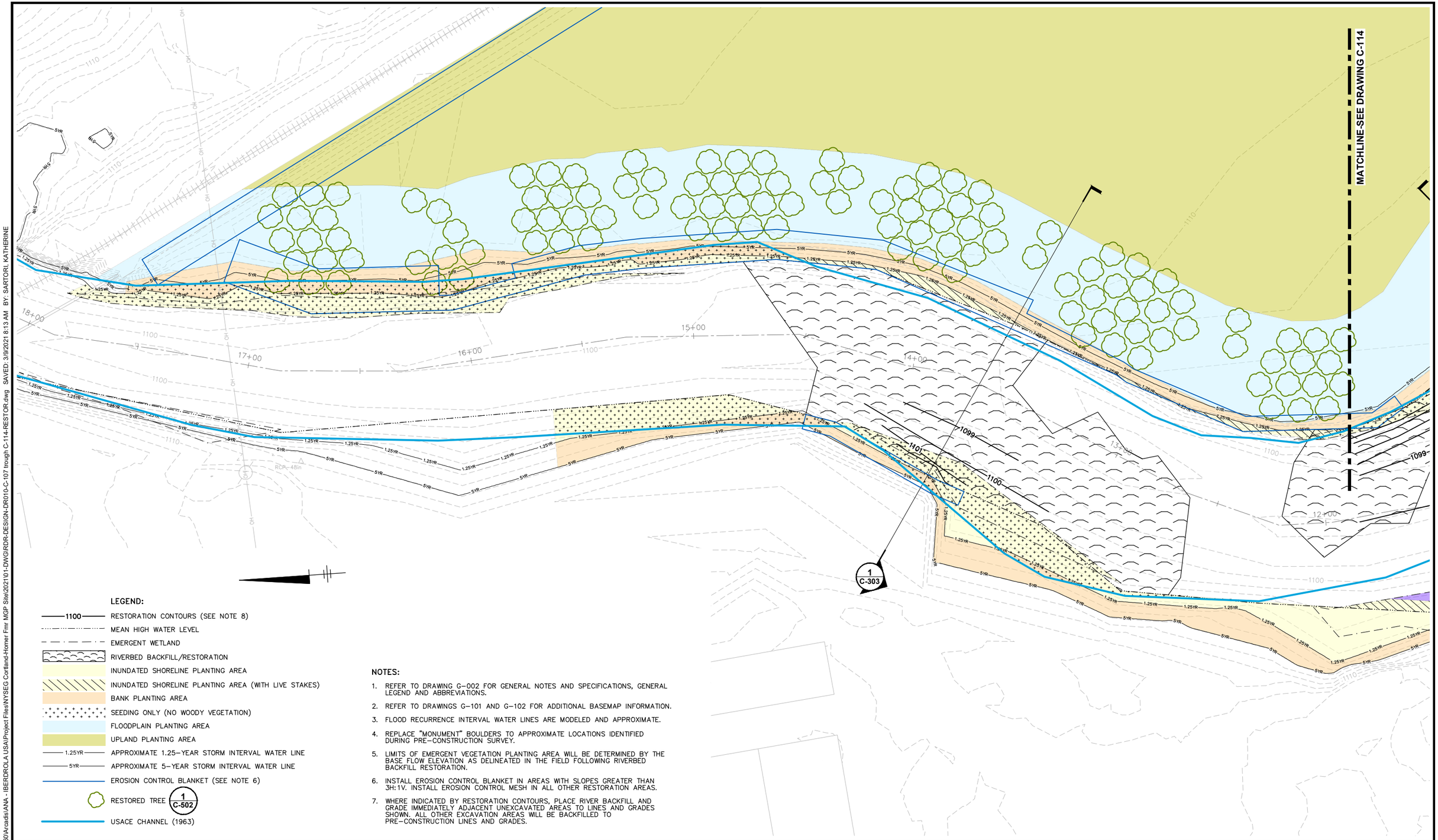
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 GENERAL RESTORATION PLAN

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-112



LEGEND:

- 1100 — RESTORATION CONTOURS (SEE NOTE 8)
- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- SEEDING ONLY (NO WOODY VEGETATION)
- FLOODPLAIN PLANTING AREA
- UPLAND PLANTING AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE (1 / C-502)
- USACE CHANNEL (1963)

NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWINGS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRENCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
5. LIMITS OF EMERGENT VEGETATION PLANTING AREA WILL BE DETERMINED BY THE BASE FLOW ELEVATION AS DELINEATED IN THE FIELD FOLLOWING RIVERBED BACKFILL RESTORATION.
6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.
7. WHERE INDICATED BY RESTORATION CONTOURS, PLACE RIVER BACKFILL AND GRADE IMMEDIATELY ADJACENT UNEXCAVATED AREAS TO LINES AND GRADES SHOWN. ALL OTHER EXCAVATION AREAS WILL BE BACKFILLED TO PRE-CONSTRUCTION LINES AND GRADES.

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	12/21/2020	RESTORATION MODIFICATIONS, USACE CHANNEL	BKD	JJB

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

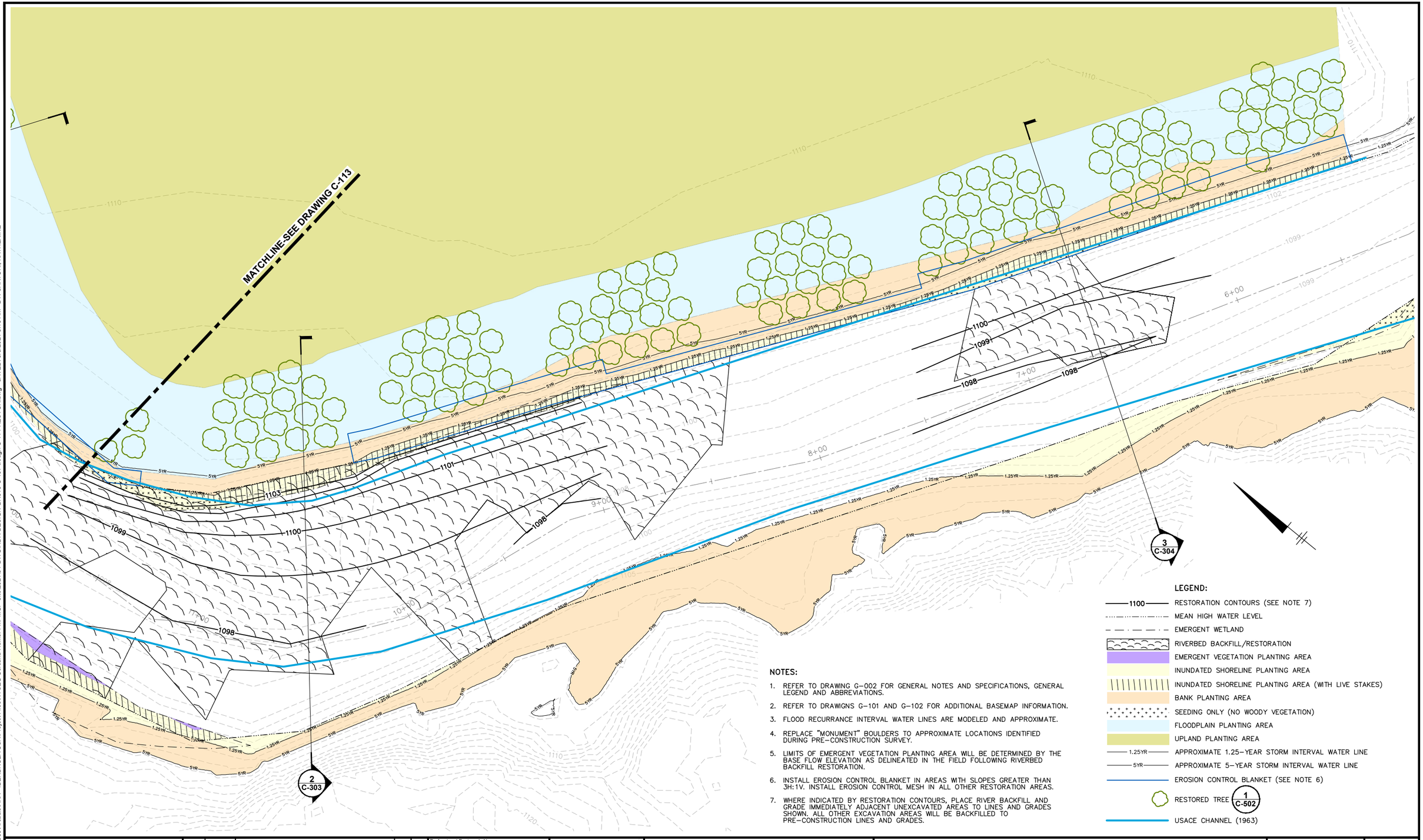
AREA 2 RESTORATION PLAN (STA.0+00 - STA.3+50)

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-113



NOTES:

1. REFER TO DRAWING G-002 FOR GENERAL NOTES AND SPECIFICATIONS, GENERAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWIGNS G-101 AND G-102 FOR ADDITIONAL BASEMAP INFORMATION.
3. FLOOD RECURRANCE INTERVAL WATER LINES ARE MODELED AND APPROXIMATE.
4. REPLACE "MONUMENT" BOULDERS TO APPROXIMATE LOCATIONS IDENTIFIED DURING PRE-CONSTRUCTION SURVEY.
5. LIMITS OF EMERGENT VEGETATION PLANTING AREA WILL BE DETERMINED BY THE BASE FLOW ELEVATION AS DELINEATED IN THE FIELD FOLLOWING RIVERBED BACKFILL RESTORATION.
6. INSTALL EROSION CONTROL BLANKET IN AREAS WITH SLOPES GREATER THAN 3H:1V. INSTALL EROSION CONTROL MESH IN ALL OTHER RESTORATION AREAS.
7. WHERE INDICATED BY RESTORATION CONTOURS, PLACE RIVER BACKFILL AND GRADE IMMEDIATELY ADJACENT UNEXCAVATED AREAS TO LINES AND GRADES SHOWN. ALL OTHER EXCAVATION AREAS WILL BE BACKFILLED TO PRE-CONSTRUCTION LINES AND GRADES.

LEGEND:

- 1100 — RESTORATION CONTOURS (SEE NOTE 7)
- MEAN HIGH WATER LEVEL
- EMERGENT WETLAND
- RIVERBED BACKFILL/RESTORATION
- EMERGENT VEGETATION PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA
- INUNDATED SHORELINE PLANTING AREA (WITH LIVE STAKES)
- BANK PLANTING AREA
- SEEDING ONLY (NO WOODY VEGETATION)
- FLOODPLAIN PLANTING AREA
- UPLAND PLANTING AREA
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE
- EROSION CONTROL BLANKET (SEE NOTE 6)
- RESTORED TREE (1 / C-502)
- USACE CHANNEL (1963)

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	12/21/2020	RESTORATION MODIFICATIONS, USACE CHANNEL	BKD	JJB

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK O. GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

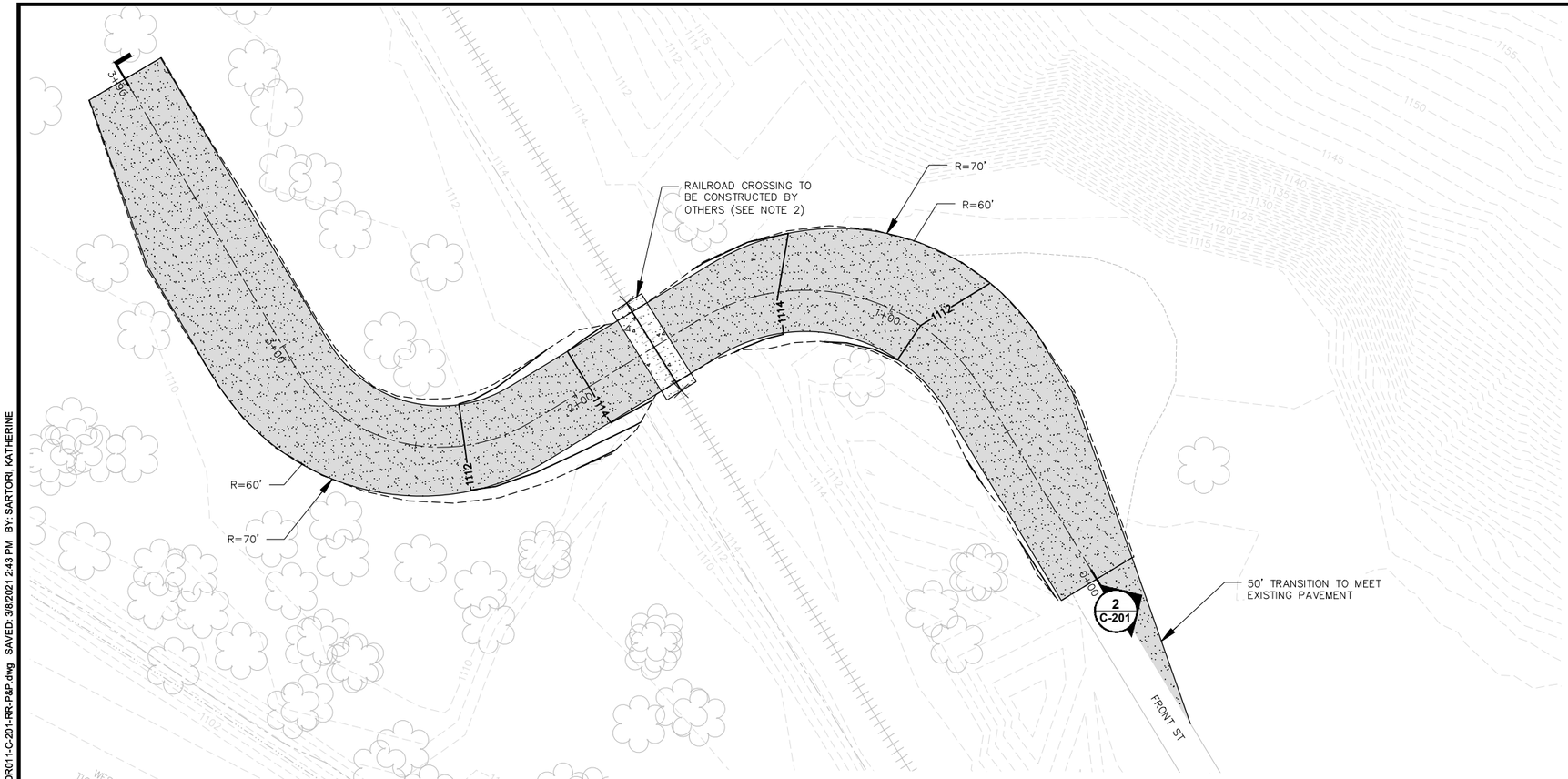
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 RESTORATION PLAN (STA.3+50 - STA.7+34)

ARCADIS Project No. B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-114



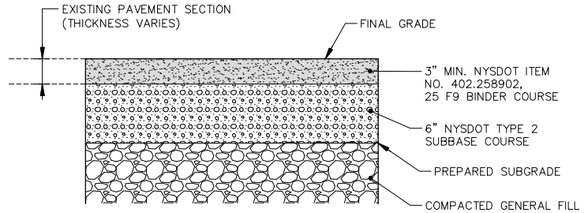
PLAN

LEGEND:

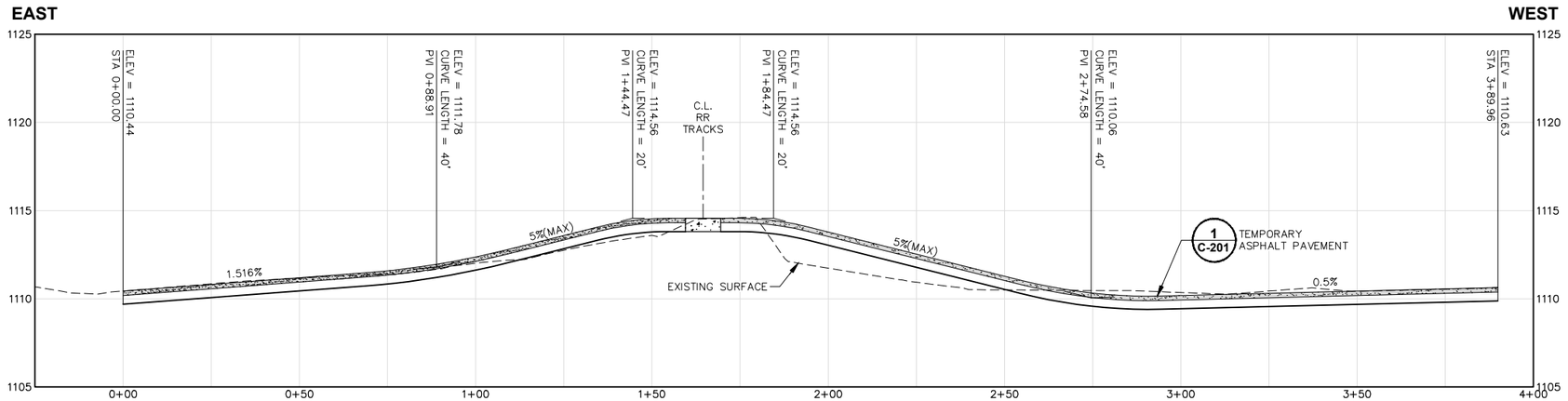
- 1110 — EXISTING CONTOURS
- EXISTING RAILROAD
- 1114 — PROPOSED CONTOURS
- PROPOSED GRADING LIMITS
- PROPOSED RAILROAD CROSSING
- PROPOSED ASPHALT PAVEMENT

NOTES:

1. SEE RAILROAD CROSSING DESIGN PREPARED BY OTHERS FOR CROSSING DETAILS.
2. NYSW TO COMPLETE GRADE CROSSING (I.E., RAIL AND TIE REPLACEMENT, CONCRETE INSTALLATION).
3. COMPLETE ALL OTHER EARTHWORK, PAVING, ETC. NECESSARY TO CONSTRUCT CROSSING.



TEMPORARY ASPHALT PAVEMENT (1)
NOT TO SCALE



ROADWAY PROFILE - TEMPORARY RAILROAD CROSSING (2)

HORIZONTAL SCALE: 1"=20' (0, 20', 40')
VERTICAL SCALE: 1"=4' (0, 4', 8')

1"=20' (20', 0, 20', 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

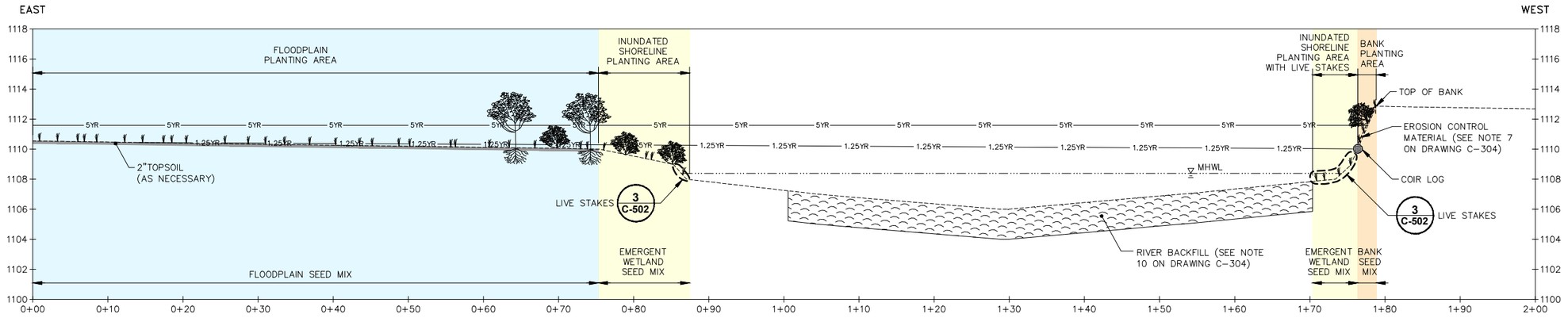
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 TEMPORARY RAILROAD CROSSING PLAN AND PROFILE

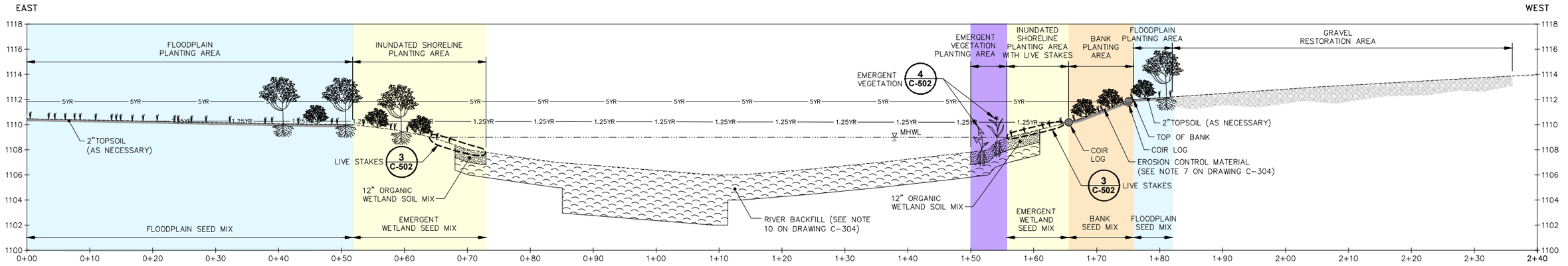
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

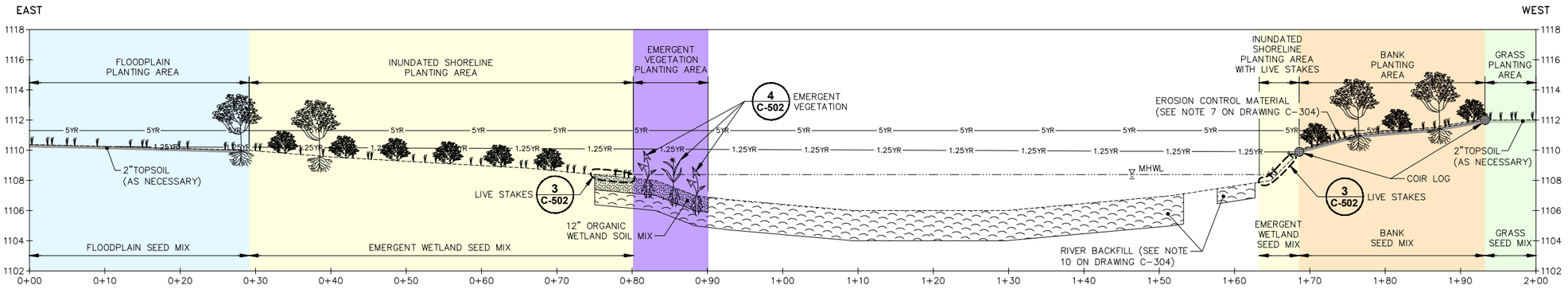
C-201



SECTION 1



SECTION 2



SECTION 3

NOTE:

1. SEE C-304 FOR NOTES AND LEGEND ITEMS APPLICABLE TO RIVERBED AND BANK RESTORATION DETAILS.

HORIZONTAL SCALE: 1"=8'

VERTICAL SCALE (2x): 1"=4'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OREN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

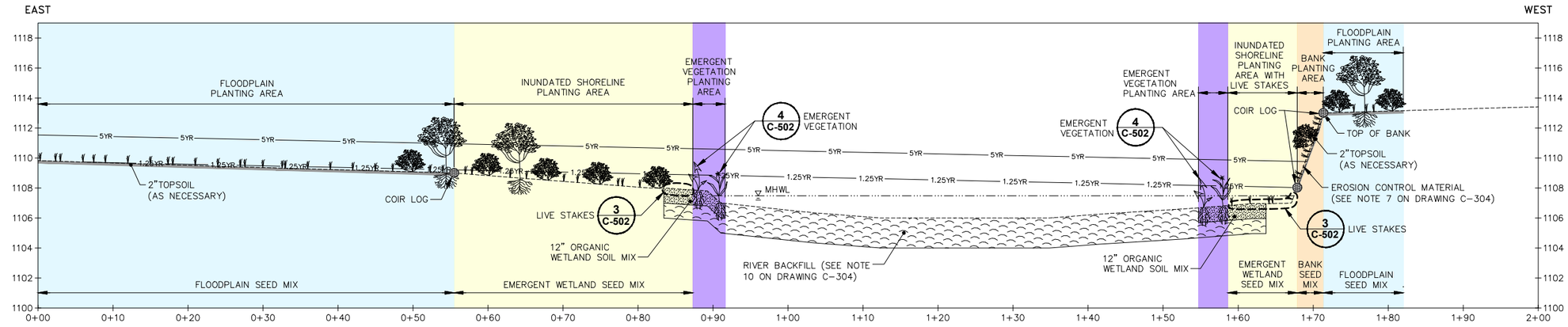
RIVERBED AND BANK RESTORATION DETAILS

ARCADIS Project No.
B0013137.0008.00016

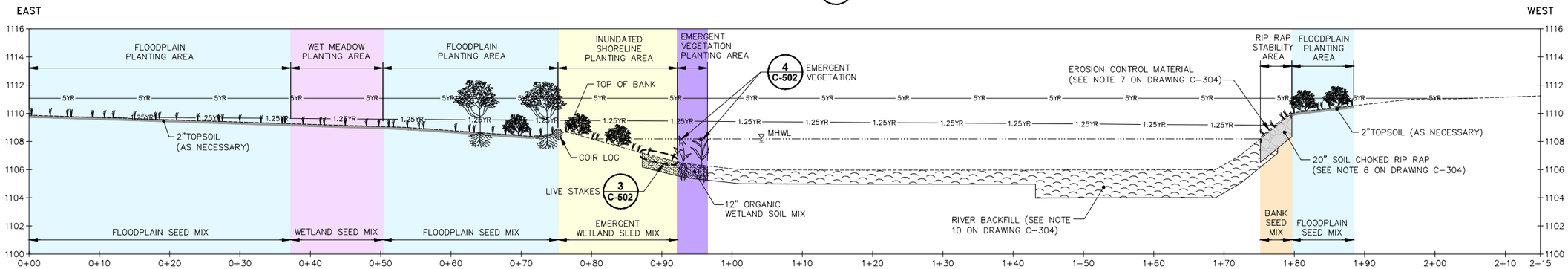
Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

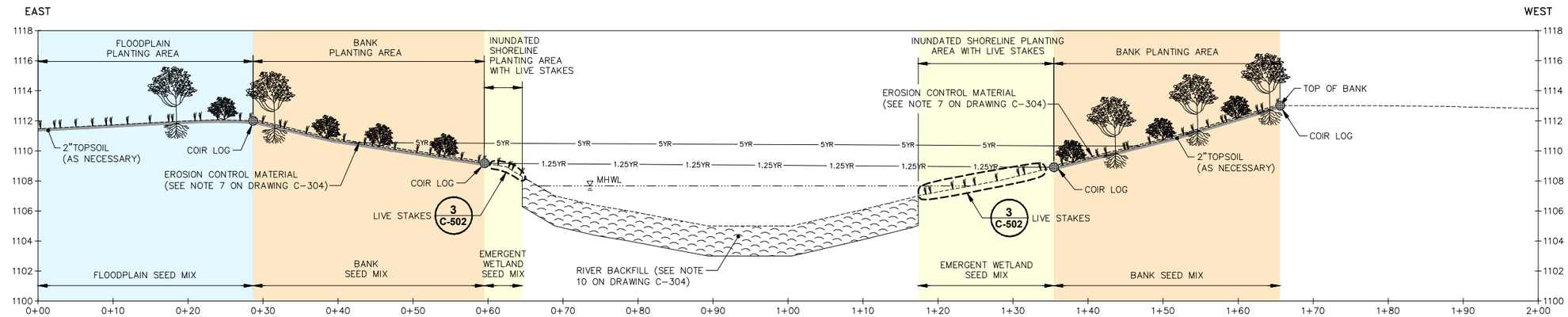
C-301



SECTION 4



SECTION 5



SECTION 6

NOTE:

1. SEE C-304 FOR NOTES AND LEGEND ITEMS APPLICABLE TO RIVERBED AND BANK RESTORATION DETAILS.

8' 0 8' 16'
HORIZONTAL SCALE: 1"=8'
4' 0 4' 8'
VERTICAL SCALE (2x): 1"=4'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

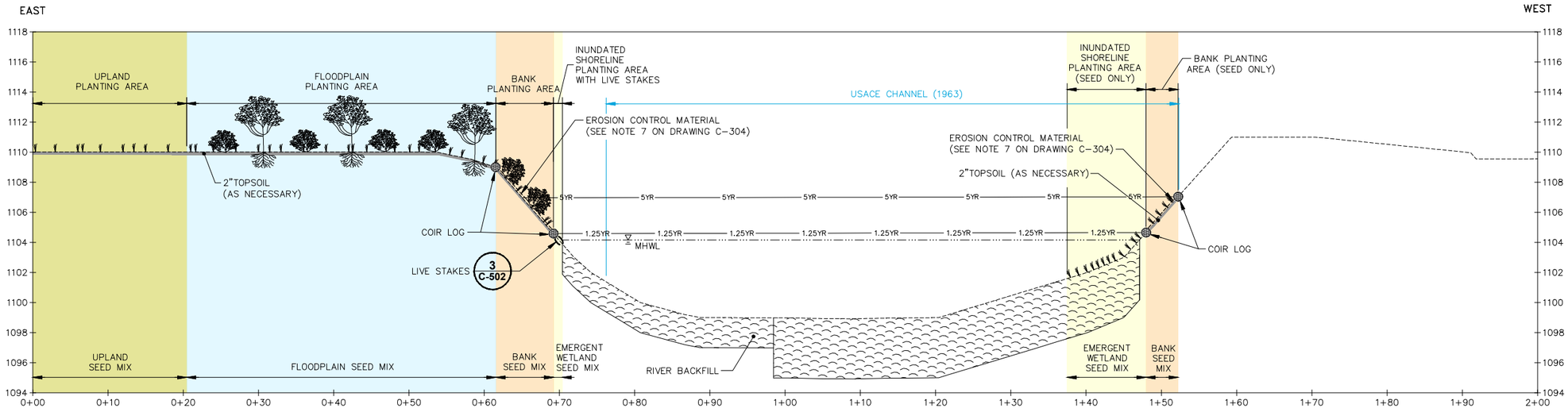
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RIVERBED AND BANK RESTORATION DETAILS

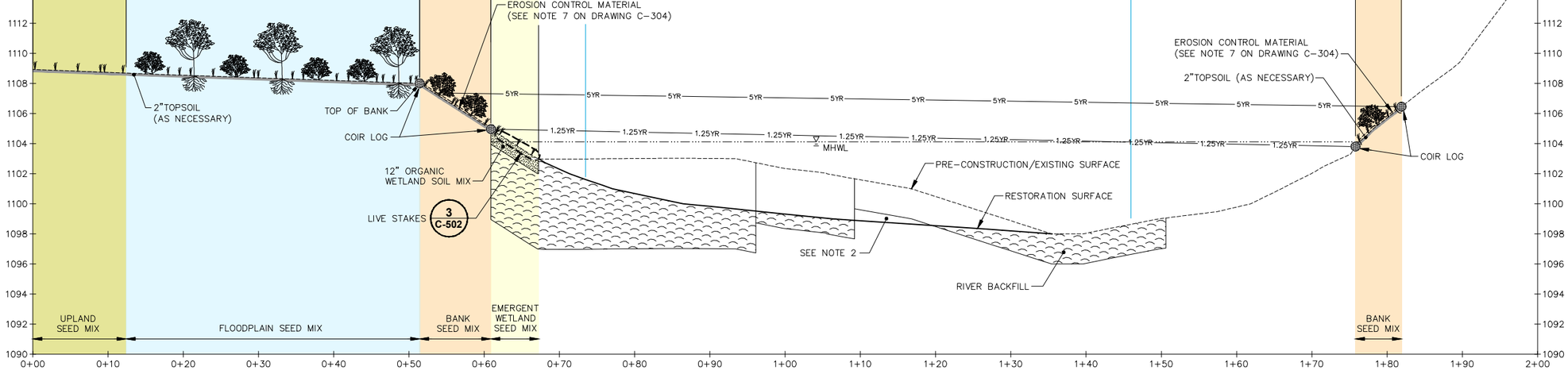
ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-302



SECTION 1



SECTION 2

NOTES:

1. SEE C–304 FOR NOTES AND LEGEND ITEMS APPLICABLE TO RIVERBED AND BANK RESTORATION DETAILS.
2. AT LOCATIONS WHERE EXCAVATION DOES NOT EXTEND TO THE RESTORATION SURFACE (I.E., HIGH SPOTS), CLEAN MATERIAL WILL BE EXCAVATED TO MEET THE RESTORATION GRADE AND USED AS BACKFILL IN ADJACENT EXCAVATION AREAS, PRIOR TO INSTALLING RIVER BACKFILL MATERIAL.

8' 0 8' 16' HORIZONTAL SCALE: 1"=8'
4' 0 4' 8' VERTICAL SCALE (2x): 1"=4'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	12/21/2020	RESTORATION MODIFICATIONS, USACE CHANNEL	BKD	JJB

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 3/10/2021 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985-1 LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

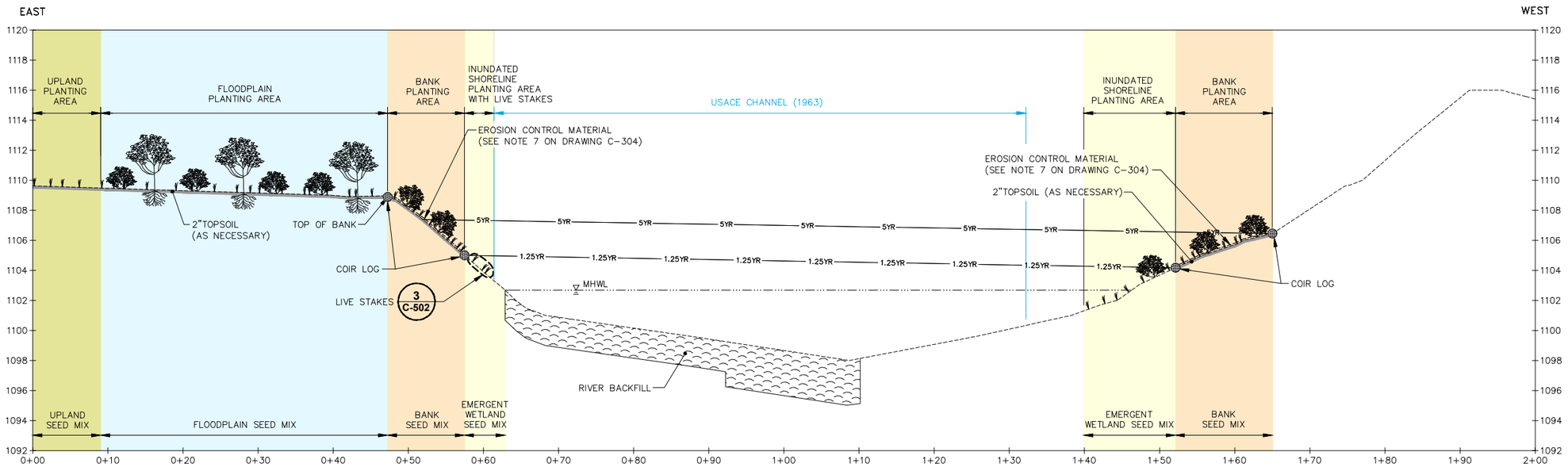
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RIVERBED AND BANK RESTORATION DETAILS

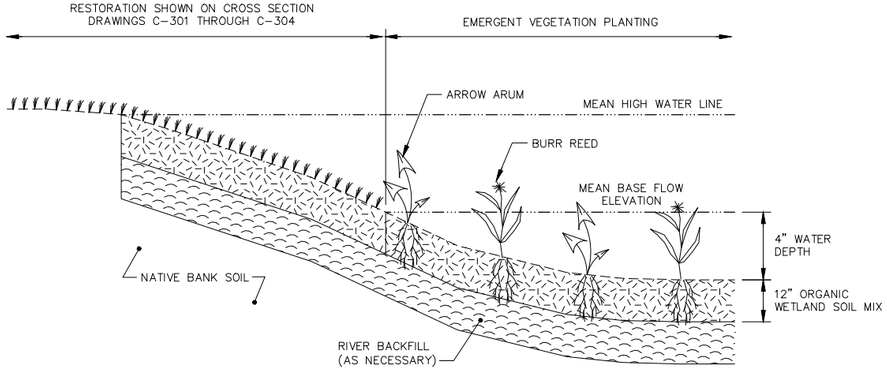
ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-303



SECTION 3



NOTE:

1. INSTALL EMERGENT VEGETATION AT 2.5 FEET ON CENTER SPACING AT A MEAN BASE FLOW ELEVATION THAT CORRESPONDS TO A MAXIMUM WATER DEPTH OF 4 INCHES. PLACE EMERGENT WETLAND SEED MIX FROM MEAN BASE FLOW ELEVATION TO THE EXTENT OF INUNDATED SHORELINE PLANTING AREA.

AREA 1 EMERGENT VEGETATION PLANTING AREA TYPICAL DETAIL 1

NOT TO SCALE

LEGEND:

- TREE 1 / C-502
- SHRUB 2 / C-502
- BIODEGRADABLE EROSION CONTROL BLANKET (SEE NOTE 7) 2 / C-503
- COIR LOG 1 / C-503
- 1.25YR — APPROXIMATE 1.25-YEAR STORM INTERVAL WATER LINE
- 5YR — APPROXIMATE 5-YEAR STORM INTERVAL WATER LINE

NOTES FOR C-301 TO C-304:

1. RESTORATION DETAIL(S) SHALL BE IMPLEMENTED ONLY IN AREAS DISTURBED BY REMEDIATION.
2. THICKNESSES NOTED ARE MINIMUM THICKNESSES.
3. RESTORE IN KIND, OUTLET PROTECTION DISTURBED DURING REMEDIAL CONSTRUCTION.
4. REPLACEMENT TREE OR SHRUBS WILL BE PLANTED IN ACCORDANCE WITH SPACING AND PLANTING RECOMMENDATIONS PROVIDED ON DESIGN DRAWINGS C-504A, C-504B, AND C-505.
5. TREES AND SHRUBS INSTALLED IN THE BANK AND FLOODPLAIN PLANTING AREA OF AREA 2 (I.E., EAST BANK) WILL BE PLANTED WITHIN 50 FEET OF THE MHWL.
6. RIP RAP STABILITY AREA WILL INCLUDE RIP RAP CHOKED WITH CLAYEY SOIL MIX. CLAYEY SOIL MIX AND RIP RAP WILL BE BLENDED PRIOR TO PLACEMENT. BANK SEED MIX WILL BE APPLIED AND A BIODEGRADABLE EROSION CONTROL MATERIAL WILL BE PLACED TO TO PROTECT BANK SEED.
7. INSTALL BIODEGRADABLE EROSION CONTROL MATERIALS OVER SEED MIX ABOVE THE 1.25-YEAR FLOOD ELEVATION IN RESTORATION AREAS. INSTALL BIODEGRADABLE EROSION CONTROL BLANKET (ECB) ON SLOPES GREATER THAN 3H:1V. INSTALL BIODEGRADABLE EROSION CONTROL MESH ON SLOPES LESS THAN 3H:1V. INSTALL COIR LOG AT TOP OF BANK TO ANCHOR EROSION CONTROL MATERIALS. EXTEND EROSION CONTROL MATERIALS FROM TOP OF BANK TO MWHL IF LIVE STAKES ARE NOT INSTALLED.
8. A POST-CONSTRUCTION SURVEY WILL BE COMPLETED BY THE REMEDIATION ENGINEER TO DETERMINE BASE FLOW WATER ELEVATION. EMERGENT VEGETATION PLANTINGS WILL BE INSTALLED FROM BASE FLOW ELEVATION TO A WATER DEPTH OF APPROXIMATELY 4-INCHES.
9. MHWL ELEVATIONS SHOWN ON CROSS SECTION DRAWINGS ARE APPROXIMATED TO EQUALIZE DIFFERENCES IN SURVEYED MHWL ELEVATIONS FROM SHORELINE TO SHORELINE.
10. PLACE RIVER COBBLE RANDOMLY AT THE TOP OF THE RESTORED RIVERBED SURFACE. RIVER COBBLE WILL ACCOUNT FOR 10% (BY WEIGHT) OF THE TOTAL RIVER BACKFILL QUANTITY. (2)

8' 0 8' 16'
HORIZONTAL SCALE: 1"=8'
4' 0 4' 8'
VERTICAL SCALE (2x): 1"=4'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
2	3/8/2021	ADDED RIVER COBBLE NOTE	KLS	JJB
1	12/21/2020	RESTORATION MODIFICATIONS, USACE CHANNEL	BKD	JJB

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 3/10/2021 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

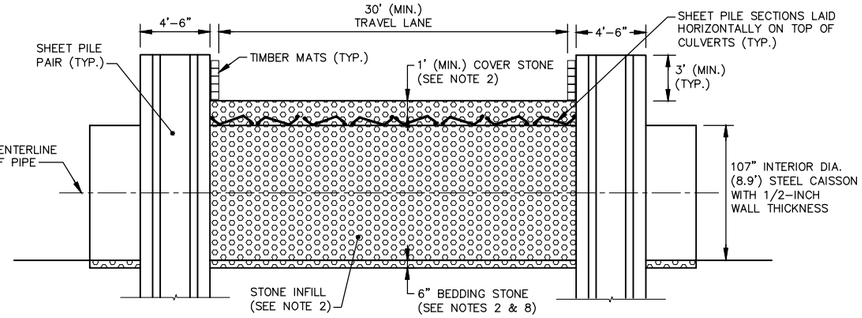
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RIVERBED AND BANK RESTORATION DETAILS

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

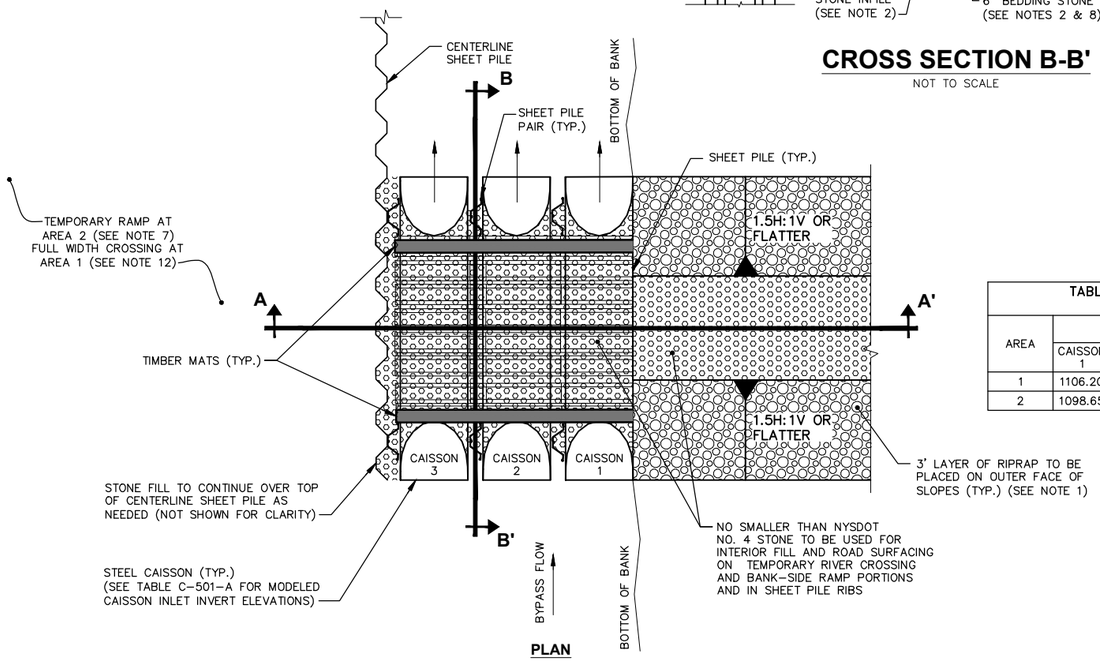
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-304

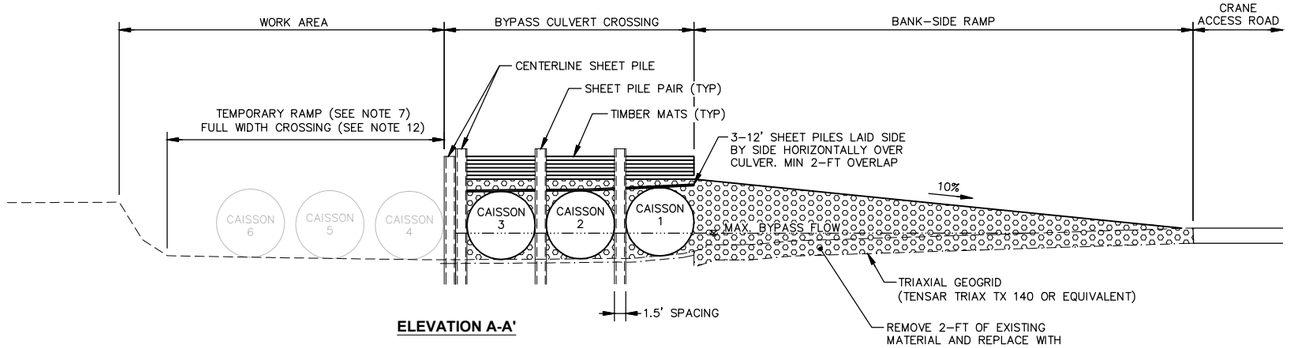


CROSS SECTION B-B'

NOT TO SCALE



PLAN



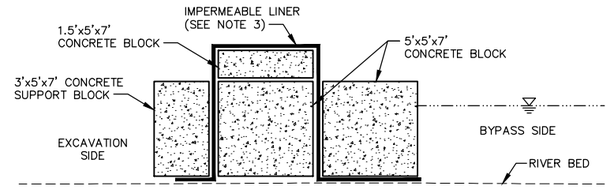
ELEVATION A-A'

BYPASS CULVERT CROSSING (1)

NOT TO SCALE

TABLE C-501-A – MODELED CAISSON INLET INVERT ELEVATIONS

AREA	INVERT ELEVATIONS (FT NAVD88)					
	CAISSON 1	CAISSON 2	CAISSON 3	CAISSON 4	CAISSON 5	CAISSON 6
1	1106.20	1106.20	1106.20	1106.20	1106.20	1106.20
2	1098.65	1098.65	1098.65			



NOTES:

1. ALTERNATIVE BYPASS SYSTEM TO BE USED IN THE EVENT THAT, DUE TO OVERHEAD STRUCTURE(S) OR BEDROCK AT SEDIMENT SURFACE, THE REMEDIATION CONTRACTOR IS UNABLE TO DRIVE STEEL SHEETING. REMEDIATION CONTRACTOR MAY PROPOSE ADDITIONAL ALTERNATIVE BYPASS BARRIER(S). ADDITIONAL ALTERNATIVE BYPASS BARRIERS WILL BE APPROVED BY THE REMEDIATION ENGINEER PRIOR TO INSTALLATION.
2. PRIOR TO BACKFILLING EXCAVATION, WATER ENTERING OR WITHIN THE EXCAVATION AREA WILL BE PUMPED TO THE ONSITE WATER TREATMENT SYSTEM FOR TREATMENT AND DISCHARGE IN ACCORDANCE WITH SPECIFICATION 01 53 53, TEMPORARY WATER TREATMENT AND MANAGEMENT.
3. IMPERMEABLE LINER WILL BE OVERLAPPED IN THE DIRECTION OF FLOW AS NECESSARY TO MITIGATE WATER INFILTRATION.
4. PRIOR TO PLACEMENT OF CONCRETE BLOCKS THE EXISTING GRADE SURFACE WILL BE SMOOTHED, TO THE EXTENT FEASIBLE, TO BE FREE OF MATERIAL THAT COULD AFFECT THE STABILITY OF BLOCKS AND UNIFORM CONTACT WITH THE EXISTING GRADE. FILL OR LEVELING MATERIAL, WHERE NEEDED TO CREATE A BETTER SEAL WITH THE RIVER BED AND LIMIT WATER INFILTRATION TO THE WORK AREA, WILL BE WASHED SAND OR PEA GRAVEL MATERIAL WITH LESS THAN 5% FINES. IF FILL MATERIAL IS NOT USED, LINER WILL BE ANCHORED UNDERNEATH AN EXCAVATION-SIDE CONCRETE BLOCK.
5. REMEDIATION CONTRACTOR WILL PROPOSE METHODS OR PROCEDURES TO INTEGRATE THE ALTERNATE BYPASS BARRIER INTO THE SHEET PILE BYPASS BARRIER SYSTEM TO MAINTAIN A CONTINUOUS AND WATER TIGHT RIVER BYPASS SYSTEM, TO THE EXTENT PRACTICABLE.

ALTERNATIVE BYPASS BARRIER DETAIL (OVERHEAD STRUCTURE) (2)

NOT TO SCALE

NOTES:

1. RIPRAP WILL BE AS SPECIFIED IN SECTION 31 05 05, AGGREGATES FOR EARTHWORK.
2. BEDDING STONE, COVER STONE, AND STONE INFILL WILL BE NO. 4 STONE AS SPECIFIED IN SECTION 31 05 05, AGGREGATES FOR EARTHWORK OR SIMILAR WASHED GRAVEL.
3. ESTABLISH A MINIMUM OF THREE SURVEY CONTROL POINTS AT THE UPSTREAM AND DOWNSTREAM SIDES OF TEMPORARY CROSSINGS. SURVEY CONTROL POINTS AT A MINIMUM FREQUENCY OF ONCE PER DAY DURING USE OF TEMPORARY RIVER CROSSING AND ACCESS FOR EVIDENCE OF EXCESSIVE MOVEMENT IN ANY COMPONENT OF THE CROSSING THAT COULD INDICATE IMMINENT FAILURE (E.G., LEANING OF SHEET PILE SECTIONS BETWEEN PIPE AND/OR PIPE DEFLECTION).
4. SUPPLY, FABRICATE, INSTALL, MAINTAIN AND REMOVE TEMPORARY RIVER CROSSING, AS NECESSARY TO COMPLETE THE WORK. TEMPORARY RIVER CROSSING WILL BE INSTALLED, INSPECTED, MAINTAINED, AND REMOVED IN ACCORDANCE WITH THE REQUIREMENTS FOR A TEMPORARY ACCESS WATERWAY CROSSING IN THE LATEST EDITION OF THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.
5. MAXIMUM CAPACITY OF THE BYPASS CULVERT CROSSING, AS DESIGNED, IS 32 TONS FOR WHEELED EQUIPMENT AND 90 TONS FOR TRACKED EQUIPMENT.
6. MAINTAIN TEMPORARY RIVER CROSSING BY REPAIRING OR REPLACING ANY PORTION OR COMPONENT OF THE RIVER CROSSING THAT HAS BECOME WORN OR DAMAGED.
7. CONSTRUCT TEMPORARY RAMP WITH A MINIMUM CLEAR WIDTH OF 35 FEET AND A MAXIMUM SLOPE OF 10% (OR AS REQUIRED FOR SPECIFIC CONSTRUCTION EQUIPMENT) USING RIPRAP.
8. INSTALL STEEL CAISSONS BEGINNING AS CLOSE AS REASONABLY PRACTICAL TO TOE OF BANK OF NEAR SHORE, LEAVING NO LESS THAN 6 FEET CLEAR BETWEEN LAST CAISSON AND EDGE OF STEEL SHEET PILE.
9. COVER EXISTING STREAMBED WITH AT LEAST 6 INCHES OF NO. 4 STONE TO CREATE A RELATIVELY SMOOTH UNIFORM SURFACE ON WHICH TO BED THE STEEL CAISSONS. CAISSONS WILL NOT BE BEDDED DIRECTLY ON STREAMBED/COBBLE.
10. PERFORM PERIODIC INSPECTION TO ENSURE THAT THE CULVERTS, STREAMBED, AND STREAMBANKS ARE NOT DAMAGED, AND THAT SEDIMENT IS NOT ENTERING THE STREAM OR BLOCKING FISH PASSAGE OR MIGRATION. MAINTENANCE WILL BE PERFORMED, AS NEEDED IN A TIMELY MANNER TO ENSURE THAT STRUCTURES ARE IN COMPLIANCE WITH THIS DRAWING. THIS WILL INCLUDE REMOVAL AND DISPOSAL OF ANY TRAPPED SEDIMENT OR DEBRIS. SEDIMENT WILL BE DISPOSED OF AND STABILIZED OUTSIDE THE WATERWAY FLOOD PLAIN.
11. WHEN THE CROSSING HAS SERVED ITS PURPOSE, ALL STRUCTURES, INCLUDING CULVERTS, BEDDING, AND FILTER CLOTH MATERIALS WILL BE REMOVED WITHIN 7 CALENDAR DAYS. IN ALL CASES, THE CULVERT MATERIALS WILL BE REMOVED WITHIN ONE YEAR OF INSTALLATION. FINAL CLEAN-UP WILL CONSIST OF REMOVAL OF THE TEMPORARY STRUCTURE FROM THE WATERWAY, REMOVAL OF ALL CONSTRUCTION MATERIALS, RESTORATION OF ORIGINAL STREAM CHANNEL CROSS SECTION, AND PROTECTION OF THE STREAMBANKS FROM EROSION. REMOVAL MATERIAL WILL BE STORED OUTSIDE OF THE WATERWAY FLOODPLAIN. ALL AREAS DISTURBED DURING CULVERT REMOVAL WILL BE STABILIZED WITHIN 14 CALENDAR DAYS OF THE DISTURBANCE.
12. FOR FULL RIVER-WIDTH CROSSING AT AREA 1, CROSSING CONSTRUCTION WILL MIRROR THAT SHOWN (I.E., SIX CULVERTS ACROSS INSTEAD OF JUST THREE, AND SIMILAR SIDE PROTECTION AND BANK-SIDE RAMP).
13. INSTALLATION OF INTERIM DAMS (NOT SHOWN), TO FACILITATE CONSTRUCTION OF THE BYPASS CULVERT CROSSING, WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-201-A ON DRAWING S-201.
14. REMEDIATION CONTRACTOR MAY PROPOSE ALTERNATE RIVER CROSSINGS, WHICH MUST BE APPROVED BY THE DESIGN ENGINEER AND REMEDIATION ENGINEER PRIOR TO CONSTRUCTION. ALTERNATE RIVER CROSSINGS ARE SUBJECT TO HYDRAULIC MODELING BY THE DESIGN ENGINEER AND MAY NOT BE ANY MORE RESTRICTIVE TO RIVER FLOWS THAT THE CROSSING SHOWN HEREIN.

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

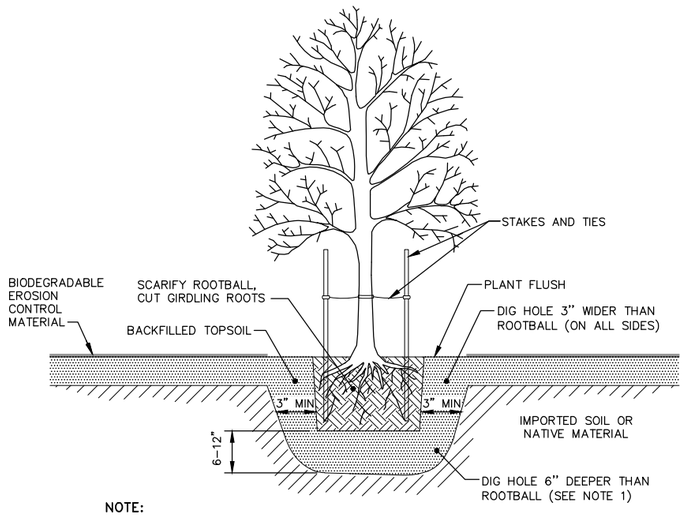
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

TEMPORARY RIVER CROSSING AND ALTERNATIVE BYPASS DETAILS

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-501

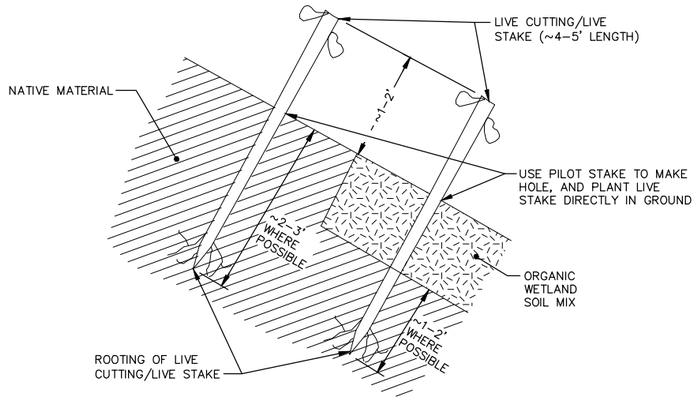


NOTE:

1. IF AT LEAST 6 INCHES OF SOIL IS PRESENT BELOW THE BOTTOM OF THE HOLE 6 INCHES MIN. OF TOPSOIL WILL BE PLACED BELOW THE ROOTBALL. IF LESS THAN 6 INCHES OF NATIVE SOIL IS PRESENT BELOW THE BOTTOM OF THE HOLE, THE HOLE WILL BE DUG DEEPER SUCH THAT UP TO 12 INCHES OF TOPSOIL CAN BE PLACED BELOW THE ROOTBALL.
2. PROVIDE AND INSTALL 2" X 4" (MIN.) 14-GAUGE GALVANIZED WIRE MESH CYLINDERS TO PROTECT RESTORED TREES AT AREA 2. INSTALL IN ACCORDANCE WITH SPECIFICATION 32 90 00 -PLANTINGS AND RESTORATION.

TYPICAL TREE PLANTING DETAIL 1

NOT TO SCALE

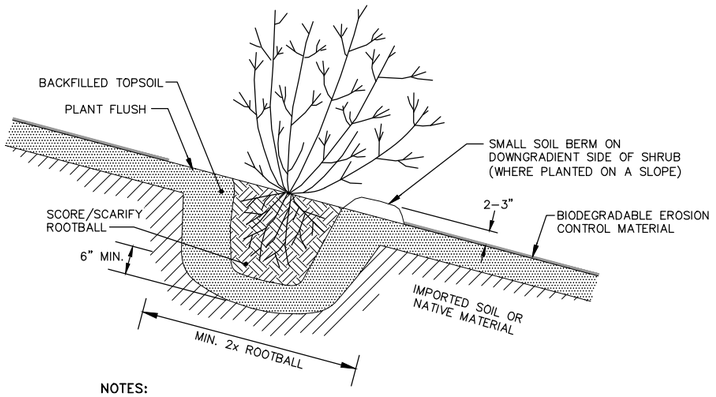


NOTES:

1. INSTALL LIVE STAKES SUCH THAT A MINIMUM OF 1' (2' WHERE POSSIBLE) OF STAKE IS EXPOSED ABOVE SURFACE AND ROOTING IS INSTALLED APPROXIMATELY ~1-3' IN TO SOIL, WHERE POSSIBLE.
2. LIVE CUTTING / LIVE STAKE LENGTH WILL BE BASED ON AVAILABILITY FROM LOCAL OR REGIONAL SUPPLIERS. TARGET WILL BE A MINIMUM OF 4-FOOT LENGTHS.

TYPICAL LIVE STAKE PLANTING DETAIL 3

NOT TO SCALE

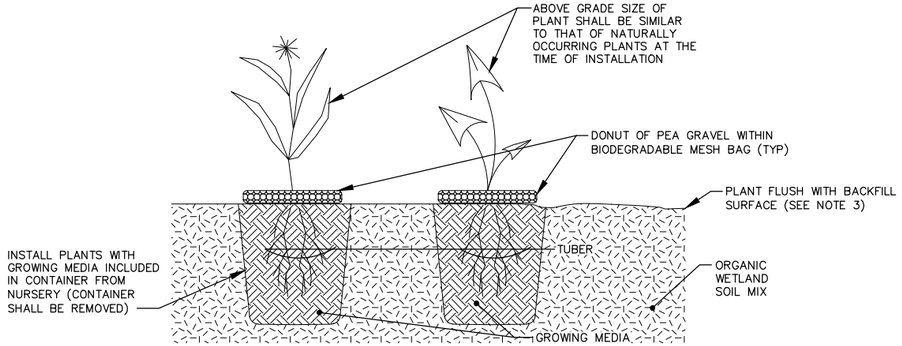


NOTES:

1. IN AREAS WHERE SOIL EROSION CONTROL MATERIAL HAS BEEN PLACED, A SMALL HOLE OR SLIT WILL BE MADE IN THE BLANKET TO ALLOW ACCESS TO THE SOIL. DISTURBANCE TO THE EROSION CONTROL MATERIAL WILL BE THE MINIMAL NECESSARY TO FACILITATE PLANTING.
2. DIG HOLE 3" BIGGER THAN ROOTBALL (ON ALL SIDES) AND REFILL WITH TOPSOIL (FERTILIZE AS NEEDED).

TYPICAL SHRUB PLANTING DETAIL 2

NOT TO SCALE



BURR REED **ARROW ARUM**

NOTES:

1. GROWING MEDIA SHALL CONSIST OF PEAT AND SAND.
2. PEA GRAVEL (OR SIMILAR) IN BIODEGRADABLE MESH BAG SHALL BE ADDED TO THE TOP OF RESTORED SURFACE AROUND PLANT.
3. TOP OF PLUG (I.E., GROWING MEDIA FROM CONTAINER) SHALL BE PLANTED FLUSH WITH OR NO MORE THAN 1 INCH BELOW THE BACKFILL SURFACE.
4. AQUATIC BED SPECIES SHALL BE PLANTED APPROXIMATELY 2.5-FEET ON CENTER.

EMERGENT VEGETATION SPECIES PLANTING DETAIL 4

NOT TO SCALE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: _____ USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	3/8/2021	ADDED TREE PROTECTION NOTE	KLS	JJB

Professional Engineer's Name	MARK O. GRAVELDING	
Professional Engineer's No.	069985-1	
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

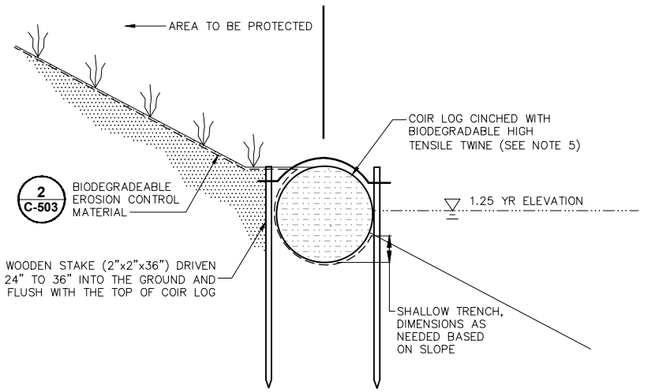
RESTORATION DETAILS

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-502



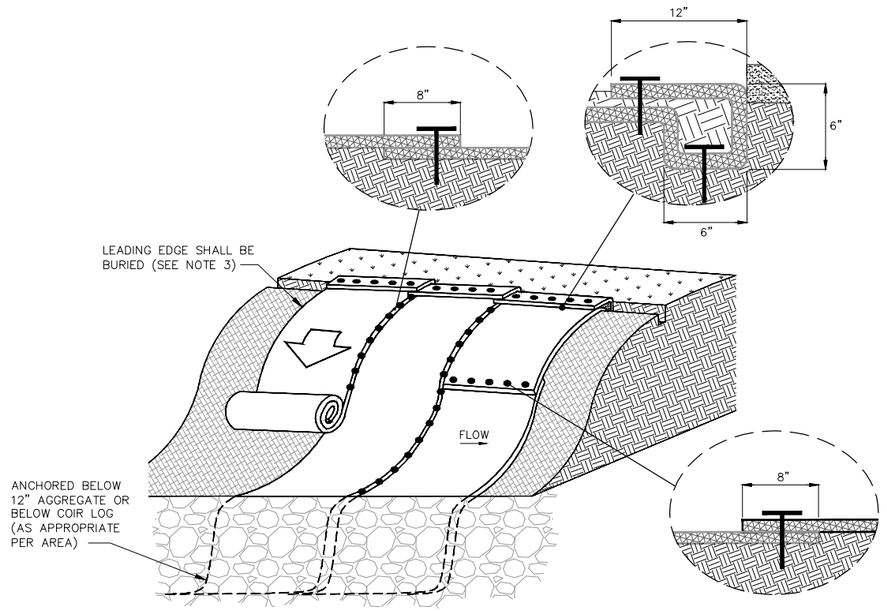
SECTION VIEW

NOTES:

1. COIR LOG WILL BE PLACED ON OR NEAR THE MHWL ELEVATION, AND END OF COIR LOG SHALL BE TURNED UP-GRADIENT AT UPSTREAM END OF INSTALLATION. USE OF COIR LOGS IS INTENDED TO PROTECT AGAINST EXCESSIVE FLOWS OR SEDIMENT TRANSPORT INTO THE RESTORED AREA ABOVE THE MHWL ELEVATION.
2. COIR LOGS WILL BE A MINIMUM 12" DIAMETER AND WILL BE COMPRISED OF BIODEGRADABLE MATERIALS.
3. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW MHWL ELEVATION AND PLACE COIR LOG IN TRENCH WITH POSTS PLACED ON BOTH SIDES OF THE ROLL AND SPACED LATERALLY ON 2-4' INTERVALS OR AS RECOMMENDED BY THE MANUFACTURER.
4. PLACE SOIL EXCAVATED FROM TRENCH UPGRADIENT OF THE COIR LOG AND HAND TAMPED. VEGETATION WILL BE PLACED IMMEDIATELY ADJACENT TO THE COIR LOG TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION WILL BE PLANTED INTO THE FIBER ROLL, WHERE APPLICABLE.
5. NOTCH WOODEN STAKES AND TIE TOGETHER, ACROSS THE COIR LOG, WITH HIGH TENSILE TWINE.
6. BIODEGRADABLE COIR LOGS WILL BE 9 LBS/FT^3 DENSITY OR EQUIVALENT FROM EAST COAST EROSION, ROLANKA, OR GEI WORKS (OR APPROVED EQUAL).

BIODEGRADABLE COIR LOG 1

NOT TO SCALE

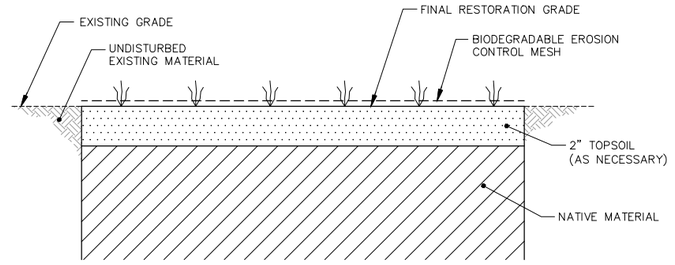


NOTES:

1. INSTALL BIODEGRADABLE EROSION CONTROL BLANKET (ON SLOPES GREATER THAN 3H:1V) OR BIODEGRADABLE EROSION CONTROL MESH (ON SLOPES LESS THAN 3H:1V), AS NECESSARY.
2. INSTALL ALL EROSION CONTROL MATERIALS AND ASSOCIATED PRODUCTS IN ACCORDANCE WITH MANUFACTURER INSTALLATION RECOMMENDATIONS AND GUIDELINES FOR HIGH FLOW CHANNELS.
3. INSTALL EROSION CONTROL MATERIAL PARALLEL TO THE DIRECTION OF THE SLOPE. INSTALL ANCHOR TRENCH AT THE UP-GRADIENT AND UPSTREAM EDGE OF THE INSTALLATION. OVERLAP EROSION CONTROL MATTING IN ACCORDANCE WITH MANUFACTURE RECOMMENDATIONS.
4. INSTALL BIODEGRADABLE ANCHORS (AS APPROVED BY NYSDEC) ON EROSION CONTROL MATERIAL OVERLAPS, AT THE TOE OF THE EROSION CONTROL MATERIAL ROLL AND THROUGHOUT THE EROSION CONTROL MATERIAL INSTALLATION PER MANUFACTURER INSTALLATION RECOMMENDATIONS AND GUIDELINES TO ENSURE THE EROSION CONTROL PRODUCT IS PROPERLY IN CONTACT WITH THE UNDERLYING GRADE.

BIODEGRADABLE EROSION CONTROL MATERIAL 2

NOT TO SCALE

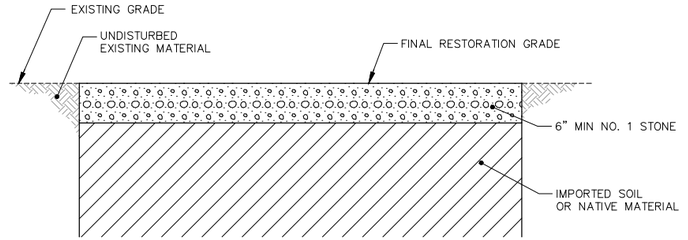


NOTES:

1. TOPSOIL AND SEEDING TO BE INSTALLED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 00, TOPSOIL AND SEEDING.

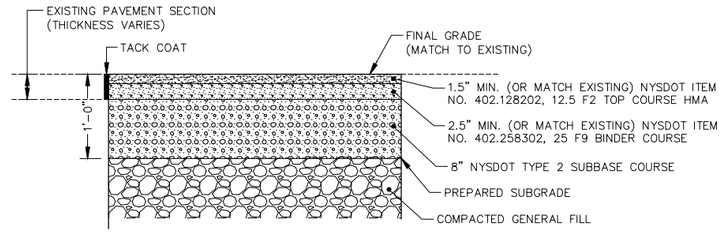
TYPICAL UPLAND RESTORATION DETAIL 3

NOT TO SCALE



TYPICAL GRAVEL COVER DETAIL 4

NOT TO SCALE



ASPHALT PARKING LOT 5

NOT TO SCALE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 3/10/2021 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION DETAILS

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-503

Table C-504 - Planting Scheme for Drawing C-108 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	100	0.002	5576	13	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	3	
Western Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	1,300	0.030	5576	166	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	42	
					Total	**6,970**	**224**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	4,950	0.114	300	34	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	23	
Salix sericea	Silky willow	Shrub	OBL			200	23	
					Total	**700**	**80**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharinum	Silver maple	Tree	FACW				2	
					Total		**4**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	830	0.019	500	10	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	8	
Salix nigra	Black willow	Shrub	FACW			300	6	
					Total	**1,200**	**24**	

Inundated Shoreline Planting Area (With Live Stakes) - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	2,400	0.055	500	28	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	22	
Salix nigra	Black willow	Shrub	FACW			300	17	
					Total	**1,200**	**67**	

Bank Planting Area - Western Shoreline [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	2,300	0.053	200	11	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	11	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	8	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	8	
Cornus amomum	Silky dogwood	Shrub	FACW			200	11	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	8	
Salix nigra	Black willow	Shrub	FACW			150	8	
					Total	**1,200**	**65**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	39,100	0.898	76	68	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	67	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	67	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	68	
					Total	**302**	**270**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	10	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				10	
Acer saccharinum	Silver maple	Tree	FACW				12	
Quercus palustris	Pin oak	Tree	FACW				9	
					Total		**41**	

Table C-504 - Planting Scheme for Drawing C-109 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	4,300	0.099	5576	550	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	138	
Western Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	1,400	0.032	5576	179	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	45	
					Total	**6,970**	**912**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	17,000	0.390	300	117	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	78	
Salix sericea	Silky willow	Shrub	OBL			200	78	
					Total	**700**	**273**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	13	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharinum	Silver maple	Tree	FACW				12	
					Total		**25**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	2,500	0.057	500	29	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	23	
Salix nigra	Black willow	Shrub	FACW			300	17	
					Total	**1,200**	**69**	

Inundated Shoreline Planting Area (With Live Stakes) - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	2,900	0.067	500	33	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	27	
Salix nigra	Black willow	Shrub	FACW			300	20	
					Total	**1,200**	**80**	

Bank Planting Area - Western Shoreline [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	5,900	0.135	200	27	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	27	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	20	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	20	
Cornus amomum	Silky dogwood	Shrub	FACW			200	27	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	20	
Salix nigra	Black willow	Shrub	FACW			150	20	
					Total	**1,200**	**161**	
Populus deltoides	Cottonwood	Tree	FAC	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				2	
Acer saccharinum	Silver maple	Tree	FACW				2	
Betula nigra	River birch	Tree	FACW				3	
					Total		**9**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	32,600	0.748	76	57	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	56	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	56	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	57	
					Total	**302**	**226**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-504. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				11	
Acer saccharinum	Silver maple	Tree	FACW				1	
Quercus palustris	Pin oak	Tree	FACW				9	
					Total		**23**	

Grass Planting Area - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Vaccinium angustifolium	Lowbush blueberry	Shrub	FAC	6,400	0.147	80	12	See Detail 2 on Sheet C-502. Plant in clumps of 2 to 3 along top of bank. Minimum 16 foot on-center spacing.
Corylus americana	American hazlenut	Shrub	FACU			80	12	
Comptonia peregrina	Sweet fern	Shrub	NL			80	12	
Viburnum acerifolium	Maple leaf viburnum	Shrub	UPL			80	12	
					Total	**320**	**48**	
Acer saccharum	Sugar maple	Tree	FACU	NA	NA	See Notes 5 and 6	4	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Carya ovata	Shagbark hickory	Tree	FACU				3	
Acer rubrum	Red maple	Tree	FAC				2	
Prunus serotina	Black cherry	Tree	FACU				3	
					Total		**12**	

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	3/8/2021	UPDATED PLANTING TABLE	KLS	JJB

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by	**Drawn by**	**Checked by**
JJB	BKD	LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG ● CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION PLANTING SCHEME - AREA 1

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-504 A

Table C-504 - Planting Scheme for Drawing C-110 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	400	0.009	5576	51	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	13	
Western Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	400	0.009	5576	51	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	13	
					Total	**6,970**	**128**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	12,300	0.282	300	85	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	56	
Salix sericea	Silky willow	Shrub	OBL			200	56	
					Total	**700**	**197**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	6	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharinum	Silver maple	Tree	FACW				6	
					Total		**12**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	600	0.014	500	7	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	6	
Salix nigra	Black willow	Shrub	FACW			300	4	
					Total	**1,200**	**17**	

Inundated Shoreline Planting Area (With Live Stakes) - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	700	0.016	500	8	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	6	
Salix nigra	Black willow	Shrub	FACW			300	5	
					Total	**1,200**	**19**	

Bank Planting Area - Western Shoreline [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	1,100	0.025	200	5	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	5	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	4	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	4	
Cornus amomum	Silky dogwood	Shrub	FACW			200	5	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	4	
Salix nigra	Black willow	Shrub	FACW			150	4	
					Total	**1,200**	**31**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	35,400	0.813	76	62	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	61	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	61	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	62	
					Total	**302**	**246**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	13	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				11	
Acer saccharinum	Silver maple	Tree	FACW				15	
Quercus palustris	Pin oak	Tree	FACW				9	
					Total		**48**	

Grass Planting Area - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Vaccinium angustifolium	Lowbush blueberry	Shrub	FAC	1,600	0.037	80	3	See Detail 2 on Sheet C-502. Plant in clumps of 2 to 3 along top of bank. Minimum 16 foot on-center spacing.
Corylus americana	American hazlenut	Shrub	FACU			80	3	
Comptonia peregrina	Sweet fern	Shrub	NL			80	3	
Viburnum acerifolium	Maple leaf viburnum	Shrub	UPL			80	3	
					Total	**320**	**12**	
Acer saccharum	Sugar maple	Tree	FACU	NA	NA	See Notes 5 and 6	1	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
					Total		**1**	

Table C-504 - Planting Scheme for Drawing C-111 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Sparganium americanum	American bur-reed	Herbaceous	OBL	400	0.009	5576	51	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
Peltandra virginica	Arrow arum	Herbaceous	OBL			1394	13	
					Total	**6,970**	**64**	

Inundated Shoreline Planting Area - Eastern Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	1,600	0.037	300	11	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	7	
Salix sericea	Silky willow	Shrub	OBL			200	7	
					Total	**700**	**25**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	2,100	0.048	500	24	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	19	
Salix nigra	Black willow	Shrub	FACW			300	14	
Western Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	2,900	0.067	500	33	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	27	
Salix nigra	Black willow	Shrub	FACW			300	20	
					Total	**1,200**	**137**	

Bank Planting Area - Eastern and Western Shorelines [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	8,100	0.186	200	37	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	37	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	28	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	28	
Cornus amomum	Silky dogwood	Shrub	FACW			200	37	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	28	
Salix nigra	Black willow	Shrub	FACW			150	28	
					Total	**1,200**	**223**	
Liriodendron tulipifera	Yellow poplar	Tree	FACU	NA	NA	See Notes 5 and 6	6	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				6	
Acer saccharinum	Silver maple	Tree	FACW				6	
Betula nigra	River birch	Tree	FACW				6	
					Total		**24**	

Floodplain Planting Area - Western Shoreline and Eastern Access Road

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	42,000	0.964	76	73	See Detail 2 on Drawing C-502. Plant 1-gallon container on 12 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			75	72	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			75	72	
Amerlanchier arborea	Serviceberry	Shrub	FAC			76	73	
					Total	**302**	**290**	
Salix nigra	Black willow	Tree	FACW	NA	NA	See Notes 5 and 6	5	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				5	
Acer saccharinum	Silver maple	Tree	FACW				10	
Quercus palustris	Pin oak	Tree	FACW				4	
					Total		**24**	

Grass Planting Area - Western Shoreline

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Vaccinium angustifolium	Lowbush blueberry	Shrub	FAC	4,100	0.094	80	8	See Detail 2 on Sheet C-502. Plant in clumps of 2 to 3 along top of bank. Minimum 16 foot on-center spacing.
Corylus americana	American hazlenut	Shrub	FACU			80	8	
Comptonia peregrina	Sweet fern	Shrub	NL			80	8	
Viburnum acerifolium	Maple leaf viburnum	Shrub	UPL			80	8	
					Total	**320**	**32**	
Acer saccharum	Sugar maple	Tree	FACU	NA	NA	See Notes 5 and 6	2	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FACU				2	
Carya cordiformis	Bitternut hickory	Tree	FACU				3	
Tilia americana	American basswood	Tree	FACU				2	
					Total		**9**	

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd.
1	3/8/2021	UPDATED PLANTING TABLE	KLS	JJB

Professional Engineer's Name: **MARK O. GRAVELDING**
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 3/10/2021 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.
NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION PLANTING SCHEME - AREA 1

ARCADIS Project No. B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-504 B

Table C-505 - Planting Scheme for Drawing C-113 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Western Shoreline								
Peltandra virginica	Arrow arum	Herbaceous	OBL	40	0.001	6970	6	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
					Total	**6,970**	**6**	

Inundated Shoreline Planting Area - Western Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	1,800	0.041	300	12	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	8	
Salix sericea	Silky willow	Shrub	OBL			200	8	
					Total	**700**	**28**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	600	0.014	500	7	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	6	
Salix nigra	Black willow	Shrub	FACW			300	4	
Western Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	200	0.005	500	2	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	2	
Salix nigra	Black willow	Shrub	FACW			300	1	
					Total	**1,200**	**22**	

Bank Planting Area - Eastern and Western Shorelines [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	6,400	0.147	200	29	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	29	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	22	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	22	
Cornus amomum	Silky dogwood	Shrub	FACW			200	29	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	22	
Salix nigra	Black willow	Shrub	FACW			150	22	
					Total	**1,200**	**175**	
Populus deltoides	Cottonwood	Tree	FAC	NA	NA	See Notes 5 and 6	3	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				2	
Acer saccharinum	Silver maple	Tree	FACW				1	
Betula nigra	River birch	Tree	FACW				2	
					Total		**8**	

Floodplain Planting Area - Eastern Access Road within Buffer Area

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	21,900	0.503	300	151	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			300	151	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			300	151	
Amerlanchier arborea	Serviceberry	Shrub	FAC			300	151	
					Total	**1,200**	**604**	
Tilia americana	American basswood	Tree	FACU	NA	NA	See Notes 5 and 6	24	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharum	Sugar maple	Tree	FACU				20	
Prunus serotina	Black cherry	Tree	FACU				24	
Quercus rubra	Red oak	Tree	FACU				24	
Carya cordiformis	Bitternut hickory	Tree	FACU				15	
					Total		**107**	

Table C-505 - Planting Scheme for Drawing C-114 (Eastern and Western Shoreline Areas)

Emergent Vegetation Planting Area - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Western Shoreline								
Peltandra virginica	Arrow arum	Herbaceous	OBL	140	0.003	6970	22	See Detail 4 on Drawing C-502. Plant 2 inch plugs on 2.5 foot on-center spacing.
					Total	**6,970**	**22**	

Inundated Shoreline Planting Area - Western Shoreline [3]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus amomum	Silky dogwood	Shrub	FACW	2,400	0.055	300	17	See Detail 2 on Drawing C-502. Plant 1-gallon container on 8 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			200	11	
Salix sericea	Silky willow	Shrub	OBL			200	11	
					Total	**700**	**106**	

Inundated Shoreline Planting Area (With Live Stakes) - Eastern and Western Shorelines

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Eastern Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	2,100	0.048	500	24	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	19	
Salix nigra	Black willow	Shrub	FACW			300	14	
Western Shoreline								
Cornus amomum	Silky dogwood	Shrub	FACW	500	0.012	500	6	See Detail 3 on Drawing C-502. Plant live stakes in offset rows on 6 foot on-center spacing.
Cornus sericea	Red-osier dogwood	Shrub	FACW			400	5	
Salix nigra	Black willow	Shrub	FACW			300	3	
					Total	**1,200**	**71**	

Bank Planting Area - Eastern and Western Shorelines [4]

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	20,000	0.46	200	92	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			200	92	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			150	69	
Amerlanchier arborea	Serviceberry	Shrub	FAC			150	69	
Cornus amomum	Silky dogwood	Shrub	FACW			200	92	
Cornus sericea	Red-osier dogwood	Shrub	FACW			150	69	
Salix nigra	Black willow	Shrub	FACW			150	69	
					Total	**1,200**	**552**	
Populus deltoides	Cottonwood	Tree	FAC	NA	NA	See Notes 5 and 6	4	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer rubrum	Red maple	Tree	FAC				4	
Carya cordiformis	Bitternut hickory	Tree	FACU				4	
Quercus rubra	Red oak	Tree	FACU				4	
					Total		**16**	

Floodplain Planting Area - Eastern Access Road within Buffer Area

Scientific Name	Common name	Stratum	Wetland Indicator	Area (sf)	Area (acre)	Density (stems/acre)	Total to Plant	Planting Notes
Cornus racemosa	Grey dogwood	Shrub	FAC	20,100	0.46	300	138	See Detail 2 on Drawing C-502. Plant 1-gallon container on 6 foot on-center spacing.
Viburnum dentatum	Arrowwood	Shrub	FAC			300	138	
Aronia melanocarpa	Black chokeberry	Shrub	FAC			300	138	
Amerlanchier arborea	Serviceberry	Shrub	FAC			300	138	
					Total	**1,200**	**552**	
Liriodendron tulipfera	Yellow poplar	Tree	FACU	NA	NA	See Notes 5 and 6	22	See Detail 1 on Drawing C-502. Minimum 12.5 foot on-center spacing.
Acer saccharum	Sugar maple	Tree	FACU				20	
Prunus serotina	Black cherry	Tree	FACU				22	
Quercus rubra	Red oak	Tree	FACU				20	
Carya cordiformis	Bitternut hickory	Tree	FACU				15	
					Total		**99**	

NOTES:

1. SEE SECTION 32 90 00, PLANTINGS AND RESTORATION FOR ADDITIONAL DETAILS.
2. WETLAND INDICATOR DESIGNATION SIGNIFIES ITS FREQUENCY OF OCCURRENCE IN A WETLAND: FACULTATIVE (FAC), FACULTATIVE UPLAND (FACU), FACULTATIVE WETLAND (FACW), NOT LISTED (NL), OBLIGATE (OBL), AND OBLIGATE UPLAND (UPL).
3. SHRUB PLANTING DENSITY ON EASTERN SHORELINE IS BASED ON EXISTING SITE CONDITIONS FOUND DURING PDI ACTIVITIES.
4. TREE AND SHRUB SPECIES WILL BE PLANTED IN BANK AREAS AS DIRECTED BY THE REMEDIATION ENGINEER. TO ACCOUNT FOR SPECIES TOLERANCE TO WET OR DRY CONDITIONS.
5. PLANTING PLAN ASSUMES ALL TREES WILL BE REMOVED WITHIN THE LIMITS OF DISTURBANCE. ESTIMATED QUANTITIES PROVIDE A CONSERVATIVE MAXIMUM NUMBER OF TREES TO BE REPLACED PER PLANTING AREA..
6. EXISTING TREES WITH DBH >3–INCHES LOCATED WITHIN THE ACTIVE CHANNEL (i.e., BELOW THE MHWL) THAT ARE REMOVED, WILL BE REPLACED IN KIND, ON A ONE FOR ONE TRUNK BASIS, WITH TREES PLANTED ABOVE THE MHWL (i.e., WITHIN THE ADJACENT BANK AND/OR FLOODPLAIN PLANTING AREAS).

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	3/8/2021	UPDATED PLANTING TABLE	BKD	JJB

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

ARCADIS
Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

RESTORATION PLANTING SCHEME - AREA 2

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

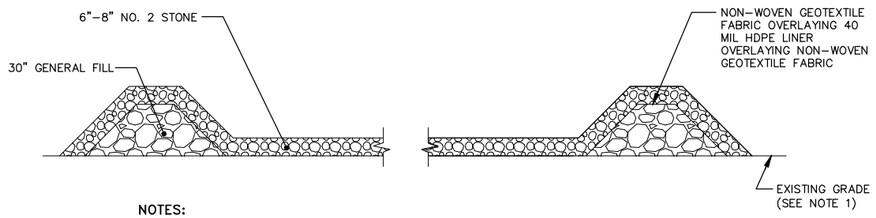
C-505

ABBREVIATIONS:

GAC	GRANULAR ACTIVATED CARBON
PVC	POLYVINYL CHLORIDE
SCH	SCHEDULE
TYP	TYPICAL
TDH	TOTAL DYNAMIC HEAD
GPM	GALLONS PER MINUTE
PSI	POUNDS PER SQUARE INCH

LEGEND:

- MAIN PROCESS PIPING
- SAMPLE TAP
- PRESSURE GAUGE
- FLANGE CONNECTION
- FLOW METER
- BALL VALVES
- CENTRIFUGAL PUMP
- 3" FLEXIBLE HOSE
- CAM LOCK CONNECTION

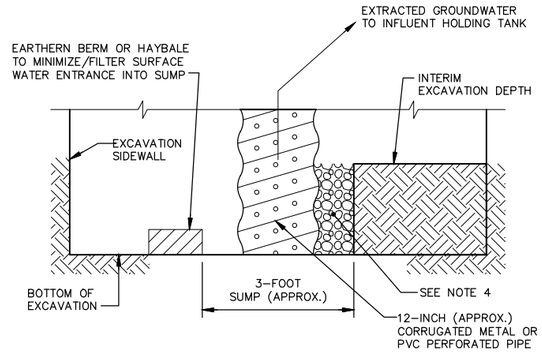


NOTES:

1. THE EXISTING GRADE SURFACE WILL BE UNIFORM AND FREE OF DELETERIOUS MATERIALS (E.G. WOODY DEBRIS, ETC.) THAT COULD EFFECT THE STABILITY OF THE PAD.
2. COMPACTION OF CRUSHED GRAVEL WILL BE SUFFICIENT DENSITY TO PROVIDE A FIRM AND UNIFORM SURFACE USING APPROPRIATE EQUIPMENT.
3. COMPACTION ABOVE GEOSYNTHETICS WILL BE PERFORMED IN A MANNER AND USING APPROPRIATE EQUIPMENT THAT AVOIDS DAMAGING THE GEOSYNTHETICS.
4. PAD SURFACE WILL BE 120 FEET BY 60 FEET MINIMUM.
5. ANY DAMAGE TO THE TEMPORARY WATER TREATMENT SYSTEM FOUNDATION PAD OR SECONDARY CONTAINMENT WILL BE ADDRESSED IMMEDIATELY BY THE REMEDIATION CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
6. REMEDIATION CONTRACTOR MAY PROPOSE USE OF A PREFABRICATED SPILL PREVENTION/SECONDARY CONTAINMENT SYSTEM IN LIEU OF THE TEMPORARY WATER TREATMENT SYSTEM FOUNDATION/CONTAINMENT SHOWN.
7. BERM HEIGHT CORRESPONDS TO AN APPROXIMATE FLOOD ELEVATION FOR A 5–YEAR STORM, PLUS 6 INCHES OF FREE–BOARD. IF LARGER STORM IS IMMINENT, INCREASE BERM HEIGHT TO 6 FEET (FOR 100–YEAR STORM) OR OTHERWISE PROTECT TEMPORARY WATER TREATMENT SYSTEM, AS NECESSARY.

WASTE WATER TREATMENT SYSTEM PAD DETAIL 1

NOT TO SCALE



NOTES:

1. THE INFORMATION SHOWN ON THIS DETAIL IS CONCEPTUAL AND PROVIDED FOR INFORMATIONAL PURPOSES.
2. TO THE EXTENT PRACTICABLE, TAKE MEASURES TO MINIMIZE THE PRESENCE OF SOLIDS IN THE EXTRACTED GROUNDWATER.
3. SUBMIT PROPOSED DEWATERING TECHNIQUE, LOCATIONS, DIMENSIONS, AND OTHER RELEVANT INFORMATION AS PART OF THE EXCAVATION AND MATERIAL DEWATERING PLAN.
4. WHERE THE PERFORATED PIPE EXTENDS INTO THE EXISTING SOIL FORMATION, A SUMP WILL BE CREATED, THE PIPE INSTALLED, AND NO. 2 STONE PLACED IN THE REMAINING SUMP AREA. IN THE ABSENCE OF GRAVEL, THE PIPE WILL BE WRAPPED IN A NON–WOVEN GEOTEXTILE FABRIC.

EXCAVATION DEWATERING SUMP DETAIL 2

NOT TO SCALE

C:\Users\ksartori\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021\01-DWG\RDR-DESIGN-DR\018-C-601-DETAILS.dwg SAVED: 3/8/2021 3:43 PM BY: SARTORI, KATHERINE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · LICENSED PROFESSIONAL ENGINEER · NO. 069985-1

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

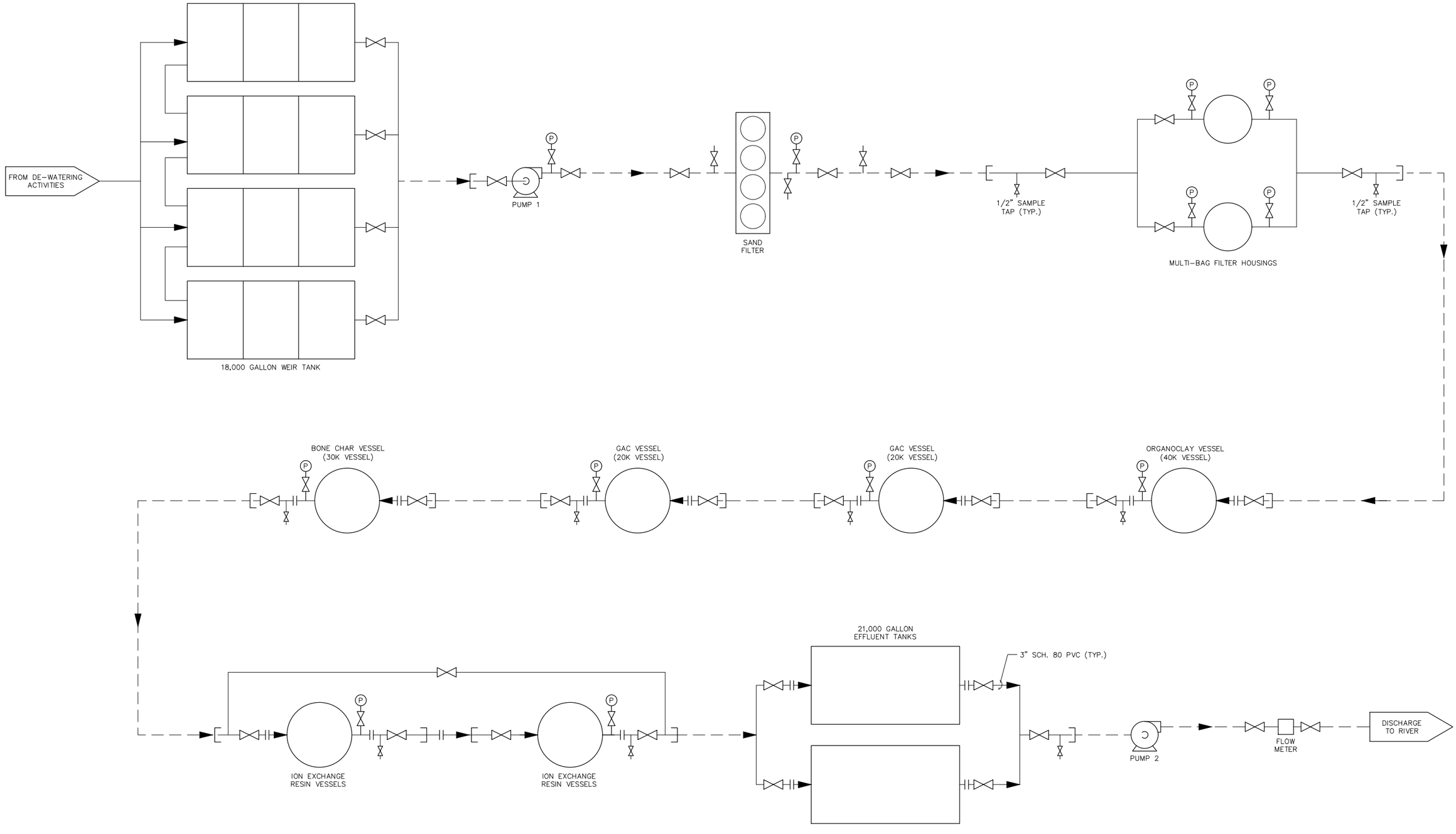
TEMPORARY WATER TREATMENT SYSTEM ABBREVIATIONS, LEGEND, AND DETAILS

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-601



C:\Users\kartorin\BIM 360\Arcadis\ANA - IBERDROLA USA\Project Files\NYSEG Cortland-Homer Fmr MGP Site\2021101-DWG\RDR-DESIGN-DR0119-C-602-P&ID.dwg SAVED: 3/8/2021 3:47 PM BY: SARTORI, KATHERINE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MARK O. GRAVELDING		
Professional Engineer's No.		
069985-1		
State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by	Drawn by	Checked by
JJB	BKD	LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

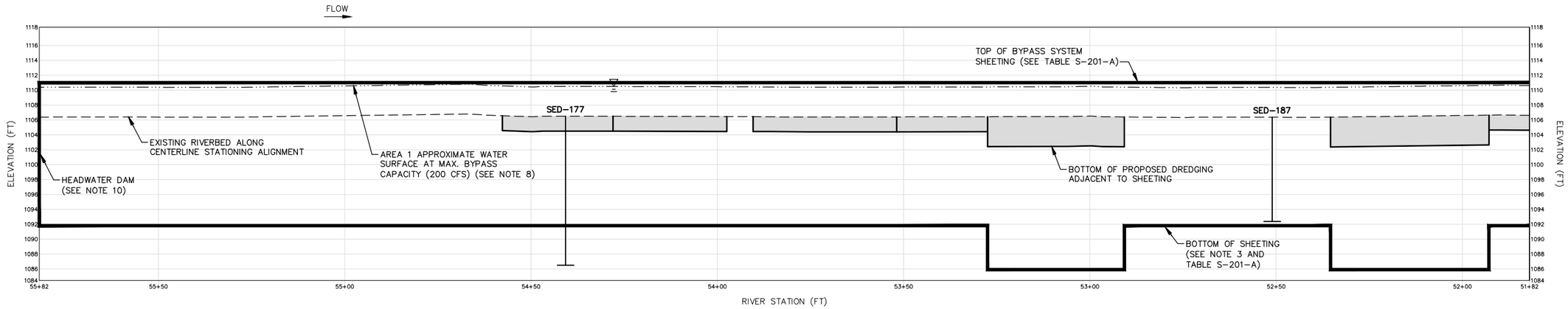
TEMPORARY WATER TREATMENT SYSTEM PIPING AND INSTRUMENTATION DIAGRAM

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

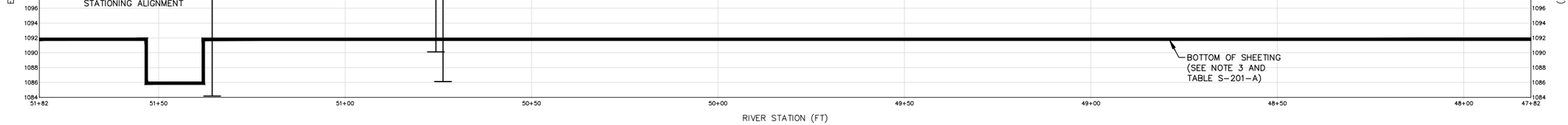
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

C-602



AREA 1 CENTERLINE BYPASS SYSTEM PROFILE (1)

SCALE AS INDICATED



AREA 1 CENTERLINE BYPASS SYSTEM PROFILE (2)

SCALE AS INDICATED

TABLE S-201-A – AREA 1 BYPASS STRUCTURE ELEVATIONS TABLE			
APPROXIMATE RIVER STATION LOCATION	MAXIMUM CENTERLINE TOP ELEVATION (FT NAVD88)	CENTERLINE BOTTOM ELEVATION (FT NAVD88)	MINIMUM LENGTH OF SHEET (FT)
55+82 TO 53+28	1111.0	1091.8	19.2
53+28 TO 52+90	1111.0	1085.9	25.1
52+90 TO 52+36	1111.0	1091.8	19.2
52+36 TO 51+92	1111.0	1085.9	25.1
51+92 TO 51+54	1111.0	1091.8	19.2
51+54 TO 51+36	1111.0	1085.9	25.1
51+36 TO 45+00	1111.0	1091.8	19.2
45+00 TO 44+68	1111.0	1085.9	25.1
44+68 TO 40+94	1111.0	1091.8	19.2
40+94 TO 40+74[1]	1111.0	NA	NA
40+74 TO 39+35	1111.0	1091.8	19.2

TABLE NOTE:

1. LOCATION OF ALTERNATIVE BYPASS BARRIER.

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA
- SEDIMENT BORING

RIVER BYPASS SYSTEM NOTES:

1. A BYPASS SYSTEM CONSISTING OF SHEET PILE WILL BE USED TO THE FULL EXTENT POSSIBLE CONSISTENT WITH THE DESIGN PROVIDED.
2. MINIMUM REQUIRED STEEL SHEET PILE SECTION MODULUS IS 46.0 CU.IN/FT FOR ALL REMOVAL AREAS. IT IS ASSUMED THAT EXISTING AZ-48 NYSEG-OWNED STEEL SHEET PILES ARE TO BE USED.
3. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-201-A AND IN THE CROSS SECTIONS.
4. NOTIFY DESIGN ENGINEER OF ANY AND ALL LOCATIONS WHERE EMBEDMENT CANNOT BE REACHED DURING INSTALLATION. ADDITIONAL CONTINGENCY MEASURES MAY BE REQUIRED TO PROVIDE ADEQUATE SHEET PILING SUPPORT UNDER SUCH CONDITIONS.
5. INSTALL DENEEF®SWELLSEAL®WA 90R EQUIVALENT HYDROPHILIC WATERSTOP) IN ALL SHEET PILE INTERLOCKS.
6. SEDIMENT REMOVAL REQUIRED TO SPECIFIED APPROXIMATE REMOVAL ELEVATION, AS SHOWN, AT A MINIMUM.
7. MONITOR THE BYPASS CHANNEL FOR EVIDENCE OF POTENTIAL SCOUR DURING IN-RIVER CONSTRUCTION. IF EVIDENCE OF POTENTIAL SCOUR IS OBSERVED, COORDINATE WITH THE REMEDIATION ENGINEER TO DETERMINE THE NEED FOR ADDITIONAL SCOUR PROTECTION MEASURES.
8. RIVERBED ELEVATIONS, WATER SURFACE ELEVATIONS, AND MAXIMUM BYPASS CAPACITIES ARE APPROXIMATE. THE MAXIMUM CAPACITY OF THE RIVER BYPASS SYSTEM WILL VARY BASED ON PHYSICAL CONSTRUCTION LIMITATIONS AND/OR UNKNOWN VARIATIONS IN ACTUAL FIELD CONDITIONS (E.G. RIVERBED BATHYMETRY, RIVERBED COMPOSITION).
9. CONSTRUCTION SEQUENCE INCLUDING SHEET PILE INSTALLATION SEQUENCE SHOWN ON DRAWING C-101 (AREA 1) AND C-104 (AREA 2). INSTALL SHEET PILE IN ACCORDANCE WITH TECHNICAL SPECIFICATION 31 50 00, EXCAVATION PROTECTION (BYPASS SYSTEM).
10. INSTALLATION OF HEADWATER, BACKWATER, AND INTERIM DAMS (NOT SHOWN) WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-201-A.
11. ANY PROPOSED DEVIATIONS FROM THE RIVER BYPASS SYSTEM CONFIGURATION SHOWN HEREIN MUST BE REVIEWED AND APPROVED BY THE DESIGN ENGINEER PRIOR TO IMPLEMENTATION. IF THE RIVER BYPASS SYSTEM IS INSTALLED AT ELEVATIONS HIGHER THAN STATED HEREIN, THE REMEDIATION CONTRACTOR IS LIABLE FOR ANY IMPACTS ASSOCIATED WITH INCREASED FLOOD POTENTIAL AND/OR THE REMEDIATION CONTRACTOR MAY BE REQUIRED TO PULL SELECT SHEET PILES TO MINIMIZE THE POTENTIAL FOR FLOODING DURING AN IMPENDING STORM/FLOOD EVENT.

15' 0 15' 30'
HORIZONTAL SCALE: 1"=15'
7.5' 0 7.5' 15'
VERTICAL SCALE: 1"=7.5'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	3/8/2021	UPDATED SECTION MODULUS	KLS	JJB

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: 3/10/2021 | Project Mgr.: JRG
Designed by: JJB | Drawn by: BKD | Checked by: LJP

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985 LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

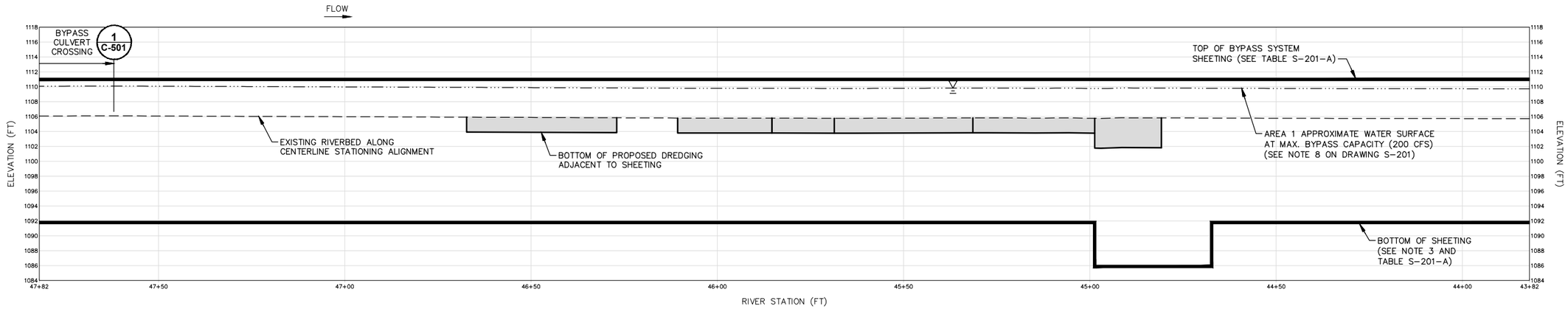
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 SHEET PILE PROFILE (STA. 55+82 TO STA. 47+82)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

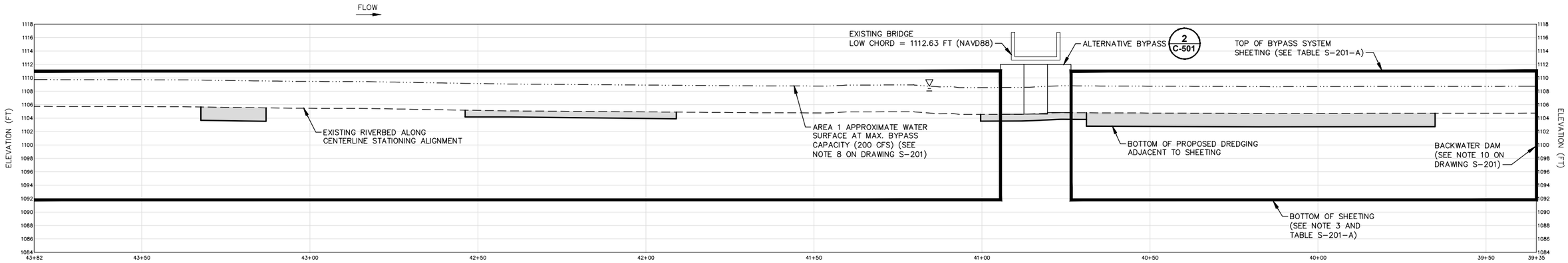
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

S-201



AREA 1 CENTERLINE BYPASS SYSTEM PROFILE 3

SCALE AS INDICATED



AREA 1 CENTERLINE BYPASS SYSTEM PROFILE 4

SCALE AS INDICATED

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA

RIVER BYPASS SYSTEM NOTES:

1. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-201-A AND IN THE CROSS SECTIONS.
2. INSTALLATION OF HEADWATER, BACKWATER, AND INTERIM DAMS (NOT SHOWN) WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-201-A.
3. REFER TO DRAWING S-201 FOR ADDITIONAL NOTES.

15' 0 15' 30' HORIZONTAL SCALE: 1"=15'
7.5' 0 7.5' 15' VERTICAL SCALE: 1"=7.5'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1

State	Date Signed	Project Mgr.
NY	3/10/2021	JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

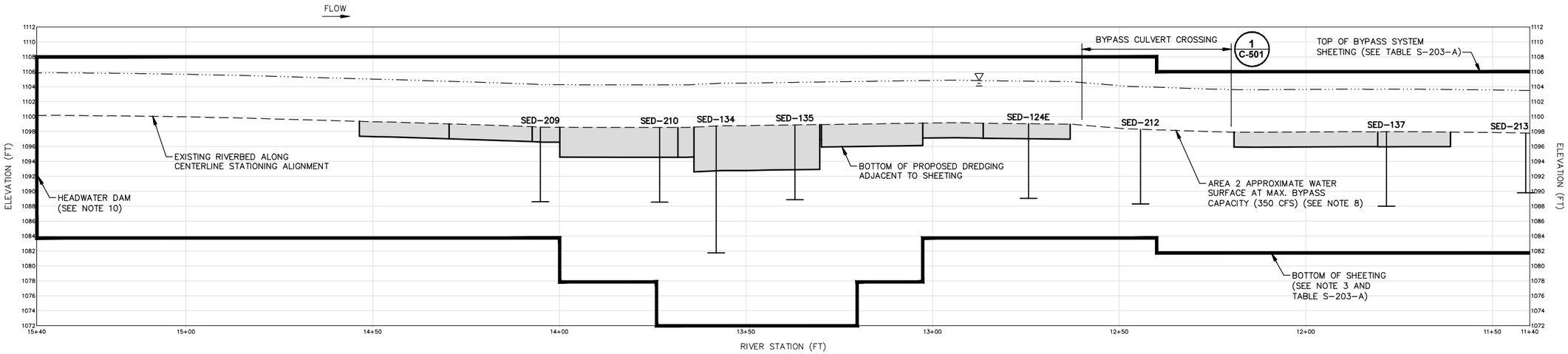
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 1 SHEET PILE PROFILE (STA. 47+82 TO STA. 39+35)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

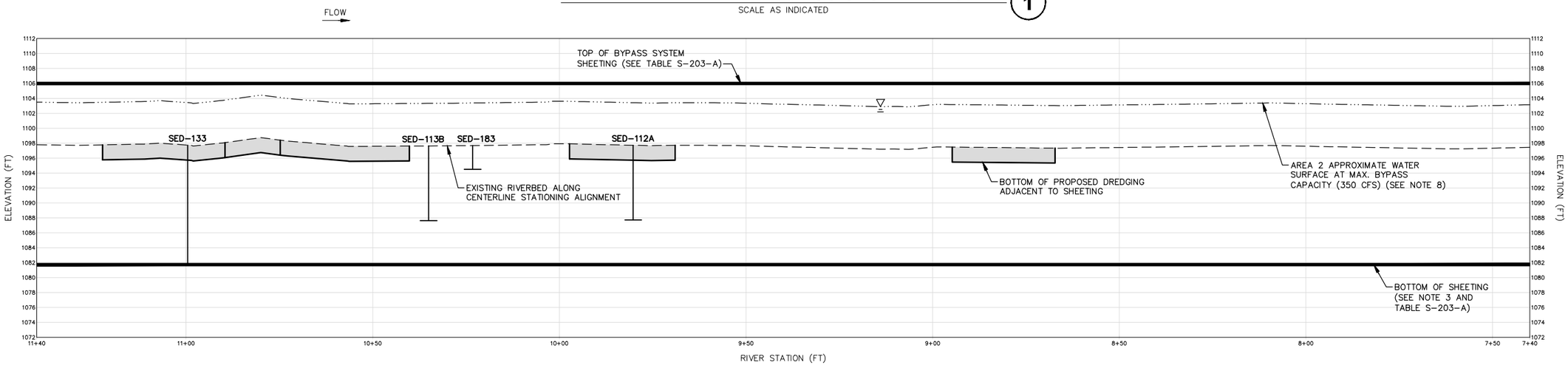
ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

S-202



AREA 2 CENTERLINE BYPASS SYSTEM PROFILE 1

SCALE AS INDICATED



AREA 2 CENTERLINE BYPASS SYSTEM PROFILE 2

SCALE AS INDICATED

TABLE S-203-A – AREA 2 BYPASS STRUCTURE ELEVATIONS TABLE			
APPROXIMATE RIVER STATION LOCATION	MAXIMUM CENTERLINE TOP ELEVATION (FT NAVD88)	CENTERLINE BOTTOM ELEVATION (FT NAVD88)	MINIMUM LENGTH OF SHEET (FT)
15+40 TO 14+00	1108.0	1083.7	24.3
14+00 TO 13+74	1108.0	1077.8	30.2
13+74 TO 13+20	1108.0	1072.0	36.0
13+20 TO 13+02	1108.0	1077.8	30.2
13+02 TO 12+42	1108.0	1083.7	24.3
12+42 TO 6+82	1106.0	1081.7	24.3
6+82 TO 6+32	1106.0	1075.8	30.2
6+32 TO 5+97	1106.0	1081.7	24.3

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA
- SEDIMENT BORING

RIVER BYPASS SYSTEM NOTES:

1. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-203-A AND IN THE CROSS SECTIONS.
2. INSTALLATION OF HEADWATER, BACKWATER, AND INTERIM DAMS (NOT SHOWN) WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-203-A.
3. REFER TO DRAWING S-201 FOR ADDITIONAL NOTES.

15' 0 15' 30' HORIZONTAL SCALE: 1"=15'
7.5' 0 7.5' 15' VERTICAL SCALE: 1"=7.5'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING		
Professional Engineer's No.: 069985-1		
State: NY	Date Signed: 3/10/2021	Project Mgr.: JRG
Designed by: JJB	Drawn by: BKD	Checked by: LJP

STATE OF NEW YORK · MARK OWEN GRAVELDING · NO. 069985-1 · LICENSED PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS OF NEW YORK, INC.

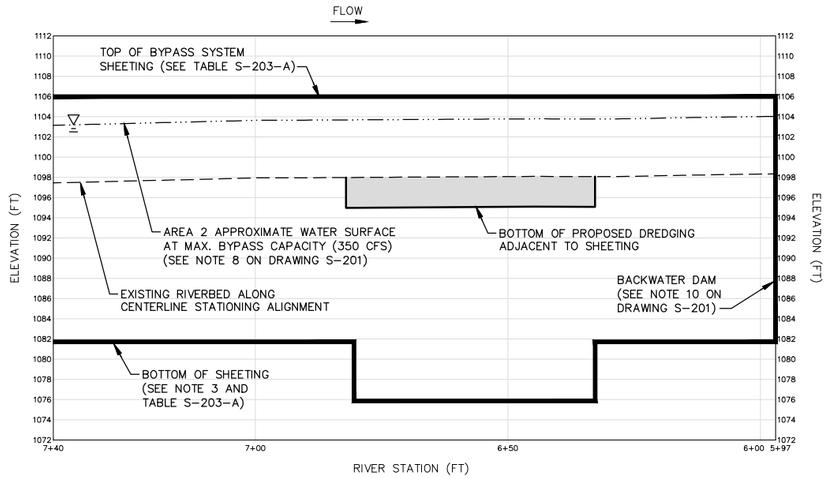
NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 SHEET PILE PROFILE (STA. 15+40 TO STA. 7+40)

ARCADIS Project No.: B0013137.0008.00016
Date: MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

S-203



AREA 2 CENTERLINE BYPASS SYSTEM PROFILE 3

SCALE AS INDICATED

LEGEND:

- SEDIMENT SURFACE
- WATER SURFACE ELEVATION
- SHEET PILE
- REMOVAL AREA

RIVER BYPASS SYSTEM NOTES:

1. INSTALL ALL STEEL SHEET PILES THROUGH THE RIVERBED MATERIAL PER THE RIVER BYPASS SYSTEM DESIGN. BOTTOM OF SHEETING IS SHOWN ON TABLE S-203-A AND IN THE CROSS SECTIONS.
2. INSTALLATION OF HEADWATER, BACKWATER, AND INTERIM DAMS (NOT SHOWN) WILL BE CONSISTENT WITH CORRESPONDING CENTERLINE SHEET PILE ELEVATIONS AS SHOWN IN TABLE S-203-A.
3. REFER TO DRAWING S-201 FOR ADDITIONAL NOTES.

15' 0 15' 30'
HORIZONTAL SCALE: 1"=15'
7.5' 0 7.5' 15'
VERTICAL SCALE: 1"=7.5'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name
MARK O. GRAVELDING
Professional Engineer's No.
069985-1
State: NY
Date Signed: 3/10/2021
Project Mgr.: JRG
Designed by: JJB
Drawn by: BKD
Checked by: LJP

STATE OF NEW YORK MARK OWEN GRAVELDING NO. 069985-1 LICENSED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NYSEG • CORTLAND-HOMER, NEW YORK
CORTLAND-HOMER FORMER MGP SITE
OPERABLE UNIT 2, REMEDIAL DESIGN REPORT

AREA 2 SHEET PILE PROFILE (STA. 7+40 TO STA. 5+97)

ARCADIS Project No.
B0013137.0008.00016

Date
MARCH 2021

ARCADIS OF NEW YORK, INC.
ONE LINCOLN CENTER
110 W FAYETTE STREET #300
SYRACUSE, NY 13202
TELEPHONE: 315-432-1529

S-204

Attachment 2

Technical Specifications

SECTION 01 57 05

TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. Remediation Contractor shall provide and maintain methods, equipment, materials, and temporary construction as required to control environmental conditions at the Site and adjacent areas.
   2. Maintain temporary controls until no longer required.
   3. Temporary controls include, but are not limited to, the following:
      a. Erosion, sediment, and turbidity controls.
      b. Control of surface water, including storm water run-on and run-off.
      c. Sheen controls.
      d. Odor, vapor, and dust controls.
      e. Pollution controls.
      f. Noise controls.

1.02 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with applicable provisions and recommendations of the following reference standards:
      a. New York State Department of Environmental Control (NYSDEC) New York State Standards and Specifications for Erosion and Sediment Control (latest edition).

1.03 SUBMITTALS

A. Informational Submittals:
   1. The Remediation Engineer shall submit daily turbidity monitoring report in accordance with Article 1.04 of this Section, or at a reduced frequency if requested by the Owner.
   2. The Remediation Engineer shall submit air monitoring report and exceedance report (as necessary) in accordance with Section 01 35 49, Community Air Monitoring Plan.

B. Action Submittals:
   1. The Remediation Contractor shall submit the following plans (separate or as part of the Remediation Contractor's Project Operation Plan):
      a. Erosion and Sediment Control Plan.
      b. Turbidity and Sheen Control Plan.
      c. Noise Control Plan.
      d. Odor, Dust, and Vapor Control Plan.
      e. Pollution Control Plan.
   2. Product Data: Submit manufacturer's product data, specifications, and installation instructions for the following:
      a. Fiber Roll, Silt fencing.
      b. Turbidity curtain system materials.
      c. Oil absorbent boom materials.
      d. Vapor mitigation agents and proposed application and storage equipment for each.
   3. Turbidity monitoring data, in accordance with Article 3.02 of this Section.

1.04 DAILY TURBIDITY MONITORING REPORTS

A. Remediation Engineer shall prepare turbidity monitoring reports throughout the Project. Include in each report, at a minimum, the following:
   1. Remediation Contractor's name.
   2. Owner's name.
   3. Remediation Engineer's name.
   4. Project name.
   5. Site name and location.
   6. The following for each day that turbidity monitoring is performed:
      a. Date and day of the week.
      b. General location and brief description of work performed at the Site.
      c. Turbidity results for each monitoring station and the differential between the upstream and downstream monitoring stations.
      d. Daily maximum differential between the upstream and downstream monitoring stations.
      e. Exceedances (if any) of the action levels specified in Article 3.02.F of this Section. Provide the following:
         1) Time, location, and reading (above background) of exceedance.
         2) General location and brief description of work being performed at time of exceedance.
         3) Source or cause of exceedance, if determined.
         4) Corrective actions taken or to be taken in response to exceedance.
         5) Date and time verbal or written notification was provided to NYSDEC of the exceedance.
      f. Notation of visual observation of turbidity, if any.

B. Remediation Engineer will distribute daily turbidity monitoring reports within three business days after the day covered in the associated report:
   1. Owner.
   2. Remediation Contractor.
   3. NYSDEC.
   4. New York State Department of Health.
   5. Others as appropriate.

PART 2 – PRODUCTS

2.01 EROSION, SEDIMENT, AND TURBIDITY CONTROLS

A. General:
   1. Materials used for erosion, sediment, and turbidity controls will be in accordance with the applicable regulatory requirements indicated in Article 1.02 of this Section, unless otherwise shown or indicated in the Contract Documents.

B. Silt Fencing:
   1. Filter Fabric:
      a. Material: Geotextile will comply with the New York State Standards and Specifications for Erosion and Sediment Control standard and specifications for reinforced silt fence.
      b. Height: Three feet, minimum.
   2. Fence Support Posts:
      a. Material: Hardwood or steel posts may be used.
         1) Hardwood posts will be at least 1.25 inches by 1.25 inches in cross section.

2) Steel posts will be "T" or "U" shape in cross section with a minimum weight of 1.0 pound per linear foot.

b. Length: Three feet, minimum.

3. Wire Reinforcing: Wire fencing will be a minimum 14 gauge with a maximum 6 in. mesh opening or as approved.
4. Fabric fasteners will be heavy-duty staples, wire ties, or other fastener compatible with support post material.

C. Straw Bale Dike:
1. Bales will be firmly packed, unrotted straw bound firmly with intact baling wire. Cross-sectional area on the small end of each bale will be approximately 12 inches by 12 inches or larger.
2. Posts will comply with requirements for silt fencing support posts or may be suitable reinforcing steel.

D. Fiber Roll:
1. Fiber Roll will be a minimum of 9 inches in diameter and follow selected manufacturer material recommendations.
2. Fiber Roll Support:
a. Hardwood posts will be at least 2 inches by 2 inches in cross section and installed in the middle of the Fiber Roll.
b. In the event staking is not possible, concrete blocks or sandbags will be used to stabilize the Fiber Roll.

E. Temporary Construction Entrance:
1. Stone used will be in accordance with the Design Drawings and Section 31 05 05, Aggregates for Earthwork.

F. Turbidity Curtain System:
1. Turbidity curtain system will isolate the active Work Area as indicated on the Design Drawings or as directed by the Remediation Engineer, from the Tioughnioga River to prevent migration of suspended sediments outside the Work Area.
2. Turbidity curtains will be a pre-assembled system, as specified on the Design Drawings and meet the specifications of a monofilament Type II turbidity curtain (e.g., SILTDAM 40/60) or approved equal.

2.02 TURBIDITY MONITOR

A. Turbidity monitor will consist of the following main components, or equivalent:
1. Data station (NexSens MB-300) with batteries, solar panels, and LED beacon, turbidity sensor (YSI 6136).
2. Submersible data-logging system (NexSens SDL500C) with cellular modem telemetry.
3. Computer software (iCharts).

2.03 SHEEN CONTROLS

A. Oil Absorbent Boom:
1. Provide oil absorbent pads, rolls, and booms as required to contain sheens, should they occur, and prevent the potential migration of pollutants in accordance with all applicable laws and regulations.
2. Oil absorbent booms will be five to eight inches in diameter.
3. Remediation Contractor shall maintain and replace oil absorbent booms as necessary to prevent migration of oils/sheens beyond the boom.

2.04 ODOR, VAPOR, AND DUST CONTROLS

A. Vapor Mitigation Agents:
   1. BioSolve® Pinkwater®, by The BioSolve Company.
   2. AC-645 Long-Duration Foam, by Rusmar, Inc.

B. Water: Clean, potable.

C. Provide pressure washers, pneumatic foam unit, portable tanks, hoses, and other equipment required for the storage and application of vapor mitigation agents and water.

D. Provide a water truck, as necessary to control dust on site and on river access roads. Provide a sweeper truck to clean any materials tracked off site onto public roadways, as necessary.

PART 3 – EXECUTION

3.01 EROSION, SEDIMENT, AND TURBIDITY (INCLUDING SHEEN) CONTROL

A. Installation and Maintenance:
   1. General:
      a. Provide erosion and sediment controls as shown and indicated on the Design Drawings and elsewhere in the Contract Documents. Provide erosion and sediment controls as the Work progresses into previously undisturbed areas.
      b. Installation of erosion and sediment controls will be in accordance with the applicable regulatory requirements indicated in Article 1.02 of this Section, unless otherwise shown or indicated in the Contract Documents.
      c. Use necessary methods to successfully control erosion and sedimentation, including ecology-oriented construction practices, vegetative measures, and mechanical controls. Use best management practices in accordance with Laws and Regulations, and regulatory requirements indicated in Article 1.02 of this Section, to control erosion and sedimentation during the Project.
      d. Plan and execute construction, disturbances of soils and soil cover, and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation. Provide temporary measures for controlling erosion and sedimentation, as indicated in the Contract Documents and as required for the Project.
      e. Where areas must be cleared for storage of materials or equipment, or for temporary facilities, provisions will be made for regulating drainage and controlling erosion and sedimentation, subject to the Remediation Engineer’s approval.
      f. Provide erosion and sediment controls, including stabilization of soils, at the end of each workday.
   2. Coordination:
      a. Coordinate erosion and sediment controls with this Section's requirements on water control and with Section 01 41 26, Storm Water Pollution Prevention Plan (SWPPP) and Permit.
      b. Coordinate temporary erosion and sediment controls with construction of permanent drainage facilities and other Work to the extent necessary for economical, effective, and continuous erosion and sediment control.
   3. Before commencing activities that will disturb soil or soil cover at the Site, provide all erosion and sediment control measures required by the Contract Documents for the areas where soil or soil cover will be disturbed.
   4. In general, implement construction procedures associated with, or that may affect, erosion and sediment control to ensure minimum damage to the environment during

construction. Remediation Contractor shall implement any and all additional measures required to comply with Laws and Regulations, and Section 01 41 26, SWPPP and Permit.

5. Vegetation Removal:
   a. Perform clearing, grubbing, and related operations in accordance with Section 31 11 00, Clearing and Grubbing.
   b. Remove only those shrubs, grasses, and other vegetation that must be removed for construction. Protect remaining vegetation.
6. Access Roads and Parking Areas: When possible, access roads and temporary roads will be located and constructed to avoid adverse effects on the environment. Provisions will be made to regulate drainage, avoid erosion and sedimentation, and minimize damage to vegetation.
7. Sediment Removal and Temporary Controls:
   a. Perform sediment removal, fill, and related operations in accordance with Section 31 05 05, Aggregates for Earthwork and Section 31 23 00, Excavation and Fill.
   b. Control erosion to minimize transport of soil from staging areas into existing waterways and surface waters. Such measures will include, but are not limited to, using berms, silt fencing, straw bale dikes, gravel or crushed stone, slope drains, and other methods. Apply such temporary measures to erodible materials exposed by activities associated with the construction of the Project.
   c. Remediation Contractor shall provide special care in areas with steep slopes, where disturbance of vegetation will be minimized to maintain soil stability.
8. Inspection and Maintenance:
   a. Periodically inspect areas of earthwork and areas where soil or soil cover are disturbed to detect evidence of the start of erosion and sedimentation; apply corrective measures as required to control erosion and sedimentation. Continue inspections and corrective measures until soils are permanently stabilized and permanent vegetation has been established.
   b. Inspect and report not less often than the frequency specified in Section 01 41 26, SWPPP and Permit.
   c. Repair or replace damaged erosion and sediment controls within one day of Remediation Contractor becoming aware of such damage.
   d. Periodically remove silt and sediment that has accumulated in or behind sediment and erosion controls. Properly dispose of silt and sediment in accordance with Section 01 74 19, Construction Waste Management and Disposal or Section 02 61 15, Handling and Disposal of Impacted Materials, as appropriate.
9. Duration of Erosion and Sediment Controls:
   a. Maintain erosion and sediment controls in effective working condition until the associated drainage area has been permanently stabilized.
   b. Maintain erosion and sediment controls until the Site is restored and site improvements including landscaping, if any, are complete with underlying soils permanently stabilized.
10. Work Stoppage: If the Work is temporarily stopped or suspended for any reason, Remediation Contractor shall provide additional temporary controls necessary to prevent environmental damage to the Site and adjacent areas while the Work is stopped or suspended.
11. Failure to Provide Adequate Controls: In the event Remediation Contractor repeatedly fails to satisfactorily control erosion and siltation, the Owner reserves the right to employ outside assistance or to use Owner's own forces for erosion and sediment control. Cost of such work, plus engineering and inspection costs, will be deducted from monies due to Remediation Contractor.

B. Silt Fencing:
   1. Install and maintain silt fencing in a vertical plane, at the location(s) shown or indicated on the Design Drawings.
   2. Locations of Silt Fencing:
      a. Where possible, install silt fencing along contour lines so that each given run of fencing is at the same elevation.
      b. On slopes, install silt fencing at intervals that do not exceed the maximum lengths indicated in Table 01 57 05-A.

TABLE 01 57 05-A
MAXIMUM LENGTH OF SLOPE BETWEEN RUNS

Slope	Slope Length (feet)
1:2 (50%)	25
1:3 (33%)	50
1:4 (25%)	75
1:5 (20%) and Less	100

      c. Provide silt fencing around the perimeter of each stockpile of topsoil, general fill material, and excavated material. Install silt fencing before expected precipitation and maintain until stockpile is removed.
      d. Do not install silt fencing at the following types of locations:
         1) Area of concentrated storm water flows such as ditches, swales, or channels.
         2) Where rock or rocky soils prevent full and uniform anchoring of silt fencing.
         3) Across upstream or discharge ends of storm water piping or culverts.

   3. Installation:
      a. Securely fasten filter fabric to each support post in no less than four locations. Spacing between support posts will not exceed 10 feet (center to center).
      b. When two sections of filter fabric abut each other, fold over edges and overlap by minimum of six inches and securely fasten to wire mesh.
      c. Embed posts in the ground to the depth necessary for proper controls, but not less than 16 inches below ground surface.
      d. Filter fabric will extend a minimum of six inches below ground and a minimum of 20 inches above ground.
      e. Filter fabric at bottom of silt fence will be buried in a trench, in a “J” configuration, to a depth of six inches.
   4. Maintenance:
      a. Conduct routine inspection in accordance with Section 01 41 26, SWPPP and Permit.
      b. Remove accumulated sediment when depth reaches one-half the effective height of the sediment control.
      c. Repair and reinstall silt fencing as required.
      d. Do not allow formation of concentrated storm water flows on slopes above silt fencing unless so shown or indicated in the Contract Documents. If unauthorized concentrated storm water flows occur, stabilize the slope via earthmoving and other stabilization measures as required to prevent flow of concentrated storm water flows toward silt fencing.

C. Fiber Roll:
   1. Install and maintain Fiber Roll at the location(s) downgradient of Work Area and/or as shown on the Construction Drawings or modified by the Remediation Engineer in the field, or as otherwise deemed necessary by the Remediation Contractor. Fiber Roll will be installed in accordance with the manufacturer’s recommendations.

a. Where possible, install Fiber Roll along contour lines so that each given run is at the same elevation.
b. On slopes greater than 2:1 (H:V) install a second run of Fiber Roll at the top of slope. Install Fiber Roll at intervals that do not exceed the maximum intervals indicated in Table 01 57 05-B of this Section.

TABLE 01 57 05-B
MAXIMUM LENGTH OF SLOPE ABOVE EACH FIBER ROLL RUN

Slope (percent)	Slope Length (feet)
2 and less	600
2.1 to 5	400
5.1 to 10	200
10.1 to 15	140
15.1 to 20	100
20.1 to 25	80
25.1 to 40	60
40.1 to 50	40

c. Provide erosion and sediment control measures around the perimeter of each stockpile of topsoil, general fill material, and excavated material. Install erosion and sediment control before expected precipitation and maintain until stockpile is removed.

2. Installation:
   a. Securely stake Fiber Roll using 2-inch x 2-inch x 3 feet hard wood stakes through the middle of the Fiber Roll on 10 feet centers or other methods in accordance with manufacturer's instructions and approved by the Remediation Engineer.
   b. When two sections of Fiber Roll abut each other, overlap sections 18 inches and securely stake.
   c. Embed posts in the ground to the depth necessary for proper controls in accordance with manufacturer's specifications.
3. Maintenance:
   a. Conduct routine inspection in accordance with Section 01 41 26, SWPPP and Permit.
   b. Remove accumulated sediment when depth reaches one-half the effective height of the sediment control.
   c. Repair and reinstall Fiber Roll as required.
   d. Do not allow formation of concentrated storm water flows on slopes above Fiber Roll unless so shown or indicated in the Contract Documents. If unauthorized concentrated storm water flows occur, stabilize the slope via earthmoving and other stabilization measures as required to prevent flow of concentrated storm water flows toward Fiber Roll.

D. Straw Bale Dike:
   1. Install straw bale dikes where shown or indicated, including in swales, along contours, and along toe of slopes. On slopes, install straw bale dikes at intervals that do not exceed the maximum lengths indicated in Table 01 57 05-A of this Section.
   2. Install bales in shallow excavation as wide as the bale and approximately four to six inches below surrounding grade.
   3. Ends of bale will tightly abut ends of adjacent bales.
   4. Securely install straw bales using two support posts per bale, driven into the ground a minimum of 1.5 to 2 feet below bottom of bale. Top of post will be flush with top of bale. Angle first post for each bale toward the previously installed bale.
   5. Frequently inspect bales and repair or replace as required. Remove accumulated silt and debris from behind straw bales.

E. Protection of Storm Water Drainage Inlets and Catch Basins:
   1. Protect each drainage inlet and catch basin that has the potential to receive storm water run-off from exposed soils.
   2. Install inlet filter bags inside of drainage inlet or catch basin in accordance with manufacturer's instructions. Secure inlet filter bag with the structure's grate or by other acceptable means. Alternate protection methods may be used with Remediation Engineer's approval.
   3. Inlet filter bags will not pose any obstruction above the elevation of the drainage inlet or catch basin grate requiring barricades or flashers.
   4. When removing silt and sediment from inlet filter bag, do not dump filter bag's contents into the drainage inlet or catch basin.
   5. Remove silt and sediment from inlet filter bag, or replace inlet filter bag, when inlet filter bag is not more than half full.

F. Temporary Construction Entrance:
   1. Where shown on the Design Drawings, and where construction vehicles will regularly transit to paved surfaces from unstabilized surfaces, provide a temporary construction entrance. Remediation Contractor vehicles shall use temporary construction entrances.
   2. Provide temporary construction entrances of the width, length, and thickness shown or indicated on the Drawings. When not shown or indicated on the Drawings, temporary construction entrance will be not less than 50 feet long, by 15 feet wide, by 6 inches thick. Slope of entrance will not exceed 12 percent.
   3. Installation:
      a. Ensure that subgrade under temporary construction entrance is suitably dense for the intended purpose. Suitably prepare subgrade as required for temporary construction entrance.
      b. Provide on subgrade a layer of geotextile fabric, installed in accordance with geotextile manufacturer's recommendations and in accordance with Section 31 05 19.13, Geotextiles for Earthwork.
      c. Provide crushed stone on installed geotextile in accordance with Design Drawings and Section 31 05 05, Aggregates for Earthwork. Grade crushed stone for passage of vehicles.
   4. Maintenance:
      a. Maintain temporary construction entrance at not less than the minimum required thickness. Add crushed stone as required to maintain thickness.
      b. When upper layer of temporary construction entrance becomes contaminated with soil, remove the contaminated material and replace with clean crushed stone.
      c. Using water to wash down temporary construction entrance or paved areas onto which soil material has been tracked is prohibited.

G. Turbidity Curtain System (Including Oil Absorbent Booms and Pads)
   1. General:
      a. Provide two-stage turbidity curtain and sheen controls as shown and indicated on the Design Drawings.
      b. Install two-stage turbidity curtain system downstream of the Work Area.
      c. Use best management practices (BMP) to control turbidity and sheen, including mechanical controls.
      d. Anchor the turbidity curtain at the shoreline in a manner that controls suspended particulates near the shoreline.
      e. If installation of the two-stage curtain is not practicable due to river conditions (e.g., water depth or velocity), more localized measures for turbidity and sheen control measures will be used.
      f. Oil Absorbent Booms and Pads will be on hand for immediate deployment if sheens are observed on the water column.

2. Before commencing activities that will disturb sediment at the Work Area, provide all turbidity and sheen control measures required for the areas where material will be disturbed.
3. Implement construction procedures associated with, or that may affect, turbidity and sheen control to ensure minimum damage to the environment during construction. Remediation Contractor shall implement any and all additional measures required to comply with Laws and Regulations.
4. Control turbidity and sheen to minimize transport of material to or from the Site and adjacent surface waters. Apply such temporary measures to areas disturbed by activities associated with the construction of the Project.
5. Inspection and Maintenance
    a. Periodically inspect areas where sediments are disturbed to detect evidence of the start of turbidity and sheen; apply corrective measures as required to control turbidity and sheen.
    b. Repair or replace damaged turbidity and sheen controls within 1 hour of Remediation Contractor becoming aware of such damage.
6. Maintain turbidity and sheen controls in effective working condition until the associated Work Area has been returned to pre-construction conditions.

3.02 TURBIDITY MONITORING

A. Turbidity monitoring will be performed by the Remediation Contractor to monitor the effectiveness of the turbidity barriers. Monitoring will be conducted by the Remediation Contractor prior to the start of dredging activities to establish a baseline and subsequently during the dredging operations to assess the effectiveness of the turbidity barriers.
B. During the intrusive operations, turbidity monitoring will consist of real-time turbidity monitoring stations at a minimum of two locations in the Tioughnioga River:
    1. One location approximately 300 feet upstream of the active work area (upstream location).
    2. One location approximately 100 feet downstream of the turbidity curtain system (downstream location).
    3. Final locations to be determined based on field conditions/accessibility and/or permit requirements.
C. At each monitoring location, turbidity will be monitored in real time using a turbidity monitoring system, consisting of the following main components: data station, turbidity sensor, submersible data-logging system with cellular modem telemetry, and computer software. Turbidity levels will be measured using International Organization for Standardization 7027 method and reported in nephelometric turbidity units (NTUs).
D. Turbidity levels will be logged and transmitted a minimum of every 15 minutes. The Remediation Contractor will provide the Remediation Engineer with access to the real-time turbidity data.
E. Turbidity exceedance levels are as follows:
    1. Early Warning Level: More than 25, but less than 50 NTUs greater than background (i.e., upstream) or if minor contrast between the upstream and downstream location or oily sheens immediately downstream of the backwater dam are visually observed. Requires visual inspection of current work activities, turbidity control system, and engineering controls to assess the need to make any minor operational changes.
    2. Action Level: Two consecutive measurements more than 50, but less than 100 NTUs greater than background, or if significant visible contrast between the upstream and downstream location is visually observed. A number of site assessment activities will be initiated, including, but not limited to, the following:
        a. Temporarily cease remedial activities to perform a visual inspection of the existing erosion and sedimentation controls, temporary river bypass system, and turbidity

curtain system. Remediation Contractor shall perform maintenance/repairs, implement BMPs and/or operational changes, as appropriate.

b. Continued monitoring to determine if prior results greater than 50 NTUs was anomaly or short duration event.
c. If these assessment activities indicate that the elevated downstream turbidity reading reflects a water quality impact that could persist or recur and that it is related to specific construction activities or site controls, the Remediation Contractor will make recommendations to modify the pertinent activities to the extent feasible, or additional controls will be implemented.
d. If oily sheen emanating from the project is observed downstream of the turbidity curtain system, the Remediation Contractor shall facilitate the Remediation Engineer promptly collecting a surface water sample from the downstream turbidity monitoring station. The Remediation Engineer shall submit the sample for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX) using test method 8021/BTEX at Practical Quantitation Limit (PQL) and polycyclic aromatic hydrocarbons (PAHs) using test method 8270/PAH at PQL. Results will be requested on a 2- to 3-day rush turn-around-time to facilitate reporting of results within 72 hours.

3. Stop Work Level: More than 100 NTUs greater than background. Temporarily cease sediment removal activities until the turbidity level is less than 100 NTU. Perform response for greater than 50 but less than 100 NTU. Work will not commence until approval is received from the Owner or the Remediation Engineer.
4. If the Work is temporarily stopped or suspended for any reason, Remediation Contractor shall provide additional temporary controls necessary to prevent environmental damage to the Work Area and adjacent areas while the Work is stopped or suspended.
5. In the event Remediation Contractor repeatedly fails to satisfactorily control turbidity and sheen, the Owner reserves the right to employ outside assistance or to use Owner's own forces for turbidity and sheen control. Cost of such work, plus engineering and inspection costs, will be deducted from monies due to the Remediation Contractor.

3.03 SURFACE WATER CONTROL

A. General:
1. Provide methods to control surface water to prevent damage to the Work, the Site (including temporary support areas), and adjoining properties.
2. Control fill, grading, and ditching to direct surface water away from disturbed areas, excavations, pits, tunnels, and other construction areas, and to direct drainage to proper run-off courses to prevent erosion, damage, or nuisance.

B. Equipment and Facilities for Surface Water Control:
1. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.

C. Discharge and Disposal:
1. Dispose of surface water in a manner to prevent flooding, erosion, and other damage to any and all parts of the Site (including temporary support areas), and adjoining areas, and that complies with Laws and Regulations.

3.04 ODOR, VAPOR, AND DUST CONTROL

A. General:
1. Provide means, methods, and facilities required to control MGP-related odors, vapors, and dust generated during the Work.

2. Proactively employ odor, vapor, and dust controls during the Work, and evaluate and modify construction techniques and site management practices, as necessary and appropriate, to:
    a. Mitigate MGP-related odor emissions to the extent practicable, and to the satisfaction of the Owner, the Remediation Engineer, and the NYSDEC.
    b. Prevent exceedances of the community air monitoring action levels specified in Section 01 35 49, Community Air Monitoring Plan.
3. If Remediation Contractor's means, methods, and facilities are unsuccessful in controlling MGP-related odors, vapors, and dust as specified in this Section, based on visual observations or the results of community air monitoring, Work will be suspended until appropriate corrective actions are taken by the Remediation Contractor to remedy the situation to the Remediation Engineer's satisfaction. Owner will not be liable for any expense or delay resulting from the Remediation Contractor's failure to control MGP-related odors, vapors, and dust in accordance with this Section.

B. Vapor Mitigation Agents:
1. Mobilize vapor mitigation agents and means of storage and dispersion at the Site before initiating any ground-intrusive Work or dust-generating Work.
2. Application of vapor mitigation agents will be as follows:
    a. BioSolve Pinkwater:
        1) Prepare a solution of BioSolve® Pinkwater® concentrate and water in accordance with manufacturer's recommendations.
        2) Apply when actively handling excavated materials and as required by Owner or Remediation Engineer.
        3) Application of BioSolve® Pinkwater® to the water surface or below the mean high-water line (MHWL) is prohibited.
    b. AC-645 Long-Duration Foam:
        1) Prepare a solution of AC-645 Long-Duration Foam concentrate and water in accordance with manufacturer's recommendations. Apply to uniformly cover excavated materials with minimum three inches of foam.
        2) Apply before each work break, at the end of each workday, and as required by Owner or Remediation Engineer.
        3) AC-645 Long-Duration Foam applied to removal areas below the MHWL will be completely excavated/removed prior to backfilling/flooding removal cell.

C. Construction Techniques and Site Management Practices:
1. Excavate and backfill, and load, handle, and unload excavated materials and clean fill materials, in manner that minimizes the generation of airborne dust.
2. Haul excavated materials and clean fill materials in properly covered vehicles.
3. Restrict vehicle speeds on temporary access roads and active haul routes.
4. Cover shallow excavations and stockpiles of clean fill materials with polyethylene liners before extended work breaks and at the end of each workday. Anchor liners to resist wind forces; slope to prevent accumulation of water.
5. Hold to a minimum the areas of bare soil exposed at one time.
6. Comply with progress cleaning requirements of Section 01 74 05, Cleaning.

3.05 POLLUTION CONTROL

A. General:
1. Provide means, methods, and facilities required to prevent contamination of soil, water, and atmosphere caused by discharge of noxious substances from construction operations.
2. Equipment used during construction will comply with Laws and Regulations.
3. Comply with Section 01 35 43.13, Environmental Procedures for Hazardous Materials.

B. Spills and Contamination:
   1. Provide equipment, materials, and personnel to perform emergency measures required to contain and clean up spills, and to remove soils and liquids contaminated by spills.
   2. Provide spill kits, including oil-absorbent pads, socks, and booms, at or immediately adjacent to the Site's major work areas and equipment storage and fueling areas.
   3. Immediately notify the Owner or the Remediation Engineer of all spills, regardless of material, volume, or circumstances involved.
   4. Excavate contaminated material and properly dispose of off-site and replace with suitable compacted fill and topsoil.

C. Protection of Surface Waters:
   1. Implement special measures to prevent harmful substances from entering surface waters. Prevent disposal of wastes, effluents, chemicals, and other such substances in or adjacent to surface waters and open drainage routes, in sanitary sewers, or in storm sewers.

D. Atmospheric Pollutants:
   1. Provide systems for controlling atmospheric pollutants related to the Work.
   2. Prevent toxic concentrations of chemicals and vapors.
   3. Prevent harmful dispersal of pollutants into atmosphere.

E. Solid Waste:
   1. Provide systems for controlling and managing solid waste related to the Work.
   2. Prevent solid waste from becoming airborne, and from discharging to surface waters and drainage routes.
   3. Properly handle and dispose of solid waste.

3.06 NOISE CONTROL

A. Remediation Contractor's vehicles, equipment, and operations will minimize noise emissions to the greatest degree practicable. Provide mufflers, silencers, and sound barriers when necessary, or as directed by Owner or Remediation Engineer.

B. Noise levels will comply with all applicable Laws and Regulations, including OSHA requirements and local ordinances.

C. Noise emissions will not interfere with the Work of the Owner or others.

D. Additional noise monitoring may be conducted by the Remediation Engineer to evaluate noise emissions if requested by neighboring private property owners.

3.07 PROHIBITED CONSTRUCTION PROCEDURES

A. Prohibited construction procedures include, but are not limited to, the following:
   1. Dumping or disposing of spoil material, cleared vegetation, debris, or other waste material in any surface waters, drainage ways, or other unauthorized locations.
   2. Indiscriminate, arbitrary, or capricious operation of equipment in any surface waters, drainage ways, or other unauthorized locations.
   3. Pumping of silt-laden water from trenches or other excavations to any surface waters, drainage ways, sewers, or other unauthorized locations.
   4. Damaging vegetation beyond the extent necessary for construction.

3.08 REMOVAL OF TEMPORARY CONTROLS

A. Remove temporary controls only when directed by the Owner or the Remediation Engineer.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 31 05 05

AGGREGATES FOR EARTHWORK

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified
   1. Aggregates for Earthwork materials will be used as shown on the Design Drawings, as specified herein, or as directed by the Owner.

1.02 APPLICABLE CODES, STANDARDS, AND SPECS

A. The following standards are referenced in this Section:
   1. ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 [600 kN-m/m^3]).
   2. ASTM D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
   3. ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
   4. ASTM D4972, Standard Test Methods for pH of Soils.
   5. ASTM D6913, Standard Test Method for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
   6. ASTM D5519-15, Standard Test Method for Particle Size Analysis of Natural and Man-Made Riprap Materials.
   7. ASTM D7928, Standard Test Method for Particle-Size Distribution (Gradation) of Fine0Grained Soils Using the Sedimentation (Hydrometer) Analysis.
   8. Nutrient Content in accordance with Agricultural Experiment Station recommendations for New York State (Hesse, P. R., A Textbook of Soil Chemical Analysis, Chemical Publishing Co., New York, NY, 1972).
   9. Total volatile organic compounds (VOCs) in accordance with USEPA SW-846 Method 8260C.
   10. Total semi-volatile organic compounds (SVOCs) in accordance with USEPA SW-846 Method 8270D.
   11. Total polychlorinated biphenyls (PCBs) in accordance with USEPA SW-846 Method 8082.
   12. Pesticides in accordance with USEPA SW-846 Method 8081B.
   13. Herbicides in accordance with USEPA SW-846 Method 8051A.
   14. Target Analyte List (TAL) Metals in accordance with USEPA SW-846 Method 6010C/6020A/7471B.
   15. Total mercury in accordance with USEPA SW-846 Method 7471.
   16. Total Cyanide in accordance with USEPA SW-846 Method 9012B.
   17. pH in accordance with USEPA SW-846 Method 9045C.
   18. Per- and Polyfluoroalkyl Substances (PFAS) in accordance with USEPA Modified Method 537.

B. Regulatory Requirements: Laws and Regulations applying to the Work under this Section include:
   1. NYSDEC, Technical Guidance for Site Investigations and Remediation (DER-10).
   2. NYSDEC, Title 6 of the Official Compilation of Codes, Rules, and Regulations (6 NYCRR) Part 375 (Environmental Remediation Programs).
   3. New York State Department of Transportation (NYSDOT), Standard Specifications.

1.03 QUALITY ASSURANCE

A. Qualifications:
   1. Remediation Contractor's Testing Laboratory:
      a. Retain the services of an independent agriculture testing laboratory (Cornell Cooperative Extension or equivalent) authorized to operate in New York State to perform organic content, nutrient content, and pH quality assurance testing.
   2. Remediation Engineer's Testing Laboratory:
      a. The Remediation Engineer shall retain the services of an independent testing laboratory authorized to operate in the New York State to perform quality assurance testing required in this Section (except for organic content, nutrient content, and pH quality assurance testing, which is to be performed by the Remediation Contractor).
      b. Testing laboratory shall have current National Environmental Laboratory Accreditation Program (NELAP) and New York State Environmental Laboratory Approval Program (ELAP) certification for specific methods (including Perfluorooctane Sulfonate [PFOA] and Perfluorooctanoic Acid [PFOS]) they are performing from a recognized state or federal laboratory accreditation program.
      c. The laboratory shall be capable of providing detection limits at or below New York State Department of Environmental Conservation (NYSDEC) Screening and Assessment of Contaminated Sediment or 6 NYCRR Part 375 Unrestricted Use soil cleanup objectives (other fill and stone) to allow for comparison of the analytical results to those objectives.
   3. Off-site Fill Sources:
      a. Source of off-site general fill will be from a NYSDEC-permitted mine, pit, or quarry, and will be approved by NYSDOT for furnishing aggregates for NYSDOT projects.

B. Quality Assurance Material Testing for Off-site Materials:
   1. Materials used in the Work may require testing and retesting, as directed by the Remediation Engineer, during the Project. In addition to providing a representative sample (see Article 1.04 of this Section) the Remediation Contractor shall provide the Remediation Engineer with free access to material stockpiles and facilities at all times. Costs for initial testing will be the Remediation Engineer's responsibility.
   2. Remediation Engineer reserves the right to visit each material source and conduct visual observation of the materials proposed for use. Remediation Contractor shall coordinate access with the material sources for the Remediation Engineer to perform visits.
   3. Quality assurance testing of the imported materials will be performed at the source location prior to shipment to the Project Site unless otherwise approved by the Remediation Engineer.
   4. The Remediation Engineer reserves the right to reject material based on the results of conformance tests. Rejected materials will be removed from the Project Site at no cost to the Owner (if delivered without Remediation Engineer approval).
   5. Remediation Engineer required Quality Assurance Material Testing: Perform the testing described below at the frequency indicated. Additional sampling may be required at the discretion of the Remediation Engineer if concerns arise that the characteristics of the fill materials have changed.
      a. Geotechnical Testing:
         1) Gradation in accordance with ASTM D6913 and D5519-15 (as appropriate). Perform one test for each type and source of material indicated in Part 2.
         2) Compaction characteristics in accordance with ASTM D698. Perform one test for each type and source of material requiring compaction.

3) Atterberg limits in accordance with ASTM D4318. Perform one test for each type and source of material requiring compaction.

b. Chemical Testing: For each material with greater than 10 percent by weight passing the No. 80 sieve, as determined by gradation testing performed in accordance with this section, perform chemical testing as follows:
   1) Frequency:
      a) For all imported materials requiring chemical testing, collect seven (7) discrete and two (2) composite samples for the initial 1,000 cubic yards of imported material at the frequency presented in DER-10 Table 5.4(e)10.
      b) Following analysis of the initial 1,000 cubic yards of imported material, chemical testing will be completed as specified in DER-10 Table 5.4(e)10 or may be modified in consultation with the NYSDEC project manager.
   2) Analysis: Collected samples will be submitted for the following:
      a) Discrete Grab Samples:
         i. VOCs by USEPA SW-846 Method 8260 (including 1,4-Dioxane).
      b) Composite Samples:
         i. SVOCs by USEPA SW-846 Method 8270D.
         ii. PCBs by USEPA SW-846 Method 8082.
         iii. Pesticides by USEPA SW-846 Method 8081B.
         iv. Herbicides by USEPA SW-846 Method 8151A.
         v. TAL metals by USEPA SW-846 Method 6010C/6020A/7471B.
         vi. Total mercury by USEPA SW-846 Method 7471
         vii. Total Cyanide by USEPA SW-846 Method 9012B.
         viii. pH by USEPA SW-846 Method 9045C.
         ix. PFAS by USEPA SW-846 Modified Method 537.
   3) Off-site materials used as backfill below the mean high-water line (MHWL) will meet the Class A sediment guidance values (SGVs) detailed in the Screening and Assessment of Contaminated Sediment, NYSDEC, June 2014.
   4) Off-site materials used as backfill above the MHWL will meet the Unrestricted Use soil cleanup objective (SCO) as presented in 6 NYCRR Table 375-6.8(a).
   5) Costs for retesting of rejected materials and installed Work will be the Remediation Contractor's responsibility.

6. Remediation Contractor Required Quality Assurance Material Testing: Perform the testing described below at the frequency indicated. Additional sampling may be required if concerns arise that the characteristics of the fill materials have changed.
   a. Physical Testing:
      1) For each imported topsoil, clay, or clayey soil mix source, perform the following analyses on one representative sample from each source.
         a) pH of soils in accordance with ASTM D4972 or USEPA SW-846 Method 9045C.
         b) Organic matter in accordance with ASTM D2974.
         c) Submit sample to a certified agricultural laboratory (Cornell Cooperative Extension or equivalent) for analysis of nutrient content of soils and recommendations for soil amendments, if applicable, in accordance with Agricultural Experiment Station recommendations for New York State.
   b. If testing results indicate that a proposed off-site fill material does not comply with the Contract Documents, Remediation Contractor shall identify and propose a new off-site source of the specified material in accordance with Article 1.04 of this Section.
   c. Do not ship off-site fill materials to the Site until proposed materials, sources, and Suppliers are accepted by Remediation Engineer

d. Costs for retesting of rejected materials and installed Work will be the Remediation Contractor's responsibility.

C. Required Quality Assurance Material Testing for On-site Materials (Reuse Materials): If Remediation Engineer approves reuse of excavated material (i.e., from potentially impacted material) based on visual observation (i.e., no coal tar impacts observed), Remediation Engineer shall collect samples and perform the testing described below at the frequency indicated to verify compliance with the requirements of this Section. Additional sampling may be required at the discretion of the Remediation Engineer if concerns arise that the characteristics of the fill materials have changed.
   a. Geotechnical Testing: Perform geotechnical testing as specified in Article 1.03.B(5)(a) of this Section.
   b. Chemical Testing; For each material with greater than 10 percent by weight passing the No. 80 sieve, as determined by gradation testing performed in accordance with this section, perform chemical testing as follows
      1) Frequency:
         a) For on-site materials designated for reuse, collect samples at the frequency as presented in DER-10 subdivision 5.4(e) and Appendix 5 or as agreed upon with the NYSDEC project manager.
      2) Analysis:
         a) Perform chemical analysis as specified in Article 1.03.B(5)(b) of this Section demonstrating that on-site materials meet the Unrestricted Use soil cleanup objectives outlined in 6 NYCRR Part 375 (Environmental Remediation Programs).
   2. If testing results indicate that an on-site material does not comply with the Contract Documents, Remediation Contractor shall remove, transport, and dispose of material, unless otherwise approved by Remediation Engineer.

1.04 SUBMITTALS

A. Action Submittals:
   1. Borrow Source Characterization Report: At least four weeks prior to import of materials to project site, submit a Borrow Source Characterization Reports for each source and each material type specified in Part 2. The Borrow Source Characterization Reports will include, at a minimum following:
      a. The material source, including name, address, and contact information.
      b. A certification letter from the borrow source owner or operator certifying that the source is not from an industrial site or suspected to have been modified by the addition of manufactured chemicals and that the material does not contain oil or hazardous material as supported by test data to be provided with certification letter and a copy of applicable current permits (e.g., NYSDEC mining permit) and approvals (e.g., NYSDOT quarry certification).
   2. Representative Sample: At least four weeks prior to proposed import of materials to the Project Site, submit a representative sample of each off-site fill material to the Remediation Engineer to perform the geotechnical and chemical testing, as appropriate, and as required by Article 1.03 of this Section.
   3. Material Testing Results:
      a. Submit to the Remediation Engineer, as necessary, analytical testing results for each material tested as specified in Article 1.03.B(6).

b. Remediation Engineer to submit to the Remediation Contractor, as necessary, geotechnical and chemical testing results for each material tested as specified in Article 1.03.B(5).

4. NYSDEC's Request to Import/Reuse Fill or Soil Form:
   a. For each proposed import or reuse material, Remediation Engineer shall submit to the NYSDEC all required laboratory data and a completed Request to Import/Reuse Fill or Soil form (Attachment A) for NYSDEC review and approval prior to importing fill material or using reuse material.

B. Informational Submittals:
   1. Delivery Tickets. Submit copy of delivery ticket for each load of off-site material delivered to the Site. Each delivery ticket will indicate Supplier name and source address, project name, contract number, date, material type, NYSDOT item number when applicable, and weight delivered as measured on certified scales at the source location.

PART 2– PRODUCTS

2.01 GENERAL

A. Any off-site materials brought on-site for use as fill must be from a NYSDOT-certified source and meet the requirements of this Section.

B. If quality assurance testing shows that the material does not meet the requirements of this Section, the Remediation Contractor must identify a new source for the material and provide the required data and materials for testing by the Remediation Engineer for the new source of material prior to the use of such material on-site.

2.02 MATERIALS

A. General Fill:
   1. Imported soil/general fill will consist of clean common earth fill, free from excessive moisture; organic material; coatings; sharp angular stones; unsatisfactory soils; nuisance seeds and other deleterious materials, and having the following gradation by weight as specified in Table 31 05 05-A:

TABLE 31 05 05-A
GRADATION REQUIREMENTS FOR IMPORTED SOIL/GENERAL FILL

U.S. Sieve Size	Percentage by Weight Passing Sieve
2-inch (50 mm)	100
¼-inch	30-60
No. 200 (0.075 mm)	10-30

B. River Backfill
   1. Material will be free of debris, waste, frozen material, organic material, and other deleterious matter (e.g., inorganic debris).
   2. Material will be rounded, and gradation will be as specified in Table 31 05 05-B.

TABLE 31 05 05-B
GRADATION REQUIREMENTS FOR RIVER BACKFILL

U.S. Sieve Size	Percentage by Weight Passing Sieve
1.5-inch (37.5 mm)	60-90
½-inch (12.7 mm)	30-50
No. 40 (0.425 mm)	5-15
No. 200 (0.075 mm)	0-5

C. Type "D" Sand:
   1. Material will be free of foreign chemical contaminants and will comply with the soil cleanup objectives for Restricted Residential Use, as set forth in 6 NYCRR 375-6.8(b).
   2. Gradation will be as specified in Table 31 05 05-C.

TABLE 31 05 05-C
GRADATION REQUIREMENTS FOR TYPE "D" SAND

U.S. Sieve Size	Percentage by Weight Passing Sieve
3/8 -inch (9.5 mm)	100
No. 4 (4.8 mm)	95-100
No. 8 (2.4 mm)	80-100
No. 16 (1.2 mm)	50-85
No. 30 (0.6 mm)	25-60
No. 50 (0.3 mm)	10-30
No. 100 (0.15 mm)	2-10

D. No. 1 Stone:
   1. Material will consist of clean, durable, sharp-angled fragments of gravel free from coatings, fines, or organic materials.
   2. Material will meet the NYSDOT Standard Specifications, Section 703-02 or similar.
   3. Material gradation will be in accordance with NYSDOT Size Designation 1 as specified in Table 31 05 05-D.

TABLE 31 05 05-D
GRADATION REQUIREMENTS FOR NO. 1 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
1 -inch (25 mm)	100
½ -inch (12.7 mm)	90-100
¼ -inch (6.35 mm)	0-15
No. 200 (0.075 mm)	0-1

E. Type 2 Subbase:
   1. Material will meet the NYSDOT Standard Specifications for Construction and Materials Section 304-2.02 or will be functionally equivalent as reviewed and approved by the Remediation Engineer.
   2. Gradation will be as specified in Table 31 05 05-E.

TABLE 31 05 05-E
GRADATION REQUIREMENTS FOR TYPE 2 SUBBASE

U.S. Sieve Size	Percentage by Weight Passing Sieve
2-inch (50 mm)	100
¼-inch (6.3 mm)	25-60
No. 40 (0.425 mm)	35-70
No. 200 (0.075 mm)	0-15

   3. Plasticity index of material passing the No. 40 sieve will not exceed 5.0.

F. No. 2 Stone:
   1. Material will consist of clean, durable, sharp-angled fragments of gravel free from coatings, fines, or organic materials.
   2. Material will meet the NYSDOT Standard Specifications, Section 703-02 or similar. Material gradation will be in accordance with NYSDOT Size Designation 2 as specified in Table 31 05 05-F.

TABLE 31 05 05-F
GRADATION REQUIREMENTS FOR NO. 2 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
1 ½ -inch (37.5 mm)	100
¾ -inch (19 mm)	0-25
½ -inch (12.7 mm)	0-5

G. No. 3 Stone:
   1. Material will consist of clean, durable, sharp-angled fragments of gravel free from coatings, fines, or organic materials.
   2. Material will meet the NYSDOT Standard Specifications, Section 703-02 or similar.
   3. Material gradation will be in accordance with NYSDOT Size Designation 3 as specified in Table 31 05 05-G.

TABLE 31 05 05-G
GRADATION REQUIREMENTS FOR NO. 3 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
2 ½ -inch (63.5 mm)	100
2 -inch (50 mm)	90-100
1 ½ -inch (37.5 mm)	35-70
1 -inch (25 mm)	0-15

H. No. 4 Stone:
   1. Material will be natural or prepared mixtures consisting predominately of hard, durable particles of stone or gravel and free of organic material.
   2. Material will meet the NYSDOT Standard Specification Section 703-02 or similar.
   3. Material gradation will be in accordance with NYSDOT Size Designation 4 as specified in Table 31 05 05-H.

TABLE 31 05 05-H
GRADATION REQUIREMENTS FOR NO. 4 STONE

U.S. Sieve Size	Percentage by Weight Passing Sieve
4-inch (100 mm)	100
3-inch (75 mm)	90-100
2-inch (50 mm)	0-15

I. Rip Rap:
   1. Rip rap will consist of hard, durable, river cobble and will be composed of a well graded mixture of rock size.
   2. Material gradation will be as specified in Table 31 05 05-I.

TABLE 31 05 05-I
GRADATION REQUIREMENTS FOR RIP RAP

Stone size	Percentage Passing
20-inches	100
13-inches	50
7-inches	0

J. Clay
1. Material gradation will be as specified in Table 31 05 05-J.

TABLE 31 05 05-J
GRADATION REQUIREMENTS FOR CLAY

Stone size	Percentage by Weight Passing Sieve
No. 4	100
No. 10	95 - 100
No. 30	95 - 100
No. 40	90 - 95
No. 60	95 - 90
No. 100	90 - 85
No. 200	80 - 85

K. Topsoil:
1. All soil accepted as topsoil, whether obtained from on-site or off-site sources, will comply with requirements of this section.
2. Topsoil Source: Amend existing in-place surface soil to produce topsoil, where possible. Verify suitability of surface soil to produce topsoil, as specified. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
    a. Supplement acceptable surface soil with manufactured topsoil from off-site sources when quantities available on Site are insufficient to complete the Work.
3. The topsoil will be natural, fertile, friable, granular soil characteristic of productive soils in the region.
4. Topsoil must be uniform in composition and texture, clean and free from clay lumps, stones greater than 2 inches in diameter, weeds, stumps, roots, toxic substances, and debris or similar substances (e.g., inorganic waste) 2 inches or more in greatest dimension or that prevents proper placement of the material.
5. Topsoil will meet criteria for pH and organic content as specified in Table 31 05 05-K:

TABLE 31 05 05-K
pH AND ORGANIC CONTENT REQUIREMENTS FOR TOPSOIL

Parameter	Criteria
pH	6.0 to 7.5
Organic Content	5% (minimum)

6. Topsoil will meet the nutrient content guidance values specified in Table 31 05 05-L. Material that does not fall within the guidance ranges will require fertilization with the appropriate fertilizer to bring the topsoil within the guidance values.

TABLE 31 05 05-L
NUTRIENT CONTENT GUIDANCE FOR TOPSOIL

Parameter	Guidance Value
Total Nitrogen	0.1 - 0.3%
Total Phosphorus	0.1 - 0.3%
Total Potassium	0.1 - 0.3%
Total Calcium	0.1 - 0.3%

7. Topsoil will have clay content of less than 15% (per ASTM D7928) and gradation will otherwise be as specified in Table 31 05 05-M:

TABLE 31 05 05-M
GRADATION REQUIREMENTS FOR TOPSOIL

Stone size	Percentage by Weight Passing Sieve
1.5-inch (38.1 mm)	100
No. 4 (4.76 mm)	90 - 100
No. 40 (0.42 mm)	50 - 95
No. 200 (0.074 mm)	< 20

8. Application of soil amendments/fertilizers to the topsoil will be dictated by results of specified soil testing and subject to the Remediation Engineer's approval prior to use. Additional details regarding allowable soil amendments and fertilizers is provided in Section 32 90 00, Plantings and Restoration.
9. Topsoil formulated on-site or brought to the site from off-site locations will not be stored for long periods of time (i.e., greater than one month) nor allowed to dry out. Preferable storage will be in a saturated condition until placement in the restored areas.
10. In concert with the above requirements, the topsoil will meet the substantive requirements of Section 4 of the most recent version of the New York State Standards and Specifications for Erosion and Sediment Control.

L. Clayey Soil Mix:
1. All soil accepted as clayey soil mix, will comply with requirements of this section.
2. Clayey Soil Mix Source: If no off-site source is available, blend imported topsoil and clay to produce material in compliance with requirements of this section. All component materials will comply with the requirements of this section.
3. Clayey Topsoil Mix materials must be uniform in composition and texture, clean and free from clay lumps, stones greater than 2 inches in diameter, weeds, stumps, roots, toxic substances, and debris or similar substances (e.g., inorganic waste) 2 inches or more in greatest dimension or that prevents proper placement of the material.
4. Topsoil and Clayey Soil Mix will meet criteria for pH and organic content as specified in Table 31 05 05-N:

TABLE 31 05 05-N
pH AND ORGANIC CONTENT REQUIREMENTS FOR CLAYEY SOIL MIX

Parameter	Criteria
pH	6.0 to 7.5
Organic Content	3% (minimum)

5. Clayey Soil Mix will meet the nutrient content guidance values specified in Table 31 05 05-O. Material that does not fall within the guidance ranges will require fertilization with the appropriate fertilizer to bring the material within the guidance values.

TABLE 31 05 05-O
NUTRIENT CONTENT GUIDANCE FOR CLAYEY SOIL MIX

Parameter	Guidance Value
Total Nitrogen	0.1 - 0.3%
Total Phosphorus	0.1 - 0.3%
Total Potassium	0.1 - 0.3%
Total Calcium	0.1 - 0.3%

6. Clayey Soil Mix gradation will be as specified in Table 31 05 05-P.

TABLE 31 05 05-P
GRADATION REQUIREMENTS FOR CLAYEY SOIL MIX

Stone size	Percentage by Weight Passing Sieve
1.5-inch (38.1 mm)	100
No. 4 (4.76 mm)	90 - 100
No. 40 (0.42 mm)	40 - 90
No. 200 (0.074 mm)	30 - 50

7. Clayey Soil Mix Atterberg limits will be as specified in Table 31 05 05-Q.

TABLE 31 05 05-Q
ATTERBERG LIMIT REQUIREMENTS FOR CLAYEY SOIL MIX

Property	Limit
Liquid Limit	>30
Plasticity Index	<10

8. Application of soil amendments/fertilizers to the topsoil will be dictated by results of specified soil testing and subject to the Remediation Engineer's approval prior to use. Additional details regarding allowable soil amendments and fertilizers is provided in Section 32 90 00, Plantings and Restoration.
9. Clayey Soil Mix will not be stored for long periods of time (i.e., greater than one month) nor allowed to dry out. Preferable storage will be in a saturated condition until placement in the restored areas.

M. Organic Wetland Soil Mix
1. Organic Wetland Soil Mix Source: uniformly blend a 50/50 mix of imported topsoil and river backfill. All topsoil and river backfill materials will comply with the requirements of this section.
2. Organic wetland soil mix materials must be uniform in composition and texture, clean and free from clay lumps, stones greater than 1.5 inches in diameter, weeds, stumps, roots, toxic substances, and debris or similar substances (e.g., inorganic waste) 1.5 inches or more in greatest dimension or that prevents proper placement of the material.

N. River Cobble
1. Imported cobble material will generally consist of graded rounded cobble.
2. Material gradation will be as specified in Table 31 05 05-R.

TABLE 31 05 05-R
GRADATION REQUIREMENTS FOR RIVER COBBLE

Stone size	Percentage by Weight Passing Sieve
8-inches	100
6-inches	50
4-inches	0

PART 3 – EXECUTION

3.01 GENERAL

A. Fill materials will be placed in accordance with the Design Drawings, Specifications (e.g., Section 31 23 00, Excavation and Fill), and/or Contract Documents.

1. River cobble will account for 10% of the total river backfill quantity (by weight) placed in Area 1.
2. Place river cobble randomly at the top of the restored riverbed surface, or as directed by the Remediation Engineer.

B. Dispose of materials displaced through the use of the above materials in accordance with Section 02 61 15, Handling and Disposal of Impacted Materials.

C. Restore to design grade any settlements in the finished work at no additional cost to the Owner.

3.02 EROSION AND SEDIMENT CONTROLS

A. Provide temporary erosion and sediment controls in accordance with Specification Section 01 57 05, Temporary Controls and Design Drawings. When applicable, also comply with requirements of the erosion and sediment control plan approved by authorities having jurisdiction.

3.03 ATTACHMENT

A. The attachment listed below, which follows after the “End of Section” designation, is part of this section:
1. Attachment A: NYSDEC’s Request to Import/Reuse Fill or Spoil Form (Three pages). Attachment may also be found electronically at: https://www.dec.ny.gov/docs/remediation_hudson_pdf/requesttoreusesoil.pdf

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 32 90 00

PLANTINGS AND RESTORATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
   1. River bank and upland habitats (including existing drainage gutters, curbing, trail surfaces, etc.) that are affected, disturbed, damaged or destroyed while performing the work under or as a result of the Contract will be restored and maintained as specified herein.
   2. Furnish and/or provide all labor, tools, materials, equipment, and services, and complete all work, installed, tested, and ready for use.
   3. The quality of materials and the performance of work used in the restoration will produce a surface or feature equal to or better than the condition of each before the Project began, as reviewed by the Owner.
   4. Work includes soil amendments, mulching and fertilization, and the introduction of seeding and plants. Details for aggregate materials to be used are provided in Section 31 05 05, Aggregates for Earthwork.
   5. Work includes maintenance of riverbank and upland habitats, as defined in the Design Drawings.
   6. Types of products required include the following:
      a. Seed mixture.
      b. Shrub and tree plantings.
      c. Emergent vegetation species plantings.
      d. Soil amendments.
      e. Fertilizers.
      f. Mulches.
      g. Erosion control materials.
   7. Design details for the restoration of disturbed areas are presented on the Design Drawings for each specific area.

1.02 APPLICABLE CODES, STANDARDS, AND SPECS

A. New York State Department of Environmental Conservation (NYSDEC) Standards and Specifications for Erosion and Sediment Control, latest edition.

1.03 DEFINITIONS

A. The term “finish grade” will be used to describe the finished surface elevation of planting soil.

B. The term “percentage pure live seed” will be defined as the percent (%) purity multiplied by percent (%) germination divided by 100 to equal the percent pure live seed (PLS) and will be calculated for all seed lots using each seed lots own unique purity and germination test results. A PLS pound will be defined as the bulk weight of seed required to equal one pound of 100 percent pure, germinated seed.

C. Seed may be mixed by an approved method onsite or at the seed supplier’s facilities. If the seed is mixed onsite, each variety will be delivered in the original containers and will bear the

supplier's certified analysis. Where seed is mixed by the seed supplier, provide Remediation Engineer with the seed supplier's certified statement as to the composition of the mixture.

D. The term "emergent vegetation species plantings" will be defined as a live plant tubers, and/or rhizomes of species specified on Design Drawings, as native species of the Tioughnioga River basin to include American bur-reed (*Sparganium americanum*) and Arrow arum (*Peltandra virginica*).

E. The term "live stake" will be defined as a dormant section of parent plants that are 3 to 4 feet in length, with diameters of 1/4- to 1-inch, installed in pilot holes down 2 to 3 feet which allow 6 inches to 1 foot exposed of the live stake.

1.04 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's product data, specifications and installation instructions for all required materials including but not limited to; seed mix, fertilizers, and sediment, turbidity, and erosion control products (including biodegradable stakes).
      b. Composition and analysis of commercial fertilizers and all purchase receipts showing the total quantity actually purchased for this Project.
      c. Proportions of each component contained in hydro seed mixture, if required. Identify number of pounds of each component required for each 100 gallons of water. Include the number of square feet of bank or grassed mixture that can be installed with each full tank of hydro seed mixture.
   2. Certificates:
      3. Certification of seed mixture: For each seed mixture, furnish seed supplier's certification stating the botanical and common name, and percentage by weight of each species and variety, and percentage of purity, germination and weed seed (i.e. undesirable plant seeds). Include the year of production and date of packaging. Certify that seed has been stored in compliance with all recommendations of the seed supplier. Submit at least two weeks prior to time of planting.
      4. Certification of plant stock: Submit certificates from plant stock supplier for each group of plant stock required, stating botanical name, common name, origin, age, date of packaging, and name and address of supplier. Submit at least four weeks prior to planting.
      5. Description of the mulch material, the proposed mulching methods and application rates to be used within planting areas, as required in restoration plan.

B. Informational Submittals:
   1. Submit a schedule of restoration operations for review. Any changes to the agreed upon restoration schedule must be reviewed and accepted by the Owner and/or Remediation Engineer. The replacement of surfaces at any time, as scheduled or as directed, will not relieve the Remediation Contractor of the responsibility to repair damages by settlement or other failures.

C. Maintenance Submittal:
   1. Include maintenance instructions, application frequency and dosage of fertilizer, if necessary. Methods to control undesirable plant species and browsing and grazing by herbivores, such as Canada goose, whitetail deer and small mammals, will be included in this submittal.

1.05 QUALIFICATIONS

A. Seed Producer: Obtain seed stock only from established vendors capable of providing seed quantities adequate to complete this project. Seed vendors will be required to provide the data requested under Paragraph 1.04 of this Section prior to the use of that seed.

B. Planting Stock Supplier: Obtain planting stock only from established vendors capable of providing plant stocks in quantities and at quality levels adequate to complete the project. Plant vendors will be required to provide the data requested under Paragraph 1.04 of this Section prior to the use of that stock.

C. Installer: Company specializing in work of this Section with a minimum of 5 years' experience in planting and establishing natural plant communities with documented references. Personnel used to perform the installation of plant materials will also have occupational experience in restoration projects.

1.06 PROJECT CONDITIONS

A. Environmental Requirements of Seeding and Planting
   1. Proceed with and complete seed planting as rapidly as portions of the Site become available, working within the seasonal limitations for each type of seed mix required.
   2. Proceed with planting only when current and forecasted weather conditions are favorable to successful planting and establishment of turfs and grasses.
      a. Do not apply seed slurry when wind conditions are such that materials would be carried beyond designated areas or that materials would not be uniformly applied.
      b. Do not spread seed when wind velocity exceeds five miles per hour.
      c. Seeding activities should not be carried out on days with heavy precipitation which will result in the washing of littoral plantings into the body of water where they will not survive.
      d. Do not install plant life when the temperature may drop below 35 degrees F or rise above 90 degrees F.
      e. Do not install plant life when the wind velocity exceeds 30 miles per hour.
      f. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.

B. Scheduling:
   1. Schedule topsoil placement to permit seeding and planting operations under optimum growing conditions during normal planting seasons. Do not compact topsoil prior to seeding and/or planting.
   2. Coordinate planting with specified extended service periods to provide required service from date of Substantial Completion. Plant during one of the following periods:
      a. Install live stake plant materials while still dormant between March 1 and May 15. Live stakes will not be planted if they have "budded out" (at greater than ¼ inch).
      b. Emergent vegetation species plantings will be installed from May 1 to June 30, subject to modification based on field conditions with the approval of the Remedial Engineer. Install when water depths at the planting area are between 1 and 4 inches.
      c. Trees and shrubs will be planted either in the spring or the fall, and not in the summer, as defined as between June 15 and September 15. Fall planting after October 15 is acceptable only with species approved by the Remediation Engineer with root-balled or containerized material only.
      d. Seeding operations for permanent cover will be between April 1, or as soon thereafter as the soil can be worked, and June 15. Seeding may also be done from

September 15 to freeze-up. Seeding is not recommended between June 15 and September 15.

1) If topsoil placement occurs between June 15 and September 15, apply a cover crop of annual ryegrass at a rate of 25 pounds per acre, in addition to the specified seed mix, and cover with erosion control fabric to provide temporary erosion protection.
2) If topsoil placement occurs after freeze-up, apply a cover crop of winter ryegrass (Secale cereale, 'Aroostook' or equivalent) at a rate of 100 pounds per acre, in addition to the specified seed mix, and cover with erosion control fabric to provide temporary erosion protection.

1.07 WARRANTY

A. General Warranty: Establish a dense, healthy stand of perennial grass cover, with a uniform cover density of at least 80 percent. Maintain all vegetative ground cover (including grass), monitor, and maintain temporary erosion and sedimentation controls, repair any observed erosion, and reseed areas of poor grass growth until a dense, healthy stand of grass cover has been established. Upon full establishment of grass cover (i.e. to 80% cover density), remove all remaining temporary erosion and sedimentation controls (straw/hay/straw bales, silt fence, fiber logs, etc.) from the Site.

B. Guarantee all planted trees and shrubs (other than the live stakes or emergent vegetation species plantings) for two-years post-planting. Live stake plantings and emergent vegetation species plantings placed in the Inundated Shoreline Planting Area or Emergent Vegetation Planting Area, respectively, will not be subject to same warranty.

1.08 QUALITY ASSURANCE

A. Topsoil materials tested in accordance with the standard and frequencies – see Section 31 05 05, Aggregates for Earthwork.

B. Source quality control of mulch and fertilizers will comply with certificates of inspection and applicable regulations as required by governmental authorities. Remediation Engineer will request inspection of delivery slips for materials to verify specified quantities of bulk deliveries of soil amendments, mulch, and fertilizers.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Aggregates, including native river rock or gradated river backfill, soil-choked rip-rap, and topsoil where needed – See Section 31 05 05, Aggregates for Earthwork.

B. Coir log will be as specified on the Design Drawings.

C. Seed Mix:
   1. Seed Species:
      Seed species for each of the specified planting areas found in the Design Drawings and described in the Restoration Plan will consist of the following mixtures specified in Tables 32 90 00-A through 32 90 00-F:

TABLE 32 90 00-A
WET MEADOW SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Deertongue	Panicum clandestinum	21.5%
Virginia Wild Rye	Elymus virginicus	20.0%
Big Bluestem	Andropogon gerardii	16.6%
Japanese Millet	Echinochloa crusgalli var. frumentacea	15.0%
Fox Sedge	Carex vulpinoidea	10.0%
Switchgrass	Panicum virgatum	8.0%
Partridge Pea	Chamaecrista fasciculata	4.0%
Blue Vervain	Verbena hastata	1.5%
Ox Eye Sunflower	Heliopsis helianthoides	1.0%
Soft Rush	Juncus effusus	1.0%
Autumn Bentgrass	Agrostis perennans	0.8%
Swamp Milkweed	Panicum clandestinum	0.1%
New England Aster	Aster novae-angliae	0.1%
Joe Pye Weed	Eupatorium fistulosum	0.1%
Boneset	Eupatorium perfoliatum	0.1%
Wild Bergamot	Monarda fistulosa	0.1%
Narrowleaf Mountainmint	Pycnantheumum tenuifolium	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre. The addition of annual ryegrass (Lolium multiflorum) will be applied as a cover crop to wet meadow seed mix at same application rate.

TABLE 32 90 00-B
EMERGENT WETLAND SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Fox Sedge	Carex vulpinoidea	20.0%
Virginia Wild Rye	Elymus virginicus	20.0%
Hop Sedge	Carex lupulina	10.0%
Lurid Sedge	Carex lurida	10.0%
Blunt Broom Sedge	Carex scoparia	10.0%
Fowl Bluegrass	Poa palustris	8.5%
Deertongue	Panicum clandestinum	6.5%
American Bur-Reed	Sparganium americanum	4.5%
Giant Bur-Reed	Sparganium eurycarpum	4.0%
Soft Rush	Juncus effusus	3.0%
Rice Cutgrass	Leersia oryzoides	2.0%
Nodding Sedge	Carex crinita	0.5%
Green Bulrush	Scirpus atrovirens	0.5%
Woolgrass	Scripus cyperinus	0.5%

[1] Apply seed mix at a minimum of 30 pounds per acre.

TABLE 32 90 00-C
BANK SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Deertongue	Panicum clandestinum	30.0%
Virginia Wild Rye	Elymus virginicus	20.0%
Big Bluestem	Andropogon gerardii	11.8%
Indiangrass	Sorghastrum nutans	10.5%
Switchgrass	Panicum virgatum	5.0%
Partridge Pea	Chamaecrista fasciculata	4.0%
Blue Vervain	Verbena hastata	4.0%
Soft Rush	Juncus effusus	3.0%
Blackeyed Susan	Rudbeckia hirta	3.0%
Ox Eye Sunflower	Heliopsis helianthoides	2.0%
Swamp Milkweed	Panicum clandestinum	1.0%
New England Aster	Aster novae-angliae	0.7%
Flat Topped White Aster	Aster umbellatus	0.7%
Boneset	Eupatorium perfoliatum	0.7%
Autumn Bentgrass	Agrostis perennans	0.5%
Common Sneezeweed	Helenium autumnale	0.5%
Wild Bergamot	Monarda fistulosa	0.5%
New York Ironweed	Vernonia noveboracensis	0.5%
Narrowleaf Mountainmint	Pycnantheumum tenuifolium	0.4%
Roughleaf Goldenrod	Solidago patula	0.4%
Joe Pye Weed	Eupatorium fistulosum	0.1%
Great Blue Lobelia	Lobelia siphilitica	0.1%
Purplestem Aster	Aster puniceus	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre. The addition of annual ryegrass (Lolium multiflorum) will be applied as a cover crop to wet meadow seed mix at same application rate.

TABLE 32 90 00-D
FLOODPLAIN SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Big Bluestem	Andropogon gerardii	40.0%
Virginia Wild Rye	Elymus virginicus	25.0%
Switchgrass	Panicum virgatum	15.0%
Partridge Pea	Chamaecrista fasciculata	8.0%
Indiangrass	Sorghastrum nutans	5.0%
Purple Coneflower	Echinacea purpurea	3.9%
Blackeyed Susan	Rudbeckia hirta	3.0%
Wild Bergamot	Monarda fistulosa	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre. The addition of annual ryegrass (Lolium multiflorum) will be applied as a cover crop to wet meadow seed mix at same application rate.

TABLE 32 90 00-E
UPLAND SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Sheep Fescue	Festuca ovina	73.2%
Annual Ryegrass	Lolium multiflorum	17.0%
Shasta Daisy	Chrysanthemum maximum	3.0%
Lanceleaf Coreopsis	Coreopsis lanceolata	2.0%
Blackeyed Susan	Rudbeckia hirta	2.0%
Common Yarrow	Achillea millefolium	0.5%
Butterfly Milkweed	Acsclepias tuberosa	0.5%
Partridge Pea	Chamaecrista fasciculata	0.3%
Mistflower	Eupatorium coelestinum	0.3%
Orange Coneflower	Rudbeckia fulgida var. fulgida	0.3%
Hairy Beardtongue	Penstemon hirsutus	0.2%
Narrowleaf Mountainmint	Pycnantheumum tenuifolium	0.2%
Aromatic Aster	Aster oblongifolius	0.1%
Zigzag Aster	Aster prenanthoides	0.1%
Yellow False Indigo	Baptisia tinctoria	0.1%
Virginia Spiderwort	Tradescantia virginiana	0.1%

[1] Apply seed mix at a minimum of 30 pounds per acre.

TABLE 32 90 00-F
GRASS PLANTING SEED MIX[1]

Common Name	Scientific Name	Percent by Weight
Creeping Red Fescue	Festuca rubra	25.0%
Annual Ryegrass	Lolium multiflorum	25.0%
Perennial Ryegrass, "Amazing A+' (turf type)	Lolium perenne, 'Amazing A+'	25.0%
Perennial Ryegrass, "Confetti III' (turf type)	Lolium perenne, 'Confetti III'	25.0%

[1] Apply seed mix at a minimum of 75 pounds per acre.

2. Seed mixtures will be blended by the vendor and the ratios of the various species specified above and will be guaranteed by the vendor. The seed mix may be modified depending on seed availability. If alternative seeds are necessary, the design criteria and ecological function of the mix will remain unchanged.
3. Seed mixtures should be delivered in original sealed containers. Seeds in damaged packaging are not acceptable. Label containers with the following information:
   a. Analysis of seed mixture.
   b. Percentage of pure seed.
   c. Year of production.
   d. Net weight.
   e. Date when tagged and location.
   f. Percentage of germination.
   g. Name and address of distributor
4. Seeds will be stored in weatherproof and rodent-proof enclosures.
5. All seeds will have the proper stratification and/or scarification to break seed dormancy for other than fall planting.

D. Emergent Vegetation Species Plantings:
   1. Emergent Vegetation species will be plants and tubers of American bur-reed (*Sparganium americanum*) and Arrow arum (*Peltandra virginica)* obtained from a nursery or laboratory stock. Plant species will be native to the Tioughnioga River watershed. Source of plant material will be accepted by the Remedial Engineer.

E. Shrub and Tree Plant Stock:
   1. The shrub and sapling species, plant types, sizes, and planting densities are specified per restoration area on each of the Design Drawings.
   2. Plants will be true to their name as specified. Species may vary based on availability. Alternate species may be proposed at the time of planting if listed species are not available locally and have prior approval of the Remediation Engineer.
   3. Trees will be 2-inch diameter to the extent practicable.
   4. Shrubs will be 1-gallon container stock.
   5. Live stakes will be at least 3- to 4-feet in length.
   6. Plants will be free of insects and diseases and will show the appearance of healthy growth and vigor. Root stocks will display evidence of new growth prior to planting.
   7. All plant materials, including collected stock, will comply with state and federal laws with respect to inspection for plant diseases and insect infestations. Collected plant materials will be obtained in strict compliance with any applicable species protection programs.
   8. Each species will be handled and placed in a manner that is consistent with good trade practice to insure the arrival of the plants at site in good condition. Plants that arrive dried out, exposed to excessive heat, or that have been in storage for extended periods of time, will not be accepted. If, upon inspection, the plants or root stocks display mold or decay, the material will not be accepted.
   9. All woody shrubs and trees will have a heavy fibrous root system that has been developed by proper horticultural treatment, transplanting, and root pruning. All shrubs and saplings will be container grown.
   10. All live stakes will be pre-conditioned for placement in potentially inundated and rip rap areas by being held in a moist environment (i.e., wrapped in damp burlap or equivalent and kept out of direct sunlight) at the nursery prior to shipment to site.
   11. All plant stock will be stored in aboveground locations in non-construction areas approved by the Remediation Engineer if not transplanted directly to the areas for restoration. All plant stock will have soil placed about roots sufficient to protect from desiccation and to provide nourishment during storage. All plants stored in the field prior to installation will be kept cool and will be sheltered from the drying effects of direct sunlight and prevailing winds. Plants should not be subject to freezing, drying, or warming. Supply adequate water for all plant stock in order to maintain it in a healthy and vigorous state suitable for transplanting. Plants shall be watered within 24 hours of planting.

F. Tree and Shrub Protection:
   1. Rigid plastic mesh bark protector with a maximum mesh size of ¾'' x ¾''.
   2. Galvanized wire mesh will be a minimum of 14-gauge wire with a maximum 2" x 4" opening.

G. Soil Amendments and Fertilizers:
   1. Deliver fertilizers in waterproof bags showing weight, chemical analysis, and the name of the manufacturer. Application of fertilizers and soil amendments will be dictated by the results of soil testing and subject to the Remediation Engineer's prior approval.
   2. If needed, fertilizers will be slow release Osmocote fertilizer or similar.

3. Mulch will consist of stalks of oats, wheat, rye, or other approved crops that are free of noxious weeds. Wood chips can be used to mulch woody plantings.
4. Fungal amendment for tree and shrub planting, if used, will be mycorrhizal inoculant or similar.
5. Water absorbing gel, if used, will be Terra-Sorb or similar.

H. Erosion-Control Materials:
1. Erosion-Control Mesh: For slopes <3H:1V, 100% Biodegradable straw fiber matrix with organic fiber netting, a minimum of 9.12 ounces per square yard in accordance with Tensar North American Green BioNet® S75BN or approved equal.
2. Erosion Control Blanket: For slopes >3:1, 100% biodegradable coconut fiber matrix with jute netting, a minimum of 9.79 ounces per square yard in accordance with Tensar North American Green BioNet® C125BN or approved equal. see Design Drawings for installation details.
3. Coir Log: Biodegradable coir logs will have a minimum density of 9 pounds per cubic foot as manufactured by East Coast Erosion, Rolanka, GEI Works, or approved equal.
4. Anchors: Secure erosion control materials per manufacturer guidelines with biodegradable stakes (as approved by NYSDEC) or wood pegs. Biodegradable stakes must be approved by NYSDEC prior to use.

PART 3 - EXECUTION

3.01 INSPECTION

A. Restoration planting work will be performed under the direction of the Remediation Engineer's Restoration Ecologist.

B. Examine the areas and conditions under which planting and restoration Work is to be performed, and notify Remediation 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 a manner acceptable to Remediation Engineer.

C. Inspect the proposed restoration areas with the Remediation Engineer at least one week prior to the onset of field planting activities to review the condition of the Site. The Site condition is defined as an evaluation of soils, water levels, and grades of the Site in terms of conditions which are appropriate for introduction of plantings. Do not proceed with the planting program or other restoration in any area until all necessary modifications and/or corrections are completed and approved by the Remediation Engineer. If other conditions that are detrimental to feature installation or plant growth or the safety of the crew are encountered, immediately notify the Remediation Engineer prior to initiating restoration work.

3.02 PREPARATION OF SURFACES FOR VEGETATIVE RESTORATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
1. Protect adjacent and adjoining areas from hydro seeding overspray, as necessary.

B. Remove all construction debris, trash, rubble and all extraneous materials from area to be restored. In the event that fuels, oils, concrete washout or other material harmful to plant growth or germination have been spilled into the area, excavate the area sufficiently to

remove all such harmful materials and fill with approved fill, compacted to the required compaction level (where required).

C. Backfill topsoil (or other finish-grade material, where appropriate and as indicated on the Design Drawings), as required, to bring elevations to existing surface grade. Maintain all angles of repose. Confirm that final grade is at proper elevations and that no further earthwork is required to bring the final grade to proper elevations.

D. Where temporary access roads were installed over previously vegetated areas, to restore the area, the temporary access road material will be removed and the areas will be tilled to depth of 6-12 inches prior to seeding. Remove debris, sticks, rubbish, and other extraneous matter.

3.03 PLANTING

A. Seeding
   1. Use seed type as specified on the Design Drawings by specific area.
   2. Sow seed mixture at the minimum rates specified below unless alternate mixtures and application formulae are developed which have been reviewed and approved for use by the Remediation Engineer.
      a. Wet Meadow Seed Mix, Floodplain Seed Mix, and Bank Seed Mix: Seed mix will be broadcast spread over clean weed-free soil at a rate of 30 pounds per acre.
         1) Apply a cover crop of annual ryegrass at a rate of 30 pounds per acre, in addition to the specified seed mix.
      b. Emergent Wetland Seed Mix: Seed mix will be broadcast spread over clean weed-free soil and/or sediment at a rate of 30 pounds per acre.
      c. Upland Seed Mix: Seed mix will be broadcast spread over clean weed-free soil at a rate of 30 pounds per acre.
      d. Grass Planting Area Seed Mix: Seed mix will be broadcast spread over clean weed-free soil at a rate of 75 pounds per acre.
      e. Late fall and winter dormant seeding require an increase in the seeding rate. A light mulching of weed-free straw will be applied immediately following seeding for all planting areas, except where Bank Seed Mix and Emergent Wetland Seed Mix are applied. In both these areas, use of erosion control fabric may be applied based on bank slope or stabilization needs in near-shore areas. Alternatively, hydroseeding may be utilized to apply seed and mulch.
   3. Apply specified seed mix without delay (immediately after surface preparation and before a precipitation event) to prevent erosion or displacement of soils and discharge of soil-bearing runoff to adjacent properties or waterways.
   4. Perform seeding within the time guidelines specified in Section 1.06.B.
   5. Prior to seeding, the ground will be scarified, harrowed, raked, and broomed until the surface is smooth and of uniformly fine texture.
   6. Shallow disc and subsequently rake the seedbed of the areas to be restored to provide a uniform and firm seedbed, free of all live plant materials, including perennial rhizomes. If the soil is saturated, tilling may not be necessary.
   7. Ensure the entire area receives seed. Reseed areas with gaps in the areas of seeding in excess of 8 square feet.
   8. Where saturated soils make the use of mechanical seeding equipment impractical, the broadcast or hydroseeding techniques may be used with the prior approval of the Remediation Engineer and NYSDEC.
   9. Seeding of each area will be done twice, in two directions at right angles to each other.

10. Employ the broadcast method to put annual and short-lived perennials into the successional growth areas. Lightly rake broadcast areas within 12 hours to ensure proper soil-seed contact.
11. Mark seeded areas to prevent intrusion by foot traffic and/or equipment. Exercise the necessary precautions to keep the area undisturbed until the vegetation is established.
12. Provide and install mulch by hand or machine spreading to form a continuous blanket over the seed bed, approximately 2 inches uniform thickness at loose measurement. Mulch will be weed-free and spread as needed with a minimum amount of damage to the seeded area
13. Perform an initial watering of seeded areas within 24 hours of seeding at a rate of 25,000 gallons per acre and repeated after the second- and fourth-weeks following seeding if natural rainfall is less than 1 inch per week. Avoid creating rills and furrows as a result of watering and must repair and reseed any rills and furrows resulting from over watering
14. Protect seeded areas, with slopes less than one on three, by stabilizing with hydroseed and straw mulch or by providing erosion-control fiber mesh where surface runoff potential is high and where slopes exceed one on three, by providing erosion-control blankets. Install erosion-control materials according to manufacturer's written instructions, and for erosion-control blanket, as illustrated on the Design Drawings.
15. Using a uniform fine spray, thoroughly and evenly water seeded areas. Provide adequate water to moisten seedbed to a depth of 2 inches.
16. Maintain all seedbeds in a uniformly moist condition, conducive to seed germination and plant establishment, as specified.
17. Reseed areas that remain without mulch or erosion controls for longer than three days.
18. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.
19. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched areas. Reseed areas damaged as a result of such activity.
20. Hydroseeding, if used: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

B. Emergent Vegetation Species Planting
    1. Mark an area to be planted with 2-inch plugs by placing five (5) lengths of lead line marked at 2.5 feet intervals (or similar tool for ensuring spacing interval) onto the ground surface up to a water depth of 6 inches. Spacing between the lead lines will be 2.5 feet to allow plantings to be installed on 2.5 feet centers. Alternative methods, such as planting grids, to ensure proper spacing interval and layout may be submitted to the Remedial Engineer for review and approval.
    2. For American bur-reed and Arrow arum, a planting unit consists of a minimum of one shoot containing growing leaves, roots, rhizomes and growing medium contained within a plug tray. Remove the planting unit from the plug tray, place the planting unit on the backfill surface and press into the backfill so that the roots and rhizomes are covered with backfill. Install anchoring device to hold the roots and rhizomes in contact with the river bed. Metal anchors in planting units are prohibited. Anchor material may not be metallic or plastic and must be able to remain intact for a minimum of 3 months.

C. Planting
    1. Use species plant types, sizes, and spacing densities as specified on the Design Drawings by specific area.
    2. Perform planting within the time guidelines specified in Section 1.06.B.
    3. Dig pits and beds to the dimensions specified on Design Drawings.
    4. Remove non-biodegradable containers prior to planting.

5. Plant root stocks, bulbs, tubers, and rhizomes by hand unless weighted placement or mechanical means are approved by the Remediation Engineer.
6. Set plants into their final locations following recommended horticultural practice for that species, taking specific note to plant emergent plants at the shallow end of their depth tolerances. Plant hydrophytes in groupings to establish vegetative communities.
7. Place bare root plants vertically in holes of adequate size to allow roots to spread in all directions from the plant and adequately cover with soil. Assure adequate water supply.
8. Root stocks introduced into hydric soils may require a hand tool to facilitate planting. Space the plantings based upon horticultural experience for each specie and the desired density of the stand of vegetation sought. This will be accomplished with the coordination and guidance of Remediation Engineer's Restoration Ecologist.
9. Support plants as follows:
   a. Two-inch and four-inch diameters: two stakes and two ties.
10. Provide and install wood chip mulch by hand to form a continuous blanket over the soil surrounding the plant, approximately 2 inches uniform thickness at loose measurement.
11. Perform an initial watering of planted areas at a rate of 25,000 gallons per acre and repeated after the second and fourth weeks following seeding if natural rainfall is less than 1 inch per week. Avoid creating rills and furrows as a result of watering and must repair and reseed any rills and furrows resulting from over watering.
12. If needed, mix fertilizers with backfilled topsoil and distributed throughout the hole dug for plantings.

D. Maintenance
1. Perform all necessary watering throughout the first two years post-seeding and post-planting.
2. Maintain planted areas until accepted by the Remediation Engineer. Maintenance responsibilities begin immediately after planting and continue through two full growing seasons following the year of planting.
3. Maintenance responsibilities include control of herbivores and other vectors which threaten the establishment of a vegetative community; acts of nature which result in erosions, wind damage, and similar situations. Take necessary action to correct and restore the system.
4. Notify the Remediation Engineer prior to and following any maintenance activity.
5. At a minimum, maintenance will be performed in the spring and fall before optimal planting and seeding season.
6. Replace dead or unhealthy plants with plants of the same size and species as specified and planted in the next growing season and subject to maintenance efforts to assure their survival.
7. Maintain sediment and erosion control of works and remove collected sediments, as necessary. Maintain until vegetation areas have been stabilized with vegetation.

E. Protection of Finished Work
1. Mark seeded and planted areas to prevent intrusion by foot traffic and/or equipment.
2. Institute measures to protect completed landscape areas.
3. Protect containerized shrubs from rodent and deer damage by installation of appropriate deer fencing or rigid plastic mesh bark protector of appropriate height. The rigid plastic should have a mesh size of ¾'' x ¾''. Determine the selected approach and submit to the Remediation Engineer for approval.
4. Protect containerized trees installed at Area 2 from damage by installation of a galvanized wire mesh cylinder. Install wire mesh cylinder several inches below the ground surface and extend a minimum of 4-feet above the ground surface. Integrate

staking into the wire mesh for additional support. Determine the selected approach and submit to the Remediation Engineer for approval.

5. Herbaceous species planted will be protected from geese using appropriate measures as determined necessary. Determine the selected approach and submit to the Remediation Engineer for approval.
6. The Remediation Contractor's two-year guarantee (Section 1.07.B) includes protection from potential herbivory by deer, rodents, geese, or other wildlife.

3.04 OTHER TYPES OF RESTORATION

A. Stone or gravel surfacing
   1. All areas surfaced with stone or gravel will be replaced with material to match the existing surface unless otherwise specified.
      a. The depth of the stone or gravel will be at least equal to the existing.
      b. After compaction, the surface will conform to the slope and grade of the area being replaced.

B. Fences destroyed or removed as a result of the construction operations will be replaced in like size and material and will be replaced at the original location, or as directed by the Owner.

C. Concrete curbs, gutters, and sidewalks destroyed or removed as a result of the construction operations will be replaced in like size and material and will be replaced at the original location, or as directed by the Owner.

D. All bituminous concrete pavement or other paved driveways will be replaced with material to match the existing surface condition and in accordance with Section 32 12 00, Flexible Paving, unless otherwise specified.

E. Other site features removed or damaged as a result of the construction operations will be restored in-kind to their original location and condition unless otherwise directed by the Owner.

3.05 ACCEPTANCE CRITERIA

A. Work will be considered acceptable when:
   1. A dense, healthy stand of herbaceous ground cover exists with a uniform cover density of at least a minimum of 85% for a minimum of one-year post-seeding.
   2. Tree and shrub survival for a minimum of two-year post-planting.

B. Promptly remove soil and debris, created by turfs and grasses Work, from paved areas. Clean wheels of vehicles before leaving Site to avoid tracking soil and topsoil onto roads, walks, or other paved areas.

C. If applicable, remove non-biodegradable erosion-control measures after turfs and grasses extended service period ends.

D. Take all precautions to ensure that hydroseed slurry, if hydroseeding techniques are used, is only placed on the areas designated. Completely clean any overspray, on areas not designated to receive slurry.

E. Where restored features (trees, shrubs, curbs, pavement, etc.) do not comply with specified acceptance criteria, reestablish the feature and continue extended service period until the feature(s) comply with criteria for acceptance.

F. The finished products of restoration will be maintained in an acceptable condition for and during a period of two years following the date of substantial completion or other such date as determined by the Owner.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK