From:	Howe, Tyler
To:	Spellman, John (DEC); Deyette, Scott (DEC); Herman, David A (DEC)
Subject:	NG Rensselaer ISS Gravity Wall Plan
Date:	Wednesday, May 18, 2022 11:40:09 AM
Attachments:	image001.png image002.png image003.png image004.png image005.png 31 50 00-001-A_ISS Gravity Wall Installation and Removal Plan.pdf

So you guys have it handy, attached is the ISS Gravity Installation and Removal Plan for the National Grid Rensselaer site.

Thanks,
Tyler

Tyler Howe
Staff Environmental Engineer
Arcadis U.S., Inc.
110 West Fayette Street, Suite 300 | Syracuse, NY | 13202 | USA
T +1 518 250 7384 | M +1 315 243 1221
www.arcadis.com

COMMENTS ON CONTRACTOR SUBMITTAL NO. 31 50 00-001-A)

NATIONAL GRID
RENSSELAER NON-OWNED FORMER MGP SITE
EWMI, Inc.

Arcadis Project No. 30004017.00014

ENGINEER'S COMMENTS ON – ISS Gravity Wall Installation and Removal Plan

DISPOSITION ASSIGNED BY ENGINEER FOR ACTION SUBMITTALS (except delegated design):

☒ REVIEWED

☐ REVIEWED AND NOTED

☐ REVISE AND RESUBMIT

☐ REJECTED

Engineer's action on this submittal is subject to this note. Engineer's review is only for general compatibility with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, and for general compliance with the information given in the Contract Documents. Contractor shall be solely responsible for complying with the Contract Documents, as well as with Supplier instructions consistent with the Contract Documents, Owner's directions, and Laws and Regulations. Contractor is solely responsible for obtaining, correlating, confirming, and correcting dimensions at the Site; quantities; information and choices pertaining to fabrication processes; means, methods, sequences, procedures, and techniques of construction; safety precautions and programs incident thereto; and for coordinating the work of all trades. Engineer is not responsible for resubmittals or tracking progress of resubmittals.

Arcadis U.S., Inc.

Date: 4/19/2022 By: _____

ENGINEER'S COMMENTS:

None.

- REVIEWED SOLELY FOR COMPLIANCE WITH CONTRACT DOCUMENTS -

Brian Wert
14 Brick Kiln Court
Northampton, PA 18067-9784
(484) 788-3844 –*Cell*
(484) 275-6900 –*Fax*
E-mail address: bwert@ewmi.com

SUBMITTAL No. 31 50 00-001-A

To:	Arcadis of New York, Inc. **Att. Tyler Howe** One Lincoln Center 110 West Fayette Street Suite 300 Syracuse, NY 13202	**From:**	Environmental Waste Minimization, Inc. (EWMI) **Brian Wert** 14 Brick Kiln Court Northampton, PA 18067
Phone:	(315) 446-9120	**Pages:**	Four-teen (14, including Cover Sheet)
e-mail:	Tyler.Howe@arcadis.com	**Date:**	Monday April 18,2022
Re:		**CC:**	Jason Brien, – Arcadis Steve Beam, – National Grid Phil Reinsmith, Doug Inman, Tim David, Alec Zeoli, - EWMI
Page 1	**Submittal Cover Sheet**	**PO#**	
2-14	**Gravity Wall Installation and Removal Plan**	**Project**	Rensselaer Non-Owned Former MGP Site
		Location	Rensselaer, NY 12144
		Client Contract No.	

☐ Urgent **X** For Review ☐ Please Comment ☐ Please Reply ☐ Hand Delivered

☐ E-Mailed ☐ Check Attached ☐ FedEx/Overnight ☐ Drawings Attached ☐ USPS/Standard ● Comments:

Attach Label Below *(if applicable)*

EWMI hereby submits the following **Gravity Wall Installation and Removal Plan** in accordance with § 31 50 00 of the Technical Specifications.

Brian Wert - Brian Wert. – Project Mananger

Geo-Solutions
Soil and Groundwater Problems Solved

Rensselaer MGP Remediation
ISS Gravity Wall Installation Plan
Submitted by Geo-Solutions
April 18, 2022

Table of Contents

1.0 MOBILIZATION

This ISS Gravity Wall Installation Plan has been prepared in accordance with the Rensselaer Former MGP Remediation project bid documents. The following work plan discusses in detail Geo-Solutions Inc. (GSI's) means and methods to successfully and safely complete the ISS Gravity Wall for the project located in Rensselaer, NY.

The plan addresses the following areas of interest:

- Means and methods for in-situ solidification (ISS) including GSI's process, proposed equipment, and grout mixture to be used.
- Schematic of the proposed ISS cell locations, dimensions, and volumes.
- Procedures for tracking and documenting the progression of work and verifying location coordinates and depths.
- Grout mix design, calculations, and proportioning.
- Quality control performance criteria, testing procedures, and sampling program.
- Estimated daily production rates and schedule.
- Obstruction removal.
- Work by others.

1.1 Project Schedule

Our schedule is based on working 5 to 6 days per week, 10-11 hours per shift on a single-shift basis. The following schedule assumes the work will be performed as an independent task in one continuous and uninterrupted operation without significant delays by others.

Mobilization:	1 week
ISS:	1 week
Demobilization:	½ week

1.2 Mobilization of Personnel and Equipment

Upon approval of all project plans and submittals, GSI's team will be mobilized and will remain on-site for the duration of the work.

Each person reporting for work inside controlled areas with potential for exposure to site contaminants (including subcontractor personnel) will provide documentation of OSHA 40-hour training in accordance with 29 CFR 1910.120 and all required medical surveillance documentation.

Upon arrival, all equipment delivered to the site will be inspected for cleanliness. Delivery and service vehicles as well as all other tools and equipment entering the site are subject to the same inspection requirements.

1.3 Temporary Facilities

1.3.1 Electric

GSI will provide a 250 kVA generator to power our batch plant, silo, and pumps.

1.3.2 Water

Clean water for the batch plant will be provided by EWMI from a nearby hydrant. The water supply must be able to provide a continuous flow rate of 300 gpm.

1.4 Surveying & Location

GSI will provide our own GPS base and rover to allow control of our ongoing work. All aspects of the work performed will be survey documented and submitted for review and approval. The GPS rover will allow GSI to verify excavation surfaces and provide cell layout limits for the ISS work area as required.

EWMI will provide licensed survey services as needed to support GSI's work. This includes the following tasks:

- Pre-construction surveys and 3-ft excavation pre-cut surfaces / elevations to establish top of ISS elevation.
- Site control data and ISS cell control points to be imported into GSI's base station and rover.
- Post ISS survey verification of completed horizontal and vertical limits of the ISS gravity wall for record documents and measurement for payment.

1.5 Erosion, Sediment & Stormwater Controls

Surface water controls and all erosion and sedimentation controls will be installed by EWMI. GSI will maintain our work within the established site control limits.

1.6 Utility Location

GSI will contact UDig NY (811) to perform utility stakeout services for the project at least 72-hours prior to any site intrusive work.

EWMI will be responsible for the any utilities which must be removed, relocated, protected, or replaced.

2.0 IN-SITU STABILIZATION

2.1 General Overview

GSI's scope of work consists of installing a gravity wall via in-situ soil solidification (ISS) of potentially impacted soils by the excavator bucket soil mixing method. The project includes treatment of approximately 2,100 cubic yards (CY) of soil.

The designated limits and depths of ISS are shown on project Drawing S-101 and S-301. ISS will be installed to the top of till. GSI will stabilize the soil by the excavator in-situ soil mixing method using a grout mixture of 10% Portland cement.

Work Platform:

Prior to ISS, pre-excavation to top of ISS will be performed by EWMI throughout the entire Northern holder and Southern holder areas. The work platform must be level, dry, stable and capable of supporting our soil mixing equipment without the use of crane mats. The platform shall be at least 2 feet above any groundwater. Should dewatering be required to keep the work platform dry, it will be managed by EWMI.

Excavator Soil Mixing:

Once the overburden removal and work platform preparation is completed (by EWMI), the treatment area will be surveyed and staked in the field. The ISS area will be laid-out into a series of rectangular cells. Each ISS cell will be designated with a unique identifier based on its location within the grid. Adjacent cells will be overlapped to ensure complete treatment of the target soil. Additional details on cell dimensions and location control follow below.

ISS will be performed with a Kobelco 350 excavator (or similar) from the work platform to the top of till. The maximum anticipated depth of ISS is 15 feet below the work platform.

Grout will be directly added to the excavation and the cut gradually widened by taking small slices of soil from its sides. As the soil is removed, it is mixed with the grout in the cell. The entire cell is then mixed until homogeneous and the operation repeated in the next available cell.

ISS Spoils:

The spoils created by ISS operations are expected to cure in place up to the work platform elevation or higher if practicable. GSI will maintain the spoils during ISS operations within the ISS areas for approximately 24 hours. Thereafter, any excess spoils located above the platform elevation will be removed by EWMI as necessary to achieve final design elevations, and transported for off-site disposal.

2.2 In-Situ Solidification Equipment

GSI has continued to strive to be at the cutting edge of soil mixing and specialty construction equipment development and adaptation. GSI has designed our equipment to efficiently execute the work we perform. Equipment modification and evolution has occurred over time as a result of the completion of projects in differing conditions. GSI understands which parts and equipment are likely to require backup and redundancy on the project. GSI will utilize the following equipment on the project, similar equipment may be substituted depending on availability.

2.2.1 Excavator Bucket Mixing

GSI will provide a Kobelco 350 excavator equipped with a 48" bucket for the bucket mixing operation.

2.2.2 Batch Plant Equipment

GSI's batch plant is specialty designed for accurate proportioning of multiple reagents. Reagents are monitored by scales, flow meters and/or density meters to maintain quality control. The plant is structured to meet soil mixing production requirements. The main batch plant setup will consist of the following equipment:

- Batch Plant JM30PV-2
- One (1) Horizontal Low-Profile Silo
- Mission Mixing/Transfer Pump
- Generator (250 kVA or similar)
- Air Compressor (185 cfm)

2.2.3 Support Equipment

- 8,000 lb. Rough Terrain Forklift with telescopic boom
- 3,000 psi Pressure Washer

2.2.4 Spare Equipment and Maintenance

GSI will maintain necessary parts, filters, hoses, etc. to make necessary repairs throughout the duration of the project. Spare pumps, and other miscellaneous fittings for the plant equipment will be kept on-site at in the equipment laydown area. GSI maintains a positive relationship with all of our vendors, allowing parts that aren't kept on-site to be expedited to the jobsite. Routine scheduled maintenance will be performed on all equipment periodically throughout the job. GSI typically performs this maintenance all at once during a Saturday shift. When maintenance is performed, spill kits, pans, and or poly will be used to contain and collect any fluids during maintenance. Used oil and filters will be stored separately in clearly marked containers and disposed of properly.

2.3 Best Management Practices

All equipment will be fitted with functional factory-installed engine exhaust mufflers to minimize exhaust and noise. The reagent silos will be equipped with a filter system to minimize generation of dust during charging of the silo and discharge of cement from the silo to the mixer. If necessary, the batch plant mixers will be partially enclosed to control fugitive dust resulting from reagent addition at

the batch plant. Dust will be minimized at the ISS location due to the grout slurry being introduced during mixing.

If emission conditions or action levels are reached, GSI will apply engineering controls and physical controls as necessary as emissions subside. Response and mitigation efforts will depend on the severity of the emission condition.

2.4 Anticipated Production Rates for ISS

The estimated production rate for the installation of the ISS Gravity Wall is 350 CY per day, which includes an approximate 10% allowance for normal project delays such as weather or minor breakdowns.

2.5 ISS Cell Dimensions & Layout

GSI will construct the gravity wall with a series of rectangular cells with estimated volumes of approximately 85-100 CY each. In most areas the cells will be designed to a wall length of 12.5' or less. This will allow GSI to install up to two adjacent cells (if practical) and not exceed the 25' limit for consecutive wall length in the same location, in one day.

A preliminary cell layout is attached to this work plan. The cell layout includes estimated volumes for each cell and a conceptual installation sequence, by Cell ID#. A final cell layout will be completed in CAD upon approval of this installation work plan.

Please note that GSI reserves the right to adjust the sequence of cell installation (including adjacent cells) depending on site conditions, provided that our work complies with the 25' wall length limit.

2.5.1 Cell Location Control

Once the excavation and grading of the treatment area is complete, the ISS area will be surveyed and each cell located with the GPS rover and marked with wooden stakes. Cell locations will also be verified by manual measurements as necessary. Each cell will be identified using a unique cell designation as shown in the cell layout drawing. GSI reserves the right to amend the cell identification system as needed.

2.5.2 Cell Depth Control

During mixing of the cell, depth will be ascertained through the application of graduated marks on the excavator's boom and stick assembly. The bottom elevation of each completed cell will be measured by placing the mixing bucket at the corners of the cell and surveying a fixed target on the excavator stick by total-station. Cell depth will be verified by GSI.

2.6 Obstruction Removal & Realignment

If subsurface obstructions are encountered during the ISS, GSI will attempt to remove the obstruction with the excavator. Depending on the obstruction, this may require GSI to widen or deepen the gravity wall dimensions in the area of the obstruction until it can be removed. If the obstruction cannot be removed by excavation, or over-excavation, then a realignment of the gravity wall will be

evaluated with EWMI and the Engineer. During any obstruction removal, GSI will immediately notify both EMWI and the Engineer that an obstruction has been encountered, and will begin tracking time and resources expended to remove it.

2.7 Procedures for Measuring Grout Injection

Grout will be prepared on a batch or continuous basis in GSI's high-shear mixers. The appropriate weights of reagents will be added to the water that has been metered into the plant. Proportioning of the grout mix at the batch plant will be accomplished using the following measuring devices:

Water: Flow meters
Portland Cement: JM30PV-2 Batch Plant mixer and integral load cell

A predetermined amount of grout will be metered and pumped from the mix plant for each cell based on the volume of the cell. Parameters for each batch mix will be recorded and can be related to the particular cell in which it is to be injected.

2.7.1 Sample Grout Addition Calculation

The selected pattern of cells for soil mixing will ensure 100% coverage of the ISS work limits. Once the cell locations are finalized and depths can be calculated, the grout addition per cell will be determined. Grout addition per cell will be calculated according to the following equation:

$$\frac{((\textbf{Treated Volume}, ft^3 - \textbf{Previously Treated Overlap Volume})\ x\ \textbf{Assumed Soil Density}, pcf\ x\ \textbf{Reagent Dosage}, \%)}{\textbf{Reagent Weight per Unit Volume of Grout}, {}^{lbs}/_{gal.}}$$

The Project Engineer, Batch Plant Operator and Excavator Operator will communicate during each cell installation to ensure that the appropriate volume of grout is delivered to each cell. The actual grout volume delivered to each cell will be recorded on the "ISS Quality Control Report", which will be submitted daily as part of the Daily Quality Control Report.

2.7.2 Mix Design and Proportioning

GSI anticipates utilizing the following mix design as required in Specification 31 50 00, Section 1.05.

- Portland Cement shall be Type I/II from Lehigh Cement, Glens Falls, NY.
- Water shall be obtained from a local hydrant.

GRAVITY WALL

Parameter	Unit	Quantity (Estimated)
Area	Square feet	4,095
Average Depth	Feet	~13'
Soil Unit Density	lbs./cu. ft.	100.0
Water Usage	Gallons	143,000
Portland Cement	% of soil weight	10.0%

2.7.3 Grout Density Measurements

Grout density measurements will be compared to the theoretical grout density computed by the absolute volume method:

Absolute Volume

The water to solids (W:C) ratio (by weight) is initially assumed to be 1:1 for soil mixing. Water content ratio(s) will be evaluated and determined during preliminary cell installation and adjusted as necessary. Any changes in the water to cement (W:C) ratio will be subject to Engineer approval.

The absolute volume calculations will determine the W:C ratio and each reagent quantity (by weight) per batch and gallon required for each cell. The amount of grout pumped into the cell will be determined by the estimated cell volume and finalized once target depth (or refusal) has been reached.

Grout is prepared by first adding water to the batching tank. After the water has been added, the reagents are added until the target density is reached. Once pumping to cell commences, water and reagents are added in batch mix fashion, always maintaining the target density. The grout is continuously agitated in the holding tank. Agitation helps to keep the solid particles in suspension.

The batch plant operator will monitor the grout production and notify the supervisor of any problems. The batch plant operator is also responsible for performing and recording each of the reagent weights added to the grout for every cell and the results of quality control tests on the freshly mixed grout. The “Daily Quality Control Report” form is used to document the reagents weights for each individual cell.

The quality control testing at the batch plant will consist primarily of density measurements, but occasionally viscosity and pH may be measured and recorded. Quality control testing performed at the batch plant including specific gravity, viscosity, temperature, and pH will be recorded and submitted daily as part of the “Daily Quality Control Report”.

2.8 Procedures for Grout Batch Plant Wash Out

As described in the previous section, the grout batch plant will have multiple methods to determine the amount of grout required to be batched. This practice limits the amount of grout remaining at the end of operations. During soil mixing operation, the grout line will be flushed with water to remove any excess grout. The flushed grout and water will be discharged directly into the ISS area where previously completed cells are located. Washout water will be contained within the ISS area with berms and/or trenches.

2.9 ISS Quality Control

Quality Control (QC) is critical to the successful completion of the project. GSI will enact a Quality Control Program specifically designed to meet the requirements of this project in addition to GSI's extensive Standard Operating Procedures for soil mixing which multiple excerpts are included in the text of this plan.

The Project Manager will be responsible for establishing the QC responsibilities on this project. The Project Engineer will primarily be responsible for executing the on-site QC testing, sample collection and reporting. Each member of the crew will be accountable to the Superintendent to complete his/her work in accordance with the QC Plan which can be provided after award.

On-site QC testing will include verification of ISS cell parameters, horizontal and vertical control, grout testing, and ISS sample collection/preparation.

2.9.1 Visual Inspection

Visual inspection will be performed by GSI's Engineer on a regular basis during soil mixing, and also during every wet sample collection event. If any visual inspections indicate that the criteria are not being met, GSI will evaluate the ISS operations and make immediate corrections to the work. The visual inspection criteria are:

1. No visible non-aqueous phase liquids (NAPL).
2. Grout and soil are thoroughly mixed in the entire cell.

2.9.2 Batch Consistency Testing

GSI's batch plant operator and Engineer will perform water source and grout batch consistency testing in accordance with the following table:

Property	Requirement	Min. Frequency	Test Method
Water Source (Hydrant)			
pH	6 to 9	1 per source	Hach Kit
Total Hardness	<250 ppm	1 per source	Hach Kit
Alkalinity	<250 ppm	1 per source	Hach Kit
Total Dissolved Solids	<1,500 ppm	1 per source	Hach Kit
Grout (Batch Plant)			
Density	<95 pcf	1 per cell	API RP 13B-1
Viscosity	10 centipoise	Once per day	API RP 13B-1
pH	For record	As needed	Hach Kit
Temperature	For record	As needed	Thermometer

2.9.3 ISS Sampling and Performance Requirements

Wet "grab" samples will be taken from within recently mixed cells at a frequency of 1 sample set per day or once every 500 treated cubic yards, whichever is more frequent. The Engineer shall identify which column to be tested and at which depth.

Post ISS in-situ samples will be obtained with the excavator bucket. GSI will retrieve sample material and prepare molded specimens in accordance with ASTM D4832 for laboratory following the specified curing periods. GSI will make additional ISS samples available to the Engineer for quality assurance testing and observation, if necessary.

Typically, the grab samples will be used to cast 2" x 4" (for unconfined compressive strength (UCS) testing) and 3" x 6" (for permeability testing) specimens. Specimens will be cast in a manner that limits the entrapment of air. Immediately after casting, the specimens will be stored in a moisture and temperature-controlled environment (normally a cooler) to cure, undisturbed, prior to transport. When the samples have taken their initial "set" (normally 3 to 5 days) they will be shipped to a laboratory for UCS and permeability testing. Initially, cured specimens will be tested after 7 and 28 days of curing. Summaries of test results will be provided as they are received from the laboratory. Copies of the laboratory reports to back up the summaries will be submitted as part of the project closeout documentation.

All ISS treated soils will meet the ISS Performance Requirements as shown below:

1. Hydraulic conductivity (permeability) shall be less than 1x10-6 centimeters per second.

2. Unconfined compressive strength (UCS) of the treated soil matrix shall be greater than 50 pounds per square inch (psi). *NOTE: GSI cannot guarantee that the UCS will be less than 100 psi after 28 days. Based on GSI's bench study, it should be expected that the 28 day UCS will be approximately 200 psi, which is still very workable for excavation and removal of gravity wall segments upon completion of the project.*

2.10 Acceptance

In order to manage schedule and ensure ISS operations will achieve the performance criteria, GSI will perform early unconfined compressive strength (UCS) and hydraulic conductivity testing at the onset of ISS operations. The early tests are anticipated to begin at 7-days. If early laboratory test results are favorable, GSI will continue performance requirement testing at 28-day cure with periodic early testing if site conditions warrant. If early laboratory test results are unfavorable with the anticipation 28-day cure period will result in unfavorable results, GSI will work with the Engineer to determine a path forward.

In the event a sample result does not meet the project performance requirement at 28 days for either UCS or permeability, GSI will first review the QC data from the batch plant, in the QC daily report, field observations, and the geotechnical borings for the day and area in questions. Additionally, GSI

will elect to send spare cylinders for the corresponding cell to the lab for additional testing and verification after 28 days to evaluate potential cylinder variability or damage to the cylinder molds during transport.

3.0 DEMOBILIZATION

3.1 Demobilization Activities

Upon completion of the work, GSI will clean up our work area and perform decontamination / final cleaning of our equipment. Decontamination liquids and solids will be managed by EWMI.

GSI will inform EWMI that our work is substantially complete. GSI will participate in a final walk-through inspection and any deficiencies that are identified will be remedied accordingly.

3.2 Project Close-Out

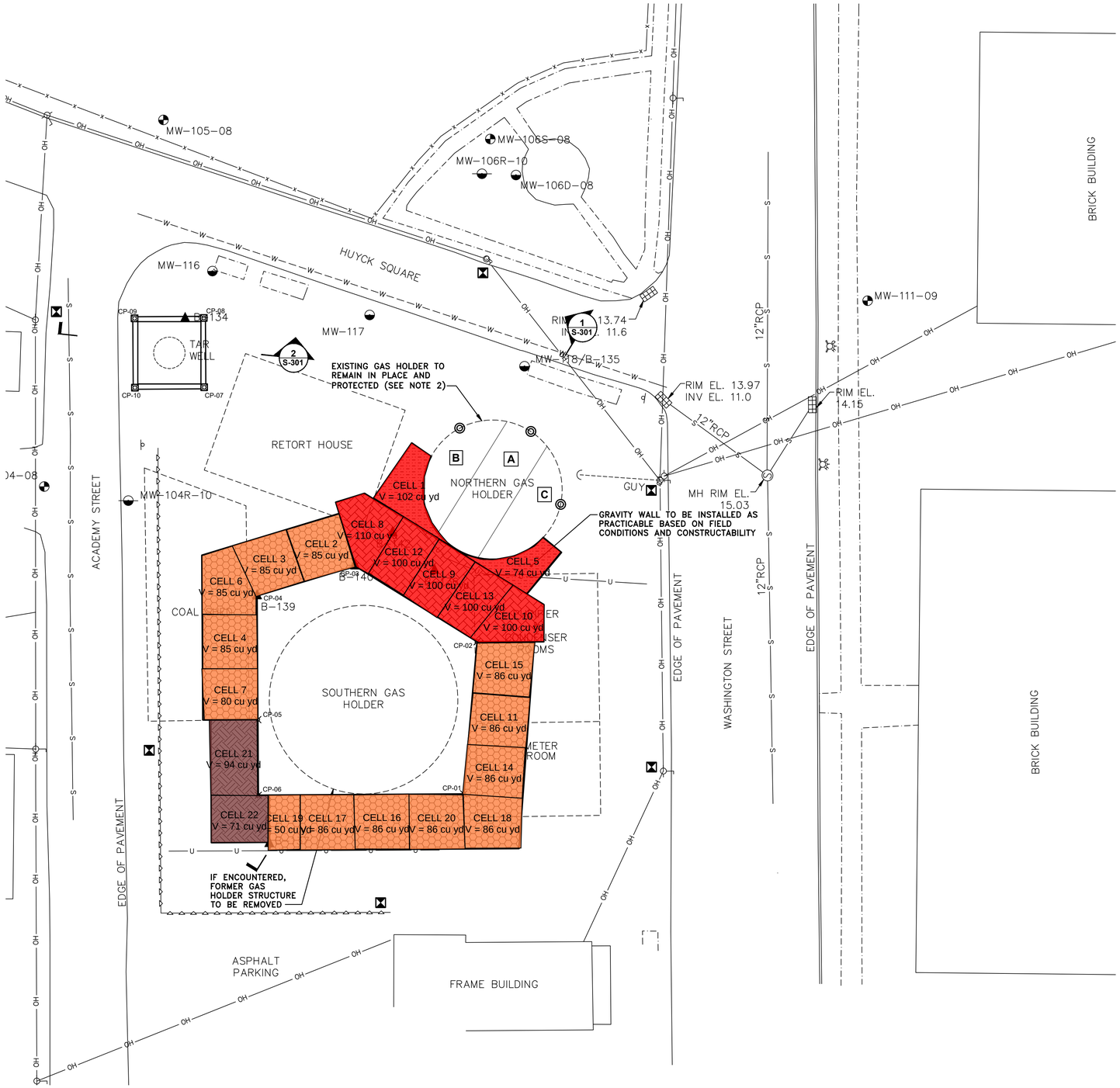
GSI will prepare and submit all required project close-out submittals at the time that EWMI and the Engineer have determined that the work is complete and acceptable.

TABLE S–101–A – GRAVITY WALL ALIGNMENT			
CONTROL POINT		TARGET EXCAVATION DEPTH	EMBEDMENT BELOW EXISTING GRADE
START	END	FT BGS	
CP–01	CP–02	10–14	11–15
CP–02	CP–03	14	15
CP–03	CP–04	11	12
CP–04	CP–05	11	12
CP–05	CP–06	10	11
CP–06	CP–01	10	11

TABLE S–101–B – EXCAVATION SUPPORT CONTROL POINTS		
CONTROL POINT	NORTHING(Y)	EASTING(X)
CP–01	1387541.87	695290.34
CP–02	1387571.85	695315.27
CP–03	1387605.43	695300.71
CP–04	1387613.44	695275.81
CP–05	1387587.39	695257.97
CP–06	1387571.47	695247.08
CP–07	1387664.85	695295.05
CP–08	1387679.42	695305.04
CP–09	1387689.41	695290.46
CP–10	1387674.83	695280.47

GAS HOLDER EXCAVATION SUPPORT INSTALLATION AND REMOVAL SEQUENCE:

1. PRE–EXCAVATE THE SOUTHERN AND NORTHERN GAS HOLDER REMOVAL LIMITS. EXPOSE TOP OF NORTHERN GAS HOLDER WALLS FOR PROPOSED ISS GRAVITY WALL LIMITS.
2. INSTALL ISS GRAVITY WALL, STARTING NEAR THE NORTHERN HOLDER AND WORKING SOUTH. AT CONTRACTOR'S DISCRETION, PRE–EXCAVATE ADDITIONAL MATERIAL PRIOR TO ISS MIXING TO ACCOMMODATE SWELLING OF THE SOLIDIFIED MATERIAL AND MANAGEMENT OF SWELL MATERIAL. ALLOW ISS TO CURE.
3. BEGIN NORTHERN GAS HOLDER EXCAVATION WHEN ISS GRAVITY WALL ADJACENT TO THE GAS HOLDER HAS REACHED THE REQUIRED MINIMUM DESIGN STRENGTH OF 50 PSI. EXCAVATE NORTHERN GAS HOLDER CELLS A, B, AND C (IN THAT ORDER). BACKFILL EACH CELL TO WITHIN 4 FEET OF THE SURROUNDING GRADE PRIOR TO EXCAVATING THE NEXT CELL. IF THE HOLDER WALL IS IN POOR CONDITION AND AS DIRECTED BY THE ENGINEER, BACKFILL NORTHERN HOLDER WITH FLOWABLE FILL.
4. BEGIN SOUTHERN GAS HOLDER EXCAVATION WHEN ISS SURROUNDING THE GAS HOLDER HAS REACHED THE REQUIRED MINIMUM DESIGN STRENGTH OF 50 PSI AND THE NORTHERN GAS HOLDER HAS BEEN BACKFILLED. BACKFILL UPON REACHING TOP OF TILL.
5. REMOVE PORTIONS OF THE ISS GRAVITY WALL (SEE DRAWING S–102) TO THE TOP OF TILL. REMOVE ALL ISS TO 4 FT BELOW FINISHED GRADE. BACKFILL PER RESTORATION REQUIREMENTS.



LEGEND:

- SLIDE RAIL POST
- SLIDE RAIL PANEL
- CP-01 CONTROL POINT
- ISS GRAVITY WALL (MINIMUM 12 FEET WIDE)
- ISS GRAVITY WALL (MINIMUM 14 FEET WIDE)
- ISS GRAVITY WALL (MINIMUM 17 FEET WIDE)
- DISPLACEMENT MONITORING POINT
- VIBRATION MONITORING LOCATION
- A NORTHERN GAS HOLDER CELL ID

NOTES:

1. REFER TO G–002 FOR ADDITIONAL LEGEND AND BASEMAP INFORMATION.
2. NORTHERN GAS HOLDER WALLS TO REMAIN IN PLACE AND BE PROTECTED FOR USE AS EXCAVATION SUPPORT FOR THE REMOVAL OF MATERIAL WITHIN EXISTING GAS HOLDER (SEE GAS HOLDER EXCAVATION SUPPORT INSTALLATION AND REMOVAL SEQUENCE). EXPOSE THE FORMER STRUCTURE, REMOVE CONTENTS, AND CLEAN THE INTERIOR SURFACES OF THE STRUCTURE, USING MECHANICAL MEANS AS NECESSARY TO REMOVE POTENTIAL MGP–RELATED MATERIALS. FOLLOWING CLEANING, PROVIDE SAFE ACCESS TO VISUALLY INSPECT THE STRUCTURE PRIOR TO BACKFILLING. IF CONDITIONS OF GAS HOLDER WALLS ARE NOT SUFFICIENT FOR EXCAVATION SUPPORT, INFORM OWNER AND ENGINEER IMMEDIATELY FOR REVIEW AND RESOLUTION.
3. EXCAVATE TAR WELL AREA USING A MODULAR SLIDE RAIL SYSTEM HAVING FOUR SIDES. ACTUAL DIMENSIONS OF INDIVIDUAL SLIDE RAIL COMPONENTS WILL VARY DEPENDING UPON CONTRACTOR'S SELECTED SLIDE RAIL MANUFACTURER. ALL COMPONENTS MUST MEET THE MINIMUM REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS.
4. EXCAVATION OF THE SOUTHERN GAS HOLDER AND SOILS TO BE CONDUCTED WITHIN AN ISS GRAVITY WALL. GRAVITY WALL TO BE INSTALLED TO TOP OF TILL.
5. PROTECT SURROUNDING AREA FROM SPLASHING DURING ISS MIXING. CLEAN SURROUNDING SURFACES, STRUCTURES, ETC. IF SPLASHED WITH ISS MATERIALS.
6. PROPOSED EMBEDMENT DEPTHS BASED ON ANTICIPATED TOP OF TILL ELEVATION. WALL EMBEDMENT DEPTHS MAY VARY BASED ON THE OBSERVED TOP OF TILL DURING CONSTRUCTION.
7. INSTALL GEOTECHNICAL MONITORING INSTRUMENTATION/ EQUIPMENT AND PERFORM MONITORING IN ACCORDANCE WITH SPECIFICATION SECTION 31 09 13, GEOTECHNICAL INSTRUMENTATION AND MONITORING. INSTALL VIBRATION MONITORS ON THE GROUND SURFACE. LOCATIONS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED, AS NECESSARY, BASED ON FIELD CONDITIONS.

C:\Users\bdeclercq\BIM 360\Arcadis\ANA - National Grid\Project Files\Rensselaer Non-Owned MGP Site\2020\30004017101-DWG\Design_S-101_Excavation Support Plan.dwg SAVED: 11/3/2020 10:09 AM PLOTSTYLETABLE: ---- BY: DECLERCQ, BRIAN

XREFS: IMAGES:
Design-X-Title074847-STAMP.tiff
Design-X-Base
Design-X-Utilities
Design-X-Wells

15' 0 15' 30'
1"=15'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

Geo-Solutions
Soil and Groundwater Problems Solved

NATIONAL GRID • RENSSELAER, NEW YORK
RENSSELAER NON-OWNED FORMER MGP SITE
FINAL REMEDIAL DESIGN

ISS CELL LAYOUT PLAN

ARCADIS Project No.
30004017

Date
NOVEMBER 2020

ARCADIS
ONE LINCOLN CENTER
110 W FAYETTE STREET
SYRACUSE, NY 13202
TELEPHONE: 315-446-9120

S-101