

## Memorandum

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**To:** Yildiz Palumbo, NYSDEC  
**From:** Rebecca A. Kinal, P.E.  
**Date:** June 26, 2026  
**Re:** Former Chesebrough Manufacturing Site  
NYSDEC BCP Site No. C224302  
**cc:** A. Obligado, J. O'Connell - NYSDEC  
M. Sherwood, A. Ramirez – NYCSCA  
A. Bosco - AKRF

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I have reviewed the attached "Mass Soil Mixing Work Plan" (the Plan, Rev4 June 16, 2026) prepared by Keller-North America for the Former Chesebrough Manufacturing site, located at 46 Verona Street, Brooklyn, New York ("the Site"). Based on my review, I certify that the Plan (inclusive of AKRF's edits and comments provided with the attachment) conforms to the NYSDEC-approved Remedial Action Work Plan and Remedial Design Report for the Site, dated July 2023 and November 2023, respectively.



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Rebecca A. Kinal, P.E.

### Attachments:

AKRF, Inc., *Memorandum Re: Review of ISS Plan Rev 2, Harbor MS – Brooklyn (K680)*, June 26, 2026  
Keller-North America, *Mass Soil Mixing – Work Plan, K680 Harbor MS, 46 Verona Street, Brooklyn, NY, Rev 4*, June 16, 2026.



*Environmental, Planning, and Engineering Consultants*

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## Transmittal

<b>To:</b> Mike Sherwood	<b>From:</b> Rebecca Kinal/ Adrianna Bosco
<b>Company:</b> NYCSCA	<b>Date:</b> June 26, 2026
<b>Address:</b> 25-01 Jackson Avenue Long Island City, NY 11101	<b>Project Number:</b> 241090
<b>Job Title:</b> Harbor MS – Brooklyn (K680)	
LLW#: 132059	

We have enclosed the following:

Report     Specifications     Drawing(s)     CD/DVD     Contractor Submittals

- ISS Plan Rev 4 (02223-001-05) – **Make Corrections Noted**

Sent Via:

Messenger     U.S. Mail     Federal Express     Email



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## Memorandum

<b>To:</b> Mike Sherwood	<b>From:</b> Rebecca Kinal / Adrianna Bosco
<b>Company:</b> NYCSCA	<b>Date:</b> June 26, 2026
<b>Project No.:</b> 132059	<b>Phone No.:</b> 914.922.2362 / 646.388.9576
<b>Re:</b> Harbor MS – Brooklyn (K680)	
Review of ISS Plan Rev 4 – <b>Make Corrections Noted</b>	

AKRF, Inc. (AKRF) has reviewed the In-Situ Solidification (ISS) Plan (Revision 4) prepared by Keller-North America (Keller) on behalf of National Environmental Safety Company, Inc. (NESCO) for K680 (the “Site”), located at 46 Verona Street, Brooklyn, NY 11231. The revised Plan incorporates edits based on comments received from New York State Department of Environmental Conservation (NYSDEC) in emails dated 6/10/26 and 6/23/26. Resubmission is required only if the Contractor is unable to comply with the corrections noted below:

### Construction Sequence - General

- Item 2 – Grout wash-out and cleaning of equipment prior to final de-mobilization will be conducted on a designated decontamination pad to be constructed and operated in accordance with Section 02222-3.02-B.

### Construction Sequence – Bench Scale Study

- The bench scale (pilot) study will be conducted using a cement mix with the same target specific gravity and other parameters proposed for the full-scale production.
- Samples for the bench scale study will be conducted in the same manner as proposed for the full scale production, and will include two sets of each grab sample for 7-day, 14-day, and 28-day testing.
- Bench scale testing shall include a core sample to be collected at a location approved by NYSDEC prior to the start of full-scale production.

### Construction Sequence - Full Scale Production

- Item 3a – Vertical cell depths will be reported to NYCSCA on a daily basis for all ISS cells completed.
- Core sampling and visual inspection: NYCSCA/NYSDEC approval of the proposed core locations/depths will be obtained prior to coring.

Appendix B - COAPP

- Core sampling and visual inspection: NYCSCA/NYSDEC approval of the proposed core locations will be obtained prior to coring.
- QC sampling will conform to the NYSDEC ISS Quality Assurance/Quality Control (QA/QC) Guidance Document, including (but not limited to) requirements for notification and NYSDEC approval.

These corrections are provided as marked-up edits (in red) on the attached submittal.

The Contractor should also note the following:

- All submittals related to ISS implementation will require additional review and approval by the NYSDEC prior to implementation. No delay claims, related to achieving NYSDEC approval of the submittals will be granted.
- All work must be completed in accordance with the Authority's Health and Safety requirements and regulations, the Health and Safety Plan included as Appendix E to the NYSDEC-approved Remedial Action Work Plan, and the Contractor's site-specific Health and Safety Plan, including odor control, which may prevent mixing of multiple cells simultaneously.
- In accordance with Section 02090-3.03-B, any petroleum-contaminated material generated for the initial 4-foot cut shall be loaded directly into trucks for transportation to the disposal facility, in lieu of stockpiling.

AKRF's review was limited to verifying environmental-related submittal requirements in NYCSCA standard specification section 02223. The comments above are intended only to provide clarification regarding the submittal. The comments should not be construed in any way as intent to limit the Contractor's responsibilities. The absence of a comment with respect to a specific contract requirement should not be interpreted as a suggestion to change a contract requirement.



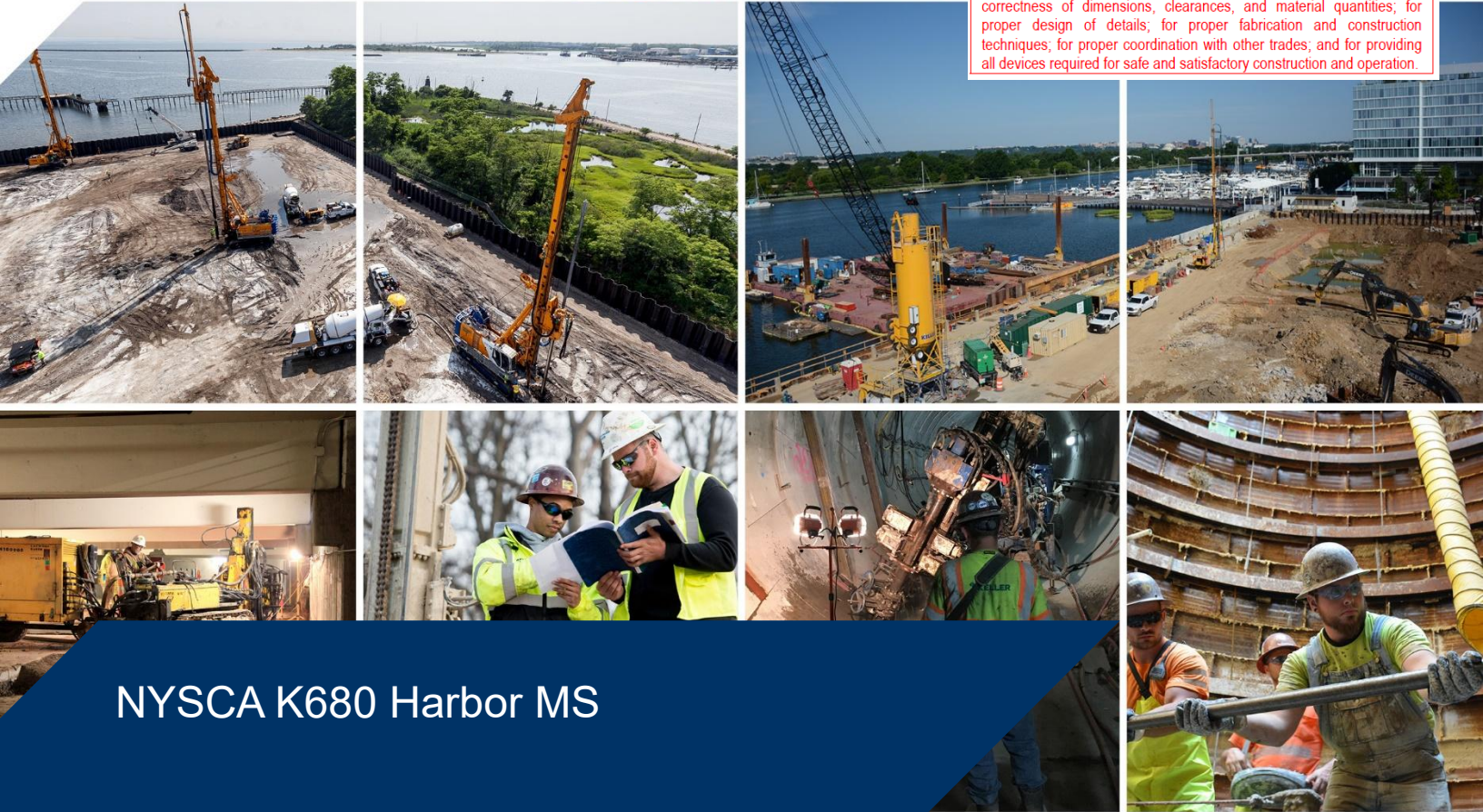
**AKRF Inc.**  
440 Park Avenue South, New York, NY 10016

<input type="checkbox"/>	NO EXCEPTIONS TAKEN.
<input checked="" type="checkbox"/>	MAKE CORRECTIONS NOTED.
<input type="checkbox"/>	REJECTED: REVISE AND RESUBMIT.
<input type="checkbox"/>	REJECTED: NOT ACCEPTABLE FOR REVIEW.
<input type="checkbox"/>	NO ACTION TAKEN.

By: **R. Kinal**

Date: **06/26/26**

This review does not relieve the contractor or any subcontractor of responsibility for full compliance with contract requirements; for correctness of dimensions, clearances, and material quantities; for proper design of details; for proper fabrication and construction techniques; for proper coordination with other trades; and for providing all devices required for safe and satisfactory construction and operation.



## NYSCA K680 Harbor MS

### Submittal 001.0 Mass Soil Mixing – Work Plan

46 Verona St  
Brooklyn, NY

REV 4 – June 16, 2026

Global strength and local focus

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## 1 Scope Commentary

This scope of work includes implementation of In Situ Solidification (ISS) to mix the contaminated soil. The work will take place from an approximate existing grade of elevation 9'-0".

ISS is performed by injecting a cementitious binder slurry into the soil and then mixed with a slotted bucket located at the end of an excavator arm. The slotted bucket excavator works individual cells that are approximately 4 FT in width and 16 FT in length (labelled as "Areas" on the cell layout plan). The cell layout plan (ID plan) is submitted under separate cover and attached in Appendix A.

Soil mixing creates 'swell', which results in an overall raising of the grade since additional volume of material is introduced to the soil mass. The bottom of the treatment zone is approximately elevation -11'-0". The plan is to first pre-excavate the ISS area to elevation 5'-0", which is approximately 4 feet below grade. These pre-excavated soils will be stockpiled locally for future handling and disposal by the General Contractor (GC). During this work, the volume of the pre-excavated cell will swell. The final mixed product (soilcrete) will be allowed to harden in place, at least overnight, and any excess product will be excavated and disposed of as needed, by others. Barriers/caution tape will be placed around the treated areas until the soilcrete has cured in accordance with our safety standards.

The neat cement grout will be batched in proportions proposed within our grout mix design (See Section 4). The grout specific gravity will be checked at least 2 times per day using either a mud balance or other measuring device.

Keller will retrieve wet grab samples from at least 2 different mixed cells per shift while the mass is still fluid for UCS testing. This will be performed using either the excavator bucket or a sampling tool. A minimum six cylinders will be cast for samples retrieved per cell.

## 2 Construction Sequence

### General

1. Keller has included a list of major equipment in the ISS area and a site logistics plan showing equipment and materials laydown, staging locations under Appendix A.

2. Safety procedures of Keller's Mobilization, daily shutdown, and demobilization protocols have been covered in Keller's Job Hazard Analysis in Appendix C. The daily work procedure includes the following:

Grout washout and equipment cleaning for final demobilization will be conducted on a designated decontamination pad to be constructed and operated in accordance with Section 02222-3.02-B

- Start Up Excavator and Grout Plant to begin mixing grout and digging. Move to ISS Location.
- Lay out ISS Cell utilizing wooden stakes.
- Dig ISS Cell with excavator to the design elevation.
- While digging cell, continuously pump grout into cell per the grout mix design.
- Once the first cell is completed. Move to next cell and repeat steps.
- At end of day, wash out grout plant and clean excavator will be conducted in the ISS area. Shut down equipment.

3. Keller intends to use the Fire Hydrant on the northern sidewalk of Verona St. as our water source. Hydrant Permit to be pulled by NESCO.

4. Keller will be using Portland Limestone Cement (Type 1L) as an alternative to ASTM C150 Type I/II Portland Cement. If bench scale testing demonstrates that it will meet the specified performance requirements, Keller will continue to use Type 1L cement.

5. No SOE will be required for initial 4 FT precut due to the sequencing of the Cells. The entire ISS area will not be excavated at once. Excavation will happen locally at the ISS Cell Keller will be working on. Sloping and SOE will not be necessary.

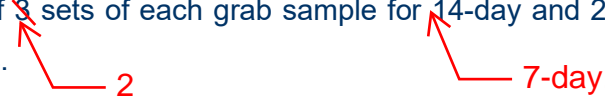
using a cement mix with the same target specific gravity and other mix parameters proposed for the full scale production

### Bench Scale Study

A test cell will be installed with the steps below where samples will be taken for bench scale testing. The test cell will be 16FT x 24FT (Group cell). See attached Sketch in Appendix A detailing where Keller intends to perform Bench Scale Studies. Keller will perform a Bench Scale Study in the petroleum contaminated ISS area and the hazardous lead contaminated area as well. Keller will collect wet grab

samples and form 6” cylinders from the test cells to perform the following tests.

Bench scale test will include the following:

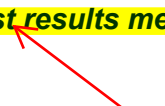
1. Strength: Minimum Unconfined Compressive Strength (UCS) of 50 PSI. ASTM D1633, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens/ Unconfined Compressive Strength. Keller will collect one (1) set of wet grab sample from each Group cell. A total of 3 sets of each grab sample for 14-day and 28-day each will be collected for UCS break results. 
2. Permeability: Maximum permeability of  $1 \times 10^{-6}$  cm/sec. ASTM D5084, Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter. One (1) grab sample will be collected from each Group Cell.
3. Leachability: Leachable lead concentrations of less than 5 mg/L. Samples will be collected and given to the GC for testing. SW-846 Test Method 311: Toxicity Characteristic Leach Procedure. One (1) grab sample will be collected from each Group Cell.

Visual Inspection: Keller will mobilize a coring drill rig to collect core samples from the test cells to check the continuity of the mass mixing and to perform a visual inspection that shows no evidence of non-aqueous phase liquids. Due to the low strength of the mass mix, the core samples will only be collected for visual inspection. The wet grab samples will be collected in lieu of the core samples and be used for UCS testing.

Core samples will be collected at a rate of one sample for every 5,000 square feet of ISS treatment area, but not less than two core samples per treatment area. **The first core sample will be completed during the Bench Scale Study which is within the first 25% of the treatment area.** The final two core samples will be collected after the full-scale production is completed.

**Full scale production will begin within the week that Bench Scale Studies have been completed and the Mix Design Report has been approved by all associated parties. Keller intends to begin full scale production if Bench Scale test results meet the project requirements.**

### Full Scale Production

 (including the first core sampling results)

1. Level working grade, including suitable working platform, to be prepared near existing grade (approximately elevation 9'-0”).
2. Excavate existing soils in sections across the entire ISS area to elevation 5'-0” which is

approximately 4 Feet below grade. This is to create a containment area for ISS spoils.

3. Layout horizontal and vertical control monuments, including offsets, to delineate boundary of each treatment area.

Measured depths will be reported to NYCSCA on a daily basis for all cells completed.

- a. Survey to layout and mark boundaries of individual cells. The depth will be measured by a mark on the excavator and visually supervised by Keller crew and a special inspector retained by the owner. A rotary self-leveling laser system ( i.e. Topcon RL-H5A or similar) will be used by attaching a prism on the excavator to verify the depth of the ISS. ↘

4. Set up the excavator with the slotted bucket on the (rectangular) treatment cell area. These cells are typically 16FT wide and up to 24FT long (aka Group Cells). Keller may elect to install multiple adjacent cells simultaneously depending on site conditions. The shorter edge of the (rectangular) treatment cell will be closest to the excavator for any given cell. The excavator will relocate and adjust while mixing a cell to ensure adequate mixing throughout the cell.
5. Atmos Shield 645 has been approved for use as odor control. Approved submittal can be found in Appendix D by the GC. Odor control product and applicator will be onsite at the start of the work and available for use to respond in real time to odor and /or other CAMP exceedances.
6. Batch neat cement grout slurry at the batching plant as per the grout mix design.
7. Pump (wet) grout slurry into the precut cell. The slotted bucket will then begin mixing the soil and grout by going into and out of the ground. The specified binder (reagent) quantities, based on the theoretical cell volume, will be introduced into the ground through a series of (or combination of) motions of the slotted bucket.
  - a. Keller will pre-determine the weight of each reagent to be injected into each treatment cell based on the cell size. A flow meter will be plumbed in-line with the grout line from the batch plant. The unit will record these parameters as they are injected into a particular cell and the volume will be noted by our field personnel.
  - b. The slotted bucket can be plunged vertically from the surface to the treatment depth, from one short edge of the cell to the other short edge of the cell. The arm of the excavator will be marked with the required depth to ensure that the mixing will reach the appropriate tip elevation.
  - c. The slotted bucket can be raked horizontally from the one short edge of the cell to the other short edge of the cell area, from the surface to the treatment depth.

- d. Utilizing the slotted bucket, large obstructions such as cobbles & boulders will be segregated and removed from the ISS area for disposal.
  - e. Grout slurry injection will continue until the minimum amount of reagent is injected into a given cell, and the cell is thoroughly mixed from edge to edge, and top to bottom. The excavator operator with the mixing tool will have a direct line of communication to the pump used for slurry injection.
8. The injection of grout slurry will cause the cell volume to swell. Excessive swell of the cell volume (mixture of grout and soil spoils) will be removed by Keller to be disposed by the GC.
    - a. Based on the observed swell due to grout slurry injection in a given cell, Keller shall modify the depth of the localized cut prior to ISS work in order to facilitate safe and efficient production work, account for swell, and minimize the amount of ISS volume that overflows a particular cell.
  9. Adjacent cells may be mixed in wet-to-wet fashion. The mixing equipment will move between cells along (parallel to) the short edge of the cells.
  10. Per the Key Notes on H-201.00, the ISS in Area 5, hazardous lead soil was delineated at elevations 4'-0" to 1'-0" (approximately 5 to 8 feet below grade). The entire ISS Treatment area shall terminate at elevation -11'-0".

NYSCA/NYSDEC approval of the proposed core locations/depths will be obtained prior to coring.

11. Keller will collect grab samples at a rate of one set (set of 6 – 2 for 7 days, 2 for 14 days and 2 for 28 days) for every Group cell which is approximately 212 cyds.

Core Sampling for Visual Inspection: Keller will mobilize a coring drill rig to collect core samples from the production cells to check the continuity of the mass mixing and to perform a visual inspection that shows no evidence of non-aqueous phase liquids. To meet the requirements of collecting one (1) core sample every 5000 square feet, a total of two (2) cores will be drilled to at least one (1) foot below the ISS depth; one in the lead contaminated area and second in the petroleum contaminated area for visual inspection.

Due to the low strength of the mass mix, the core samples will only be collected for visual inspection. The wet grab samples will be collected during the mass mix in lieu of the core samples for UCS testing.

Once the minimum reagent quantities have been injected in a given cell, grout slurry injection may cease but mixing with the tool may continue based on visual observations of the cell (i.e., homogenization). This will be done to minimize additional swell due to slurry injection and reduce the likelihood of excessive grout strength due to excess binder content.

### 3 Grout Strength

For this project, the goal is to target a reagent ratio such that the 28-day soilcrete strength will be a minimum of 50 psi.

Based upon our experience, we will start the project with a dosage of 175 kg of reagent per cubic meter of treated soil using a specific gravity of 1.52. Once we start receiving soilcrete break data we will adjust the dosage, if necessary, to maintain a grout strength above 50 psi and below 500 psi. Please note that there maybe grout breaks above 500 psi; however, the statistical average for all the breaks is not expected to exceed this value. If testing results for a completed cell indicate a CSI of less than 50 psi, appropriate corrective actions will be taken.

### 4 Grout Mix

The grout mix for the project will be a neat cement grout batched onsite. The mix ingredients are water and cement (Type IL) and Slag (GGBFS). The grout proportions on a per cubic yard basis are listed below. **Keller will be using the mix that generates a SG of 1.52.**

Grout Mix (Per CY)				
	Water	Cement	Slag	Mix
Specific Gravity	1.00	3.15	2.90	
Weight (lbs)	1234.97	213.13	1108.30	2556.40
Volume (ft <sup>3</sup> )	19.79	1.08	6.12	27.00
Density (lbs/ft <sup>3</sup> )	62.40	196.56	180.96	94.68
	148.06			
Specific Gravity of Mix			1.52	
weight of water/weight of reagent			0.93	

Figure 1 - Grout Mixes

The grout will be introduced as listed in the proportions above and the total volume will be as per the figure below. The grout:soil by volume ratio (0.30) provides a good indication of how viscous the mixed soil will be to facilitate homogeneous mixing (the higher the number, the more fluid the mixture). In the event

mixing proves difficult, we will introduce more of a leaner grout mix to decrease the viscosity of the mixed soil (increased grout:soil volume ratio) while still maintaining the target reagent ratio. The table below indicates the mix proportion that will be used for the project.

Grout SG	Width (ft)	Length (ft)	Plan Area (sqft)	Treatment Thickness (ft)	Volume (cf)	Dry Reagent to Dry Soil by Weight	Dry Unit Weight of Soil (pcf)	Moisture Mass of Soil (pcf)	Dry Total Weight of Soil (tons)	Grout Volume Needed (cf)	Volume of Grout Needed (cy)	Volume of Grout Needed (liters)	Volume of Grout Needed (gallons)	Wt. of Grout (lbs)	w.c ratio	Wt of Water (lbs)	Wt of Cement (lbs)	Wt of Cement (tons)	Grout:Soil by Volume*	kg Reagent per cubic meter soil	Final Volume Soil+Grout (cf)	Final Thickness (ft)
Target: 175kg/m <sup>3</sup> Treated Soil																						
1.52	4.00	16.00	64.0	16.00	1024.00	11.9%	100.0	20.0	51.20	256.0	9.48	7249	1915	24281	1.00	12141	12141	6.07	0.25	151.6	1280.00	20.00
1.52	4.00	1.00	4.0	16.00	64.00	11.9%	100.0	20.0	3.20	16.0	0.59	453	120	1518	1.00	759	759	0.38	0.25	151.6	80.00	20.00

Figure 2 - Calculations for Grout Volume

The treatment thickness represents the height of the mixing zone after pre-cutting but prior to grout placement. The final thickness of the cell is then estimated based on the volume of grout placed. Please note these calculations are based on projections from our experience; actual results may vary in the field due to in-situ soil conditions and onsite construction constraints, so we may need to adapt accordingly to facilitate the work.

The volume of grout needed is calculated based upon the dimension of the cell. The majority of the cells on the project will be 16FT long. There are instances where this value will be less; hence, there is a unit length provided in this table for this case. The volume of grout needed can be multiplied by the required cell length.

Should laboratory testing of early field samples result in strengths that consistently exceed our expectations, Keller may then reduce our target reagent per cubic meter soil from 175 kg/m<sup>3</sup> to 150 kg/m<sup>3</sup>. This likely will be accomplished by injecting a lower specific gravity grout and (potentially) pumping more grout volume per cell.

# Appendix A

## ISS Layout Plan



## Appendix B

# Construction Quality Assurance Project Plan

## CQAPP

1. Sample Collection methods, frequency, and testing procedures
  - a. Collection Methods: Keller will retrieve wet grab samples from at least 2 different mix cells per shift while the mass is still fluid for UCS testing. Testing will be performed using either the excavator bucket or a sampling tool. A minimum of six cylinders will be cast for samples retrieved per shift. Every group cell is considered a homogenous soil-mixed cell. Samples taken from any portion of the group cell will provide the same results in a homogenous soil-mixed cell. A sampler will be available onsite if required by DEC to collect discrete depth samples.
  - b. Procedure: Keller will mobilize a coring drill rig to collect core samples from the test cells to check to continuity of the mass mixing and to perform visual inspection that shown no evidence of non-aqueous phase liquids.
    - i. Due to low strength of the mass mix, the core samples will only be collected for visual inspection. The wet grab samples will be collected in lieu of the core samples for UCS and permeability Testing
  - c. Frequency: Keller will collect grab samples at a rate of one set (set of 6 - 2 for 7 days, 2 for 14 days and 2 for 28 days) for every Group cell which is approximately 212 cyds of mixed material.

NYCSCA/NYSDEC approval of the proposed core locations will be obtained prior to coring.

QC sampling will conform to the NYSDEC ISS Quality Assurance/Quality Control (QA/QC) Guidance Document, including (but not limited to) requirements for notification and NYSDEC approval

# Appendix C

## Job Hazard Analysis

PROJECT MANAGER:	SUPERVISOR:	SAFETY REP:
PROJECT START DATE:	DATE SUBMITTED:	
LOCATION OF WORK:	CONTACT:	
PROJECT REVISION:	JOB NAME & NUMBER:	
<p><b>PPE, Minimum:</b> Hard Hat, Safety-Toe Boots, Safety Glasses, Task Appropriate Gloves, and High Visual/Retro-Reflective Clothing.</p> <p><b>PPE, Additional – As Needed:</b> Hearing Protection, Face Shield, Fall Restraint &amp;/or Fall Arrest Systems, Respiratory Protection</p>		

### PARTICIPANTS IN THE DEVELOPMENT OF RISK ASSESSMENT AND JHA

<i>Name/Title</i>	<i>Signature</i>	<i>Name/Title</i>	<i>Signature</i>
HSEQ Safety Director			

### DOCUMENT CHANGE HISTORY

REVISION #	DATE	DESCRIPTION OF CHANGES/ IMPROVEMENTS	REVIEWED BY:	APPROVED BY:

## PART 1 – HAZARD ANALYSIS

### Section A: Batch Grout

Item	Activity/Task	Potential Hazards	Hazard Control Measures/Procedures	Responsibility
1	Cement Truck Operations	Struck-By Equipment, Crushed By Equipment, Slips, Trips and Falls, Pinch Points	<ul style="list-style-type: none"> <li>• Spot trucks when backing to pig or field bin</li> <li>• Drivers shall wear PPE in accordance with Keller requirements (safety vest, glasses, hardhat, work boots)</li> <li>• Provide staging area for trucks onsite if more than one is present for unload</li> <li>• Notify drivers of the proper access roads and lanes prior to coming onsite</li> </ul>	Supervisor, Worker
2	Fill Silo with Dry Cement/Binder	Struck By, Fall, Non-Respirable Dust	<ul style="list-style-type: none"> <li>• Use appropriate fall protection when climbing silo/tank</li> <li>• Inspect grout supply truck prior to connecting to silo and initiating pump process (gauges are present, no weak welds on tank, truck driver trained to operate pump)</li> <li>• The truck driver shall be instructed by Keller representative as to the current silo capacity and unloading procedures to prevent blowouts or other damage</li> <li>• Ensure appropriate connections between truck and silo</li> <li>• Monitor silo while filling to prevent from being overfilled. Do not wait for dry cement/binder to come out of the top of the silo. Utilize bin fill indicators to monitor binder in the silo from the ground when applicable</li> <li>• All tools shall be tethered when climbing silo</li> </ul>	Supervisor Worker
3	Grout Pump	Over pressurized lines, Caught In, Noise	<ul style="list-style-type: none"> <li>• Ensure all pressurized pneumatic lines are whip-checked</li> <li>• Do not remove guards, unless LOTO procedures have been followed</li> <li>• Utilize hearing protection while in the vicinity of the pump when in excess of 85dBA</li> <li>• Check for leaks and tighten any loose fittings at all hose and pipe connections.</li> <li>• Check for worn or damaged hoses</li> <li>• Identify all emergency stops and ensure they are operational</li> <li>• Do not feel for pressure leaks with bare hands</li> <li>• Check pressure gauges daily</li> </ul>	Worker Supervisor
4	Clearing Blockages	Over pressurized lines, Struck by, Foreign objects	<ul style="list-style-type: none"> <li>• Gradually back the pressure off the pump</li> <li>• Shutdown the pump</li> </ul>	Worker, Supervisor

Item	Activity/Task	Potential Hazards	Hazard Control Measures/Procedures	Responsibility
		in eye, grout burns	<ul style="list-style-type: none"> <li>Utilize LOTO procedures</li> <li>A face shield is required when breaking the line</li> <li>Wash out the hose and change out if needed</li> </ul>	
5	Transferring Dry Cement/Binder from Silo to Batching plant	Non-Respirable dust, Fall, Caught In, Foreign objects in Eye, Grout burns, Electrocution	<ul style="list-style-type: none"> <li>An inverted funnel should be attached to the transfer hose of the silo extending far enough into the opening of the mixing tank to prevent airborne dust (must allow air to enter into the system)</li> <li>Do not put hands or arms into any mixing equipment unless it is locked out</li> <li>Use engineering controls to minimize silica exposure. If Action Level is exceeded, requirements of the OSHA silica standard shall be followed</li> <li>Eye wash shall be readily available</li> <li>Always stand on the work platform. Never stand in a position that would allow you to fall into the mixing tank. Mixing tank should be kept clean to prevent the formation of plugs</li> <li>Ground the generator as per manufacturer specifications and ensure electrical panel is closed and all plugs are properly connected</li> <li>Batch Plant area must remain free of debris and trash</li> <li>All electrical connections must be visually checked to ensure proper connection</li> <li>All electrical connections shall be installed and maintained by qualified personnel</li> <li>Electrical cords shall be run overhead</li> <li>Elevate batch plant area slightly to allow water to drain from batch area</li> <li>Access steps or cribbing will be clear of obstructions to avoid tripping or falling</li> <li>Ensure a supply of vinegar or PH Neutralizer is within batch plant vicinity and thoroughly wash any grout off the skin with vinegar</li> <li>Check slick lines for wear, blisters or cracks. Lay slick line so that it is protected from damage by moving vehicles and mark to prevent tripping personnel. Arrange in an orderly fashion. Use proper scaffolding or other stable platform when handling grout header at heights greater than six feet</li> </ul>	Worker Supervisor
6	Wash Out/Maintenance	Caught in, Foreign Object, Grout Burn	<ul style="list-style-type: none"> <li>Goggles and safety glasses or safety glasses with foam inserts shall be worn if a splashing hazard is present</li> <li>Do not wash yourself off with high pressure water lines</li> <li>Keep two hands on pressure washer nozzle when washing out</li> <li>Ensure bleed off hose is secured and prevented from whipping at the open end</li> </ul>	Worker Supervisor

Item	Activity/Task	Potential Hazards	Hazard Control Measures/Procedures	Responsibility
			<ul style="list-style-type: none"> <li>Chain on the guardrail shall be latched when performing operations from the platform</li> <li>Equipment shall be locked out from accidental ignition should an employee need to chip out the inside of the mixing tank</li> <li>If chipping occurs, the employee should wear a face shield and be equipped with at least an N95 dust mask if the material being chipped is dry and engineering controls on infeasible</li> </ul>	

## Section B: Mass Mixing

Item	Activity/Task	Potential Hazards	Hazard Control Measures/Procedures	Responsibility
1	Conduct Daily Inspection of Mass Mixing Excavator/ Equipment	Pinch Points, Falls, Crushing, Struck-By, Caught-in between, Electrocution, Ergonomic, Overhead Hazards, Slips, Trips, Cuts	<ul style="list-style-type: none"> <li>Conduct a Daily inspection of all self-propelled equipment; this shall be documented on the equipment inspection sheet</li> <li>Use specific inspection sheets for each piece of equipment</li> <li>Any broken or damaged equipment shall be reported to the supervisor immediately. A course of action will then be decided depending on the situation.</li> <li>Wear gloves when inspecting</li> <li>Report all issues via the weekly equipment report. All safety issues must be immediately reported to the Ops Manager and/or Shop Manager to determine the best course of action</li> </ul>	Supervisor, Worker
2	Tracking Mass Mixing Excavator and Mobile Equipment	Noise, Slips, Trips and Falls, Struck-By, Crushed By Equipment, Over Turning Equipment, Caught In-between, Pinch Points, Falls, Electrical (Focus 4 Hazards)	<ul style="list-style-type: none"> <li>Radio communication must be maintained between spotter and drill operator</li> <li>Only authorized operators will be permitted to operate corresponding equipment</li> <li>Equipment will have documented shift daily inspections</li> <li>General contractor to strip, compact, add stone and recompact the job site.</li> <li>Use spotter when moving or tracking equipment</li> <li>Keep unauthorized persons off the worksite.</li> <li>Only one qualified signal person will give signals to the operator</li> <li>All personnel shall be aware of any overhead electrical wires or other obstructions in the path of suspended loads. Proper distances will be maintained and marked if necessary</li> <li>Discuss sequencing of cells during the DTA</li> </ul>	Supervisor, Worker
3	Preconditioning Mass Mixed Cells	Struck-By Equipment, Crushed By Equipment, Slips, Trips and Falls, Struck-By Debris,	<ul style="list-style-type: none"> <li>Place layout flags along the outside perimeter of proposed cell</li> <li>Ensure no personnel enter the work area of the preconditioning hoe without radio contact with the operator</li> </ul>	Supervisor, Worker

Item	Activity/Task	Potential Hazards	Hazard Control Measures/Procedures	Responsibility
		Asphyxiation, Over-turned Rig	<ul style="list-style-type: none"> <li>Operator to maintain 360-degree awareness at all times and use spotters when necessary</li> </ul>	
4	Installing Mass Mixed Cells	Struck-By Equipment, Crushed By Equipment, Slips, Trips and Falls, Struck-By Debris, Asphyxiation, Over-turned Rig	<ul style="list-style-type: none"> <li>Check for and tighten any loose fittings at all hose and pipe connections</li> <li>Ensure spotter and other ground personnel remain outside of the barricaded area</li> <li>If in close proximity to a structure/equipment, then no personnel should stand between the mobile equipment and structure/equipment</li> <li>All required guards shall be in place prior to operation</li> <li>Check for worn or damaged hoses</li> <li>Pressure gauges should be checked daily</li> <li>Only authorized personnel shall be allowed within the working vicinity of the drill</li> <li>Only one qualified signal person will give signals to the operator</li> <li>All personnel shall be aware of overhead operations while within the direct vicinity of the mixing operation</li> <li>Tool connection to excavator arm will be inspected daily</li> <li>Tool nozzles shall be checked and cleaned daily at a minimum</li> <li>Ensure cells are barricaded (see next step)</li> <li>Cells must remain barricaded for the predetermined cure time, or until samples taken during mixing show the material has achieved adequate set</li> <li>Utilize whip-checks for all pressurized hoses</li> </ul>	Supervisor, Worker
5	Barricading Mass Mixed Cells	Struck-By Equipment, Crushed By Equipment, Slips, Trips and Falls, Struck-By Debris, Asphyxiation, Over-turned Rig	<ul style="list-style-type: none"> <li>Place signs that read "Danger – Wet Slurry" around the mixing area</li> <li>As mass mixing progresses, ensure barricades are erected directly behind the operation</li> <li>Barricades must be set up 6' feet back from the edge of the cell and reach at least 3' feet above the existing grade</li> <li>They must be highly visible. Use yellow caution tape</li> <li>Once cell is complete, ensure barricade fully encompasses the cell</li> <li>Do not remove the barricade until the cell is cured</li> </ul>	Supervisor, Worker
6	Excavator Operations	Struck-By Equipment, Crushed By Equipment, Slips, Trips, and Falls	<ul style="list-style-type: none"> <li>Excavator backup alarms must be in working order</li> <li>Because of constant swinging of the excavator bucket, personnel will be cleared from area where spoils are being managed</li> </ul>	Supervisor, Worker

Item	Activity/Task	Potential Hazards	Hazard Control Measures/Procedures	Responsibility
			<ul style="list-style-type: none"> <li>• Maintain spoil piles outside of barricaded area</li> <li>• Prior to tracking, the operator(s) ensure no personnel are behind the machine and that the tracks are clear and in good working order</li> <li>• Prior to tracking, the operator(s) must ensure avoidance of freshly mixed cells by remaining outside of the barricaded area</li> </ul>	
7.	Managing Contaminated Surfaces and Equipment	Contact with petroleum-contaminated surfaces or equipment, Slips/ trips/falls on slippery surfaces caused by petroleum residue, Environmental contamination from petroleum residue left onsite, Equipment malfunction due to buildup of contaminants	<ul style="list-style-type: none"> <li>• Inspect equipment surfaces for petroleum buildup at regular intervals throughout the day</li> <li>• Use absorbent materials, such as pads or mats, to wipe down equipment immediately after contamination</li> <li>• Designate a cleaning station with appropriate materials (e.g., absorbents, scrapers, or biodegradable cleaning agents) to handle contaminated surfaces onsite</li> <li>• Ensure workers wear petroleum-resistant gloves and boots with slip-resistant soles when working around contaminated surfaces</li> <li>• Maintain spill kits at the cleaning station and near equipment in use for immediate containment of petroleum residue</li> <li>• Conduct final checks of cleaned equipment to confirm removal of contaminants before moving to other site locations or storage areas</li> <li>• Monitor nearby areas for any contamination that may spread during cleaning and address immediately to minimize environmental impact</li> </ul>	Supervisor, Worker
8.	Cleaning of Excavator and Tooling	Chemical exposure to petroleum or cleaning agents Slips/ trips/ falls due to spills or wet surfaces Inhalation of fumes Contaminated runoff/environmental hazards Cuts or abrasions from tools or equipment	<ul style="list-style-type: none"> <li>• Use appropriate PPE, including chemical-resistant gloves, goggles or foam lined glasses, and respiratory protection if fumes are present</li> <li>• Perform cleaning in a designated, well-ventilated area (outdoors is sufficient in this case)</li> <li>• Place spill containment barriers (e.g., absorbent mats, secondary containment trays) to manage runoff</li> <li>• Ensure all cleaning agents are stored and handled according to manufacturer instructions</li> <li>• Use non-sparking tools if working near petroleum residues</li> <li>• Dispose of contaminated materials (e.g., rags) following environmental and local regulations</li> </ul>	Supervisor, Worker
9.	Daily shutdown	Contact with hot surfaces	<ul style="list-style-type: none"> <li>• Ensure equipment is parked on stable, level ground away from active work areas</li> </ul>	

Item	Activity/Task	Potential Hazards	Hazard Control Measures/Procedures	Responsibility
	of equipment	or equipment components, Slips/trips/falls around equipment during shut down Exposure to petroleum contamination on equipment surfaces Environmental contamination from leaks or spills during shut down	<ul style="list-style-type: none"> <li>• Shut down equipment following manufacturer guidelines to avoid unintentional movement</li> <li>• Conduct a visual inspection of equipment for leaks, damages, or petroleum residue before leaving the site</li> <li>• Allow equipment to cool before performing any cleaning or maintenance tasks to prevent burns</li> <li>• Wipe down contaminated surfaces with absorbent materials or approved cleaning agents</li> <li>• Use appropriate PPE, including gloves and boots resistant to petroleum and sharp edges</li> <li>• Ensure all tools, hoses, and accessories are safely stored to prevent tripping hazards around the equipment</li> <li>• Maintain communication with crew members to verify all equipment has been properly shut down and inspected at the end of the shift</li> </ul>	

### Acknowledgement

All workers involved in the tasks listed in the previously read JHA are to sign below to acknowledge their understanding of the proper hazard control measures

Worker Name (print)	Worker Signature	Date
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Appendix D

Atmos Shield 645 Specs

## Atmos Shield 645

### The Odor Control Foam

Atmos Shield 645 foam concentrate produces a thick, long lasting foam barrier for immediate suppression of dust, odors, and volatile organic compounds (VOCs). Atmos Shield 645 provides superior emissions control for a period of up to 24 hours. It has been specified for use at Superfund and other hazardous waste sites across the United States and Canada. The product is designed for use exclusively in Atmos Technologies' Pneumatic Foam Units.



### Features

- Zero PFOS / PFAS
- Biodegradable
- Non-Hazardous
- Non-Reactive
- Use at any ambient temperature

### Benefits

- Immediate setup & control of VOCs
- Requires only water dilution
- Vary duration with dilution level
- No clean-up
- Will not add to soil volume

### Applications

Primary applications for Atmos Shield 645 is for control of odors, VOCs, and dust during active excavation and for overnight coverage of contaminated soils at hazardous waste sites. Wintergreen or vanilla can be added to customize the scent.

The product can also be applied on liquid surfaces, such as lagoons and retention ponds.

## PNEUMATIC FOAM UNIT NTC / 8

Atmos Technologies' most compact and portable foam generating system designed for small remediation applications. The NTC/8 can be mounted on the tongue of most standard air compressors and can be drum or auxiliary tank fed.



This system is completely air driven and comes equipped with pump, foam generator, hose and pick-up tube. The unit requires a source of compressed air.

### Features

- Simple to operate
- Minimal clean-up after use
- Remote control for one person operation
- Durable, rugged construction
- Electrical system is powered by a 12 volt battery
- Minimal preparation

### Specifications

- Coverage Rate.....90 Sq. Ft./Min. @3" depth
- Compressed Air Required.....120 CFM @ 100 PSI
- Size.....36"L x 23"W x 26"H
- Weight.....375 Pounds
- Hose.....100 Feet of 1" Diameter
- Products.....AC-645 and All AC-900 Series Long Duration Foam

