

**APPENDIX J**  
**CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN**

# **Construction Quality Assurance Project Plan**

## **Excavation & Capping of the Filled First Street Turning Basin, Gowanus Canal**

### **Borough of Brooklyn, New York**

**Project ID: PW77GOWAN**

**Contract No. HWDRCW02**

**Prepared for**



The AKRF-KSE JV

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## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
1.1	Purpose .....	1
1.2	Definitions and Terms .....	1
2.0	QUALITY MANAGEMENT ORGANIZATION.....	2
2.1	City of New York .....	2
2.2	Responsible Parties.....	2
2.3	Design Engineer .....	2
2.3.1	AKRF-KSE JV .....	2
2.3.2	Teaming Partners .....	2
2.4	Engineer.....	3
2.5	The Contractor.....	5
3.0	DOCUMENTATION REQUIREMENTS.....	7
3.1	Documentation .....	7
3.1.1	Daily Field Construction Reports.....	7
3.1.2	Health and Safety Accident Reports .....	7
3.1.3	Import Material Log.....	8
3.1.4	Transportation and Disposal Log .....	8
3.1.5	Photographic Documentation .....	8
3.1.6	Construction Completion Reports.....	8
3.1.7	Final Remedial Action Report.....	9
3.1.8	Construction Submittals .....	9
3.2	Project Meetings.....	10
3.2.1	Pre-Construction Meeting .....	10
3.2.2	Daily Site Safety and Coordination Meetings .....	10
3.2.3	Periodic Progress and Coordination Meetings .....	10
3.2.4	Project Close-Out Meeting.....	10
4.0	PRECONSTRUCTION ACTIVITIES / MOBILIZATION .....	11
4.1	Pre-Construction Surveys.....	11
4.2	Erosion and Sediment Control Measures .....	11
4.3	Temporary Site Security Measures.....	11
4.4	Remedial Support Areas.....	11
4.5	Utility Identification .....	12
4.6	Protection of Adjacent Structures.....	12
5.0	WATER TREATMENT .....	13
5.1	CQA Observations.....	13
5.2	Contractor CQA Submittals.....	13
6.0	SOIL EXCAVATION .....	14
6.1	In-Situ Characterization of Soils to be Excavated.....	14
6.1.1	CQA Observations .....	14
6.1.2	Contractor CQA Submittals .....	14
6.2	Excavation Support .....	14
6.2.1	CQA Observations .....	14
6.2.2	Contractor CQA Submittals .....	14
6.3	Soil Removal .....	14
6.3.1	CQA Observations .....	15
6.3.2	Contractor CQA Submittals .....	15
6.3.3	CQA Observations .....	15
6.4	Intertidal Vegetative Shelf.....	15

6.4.1	CQA Observations .....	15
6.5	Solid Waste Handling and Disposal .....	15
6.5.1	CQA Observations .....	16
6.6	Liquid Waste Handling, Treatment, and Disposal.....	16
7.0	CAPPING .....	17
7.1	Capping Preparation .....	17
7.1.1	CQA Observations .....	17
7.2	Sediment Cap & Intertidal Vegetative Shelf Cap.....	17
7.2.1	Contractor Submittals.....	17
7.2.2	CQA Observations .....	18
8.0	SITE RESTORATION .....	19
8.1	Intertidal Vegetative Shelf Cap Restoration .....	19
8.1.1	CQA Observations .....	19
9.0	DEMOBILIZATION .....	20
9.1	Decontamination.....	20
9.2	Post-Construction Surveys .....	20
9.3	Demobilization .....	20
9.3.1	CQA Observations .....	20
10.0	REFERENCES .....	21

**FIGURE**

Figure 1: Site Plan

### LIST OF ACRONYMS

Acronym	Definition
AKRF-KSE JV	AKRF Engineering, P.C./KS Engineers, P.C. Joint Venture
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Reports
COCs	Constituents Of Concern
CQA	Construction quality assurance
CQAPP	Construction Quality Assurance Project Plan
CQC	Construction quality control
DFCR	Daily Field Construction Report
EPA	United States Environmental Protection Agency
HASP	Health and Safety Plan
MMP	Materials Management Plan
MNLA	Mathews Nielsen Landscape Architects
MRCE	Mueser Rutledge Consulting Engineers
NAPL	Non-Aqueous Phase Liquid
NYCDCP	New York City Department of City Planning
NYCDDC	New York City Department of Design and Construction
NYCDEP	New York City Department of Environmental Protection
NYCRR	New York Codes, Rules and Regulations
NYS S&S	New York State Standards and Specifications
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
PCBs	Polychlorinated Biphenyls
QA/QC	Quality Assurance/ Quality Control
SOE	Support of Excavation
SVOCs	Semi Volatile Organic Compounds
VOCs	Volatile Organic Compounds
WMP	Waste Management Plan

## **1.0 INTRODUCTION**

This Construction Quality Assurance Project Plan (CQAPP) has been prepared by AKRF Engineering, P.C./KS Engineers, P.C. Joint Venture (AKRF-KSE JV), on behalf of the New York City Department of Design and Construction (NYCDDC), to support the excavation and capping of the former First Street Turning Basin adjacent to the Gowanus Canal in Brooklyn, New York (the Site). Details related to the removal activities are presented in the 100% Design Report, to which this CQAPP is included as an appendix and as a supporting plan. Technical Specifications supporting this CQAPP are included in Appendix F of the 100% Design Report.

### **1.1 Purpose**

The purpose of this CQAPP is to detail the quality assurance and quality control (QA/QC) procedures that will be used to maintain data accuracy and completeness during implementation of the selected remedy. This CQAPP describes the materials, procedures, and testing necessary for proper construction, evaluation, and documentation of construction activities.

### **1.2 Definitions and Terms**

The following terms and abbreviations are used throughout this CQAPP. The definition of each term or abbreviation is consistent throughout this CQAPP:

- ASTM – American Society for Testing and Materials.
- The Contractor – The person, persons, or firm retained by the Responsible Parties to perform the remedial activities, including the person or persons hired by the Contractor to install the components of the remedial work and the person or persons designated by the Contractor to perform work associated with the remedial activities.
- Responsible Parties – The person, persons, or firm identified by the United States Environmental Protection Agency (EPA) as responsible for implementing the cleanup of the Site.
- 100% Design Report – The 100% Design Report collectively includes the respective Site 100% Design Report text; Technical Specifications; Construction Drawings; this CQAPP; Community Air Monitoring Plan (CAMP); Health and Safety Plan (HASP); Operations Maintenance and Monitoring Plan; and Materials Management Plan (MMP).
- CQA – Construction Quality Assurance.
- CQC – Construction Quality Control.
- Design Engineer – The Design Engineer was responsible for preparing the 100% Design Report.
- Engineer – For the purpose of this CQAPP, the Engineer is the person or persons responsible for verifying that the Contractor completes the remedial construction activities in accordance with the 100% Design Report. The Engineer is responsible for oversight of the CAMP and HASP implementation, record keeping, and communication with the Environmental Monitor, the Responsible Parties, and/or EPA. The Engineer's duties include reviewing proposed modifications to the 100% Design Report. In addition, the Engineer will be responsible for the QA/QC aspects of the project. Duties will include sampling, testing, determination of work limits, and measurement of work for payment and final acceptance.
- Environmental Monitor – The on-site person or persons designated by the Engineer as responsible for implementation of the CAMP and HASP.
- Manufacturer – The person or persons designated by the Contractor to provide construction materials.

## 2.0 QUALITY MANAGEMENT ORGANIZATION

This section identifies the general CQA roles, qualifications, and responsibilities of the Engineer and the Contractor's personnel, as well as the Responsible Parties' role in the CQA process.

### 2.1 City of New York

Under the Administrative Order of Consent, the City is responsible for the design of the selected remedy for the First Street Turning Basin. NYCDDC is assigned to be the representative agency for the City. NYCDDC provided preliminary and final design of the excavation and capping of the former First Street Turning Basin on behalf of the City and in consultation with other City agencies, including the New York City Department of Environmental Protection (NYCDEP) and the New York City Department of City Planning (NYCDCP).

### 2.2 Responsible Parties

The Responsible Parties will have the final authority on all aspects of the remedial construction activities for the former First Street Turning Basin project. The Responsible Parties are empowered to determine the amount, quality, acceptability, and fitness of all remedial construction completed in accordance with the 100% Design Report.

The Responsible Parties will be knowledgeable of the project requirements and objectives and familiar with the 100% Design Report. The Responsible Parties will be on-site, as required, during construction activities. The responsibility of the Responsible Parties is to review the quality of construction that meets or exceeds that defined by the 100% Design Report and identified in this CQAPP.

The Responsible Parties will have the following responsibilities in the implementation of the procedures in the CQAPP:

- Attend the pre-mobilization site meeting;
- Attend project coordination meetings, as required; and
- Evaluate the construction activities and the Engineer's CQA efforts.

### 2.3 Design Engineer

#### 2.3.1 AKRF-KSE JV

AKRF-KSE JV was the NYCDDC's primary consultant responsible for the design of the selected remedy. The team organization for the AKRF-KSE JV is further described below.

#### 2.3.2 Teaming Partners

The AKRF-KSE JV has partnered with several professional consultants to provide technical direction and support for the remedial design. These firms, as well as their area of expertise, are listed below.

##### 2.23.2.1 Arcadis

ARCADIS of New York, Inc. (Arcadis) is serving as the Engineer of Record for the environmental engineering components of the remedial design.

##### 2.23.2.2 Mueser Rutledge Consulting Engineers

Mueser Rutledge Consulting Engineers (MRCE) provided support for geotechnical engineering and support of excavation (SOE) aspects of the remedial design. MRCE led the bulkhead engineering aspects of the remedial design, and the subsurface geotechnical

investigations. MRCE is the Engineer of Record for the geotechnical and structural marine engineering components of the remedial design.

2.23.2.3 Mathews Nielsen Landscape Architects

Mathews Nielsen Landscape Architects (MNLA) provided design support for the landscaping and urban design. MNLA led the design aspects for the intertidal vegetative shelf and the fence along the northern and eastern Site boundaries.

**2.4 Engineer**

The Engineer will provide on-site and office-based assistance to the Responsible Parties throughout the duration of remedial activities. The Engineer will observe construction activities and document that the materials and workmanship delivered by the Contractor comply with the requirements of the 100% Design Report and are of sufficient quality to permit the development of construction completion certifications as may be required by EPA. The observation, sampling, and/or documentation of construction activities and associated procedures will be performed by a person or persons familiar with construction procedures and materials, and the project requirements. The project personnel will be under the direct supervision of a Professional Engineer licensed in the State of New York. The CQA personnel will be familiar with the use of equipment and methodology needed to sample and test soil, water, and other materials.

The Engineer will have experience in a position of significant responsibility for construction projects similar in magnitude and complexity to the project being undertaken. The Engineer must be knowledgeable of the project requirements and objectives and must be familiar with the 100% Design Report. The Engineer's on-site personnel must demonstrate knowledge of construction, excavation, and applicable test methods through a combination of formal education, training, and experience.

The Engineer will have the following responsibilities during the implementation of the procedures in this CQAPP:

- Coordinate the pre-construction site meeting;
- Schedule and coordinate CQA inspection activities;
- Coordinate periodic project meetings;
- Attend to routine daily topics related to the overall performance of the construction activities;
- Maintain responsibility for the implementation of the procedures in this CQAPP;
- Provide the appropriate technical review (i.e., by qualified representatives of the Engineer) of the 100% Design Report;
- Review, approve (in conjunction with EPA and Responsible Parties), and document proposed field modifications to the 100% Design Report;
- Maintain contact with EPA, the Contractor, and any subcontractors regarding conformance with the requirements in this CQAPP;
- Provide overall coordination of the remedial activities;
- As an agent for the Responsible Parties, prepare manifests for the transportation of non-hazardous waste and conditionally exempt materials (i.e., soil/sediment, water, debris);
- Provide analytical results for imported fill materials (provided by the Contractor) to EPA for review and approval prior to material being brought on-site.



- Document that field and laboratory testing is conducted at the frequency established in this CQAPP, review field and laboratory QA/QC testing results for conformance with the 100% Design Report, and provide assistance in the review and interpretation of field and laboratory testing results;
- Provide assistance in the review of shop drawings, product data, and other submittals from the Contractor;
- Review the progress of the remedial activities and prepare Daily Field Construction Reports;
- Review the installed portion of work to allow further construction;
- Identify noted deficiencies during construction activities (based on QA/QC testing results) so corrective actions can be taken;
- Prepare the Construction Completion Reports to document the completion of phased remedial construction activities;
- Prepare the Final Remedial Action Report to document the completion of remedial activities; and
- Prepare a Site Management Plan or equivalent institutional control to detail the post-remedial construction operations, maintenance, and monitoring activities.

The Engineer's on-site personnel will also have the following responsibilities in the implementation of the procedures in this CQAPP:

- Oversee and coordinate the QA/QC sampling and testing;
- Record on-site activities that could result in damage to the Site and report these activities to the Contractor and EPA;
- Review shop drawings, product data, and other submittals from the Contractor;
- Identify/determine areas that require rework and/or repair;
- Coordinate activities to establish proper sampling procedures;
- Perform regular Site walkthroughs to review progress and QA/QC procedures;
- Perform community air monitoring in accordance with the CAMP included as a supporting plan and appendix to the 100% Design Report;
- Provide community air monitoring results to EPA, the Responsible Parties, and the New York State Department of Health (NYSDOH) on a weekly basis (or more frequently if requested by EPA);
- Identify areas of non-conformance based upon the results of field and laboratory testing;
- Perform and document field sampling for QA/QC testing;
- Prepare weekly erosion and sediment control inspection reports;
- Observe construction materials, such as soils, capping materials, and geosynthetics, delivered to the Site to determine general conformance with material specifications; and
- Observe and record the procedures used for the following:
  - Pre-construction activities/mobilization;
  - In-situ characterization of soils to be excavated;

- Installation of the drilled pipe piles;
- Soil excavation and sediment removal activities;
- Non-aqueous phase liquid (NAPL) collection and limited water treatment/off-site disposal;
- Installation of a soil/sediment capping system;
- Installation of an intertidal vegetative shelf capping system;
- Noise, vapor/odor suppression, and dust control;
- Decontamination of equipment and personnel;
- Waste handling, stabilization, treatment, and disposal;
- Backfilling/restoration of excavated and disturbed areas;
- Planting of vegetation; and
- Site restoration/demobilization.

## **2.5 The Contractor**

The Contractor will be trained and experienced, and demonstrate that the superintendent, field crew foreman, and subcontractors have similar experience in the construction, installation, and performance of the various components outlined in the 100% Design Report, including (but not limited to) SOE/permanent bulkheads, removal of soil and buried sediment to a presumptive depth of 23 to 27 feet below grade surface (bgs), installation of a sediment cap at the exposed surface of the excavation bottom, water handling/management, installation of an intertidal vegetative shelf and cap, restoration of three sides of the upland perimeter of the area, and restoration of the fourth side of the perimeter, such that the former First Street Turning basin is again open to the Gowanus Canal.

The Contractor will have the following responsibilities for implementing the procedures presented in this CQAPP:

- Review and be completely familiar with the 100% Design Report;
- Maintain lines of communication with the Responsible Parties and the Engineer to identify and discuss field issues as they arise;
- Coordinate with all equipment and material suppliers to document compliance with CQAPP requirements;
- Provide the Responsible Parties and/or the Engineer with at least five days written notice of any tests or inspections required by the 100% Design Report, timely notice of all other tests and inspections, and an additional 48 hours' notice prior to the actual performance of any test or inspection;
- Prepare and submit to the Engineer all shop drawings and other required submittals specified in the 100% Design Report, including copies of delivery ticket(s) for import material, copies of bills of lading or manifests for material transported off-site, and copies of operating records of water treatment system performance that adequately document the required treatment (and any related discharge monitoring per permit requirements);
- Identify any potential design and/or construction issues as early as possible to allow resolution in a manner that will not impact the quality of the construction or the schedule of construction activities;

- Maintain a continuous record of any approved changes or modifications to the 100% Design Report;
- Contract with a surveyor (all surveys necessary for the implementation of the remedial activities and for the collection of as-built information will be carried out by personnel practiced in land survey techniques and under the direction of a New York State-licensed Land Surveyor); and
- Conduct monitoring and required mitigation detailed in the 100% Design Report, including, but not limited to, geotechnical (movement and vibration monitoring), health and safety, and community air monitoring.

### **3.0 DOCUMENTATION REQUIREMENTS**

The documentation of CQA activities will support a determination of whether construction activities have been carried out in general accordance with the 100% Design Report.

#### **3.1 Documentation**

The documentation process includes recognition of construction tasks that will be observed and documented; assignment of responsibilities for the observation, testing, and documentation of these tasks; and the completion of the required reports, data sheets, forms, and checklists to provide an accurate record of the work performed during the remedial activities.

##### **3.1.1 Daily Field Construction Reports**

The Engineer will complete a Daily Field Construction Report (DFCR) of each day's construction activities. The DFCRs will be submitted at the end of the week in an electronic format to the EPA. The DFCRs will contain, at a minimum, the following information:

- Date, project name, location and description of the phase of work being performed (e.g., support of excavation, installation of bulkheads, bracing, vibration monitoring, community air monitoring, etc.);
- Time that work starts and ends, in addition to the time of work stoppages related to inclement weather, insufficient equipment, or personnel or other reasons;
- Data on weather conditions, including temperature, cloud cover, and precipitation;
- The Contractor's workforce, equipment, and materials (e.g., concrete, structural metals, etc.) delivered to or removed from the Site;
- A chronological description of work in progress, including notices to or requests from the Contractor and/or installer;
- A description of any health and safety or community air monitoring program issues;
- Results of testing performed by on-site personnel;
- Problem/deficiency identification and documentation describing corrective actions taken for field problems and non-conformance with this CQAPP;
- A record of pertinent communications with other on-site parties, outside companies, regulatory agencies, or consultants regarding the day's construction activities;
- Erosion and sediment control inspection results, including date and time of inspection, a description of the weather and soil conditions at the time of inspection, a description of the condition of the runoff at all points of discharge from the site, and identification of all erosion and sediment control measures that need repair or maintenance and/or are not functioning as designed and need corrective action(s); and
- Documentation of problems and/or deficiencies noted during construction (e.g., when construction material or activity is observed or tested that does not meet the requirements set forth in the 100% Design Report), and corrective action employed by the Contractor to address the problems or deficiencies. Include approval or acceptance of the Contractor's corrective action in the subsequent DFCRs.

##### **3.1.2 Health and Safety Accident Reports**

In the event of any accident occurring on-site during the remedial project by any involved party, incident and accident reports will be completed by the affected personnel in addition to the requirements of the individual's Site-specific HASP. The Engineer and the

Responsible Parties will be contacted in the event of an accident. The Responsible Parties' accident report sheets will be attached to the HASP and will be located in the field project trailer.

### **3.1.3 Import Material Log**

The Engineer will prepare an import material tracking log to record all loads of material transported on-site. A copy of all associated delivery tickets will be kept in conjunction with the tracking log. The import material tracking log will remain in the field office during remedial construction activities.

### **3.1.4 Transportation and Disposal Log**

The Engineer will prepare a transportation log to record all loads of solid or liquid waste that are transported off-site and document the final disposition location. A copy of all associated bills of lading or manifests will be kept in conjunction with the transportation log. The transportation log will remain in the field office during remedial construction activities.

### **3.1.5 Photographic Documentation**

The Engineer will document observations, problems, deficiencies and work in progress using a digital format camera that records date and time. Digital photographs will be filed in chronological order in a permanent protective file and computer storage system.

The following information will be documented in the DFCR or a logbook for each photograph:

- Date and time;
- Location where photograph was taken; and
- Description of the subject matter and associated follow-up photographs.

### **3.1.6 Construction Completion Reports**

Upon completion of each phase of remedial construction, a Construction Completion Report (CCR) will be prepared by the Engineer for submittal to the Responsible Parties and EPA. The CCR will present a description of the remedial activities and will follow the format of the Remedial Action Report from the EPA Superfund Remediation and Remedial Action Guidance (EPA 1986). The CCR will contain, at a minimum, the following information:

- A summary of all activities completed and any deviations from the 100% Design Report;
- A summary of soil and liquid waste characterization analytical data, transportation entity permits, and disposal documentation (bills of lading and/or finalized and executed waste manifests);
- A summary of all imported material, analytical testing data, and associated material documentation that demonstrates acceptability for use on the Site;
- Air monitoring data results (community air monitoring and applicable health and safety monitoring);
- Weekly reports that summarize the significant aspects of the DFCRs;
- A photo log documenting the remedial activities conducted during the remedial construction phase;

- Remediation-related permits pertinent to the phase of remedial construction activities; and
- Slope stability monitoring data, as pertinent.

### **3.1.7 Final Remedial Action Report**

A Final Remedial Action Report will be prepared, signed, and sealed by the Engineer at the end of the project. The report will meet the requirements of the EPA Remedial Design/Remedial Action Handbook and Superfund Remedial Design and Remedial Action Guidance and, at a minimum, contain the following information:

- A summary of the Remedial Design Report;
- Record Drawings consisting of plans and details to depict the as-constructed conditions for the remedial activities;
- Correspondence with EPA and others, as deemed relevant to the remedial activities;
- A summary of field observations and tests performed, laboratory samples collected, and test results reported;
- A summary of problems and deficiencies encountered during construction, including recurring problems and/or deficiencies discovered;
- Documentation of deviations from the 100% Design Report, including documentation of agency approval of such deviations, where applicable;
- Documentation indicating that acceptance criteria was met, including a comparison of documented procedure data with the 100% Design Report;
- Survey, metes, and bounds as surveyed by a New York State-licensed surveyor;
- A summary of the CCRs;
- Institutional controls, as necessary, established for the Site after remedial activities have been completed;
- Site management requirements;
- Future requirements for integration with the Gowanus Canal Remediation Target Area 1; and
- A summary and documentation of all waste streams generated as part of the project, including final treatment/disposal destination and volume.

### **3.1.8 Construction Submittals**

The Contractor shall prepare and submit to the Engineer all submittals required in the 100% Design Report and in accordance with Technical Specification 01 33 00 – Submittal Procedures. Information contained in the Contractor's submittals that is not applicable to the specification should be clearly lined out or deleted. The Contractor's submittals must be easily legible, clean, and clearly reproduced.

All required submittals shall be reviewed by the Engineer for conformance with the requirements presented in the 100% Design Report. The Contractor will not be permitted to perform any activity that directly or indirectly involves the item or items covered by a submittal until approval is provided by the Engineer.

The Engineer's review shall in no way be construed as permitting departure from the 100% Design Report, except where the written request by the Contractor and written acceptance by the Engineer and EPA is provided. The Engineer's review does not relieve the

Contractor of any responsibility to comply with applicable laws, rules, regulations, or agreements.

### **3.2 Project Meetings**

Daily, weekly, and/or monthly project safety inspections and/or progress and coordination meetings will be conducted for the duration of the construction activities. A brief description of the project meetings and inspections/reviews to be conducted is provided below.

#### **3.2.1 Pre-Construction Meeting**

Following award of the contract and prior to the Contractor's mobilization, a pre-construction meeting will be held at the Site to introduce project team members representing the Contractor, EPA, the Engineer, and the Responsible Parties. The meeting will be scheduled by EPA shortly after the award of the contract. The meeting will be conducted to review contract requirements, establish a detailed schedule of operations, and resolve issues (if any) raised by the attending parties.

The Engineer will prepare a summary of the pre-construction meeting. A copy of this summary will be provided to each of the parties in attendance. Failure by the Contractor to inform EPA, within seven days of receiving this summary, of any discrepancies or inaccuracies contained therein indicates that the Contractor concurs with the Engineer's summary of the meeting.

#### **3.2.2 Daily Site Safety and Coordination Meetings**

Daily meetings will be administered by the Contractor's representative(s) and attended by the Engineer, EPA (as necessary), and other parties to be on-site during the day to discuss day-to-day operations, daily schedule, health and safety issues, Contractor coordination issues, and general project status.

#### **3.2.3 Periodic Progress and Coordination Meetings**

Periodic progress and coordination meetings, administered by the Contractor, will be held on-site weekly, or as required, for the duration of the project. Participants in these meetings will include on-site representatives of the Contractor and the Engineer. EPA and the Responsible Parties may also attend some or all of the weekly progress and coordination meetings. Progress and coordination meetings will be held to discuss issues, including, but not limited to, project status, schedule, scope of work and overall project implementation.

Site inspections/reviews will be conducted by EPA and/or the Engineer as part of the periodic progress and coordination meetings prior to, during, and at the completion of the remedial activities. The weekly progress and coordination meetings will be scheduled by the Engineer.

#### **3.2.4 Project Close-Out Meeting**

A project close-out meeting will be held at the end of the remedial construction activities. Participants in the meeting will include the Contractor, EPA, the Engineer, and the Responsible Parties. The meeting will be administered by the Engineer. As part of the meeting, a final Site inspection will be conducted by EPA, the Engineer, and the Responsible Parties.

## **4.0 PRECONSTRUCTION ACTIVITIES / MOBILIZATION**

This section describes the construction and testing procedures for the activities that will take place prior to the start of the remedial construction activities. Remedial construction activities will be conducted in several phases throughout the duration of the construction, as described in the 100% Design Report.

### **4.1 Pre-Construction Surveys**

Initial Site surveys will be performed by the Contractor's surveyor to document existing (pre-construction) Site conditions. During these activities, the surveyor will also establish survey control for the proper construction, documentation and testing of subsequent work activities (e.g., excavation support system, excavation). Additional survey work will be conducted prior to the start of each phase of upland remedial action. The Engineer will visually observe and document that survey activities are performed in accordance with Technical Specification 01 71 23.16 – Construction Surveying, and survey documentation conforms to the requirements of Technical Specification 01 78 00 – Contractor Closeout Submittals. The Engineer will also obtain photographic documentation of pre-construction conditions prior to the initiation of construction activities.

Prior to initiation of removal activities, the Contractor will develop topographic data of existing (pre-construction) conditions to establish a benchmark for comparison to post-removal and post-construction conditions. Following excavation activities, restoration measures will include the backfill of substrate (as necessary), as specified in the 100% Design Report.

### **4.2 Erosion and Sediment Control Measures**

Erosion and sediment control practices will be implemented by the Contractor for all construction activities where any excavation, staging, or loading activities are conducted. Since direct loadout of soil will be implemented following the dewatering and conditioning of excavated soils, the duration of on-site staging of soils will be limited. The general sequence of actions required within the erosion and sediment control plan is runoff control, stabilization, and then sediment control, in compliance with the New York State Standards and Specifications (NYS S&S) for Erosion and Sediment Control (November 2016).

Prior to the start of the remedial activities, the Contractor shall construct/install erosion and sediment control measures in general accordance with the Construction Drawings and the NYS S&S for erosion and sediment control. The Engineer will document, through visual observations and inspection logs, that erosion and sediment control measures are constructed and maintained in accordance with the Technical Specification 01 57 13 – Temporary Erosion and Sediment Control.

### **4.3 Temporary Site Security Measures**

Temporary Site features and Site security measures (e.g., fencing, signage) will be installed by the Contractor. The Engineer will visually observe and document that temporary Site security measures are installed, inspected, and maintained by the Contractor in accordance with the 100% Design Report.

### **4.4 Remedial Support Areas**

Prior to the start of the remedial activities, the Contractor will construct and set-up remedial support areas (e.g., equipment/personnel decontamination area, field office trailers and other support facilities). The Contractor will be responsible for submitting to the Engineer a figure indicating the proposed locations of such areas for approval prior to mobilization (if different than indicated in the 100% Design Report). The Engineer will also confirm that the remedial support areas are constructed in acceptable locations (i.e., as indicated in the 100% Design Report or approved alternate locations) and in accordance with Technical Specification 01 55 29 – Staging Areas.



#### **4.5 Utility Identification**

Prior to remedial construction activities, the Engineer will document that the following has occurred:

- The Contractor has contacted Dig Safely New York, and the utility clearance is completed prior to the initiation of any intrusive activities;
- A private utility mark-out is conducted by the Contractor; and
- Utility locations/alignments are marked out on the ground.

The locations, alignments, and construction of utilities shown on the Construction Drawings are approximate and based on information available to EPA and the Design Engineer. Any differences identified by the Contractor between the utilities shown on the Construction Drawings and those encountered in the field will be brought to the immediate attention of EPA and the Engineer prior to implementing any intrusive activities.

#### **4.6 Protection of Adjacent Structures**

A pre-construction condition survey of buildings located within 100 feet of construction was completed in August 2017. The Contractor must protect the adjacent properties from damage during construction in accordance with the New York City Building Code. A subsequent pre-condition survey of buildings and utilities within the established construction influence zone must be performed by the Contractor prior to the start of construction. Buildings and structures that are within a distance equal to or less than the maximum excavation depth must be monitored for movement during construction. The 100% Design Report includes requirements for movement and vibration monitoring, including threshold and limiting action levels for implementation during construction, monitoring frequency, and reporting criteria.

## **5.0 WATER TREATMENT**

The Contractor is responsible for the installation, operation, and maintenance of any temporary on-site water containment or treatment systems in support of the remedial construction activities, as specified in Technical Specification 02 51 19 – Excavated Material and Waste Management, Technical Specification 44 08 40 – Water Treatment System Requirements, and the Materials Management Plan.

### **5.1 CQA Observations**

The Engineer will observe the limited water pumping, containment and NAPL containerization, transportation, and disposal procedures employed by the Contractor. The Engineer will be provided with waste profiles and proposed waste disposal facilities for review and approval prior to disposal of wastewater.

### **5.2 Contractor CQA Submittals**

The Contractor will be responsible for providing the water treatment system submittals listed in Technical Specification 44 08 40 – Water Treatment System Requirements.

The Contractor shall maintain (throughout the course of the project) a written record of the operation, maintenance, and monitoring activities associated with the water treatment system. Such information shall be tabulated, updated daily, and submitted on a weekly basis to the Engineer for review. At a minimum, the summary shall include the following information (for each day):

- Hours of operation;
- Volume of water extracted and treated;
- Volume of water discharged to the Gowanus Canal;
- Type and frequency of monitoring and maintenance activities (if any); and
- Other information relevant to the operation, monitoring, and maintenance of the water treatment system.

## **6.0 SOIL EXCAVATION**

Excavation activities will be performed by the Contractor in accordance with the 100% Design Report. The Contractor is required to perform in-situ characterization prior to conducting any excavation activities. All removed soil, debris, and water will be handled by the Contractor in accordance with Technical Specification 02 51 19 – Excavated Materials and Waste Management and the Materials Management Plan.

### **6.1 In-Situ Characterization of Soils to be Excavated**

The in-situ sampling and laboratory assessment of soil quality will be performed to pre-characterize the soil quality, allow for a review of soil quality analytical data, and the characterization of soils as hazardous or non-hazardous to determine the appropriate disposal facilities for excavated material in advance of excavation. This work will be performed in accordance with Technical Specification 02 51 19 – Excavated Materials and Waste Management.

#### **6.1.1 CQA Observations**

In advance of excavation, the Engineer will observe the in-situ characterization activities employed by the Contractor and review the analytical testing data to and determine the appropriate disposal facilities for the excavated material.

#### **6.1.2 Contractor CQA Submittals**

The Contractor will be responsible for providing a work plan for in-situ characterization that details the gridding of the material to be excavated with respect to construction sequencing, as well as sampling frequencies and the analytical testing requirements of the potential waste disposal facilities, as per Technical Specification 02 51 19 – Excavated Materials and Waste Management.

### **6.2 Excavation Support**

The Contractor shall construct SOE systems that will consist of continuously interlocked pipe piles drilled to depth for the north, east, and south perimeters. A temporary pipe pile wall will be provided at the Gowanus Canal/basin interface (west perimeter) for the intertidal vegetative shelf and for temporary support of the Gowanus Canal mudline during excavation of the basin. Once the Gowanus Canal is dredged to the required elevation, the pipe pile wall within the excavated basin width will be cut to the required elevation to allow for integrated construction of the cap at the Gowanus Canal/basin interface. The SOE wall at the intertidal vegetative shelf/basin interface will be integrated into the permanent bulkhead structures. The pipe pile interlocks will be treated with sealant to create low-permeability walls that minimize groundwater flow through the sides of the excavated basin.

#### **6.2.1 CQA Observations**

During excavation support installation and excavation/backfilling activities, the Engineer will monitor the installation of the SOE for conformance with the design specifications.

#### **6.2.2 Contractor CQA Submittals**

Prior to implementation, the Contractor will be responsible for providing a work plan for SOE and excavation, as per Technical Specification 31 23 16 – Excavation.

### **6.3 Soil Removal**

Excavation activities will be performed in general accordance with the following Technical Specifications:

- 01 71 23.16 – Construction Surveying;

- 02 51 19 – Excavated Material and Waste Management; and
- 31 23 16 – Excavation.

### **6.3.1 CQA Observations**

During excavation/backfilling activities, the Engineer will monitor the excavation of fill material for conformance with the design specifications.

### **6.3.2 Contractor CQA Submittals**

The Contractor will be responsible for providing the associated submittals for SOE, excavation, and backfilling, as per the Technical Specification, prior to implementation.

The limits of each phase of soil excavation activities are shown on the Construction Drawings. The Engineer shall conduct community air monitoring (in accordance with the CAMP) during all intrusive activities. The Contractor shall confirm that community air monitoring (including vapor, dust, and odor) is being conducted prior to the start of any intrusive activities. Additionally, the Contractor shall have the ability to immediately implement corrective actions if necessary.

The Contractor shall conduct geotechnical monitoring in accordance with Technical Specification 31 09 13 – Geotechnical Instrumentation and Monitoring. As indicated in the specification, the Contractor shall collect data from an inclinometer daily, at a minimum. All data should be provided to the Engineer the following day. The Engineer will work with the Contractor to interpret the data, implement corrective actions, and notify EPA if response levels are reached.

### **6.3.3 CQA Observations**

The Engineer will observe excavation activities to: 1) document that they are being performed in accordance with the 100% Design Report and; 2) report non-conformances to the Contractor.

## **6.4 Intertidal Vegetative Shelf**

The Contractor shall construct an intertidal vegetative shelf on top of bulkhead walls on the eastern and northern edges of the basin. Final elevations of excavation, cap components similar to those used for the sediment cap within the basin, and hydraulic conditions are all key components of the intertidal vegetative shelf design. On top of the cap in this area, a minimum of a 15.2-inch thick layer of sand planting soil will be installed to support establishment of the overlying intertidal vegetation and provide benthic habitat.

### **6.4.1 CQA Observations**

During the construction of the intertidal vegetative shelf, the Engineer will monitor the excavation of fill material for conformance with the Technical Specifications.

Throughout excavation activities, the surveyor (contracted by the Contractor) will measure the excavation elevations, and the Engineer will document that the excavations are completed to the required elevations.

## **6.5 Solid Waste Handling and Disposal**

The Engineer shall arrange for proper handling, treatment, and disposal of waste materials, including, but not limited to, soil, debris and miscellaneous wastes generated during the remedial activities, in accordance with the Waste Management Plan (WMP), Technical Specification 02 51 19 – Excavation Material and Waste Management, and all applicable Federal, State and local regulations.

### **6.5.1 CQA Observations**

The Engineer will observe the implementation of the remedial activities at the Site to document that waste materials are being handled/managed in accordance with the WMP, Technical Specification 31 23 16 – Excavation, Technical Specification 02 51 19 – Excavated Material and Waste Management, and all applicable Federal, State, and local regulations. The Engineer will visually inspect the loading area to confirm that the impacted material that collects on the polyethylene sheeting is either placed in the truck or delivered back into the excavation.

The Engineer will maintain the following documentation for waste handling, treatment and disposal activities:

- Bills of Lading/Hazardous Waste Manifests;
- Chain of Custody records;
- Trucking logs;
- Waste profiles; and
- Counter-signed waste manifests and facility disposal receipts for waste material transported off-site for treatment/disposal.

### **6.6 Liquid Waste Handling, Treatment, and Disposal**

The Contractor shall use appropriate means and methods to dewater/stabilize materials prior to excavation and transportation to the approved off-site treatment/disposal facility. The Contractor shall also be responsible for the set-up and operation of the temporary water treatment system, as described in Section 5.0.

## **7.0 CAPPING**

### **7.1 Capping Preparation**

The Contractor will backfill aggregate materials within the portion of the First Street Turning Basin only under the conditions described in the Construction Drawings and in accordance with the 100% Design Report.

Capping will be performed in general accordance with the following Technical Specifications:

- 01 71 23.16 – Construction Surveying
- 35 43 00 – Cap Construction

#### **7.1.1 CQA Observations**

Throughout construction activities, the Engineer will document that excavations have been completed to the specified elevations prior to installation of the sediment cap, in accordance with Technical Specification 35 43 00 – Cap Construction. Once excavation is complete, the surveyor (contracted by the Contractor) will record the final excavation elevations.

### **7.2 Sediment Cap & Intertidal Vegetative Shelf Cap**

The Contractor will provide capping material, as per the 100% Design Report. Submittals will be provided for the capping material for approval prior to use.

If submittals show that the material does not meet the requirements of Technical Specification 35 43 00 – Cap Construction, the Contractor must identify a new source for the material and provide the required data report for the new source prior to the use of such material on-site.

#### **7.2.1 Contractor Submittals**

The Contractor's submittal requirements for the cap are presented in Technical Specification 35 43 00 – Cap Construction. Such submittal requirements include, but are not limited to, the following:

- Name and location of the source of each proposed fill material;
- Geotechnical laboratory test report indicating the grain-size profile for each proposed fill material (determined by ASTM D422); and
- For any off-site material proposed for use on-site as general fill, select fill, or topsoil, the Contractor must provide the following information (for each material) at least four weeks prior to bringing such material on-site:
  - Certification that the proposed fill material is from a New York State Department of Transportation- (NYSDOT-) certified source;
  - Material for sampling by the Engineer. Results of analytical testing for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides/herbicides and inorganics are needed to demonstrate that the proposed fill material meets the unrestricted use soil cleanup objectives presented in 6 New York Codes, Rules and Regulations (NYCRR) Part 375-6; and
  - Documentation that the laboratory used to analyze the proposed fill material is certified by the New York State Department of Health Environmental Laboratory Approval Program for the parameters being analyzed.

### **7.2.2 CQA Observations**

The sediment cap will be installed across the entire bottom of the excavation area. The cap thickness varies between 30 and 55 inches thick and will have a top of cap elevation consistent to the cap installed in the Canal. The cap will include the following functional layers:

- An active layer to address remaining NAPL residuals and dissolved phase Constituents of Concern (COCs);
- An isolation layer to provide a physical barrier minimizing the potential for exposure to impacted materials remaining in the excavated area; and
- An armor layer to protect the installed cap from erosion and material loss.

The Engineer will observe the sediment capping activities to: 1) document that they are being performed in accordance with the 100% Design Report and; 2) report non-conformances to the Contractor.

## **8.0 SITE RESTORATION**

Following completion of excavation and backfilling activities, the Contractor shall restore disturbed areas and demobilize labor, equipment, and materials from the Site in accordance with the 100% Design Report. Site restoration includes intertidal vegetative shelf plantings and possible restoration of staging areas as determined by the Responsible Parties and surfaces adjacent to the permanent bulkhead walls. The permanent bulkhead walls along the south perimeter must consider the future grades planned by the adjacent property owner (Powerhouse), as incorporated into the 100% Design. All other SOE and bulkhead walls along the other adjacent properties will be designed and restored relative to existing grades and use.

The Contractor is responsible for constructing an intertidal vegetative shelf with a maximum width of 20 feet along the eastern and northern edge of the turning basin, with a cap and a minimum of a 15.2-inch thick layer of sand planting soil installed above the cap to support establishment of the overlying intertidal vegetation and provide benthic habitat. The design includes the development of a multi-zoned intertidal vegetative shelf with appropriate plant species native to the New York/New Jersey area.

### **8.1 Intertidal Vegetative Shelf Cap Restoration**

Following backfilling activities, the Contractor shall install the intertidal vegetative shelf cap in accordance with the 100% Design Report, Technical Specification 35 43 00 – Cap Construction, and Technical Specification 32 91 13 – Planting Soils.

#### **8.1.1 CQA Observations**

Prior to the start of construction, the Engineer will obtain photographic documentation of pre-construction conditions in all areas that will or may be disturbed during remedial activities.

The Engineer will observe surface restoration activities to document that restoration is completed in accordance with the 100% Design Report.

Pertaining to the intertidal vegetative surface cover, the Engineer will document:

- The sub-base material is placed to the minimum required thickness, in accordance with the 100% Design Report.
- A minimum of 15.2 inches of sand planting soil is placed to the lines and grades indicated in the 100% Design Report, and lightly compacted.
- Following planting, the Contractor continues to maintain the vegetated areas at a minimum of 90% coverage of perennial vegetation for three years. The Contractor shall be required to repair any areas of erosion or failed erosion control fabric or waterfowl fencing during this period. The Contractor shall also be required to remove any invasive species and replant any failed vegetative growth as necessary to maintain a minimum of 90% coverage.



## **9.0 DEMOBILIZATION**

### **9.1 Decontamination**

The Contractor will decontaminate (as necessary) all personnel and equipment that comes into contact with excavated materials in accordance with Technical Specification 02 51 00 – Decontamination. All construction vehicles leaving the Site shall be decontaminated (as necessary) by the Contractor to prevent the tracking of soil off-site. The Contractor will conduct decontamination activities within the constructed decontamination area.

### **9.2 Post-Construction Surveys**

The Contractor will retain a New York State-licensed surveyor to conduct survey control during completion of the remedial actions, as required by the Technical Specifications. The Contractor will supply the survey information (including an as-built survey, signed and sealed by the Contractor's New York State-licensed surveyor) to the Engineer for inclusion in the Final Remedial Action Report, to be prepared upon completion of all remedial activities.

### **9.3 Demobilization**

The Contractor will demobilize from the Site following completion of all remedial activities. Demobilization activities will include, at a minimum, the following:

- Cleaning/decontaminating equipment and construction-related materials prior to removal from the Site;
- Dismantling of the work area(s), equipment/personnel decontamination area(s), and other remedial support areas;
- Disposing of water treatment system residuals and decontamination area construction materials in accordance with Technical Specification 02 51 19 – Excavated Material and Waste Management;
- Removing all materials, equipment, and support structures from the Site; and
- Providing final project record documentation in accordance with Technical Specification 01 78 00 – Contractor Closeout Submittals.

#### **9.3.1 CQA Observations**

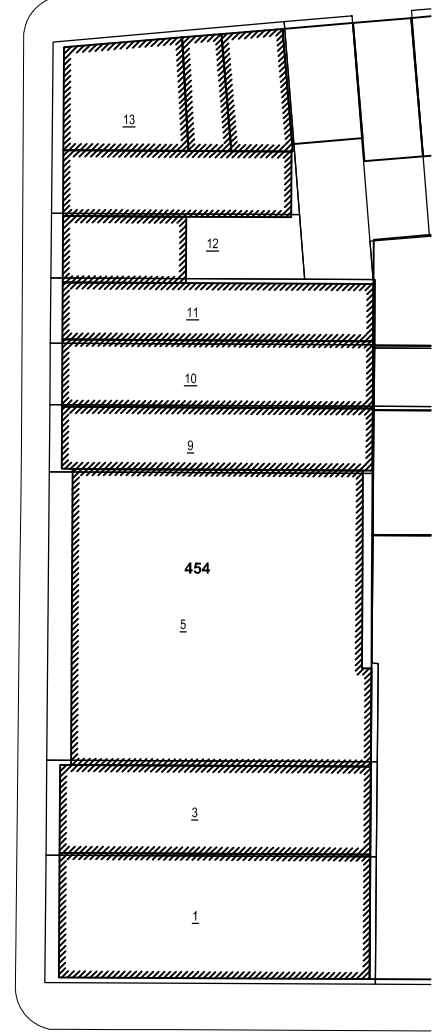
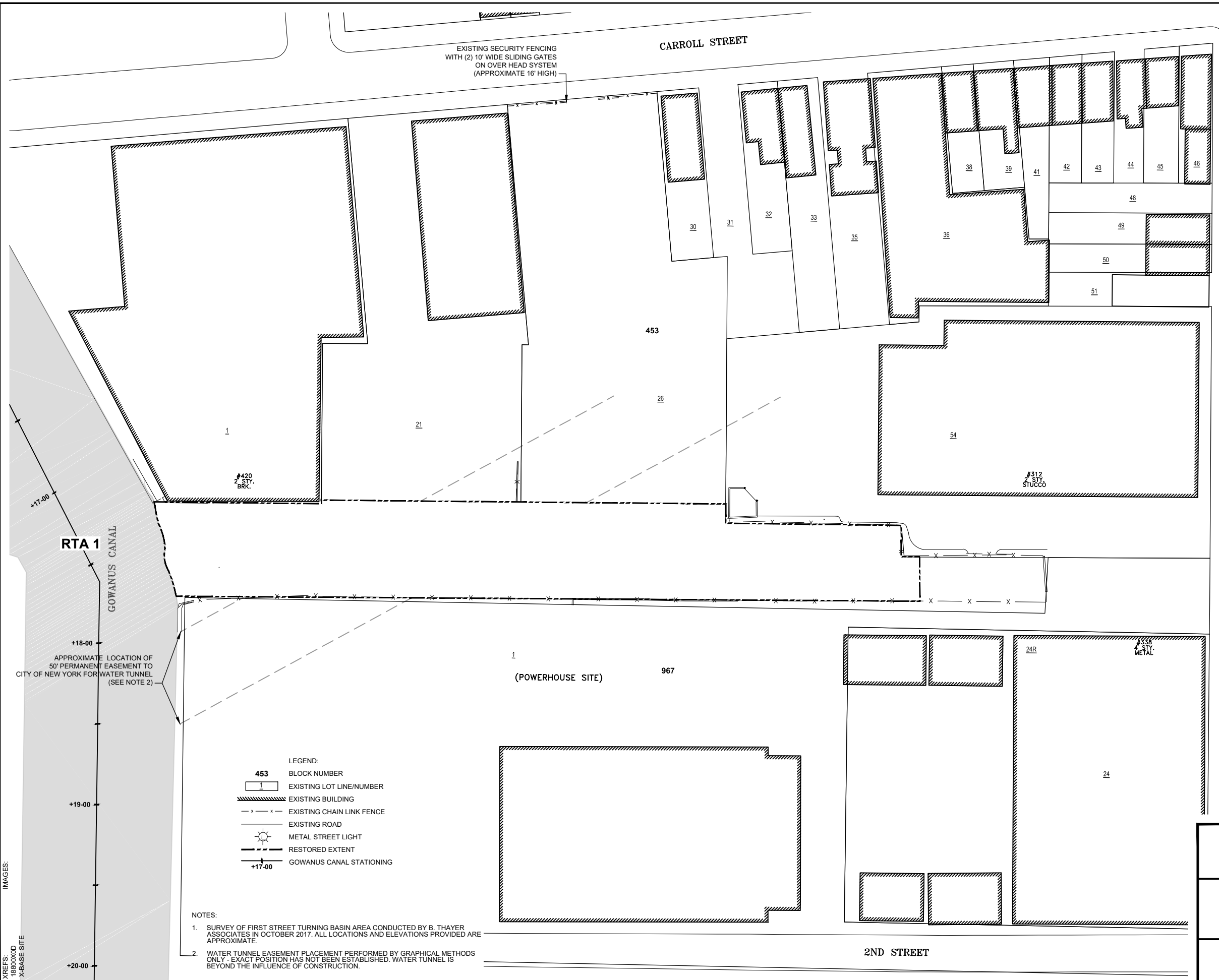
The Engineer will observe the Contractor's demobilization activities to document that the following activities are completed in accordance with the 100% Design Report:

- Equipment and construction-related materials have been cleaned/decontaminated prior to demobilization from the Site;
- Work area(s), equipment/personnel decontamination area(s), and other remedial support areas have been dismantled; and
- All of the Contractor's materials, equipment, and support systems have been removed from the Site.

## **10.0 REFERENCES**

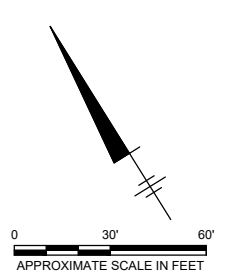
EPA. 1986. Superfund Remedial Design and Remedial Action Guidance. June.

**FIGURE**



3RD AVENUE  
80'

1ST STREET



FIRST STREET TURNING BASIN - GOWANUS CANAL  
BROOKLYN, NEW YORK

SITE PLAN



FIGURE  
1