TECHNICAL SPECIFICATIONS AND PROVISIONS

STRUCTURES

CARROLL STREET BRIDGE
B.I.N. 2-24026-0

UNION STREET BRIDGE
B.I.N. 2-24027-0

PREPARED FOR

GOWANUS ENVIRONMENTAL REMEDIATION TRUST

RTA1 BRIDGE STABILITY FINAL DESIGN

PREPARED BY

Greenman-Pedersen, Inc.

FEBRUARY 2020

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APPENDICES:

SPECIAL PROVISIONS

Scope and Description of Work

The Work under this Contract involves the stabilization of two bridges that will be impacted by the dredging of the Gowanus Canal in Remedial Target Area 1 (RTA1). The Bridge Identification Number (BIN) and location of the Bridges are as follows:

2-24026-0 Carroll Street Bridge over the Gowanus Canal
2-24027-0 Union Street Bridge over the Gowanus Canal

The Work to be performed under this Contract involves the isolation and stabilization of bridge substructures and existing fender systems as indicated on the contract drawings and specifications.

The Contractor shall perform the Work based on the contract drawings together with the approved shop drawings, and/or as directed by the Engineer.

The nature and degree of work varies from bridge to bridge. A brief description of the Work required is as follows:

1. Clearing and grubbing.
2. Temporary removal and replacement of existing fence bracing.
3. Removal of existing timber pile cluster dolphins.
4. Removal and replacement of existing pier fender system horizontal timber sections.
5. Excavation of the area between the existing pier fender system and the concrete pier.
6. Excavation of sensitive areas around abutments prior to bridge support work.
7. Installation of pipe pile walls.
8. Installation of new steel monopile dolphins.
9. Backfilling behind existing fender system.
10. Backfilling behind new pipe pile walls.

The Work shall include the furnishing of all labor, materials, equipment and incidentals required to satisfactorily complete the Project within the prescribed schedule in accordance with the plans, specifications, and the directions of the Engineer.

In order to complete the Work within the prescribed schedule and to minimize the inconvenience to the motorist, pedestrians, and the public, the Contractor shall adhere to the construction procedures as specified in the contract documents and/or as directed by the NYCDOT.
The Contractor's attention is directed to the fact that, due to the nature of construction projects, the exact extent of the work cannot always be accurately determined prior to the commencement of the work. These Contract documents have been prepared based upon field inspection and other information available at the time. Actual field conditions may require modifications in construction details and work quantities. The Contractor shall perform the work to meet field conditions.

It is required that the Contractor shall visit the work sites of the bridges prior to performing the work to assess and familiarize himself with the existing conditions and to judge for himself the extent and nature of the work to be done under this Contract, and that by bidding, he agrees that the project can be constructed within the limitations, procedures and priorities specified in the contract documents.

The Contractor shall be responsible for any damage to persons and properties during the life of the Contract and shall furnish adequate safeguards for the protection of persons and properties.

During construction, the site is to be maintained as described within the specifications. After the Work is completed, the Contractor shall clean up the work site by removing all rubbish, debris, etc., in a manner satisfactory to the Engineer. Also, as detailed in these Provisions, noise and dust resulting from construction are to be minimized. All material removed and not designated to be reused shall be legally disposed of immediately away from the site by the Contractor, unless otherwise directed by the Engineer.

Work Zone Traffic Control (WZTC)

The Contractor shall perform the work in strict accordance with traffic stipulations, as shown on the Contract Drawings and/or as the directed by the Engineer. In the case of a conflict, the Engineer's decision shall be final.

1. General

Basic Work Zone Traffic Control shall be provided, measured for payment, and paid for in accordance with Line Item No. 28i – Carroll Street Basic Work Zone Traffic Control and Line Item No. 28j – Union Street Basic Work Zone Traffic Control of the project specification.

2. Changes to the Traffic Control Plan

Prior to the start of the Work, the Contractor shall submit any proposed changes to the Traffic Control Plan to the Engineer for approval. Any change which alters the basic concept of the plan must be approved by the NYCDOT or its designee.

3. Roadway Closure

The Contractor shall promptly obtain all required permits and licenses prior to closing any roadway, sidewalk, and/or bridge in order to minimize any project delays.

Standards and List of Items

Unless otherwise noted, all sections, subsections, articles or subarticles as referred to herein within these specifications shall be those of the New York State Department of Transportation's (NYSDOT's) latest Standard Specifications for Construction and Materials, all Addenda thereto, and revisions to the Standard Specifications by EI's and EB's. Links have been provided for NYSDOT Electronic Standard Specifications and recent EI's and EB's

Link for NYSDOT Electronic Standard Specifications -
https://www.dot.ny.gov/main/business-center/engineering/specifications/busi-e-standards-usc

Link for Recent EI's and EB's - https://www.dot.ny.gov/main/business-center/consultants/forms-publications-and-instructions/engineering-information-issuance-system

However, this neither implies the City's or State's involvement in any testing and approval of materials, nor in the supervision of construction. All references, therein to the "Department", "Materials Bureau", "Regional Engineer", etc., shall be deemed to mean the "Engineer". Where any reference is made on the plans, specifications or proposal to the "State" or any of its officials, the Contractor shall substitute the City of New York Department of Transportation or any of its appropriate officials. Any reference to the cost as attributable to the State shall be deemed as attributable to the City and Trust.

This Contract incorporates only those sections, subsections, articles and subarticles of the NYSDOT Standard Specifications that are listed in the construction drawings or referred to or cross-referenced in the Technical Specifications and Provisions. In the event of any inconsistency between provisions of the

NYSDOT Standard Specifications and these Technical Specifications and Provisions, these Provisions shall take precedence.

The Work to be performed under this Contract shall be completed in accordance with the following item numbers:

Item No.	Item Description	Unit
201.06	CLEARING AND GRUBBING	LS
202.83120010	REMOVAL OF EXISTING TIMBER PILE DOLPHINS	EA
203.06	SELECT FILL	CY
551.89010010	STEEL MONOPILE DOLPHINS	LF
551.92000001	REMOVAL OF EXISTING TIMBER PILES	EA
552.11	PERMANENT STEEL SHEETING	SF
552.11000001	PIPE PILE WALLS	LF
555.06	CONCRETE FOR STRUCTURES, CLASS G (DEPOSITED UNDER WATER)	CY
560.09	TUCK POINTING	SF
564.05010011	REMOVE, STORE, AND REINSTALL STRUCTURAL STEEL	EA
564.510001	STRUCTURAL STEEL	LB
593.01000001	MONOPILE DONUT FENDER SYSTEMS	LS
594.03	TREATED TIMBER AND LUMBER	CF
619.01	BASIC WORK ZONE TRAFFIC CONTROL	LS
619.04	TYPE III CONSTRUCTION BARRIER	EA
625.01	SURVEY OPERATIONS	LS
634.99010017	BUILDING CONDITION SURVEY	LS
634.99020017	VIBRATION MONITORING (NONBLASTING)	LS

Contract Drawings

The contract drawings referred to in the Agreement and in these Specifications shall bear the general title:

CITY OF NEW YORK
DEPARTMENT OF TRANSPORATION
DIVISION OF BRIDGES

FINAL DESIGN FOR THE STABILITY DURING DREDGING FOR THE UNION STREET AND CARROLL STREET BRIDGES OVER GOWANUS CANAL

B.I.N. 2-24026-0 & 2-24027-0

BOROUGH OF BROOKLYN
COUNCIL DISTRICTS: BROOKLYN – 39
COMMUNITY BOARDS: BROOKLYN - 6

The drawings are separately numbered and titled as follows:

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Existing Dimensions

The Contractor shall verify and shall be responsible for the accuracy of all dimensions and elevations of the project site and existing structures indicated on the plans and shall notify the Engineer in writing to any errors or discrepancies that may be discovered therein. The Contractor shall have no claim for damages that may result from an error or omission in regard to the aforementioned dimensions and elevations indicated on the plans.

Responsibility of Contractor for Plant and Methods

The plant, equipment, scaffolding, methods, appliances, and procedures shall be provided in a manner to ensure a satisfactory quality of work, safe and adequate means for inspection, and a rate of progress which, in the opinion of the Engineer, will ensure the completion of the Work within the time specified. If at any time before the commencement or during the progress of the Work, or any part therein, such plant, equipment, scaffolding, methods or appliances are deemed by the Engineer to be unsafe, inefficient or inadequate for securing the safety of the workers, structure, the quality of work and the rate of progress required, he or she may order the Contractor to modify its safety methods and efficiency, the Contractor shall comply with such orders. The failure of the Engineer to make such demands shall not relieve the Contractor from its obligation to secure the safe conduct, and the Contractor alone shall be responsible for the safety, efficiency, and adequacy of its plants, equipment, scaffolding, appliances, and methods.

Night Work

When the Contractor performs work at night, the work shall be illuminated to an intensity required by applicable regulations, but not less than 5-foot candles (50 lux). For purpose of inspection by the Engineer, the Contractor shall provide satisfactory lighting of an intensity of 50-foot candles (500 lux) over any area designated by the Engineer.

Restoration of Damaged Areas

All areas utilized by the Contractor or its employees for any reason shall, where damaged, be restored by necessary paving, backfilling, grading, seeding, mulching, planting or any additional method required by the Engineer, to his/her satisfaction and at no cost to the City and Trust.

Manufacturer's Warranties

1. All manufacturers' warranties or guarantees on equipment, materials, or products purchased for use on the contract which are consistent with those provided as customary trade practice shall be obtained by the Contractor. Upon acceptance of the Contract, the Contractor shall assign to the NYCDOT, or the agency or authority having jurisdiction over the facility, all manufacturers' warranties or guarantees on all such equipment, material, or products furnished for and installed on the contract

2. The Contractor shall warrant the satisfactory in-service operation of the electrical and mechanical equipment, products and related components. The Warranty shall extend for a period of not less than one year following the date of contract acceptance.

Safe Load on Structures

Prior to commencement of construction, the Contractor shall retain the services of a licensed New York State Professional Engineer to evaluate and study the condition of the existing structure to determine the type, size, and weight of vehicles and equipment that can be supported by the existing structures during construction. The findings of the Licensed Professional Engineer shall be submitted in writing to the Engineer for review.

The Contractor shall obtain the approval of the Engineer before any loads are placed on the existing bridge structures. Approval by the Engineer shall in no way relieve the Contractor of its responsibility to fulfill the above requirements.

Permits, Laws and Notices

1. The Contractor at its sole cost and expense, shall obtain all necessary permits, issue all required notices, pay all legal fees, and comply with all Federal, State, and Municipal laws, rules, ordinances, and regulations, required for this Contract, all of which shall be performed or furnished by the Contractor at its sole cost. The Contractor shall be solely responsible for any additional fees or penalties as required by the Agencies due to re-issuance or expiration of permits.

2. Agencies and/or entities with which the Contractor may be directly or indirectly involved for permits, permissions, notifications, and coordination include, but are not limited to, the following including their respective successors:

   New York City:

   1. Honorable Eric Adams
      Borough President of Brooklyn
      The City of New York
      209 Joralemon Street, Room 140
      Brooklyn, NY 11201
      Tel: 718-802-3700
      eadams@brooklynbp.nyc.gov

   2. Honorable Ruben Diaz, Jr.
      Borough President of the Bronx
      851 Grand Concourse, Room 301
      Bronx, NY 10451
      718-590-3500
      rdiazjr@bronxbp.nyc.gov

   3. The Honorable Melinda Katz
      Borough President of Queens
      120-55 Queens Blvd - 2 Floor
      Kew Gardens, NY 11424
      718-286-3000
      mkatz@queensbp.org

   4. Honorable James Oddo
      Borough President of Staten Island
      10 Richmond Terrace, Room 120
      Staten Island, NY 10301
      718-816-2200
      joddo@statenislandusa.com

5. Mr. Ghanshyam Patel
   Director of Street Lighting
   Traffic Operations Planning
   NYC Department of Transportation
   34-02 Queens Blvd
   Long Island City, NY 11101
   718-786-2236
   gpatel@dot.nyc.gov

6. Mr. Michael Lefosse
   Asst. Director-Signal Engineering
   Traffic Operations Planning
   NYC Department of Transportation
   34-02 Queens Blvd
   Long Island City, NY 11101
   718-786-2236
   mlefosse@dot.nyc.gov

7. Deputy Chief Rubin Deltran
   New York Police Department
   1 Police Plaza - Room 900
   New York, NY 10038
   646-610-6765
   rubin.deltran@nypd.org

8. Captain Simon Ressner
   NYC Fire Department
   City Planning Desk
   9 Metro Tech - 7th Floor
   Brooklyn, NY 11201
   718-855-8571
   CityPlanning@fdny.nyc.gov

9. Nicholas Dagher
   Acting Executive Director - Streets
   Office of Construction Mitigation & Control
   NYC Department of Transportation
   55 Water Street, 7th Floor
   New York, NY 10041
   Tel: 212-839-9621
   ndagher@dot.nyc.gov

10. Mr. Edward Campbell
    Office of Construction Mitigation & Control
    NYC Department of Transportation
    55 Water Street, 7th Floor
    New York, NY 10041
    Tel: 212-839-9643
    ecampbell@dot.nyc.gov

3. In addition, the Contractor is required to comply with all requirements imposed by other entities when performing work that may impact their property or operations, including but not limited to those regarding insurance, construction operations, hours of operations, and personnel requirements and others included in the appendices to the Special Provisions. These requirements may be in addition to the requirements imposed by the City and this Contract.

Dust Control

During the progress of the Work under this contract, the Contractor shall be required to furnish and apply water and/or calcium chloride for the purpose of allaying dust conditions. Materials to be used, area to be covered, and time and rate of application shall be as directed by the Engineer. Equipment used shall be capable of a uniform application over the surface to be covered. There will be no separate measurement or payment for this work but the cost thereof is deemed to be included in the other various items of work.

Noise Control

1. Pursuant to the provisions of Section 24-222 of the noise control code:

   The permissible hours of work under this code shall be on weekdays from 7:00 AM to 6:00 PM.

   Where operations require work to be performed other than during the hours specified above, the Contractor shall obtain the necessary variances to the noise control code from the NYCDEP.

2. Prior to submission of the construction timetable and as construction progresses, the Contractor shall consult with the Engineer to ascertain the location and nature of all noise sensitive establishments such as schools, churches, hospitals, within the contract limits. The Contractor shall then make every reasonable effort to minimize interference with these activities from its operations.

3. Regulations promulgated pursuant to section 24-216 shall not alter its terms, conditions, and specifications.

Coordination with Utilities

All known public and private utility lines within or adjacent to the site of the Work are shown based on the best available information in their existing approximate locations on the contract plans. The Contractor is cautioned that these locations are neither guaranteed nor is there a guarantee that all such lines in existence have been shown on the plans.

The Contractor shall so conduct its operations as to prevent damage to such facilities. The Contractor shall make such explorations as may be necessary to determine the dimensions and locations of lines that may be subject to damage.

Where existing utilities are located within the contract limits, the Contractor will be required to give the proper Divisions and the various owning companies at least 72 hours notice before doing any work, in accordance with New York State Industrial Code (Rule No. 53), relating to construction, excavation and demolition operations at or near underground facilities.

The Contractor shall satisfy itself as to the exact location of utility lines and shall protect and support in a suitable manner all utilities encountered in its excavating and trenching operations. If the nature of the damage to the utilities is such as to endanger the satisfactory operations of the utilities and the necessary

repairs are not immediately made by the Contractor, the work may be done by the respective owning companies and the cost thereof charged against the Contractor.

Encroachment

The Contractor is responsible for all inquiries, searches and protective measures associated with any subsurface, surface or overhead lines (e.g. water mains, sewers, gas mains, electrical lines, fire lines, telephone lines, etc.), in the work area.

Store

Where the phrase "stores on the site" is used in the contract documents, it shall not mean stores on any of the areas within the right-of-way of this project. The Contractor shall rent, lease or purchase a storage area contiguous to the work, where removed and stored materials shall be placed. This area shall be properly fenced and protected at the Contractor's expense. The storage area shall be open to New York City forces designated to remove salvaged items from the site. Utilization of street property of New York City for storage purpose is not allowed unless written approval is given by the Engineer.

Protection of Existing Trees

The Contractor shall notify the Department of Parks and Recreation when the work is started, to permit a survey and examination of the site by their Inspection Unit.

No work adjacent to street trees shall be performed until the Contractor has obtained the required permit from the Department of Parks and Recreation.

Along the line of work, branches of trees in the way of equipment shall be properly tied up. If the Contractor is permitted to stockpile debris near trees, the Contractor shall be required to use tree guards to protect the trunks of said trees.

In the event of tree root damage caused by the Contractor's operations, the affected trees shall be pruned by the Contractor to compensate for said tree root damage as per Department of Parks and Recreation specifications known as "Horticulture I", at no cost to the City.

Bridge Monitoring Criteria

The contractor shall prepare a bridge monitoring plan in accordance with the requirements of the NYCDOT division of bridges review procedure for private development project near bridge structure, NYSDOT item 634.99020017, and project requirements, whichever is more stringent. All existing bridges, structures, and utilities within two-hundred (200) feet of the proposed work shall have vibration monitoring, crack monitoring and lateral and vertical movement monitoring be recorded and included in the bridge monitoring plan. The bridge monitoring plan shall contain a general description of the project, project limits, project schedule, period of monitoring plan in place, location and number of monitoring points provided for measuring movement, settlements, vibration monitoring, and crack monitoring. It shall also contain the type of monitoring instruments used, monitoring procedures, reporting system and threshold limits for monitoring. The bridge monitoring reports shall be submitted on a weekly bases to the designated engineer at the division of bridges and the design engineer.

A) Vibration Criteria

The Contractor's attention is directed to the close proximity of the existing structures and utilities located in and around RTA1. Excavation, pavement removal, backfill and compaction, demolition, driving of piles

and sheeting, and any other construction operations shall be conducted in a manner which will not damage or distress any of the above, including but not limited to, adjacent buildings and structures, historic structures, utilities or tunnels. Any damage caused by or related to the Contractor's operations shall be repaired by the Contractor at no additional cost to the City and Trust.

The Contractor shall govern its methods of operation, including installation of piling, such that the peak particle velocities measured from pile installation locations to the closest structure shall not exceed 0.5 inches per second along any axis. This limit is consistent with the threshold established for construction near New York City (NYC) owned bridges, as presented in the NYCDOT Division of Bridges Review Procedures for Private Development Project near Bridge Structures. Measured peak particle acceleration shall not exceed 0.1g measured along any axis.

These criteria will be strictly enforced and the Contractor is advised that it will be required to limit hammer energy and take all measures necessary, including possible hand excavation in front of pipe pile walls to keep vibrations within acceptable levels. The Contractor will be required to measure peak particle velocities and transmit this information to the Engineer.

B) Crack Monitoring

Existing cracks or cracks caused from construction activity shall be monitored on the existing bridges, structures and utilities within 200 feet of the proposed work. Should new cracks form or existing cracks increase in length or width, all work shall stop and the engineer be notified. The contractor shall increase the frequency of readings, as required, and prepare a plan detailing an alternative method so to prevent further damage.

C) Vertical and Lateral Movement Monitoring

Vertical and lateral movement monitoring shall be recorded for existing bridges, structures, and utilities within 200 feet of the proposed work. Maximum allowable cumulative settlements shall not exceed the values shown in Table 1 of the construction drawings. Should movement reach the maximum allowable values shown, all work shall stop and the engineer be notified. The contractor shall increase the frequency of readings and prepare a plan detailing an alternative method so to prevent further movement.

Pre-Construction and Post-Construction Surveys

It is required that the contractor engage the services of a professional engineer (P.E.) registered in the state of New York to conduct a pre-construction survey of the existing bridges, structures, and utilities within 200 feet of the proposed work. The pre-construction survey shall be completed in accordance with the requirements of the NYCDOT division of bridges review procedure for private development project near bridge, NYSDOT item 634.99010017, and project requirements, whichever is more stringent. The pre-construction survey report shall include detailed descriptions of any pre-existing defects in the interior and exterior of the existing bridges and structures, such as cracks, spalling, deteriorations, signs indicating settlement and all necessary color photographs to document the bridge condition. A copy of this report shall be supplied to the engineer and the NYCDOT division of bridges prior to the start of any work.

After the completion of all work, the contractor shall provide a post-construction survey, conducted and reported following the same requirements as the pre-construction survey. The post-constrcution survey will be compared with the pre-construction survey to ascertain if any damage was done to the existing bridges, structures and utilities within 200 feet of the proposed work. A copy of this report shall be supplied to the engineer and the NYCDOT division of bridges. If it is determined that a bridge suffered

damage caused by or related to the contractor's operations, the contractor shall repair the damage, to its original condition, at his own expense.

Protection of Private Property

Prior to the start of work, the Contractor shall contact the owners of all property and buildings abutting the project for the purpose of obtaining access to said property and buildings. The Contractor shall make a complete interior and exterior video/digital survey on a compact disk of all said property and structures, and any existing damage to the structures shall be noted. A copy of the compact disk shall be presented to the Engineer for approval prior to commencing any work.

Work Over Water (WOW)

The Contractor's attention is directed to the fact that when performing maintenance work over water (WOW), strict adherence to the Best Management Practices (BMPs – See below Note) is required by NYCDOT in order to prevent the discharge of materials into the waterway. At no time shall the run-off water from the bridge machinery be allowed to be discharged into the waterway.
Note: Best Management Practices is a practice or combination of practices determined to be an effective and practicable means of preventing to the maximum extent practicable the discharge of materials into the waterway. These practices are undertaken to comply with applicable water quality standards. BMPs include operating and management procedures. It is not required to install containment to prevent discharge of water during the cleaning and washing of bridge operations.

Landscape

1. Protection of Existing Landscape.

   Soil compaction, pollution and erosion shall be avoided or minimized at all times during the course of the project. Pursuant to the appropriate NYC Department of Parks and Recreation (DPR) Standard, a Snow Fence (DPR Standard) shall be installed under the dripline of all existing trees within the active work zone to protect the soil under the trees' branches. Outside the dripline, areas shall be designated by the Engineer if necessary for storage of materials, equipment, vehicles as well as parking of contractor's personal vehicles and driving routes through the landscape. On sloping areas, erosion-control methods shall be used to prevent movement of soil, especially into storm drains. Where it shall not impact the trees, existing topsoil shall be scraped off and stored in piles, to be replaced at time of site restoration. No tree pruning shall be performed except by a qualified tree-care professional and with the permission of DPR. Under no circumstances shall petroleum products, concrete wash water, paint or other pollutants be allowed to seep into the landscape or city drainage system.

2. Maintenance of Landscape

   During the course of the project, the Contractor shall make every effort to remove litter, debris and excess materials from the work site on a regular basis in order to deter illegal dumping and encourage the public to respect the project and the rest of the roadway. All areas within the work zone inaccessible to New York City Department of Transportation (NYCDOT) maintenance forces shall be kept as clean as possible by the Contractor. Additionally, any vegetation requiring maintenance such as mowing of grass shall be maintained by the Contractor to the standard occurring on the remainder of the roadway.

3. Restoration of Landscape

   All excess materials and debris shall be removed by the Contractor, as part of the site restoration. All soil contaminated with excess material and debris shall also be removed and replaced with acceptable topsoil. Outside the dripline of trees, soil compacted during the course of the project shall be uncompacted and loosened to the depth of 1 foot (0.305m) prior to grass seeding. Under no circumstances may heavy equipment, e.g., payloaders, be used to accomplish site restoration within the dripline of trees. In these root-sensitive areas, work must be done by hand using only light equipment.

   Damage to trees, both above and below ground, shall be repaired or replaced by an approved tree-care professional according to DPR Standards. Trees severely damaged shall be replaced in quantity according to the DPR latest Basal Area Conversion chart. Both trees and newly seeded turf areas shall be cared for and watered by the Contractor as often as is necessary during their first growing year to establish their health and vigor after the stress of transplanting/germination and allow them to thrive in future without additional watering and care. Plants not established properly after one year shall be replaced and established as many times as is required for successful establishment.

4. Prior to performance of any tree pruning or tree work, Contractor shall contact appropriate DPR Borough Forester.

5. Prior to commencement of work, the Contractor shall contact NYCDOT Arterial Maintenance, Landscape Improvement Unit to arrange for a preconstruction site inspection.

Notification Regarding Bridge Roadway Closures

The Contractor shall notify the Engineer in writing at least fourteen (14) working days in advance, in order to distribute the public notification seven (7) working days in advance for roadway lane closure when:

1. More than two thirds of the moving lanes per direction on a bridge are closed to traffic for more than 15 minutes per hour between the hours of 1:00 a.m. and 5:00 a.m.

2. Half (50%) or more of the moving lanes per direction on a bridge are closed to traffic for any duration during all other hours.

The Contractor shall ensure that appropriate signage is in place for not less than one week before the closure is to take place.

If the proposed lane closures as specified in (a) and (b) above are not as shown on the contract documents and therefore require separate approval by the OCMC, the Contractor shall give the Engineer at least four weeks advance notification of the intended lane closure.

The above mentioned procedure shall be strictly followed so that the public receive prior notification of all bridge roadway closures, and have an opportunity to plan alternate travel routes or expect delays.

Asian Longhorned Beetle

This project may fall, now or in the future, within areas under regulation pursuant to Part 139 of the New York Codes, Rules and Regulations for Control of the Asian Long Horned Beetle. It is the Contractor's responsibility to remain apprised of the current Quarantine Zones within the five boroughs for the life of this Contract.

If this project now or at any time falls within a Quarantine Zone, the Contractor, in handling host material living, dead, cut or fallen, inclusive of nursery stock, logs, green lumber, stumps, roots, branches and debris of a ½" (12mm) or more in diameter, shall comply with all requirements of that law including "certification", meaning: the Contractor shall obtain all necessary training and execute a "Compliance Agreement" with the New York State Department of Agriculture and Markets. The Contractor shall provide the New York City Department of Transportation ("DOT") a copy of the fully executed agreement before commencing any tree work in the Quarantine Zone and shall display the issued identification stickers on all vehicles involved with tree work within the Quarantine Zone. The Contractor shall perform all work in accordance with the compliance agreement and all applicable State or Federal regulations and shall, upon demand, provide DOT with proof that any and all host wood is disposed of in full compliance of the provisions set forth in the compliance agreement.

The Contractor shall be responsible for paying any fine or penalty levied against DOT and/or Trust that results from the Contractor's neglect or failure to abide by its Compliance Agreement or with any applicable State or Federal regulations related to the Asian Longhorned Beetle while performing work under this Contract.

In all other work zones, Contractors are alerted to the possibility of encountering the Asian Longhorned Beetle and are required, if beetles are observed or suspected of being present, to contact: New York State Department of Agriculture and Markets, Division of Plant Industry, 4 Stewart Avenue, Westhampton Beach New York 11978-1103. Tel: (631) 288-1751 or (800) 554-4501, ext. 72087. More information about the Beetle and quarantine limits can be found at: http://www.na.fs.fed.us/fhp/alb or http://www.aphis.usda.gov. In such circumstances, the Contractor shall handle any and all host material in accordance with the terms of its Compliance Agreement.

Project Safety and Health Plan

The Contractor shall perform all necessary planning, supervision, and training activities to ensure that all of the requirements of 29 CFR 1926 are fully met for all workers employed in the construction of the contract. The contractor shall provide to the Department and Trust prior to the start of work satisfactory evidence that all current requirements of 29 CFR 1926 will be adequately addressed. As a minimum, the Contractor shall provide a written Project Safety and Health Plan which documents the Contractor's company policy relative to safety, and which identifies and addresses specific safety and health concerns to be encountered on the project. Before the work begins and periodically throughout the project, the Contractor's project supervision staff shall meet with the Engineer to review and discuss the status of safety issues on the project. An appropriate notice shall be posted on the contract site that the Project Safety and Health Plan is available for examination by any worker employed on the project. As a minimum this plan shall include the following items:

- Identification of project and company safety officers.
- Hazardous Materials Communications Plan.
- Employee Safety Training Program.
- Company safety policy.
- Procedures to address project safety and health concerns
- Procedures to address distraught, emotionally disturbed persons and/or homeless persons.
- Procedures for compelling worker compliance with safety and health requirements.

Certain of these items may be submitted in the format of a Company Safety and Health Program, with the Project Safety and Health Plan limited to project-specific issues.

The Contractor shall ensure that each subcontractor employed on the project complies with this requirement. The Contractor shall provide to the Department a Project Safety and Health Plan covering all work to be done by the subcontractor prior to starting work. As an alternative, the Contractor may provide a certification that all activities performed by and workers employed by the subcontractor will be subject to the Contractor's Project Safety and Health Plan.

Submission of the required Project Safety and Health Plan by the Contractor and its acceptance by the Department and/or Trust shall not be construed to imply approval of any particular method or sequence for addressing safety and health concerns, or to relieve the Contractor from the responsibility to adequately protect the safety and health of all workers involved in the project as well as any members of the public who are affected by the project.

In accordance with NYS Labor law §220-h, all laborers, workers, and mechanics shall be certified prior to performing any work on the contract as having successfully completed a course in construction safety and health approved by the US Department of Labor's Occupational Safety and Health Administration (OSHA) that is at least ten hours in duration. The Contractor shall attach proof of completion to first certified payroll for initial workers, and to subsequent payrolls for new or additional workers. The Contractor shall clearly indicate on subsequent payrolls any workers not previously employed on that contract. If no proof of completion has been submitted for a worker listed on a certified payroll, the Engineer will alert the Contractor to this fact. If the Contractor cannot provide proof of completion and the worker continues to work, the Department will notify the Contractor in writing with a copy to the NYSDOL by e-mail at PWAsk@labor.state.nv.us.

Imminent Danger and Emergency Actions

Any action by the Contractor that presents a potentially imminent danger of injury to the public, a worker, or the inspection staff will be halted immediately by the Engineer, and operations stopped in accordance with §105-01 *Engineer's Authority*, specified in the NYSDOT Standard Specifications. The Contractor's

personnel shall have local emergency numbers readily available. These numbers shall include local utility, police/fire and medical assistance. In the event of an emergency, the Contractor shall evacuate all employees and endangered persons from the immediate vicinity to the best of the Contractor's ability.

Accident Reporting

The Contractor shall immediately notify the Department and Trust verbally of any accident or incident that results in the death of a worker, motorist or pedestrian. The Contractor shall notify the Department and Trust in writing within 24 hours, with the details relative to any accident or incident occurring within the contract limits or is directly related to construction activity or involving any worker employed on the contract or delivering materials, equipment or supplies to the contract, provided:

- The accident or incident results in the death of a worker, or (2) requires that a worker be hospitalized overnight for treatment of the injury, or (3) results in 3 or more personal injuries, or:
- The accident or incident involved a utility (overhead or underground), or:
- The accident or incident involved a motorist or pedestrian, or:
- The incident was a near miss, or:
- The accident otherwise meets the notification requirements of OSHA.

The Engineer will provide the Contractor with a copy of the Department accident report for any accident occurring within the contract limits or involving the Contractor's personnel, equipment or operations.

Safeguarding Existing Buildings and Structures

The Contractor shall conduct his operations to avoid damage to the existing structures and other facilities that are to remain in use. Should any damage occur as a result of the Contractor's operations, the contractor shall restore, at his own expense, the damaged structures or facilities to their original condition or better in a manner acceptable to the Engineer.

Protection of the Public from the Contractor's Operation

The Contractor shall govern his actions such that the public is not endangered from his execution of the work in any way. No work shall be done above areas not protected by fencing, lane closures or overhead projective shielding. The Contractor shall also make provisions to protect the areas immediately adjacent to those above which he is working. Lifting operations of materials too heavy to be intercepted by overhead protective shielding, may be done only when traffic restrictions, fencing or other techniques are utilized to exclude the public from the area below and immediately surrounding the lifting location. In addition, the Contractor shall comply with the following related requirements:

1. Traffic shall be restricted from the work zone, as specified in the Special Provision entitled "Work Zone Traffic Control" and as shown on the Plans.

2. Overhead protective shielding shall be provided to protect traffic at all locations where the public has access to the area beneath the work zone.

3. Work zones not protected by overhead shielding or isolated by the WZTC plan shall be fenced or otherwise isolated.

4. No work shall be done above the roadway without temporary shielding in-place.

Nothing herein shall be construed as giving the Contractor permission to close any roadway or sidewalk, except as permitted in the Work Zone Traffic Control Plan.

Staging Areas and Site Access

It is the responsibility of the Contractor to formally request and obtain the necessary approvals and / or permits required for all proposed staging and access areas to the work zones. The Contractor shall indicate the location and size of the staging and access areas proposed within the work limits. A plan of the locations selected shall be submitted to the Engineer for approval prior to mobilization. The staging and access plan shall indicate the location of Field Office.

Job Safety and Access

The Contractor shall be required to maintain access and protection for vehicles, pedestrians, and cyclists for the duration of the Contract, and he shall maintain safeguards for the protection of persons and property. Special precautionary measures as described in these specifications shall be taken to during the demolition and rehabilitation to prevent materials from falling onto the roadway and/or sidewalk beneath and/or adjacent to the bridges. The Contractor shall be responsible for any damage to persons or property resulting from his work on the Contract; therefore, he shall provide suitable protective measures such as shielding, warning and traffic signs, barriers, fencing, and flaggers as needed in order to secure demolition and construction areas from unauthorized entry.

Construction Project Informational (CPI) Signs

Contractor shall purchase the "CPI" signs from the NYCDOT Sign Shop by supplying project specific information. The contractor shall contact Mr. Anthony Galgan, Tel. (646) 892-1146 or email agalgan@dot.nyc.gov before ordering the "CPI" signs. Contractor is responsible for delivering the signs to the site and installing the signs pursuant to the provisions set forth below and as directed by the Engineer. The cost to furnish, install, maintain throughout the contract, remove and dispose off the site shall be paid under item 619.01. The provisions set forth below detail the CPI sign placement and specifications.

Pursuant to §2-02 of the NYCDOT Highway Rules (as codified in Title 34, Chapter 2 of the Rules of the City of New York), DOT permittees are required to post CPI signs for projects with a projected completion time of three months or more. Construction projects where such signs are required include but are not limited to the following:

Roadway reconstruction
Major installation or upgrade of sewer/water systems
Installation or upgrade of transit stations or lines
Bridge reconstruction
Major utility installation

CPI signs are not required for any construction or demolition project requiring a New York City Department of Buildings permit and whose site is enclosed with a fence or contains a sidewalk shed. Such signs must comply with the applicable requirements of the New York City Building Code and the rules of the New York City Department of Buildings.

Placement of CPI sign:

Signs must be posted on each block segment where the project is located, and must be easily visible and readable by pedestrians, unless otherwise directed by the Commissioner. Signs must be kept in good condition.

The following information must be included on the CPI sign (see CPI sign template below):

1. The names of the entities responsible for the project, including but not limited to the contractor, developer, and property owner.
2. The telephone number, email address, and website for such entities responsible for the project.
3. The name of the project and the project number (if any).
4. The address of the project.
5. The nature of the project.
6. A brief description of the project.
7. The start and scheduled completion dates of the project.

CPI Sign Template

Project Entity:	_____ The names of the entities responsible for the project.
Project Name:	_____ The name of the project.
Project #:	_____ The project # (if any).
Project Location:	_____ The address of the project.
Project Description:	_____ A brief description of the project, including the nature of the project.
Project Dates:	_____ The start date and scheduled completion dates of the project.
Project Contact:	_____ The telephone number, email address, and website for such entities responsible for the project.
To anonymously report unsafe conditions at this site, please dial 311	

CPI Sign Specifications (CPI sign template is available above):

Sign Material: Durable and waterproof material, such as, vinyl, plastic, or aluminum.

Sign Size: Two feet four inches (2'-4") wide by four feet high (4'-0").

Letter Font and Size: Calibri font or similar serif font style, with letters a minimum of 1 inch high as measured by the upper case character. Such letters shall be white on a blue background, with such blue color of a shade matching Pantone 296, or RGB 15, 43, 84, or CMYK 100, 88, 38, 35.

Line Spacing: Half of an inch.

APPENDIX A – SPECIAL SPECIFICATIONS

ITEM 202.83120010 – REMOVAL OF EXISTING TIMBER PILE DOLPHINS

DESCRIPTION

The work under this item shall consist of the complete removal and disposal of the timber pile dolphins as located on the Construction Drawings and as directed by the Engineer.

MATERIALS

None specified.

CONSTRUCTION DETAILS

Existing submarine cables are located within the canal. Approximate locations are shown on the Construction Drawings. The Contractor shall verify the locations of all utilities prior to removal of the piles.

The Contractor shall remove from the site and dispose of the existing timber pile dolphins as shown on the Construction Drawings. The existing piles of the dolphins, including broken piles, shall be completely removed so as not to interfere with the installation of the new steel pipe piles being installed in accordance with the Construction Drawings.

METHOD OF MEASUREMENT

This work shall be measured by the number of timber pile dolphins removed. Each timber pile dolphin consists of a cluster of piles with cable wrapping.

BASIS OF PAYMENT

The unit price bid for each timber pile dolphin removed shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work.

ITEM 551.89010010 - STEEL MONOPILE DOLPHINS

DESCRIPTION

The work under this item shall consist of furnishing and installing steel monopile dolphins in accordance with the Construction Drawings and as directed by the Engineer.

MATERIALS

The Contractor shall furnish all labor, materials, tools, and equipment necessary for completion of this work.

A. Pipe Piles

All steel pipe piling shall conform to ASTM A572, Grade 50 unless otherwise reviewed and accepted by the Owner's Representative.

All steel pipe piling to be used for this work shall be open-ended unless otherwise directed by the Engineer.

Piles shall be filled in accordance with Item 203.06 – *Select Fill*.

Splices shall be butt-welded, full circumference.

B. Pipe Pile Stops

All pile stops shall conform to ASTM A36 unless otherwise reviewed and accepted by the Owner's Representative.

All pipe pile stops shall be field welded to the piles as shown on the contract drawings.

C. Down-The-Hole (DTH) Drilling Equipment

All selected Down-The-Hole (DTH) equipment shall be consistent with the pile sizes and ground conditions at the site.

All DTH hammers to be used for this work shall be designed to maximize energy output while operating at high frequencies.

All DTH drill bits to be used for this work shall be designed to control the air used in drilling by preventing the air from escaping to the surroundings. All air shall be directed crosswise and there shall be no air channels forward to the drilled ground. All cuttings and flushing air shall be kept inside of the casing. No pressure on the ground shall occur as a result of the drilling operation. Back hammering and over-drilling shall be prevented. A heavy duty ring bit system shall be used in conjunction with the DTH drill bit in order to protect the pilot gauge buttons and to ensure that adequate room is drilled for female pipe pile connectors. Coupling threads from the drill shall be of the same specification as that of the hammer.

ITEM 551.89010010 - STEEL MONOPILE DOLPHINS

CONSTRUCTION DETAILS

A. General

Existing submarine cables are located within the canal. Approximate locations are shown on the Construction Drawings. The Contractor shall verify the location of all utilities prior to the installation of the piles.

All steel monopile dolphins shall be installed in accordance with the Construction Drawings.

All equipment to be used for this work shall be operated in accordance with the manufacturer's recommendations.

Any design changes or field adjustments required during construction shall be approved by the Engineer and Owner's Representative prior to executing the change in work.

B. Placement of Piles

Any excavation required within the area where steel monopile dolphins are to be installed shall be completed prior to placing pipe piles.

Pipe piles shall be carefully located as shown. Piles shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot of length and true to line. The pile shall be placed so the face will not be more than 6 inches from vertical alignment at any point. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 1 inch low or 2 inches high vertically of the location indicated. Manipulation of piles to force them into position shall not be permitted. All piles shall be checked for heave. Heaved piles shall be reinstalled to the required tip elevation.

C. Drilling Operations

DTH drilling shall be utilized to achieve the minimum depths shown on the Construction Drawings.

Prior to operation, drill bit shanks and hammer threads shall be adequately lubricated for protection and easier break-out. The hammer shall be fitted to the drilling rig in such a way that no debris or dirt enters the hammer from the site, dirty tubes or from unclean air lines.

The drill bit shall rotate clockwise at all times during drilling and tool recovery to avoid uncoupling of the drill bit, hammer and drill pipe or damage to the drill bit from point loading on anything that may fall back into the bore-hole.

Maintain drilling equipment in proper alignment during DTH drilling operations by use of leads or guides attached to the hammer.

The Contractor shall submit records of the completed pipe pile installation operations, including a system of identification which shows the disposition of approved piling in the work, drilling equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling as required by the Owner's Representative. Prior to drilling piles, a horizontal line shall be painted on both sides of each pile at a fixed distance from the bottom so that it will be visible above the water line after installation. This line shall indicate the profile of

the bottom elevation of installed piles and potential problem areas can be identified by abrupt changes in its elevation. Drill piles with the proper size hammer and by approved methods so as not to subject the piles to damage and to ensure proper interlocking throughout their lengths.

Pile installation logs shall be recorded and maintained submitted for each pipe pile installed. Indicate on the installation record: installation dates and times, pile locations, tip elevations, ground elevations, cut-off elevations, any unusual problems during installation including interruptions and their duration, locations and depths of obstructions, and mitigation of obstructions. All pile installation logs shall be submitted to the Engineer.

Operations shall be conducted in a manner consistent with the Community Air Monitoring Program (CAMP) for the project. Adjustments/modifications shall be made to operations as needed to maintain compliance with CAMP requirements during all drilling activities.

D. Length of Piles

Pipe piling shall be drilled to the minimum depths shown on the Construction Drawings or to refusal. The Contractor shall submit the refusal criteria for driving piles based on the pile driving equipment to be used for the project. Acceptance of the refusal criteria is subject to the approval of the Owner's Representative. Pipe piles that meet refusal prior to achieving target depths shall be reported to the Owner's Representative for review and recommendation for remedial action.

If obstructions restrict drilling a pile to the specified depth and the Contractor demonstrates that removal or penetration is impractical, changes shall be made in the design alignment of the piling structure as directed to ensure the adequacy and stability of the structure. Pilings shall be drilled to depths shown and shall extend up to the elevation indicated for the top of piles. A tolerance of 2 inches above the indicated top elevation will be permitted. Piles shall not be drilled within 100 feet of concrete less than 7 days old.

E. Site Stability

The Contractor shall protect existing bulkheads and upland structures from damage. Any property damages caused by the Contractor shall be replaced or repaired at no expense to the Owner.

F. Vibration Monitoring

Vibration monitoring shall be performed during all pile installation activities as presented in Item 634.99020017.

Measured peak particle velocity shall not exceed 0.5 in/sec measured along any axis. Measured peak particle acceleration shall not exceed 0.1 g measured along any axis. If the vibration tolerances are exceeded, work shall cease immediately and the Owner's Representative shall be notified.

G. Survey

Existing conditions surveys shall be completed for the bulkhead and all structures located within 200 ft of the pile installation operation prior to the start of pile installation work. Structures within this zone shall be photographed and documented as part of the survey. Pre-construction surveys

shall be submitted prior to construction and post-construction surveys shall be submitted as part of the completion reports. If during construction activities conditions occur that additional photograph surveys are warranted to document concerns, the Contractor shall conduct additional surveys when requested by the Owner or Owner's Representative.

The Contractor shall establish temporary benchmarks and optical survey markers on the top edge of the existing bulkhead and all bridges along RTA1. Baseline readings shall be taken to establish, spatially position, and verify the locations of the existing structures in accordance with Item 625.01 or as directed by the Engineer. Displacements shall be monitored to detect any settlement, uplift or lateral movement. Survey readings shall be recorded daily during pile installation operations. If readings for settlement, uplift or lateral movement of the existing structures/facilities equal to or greater than ¼" are recorded, all pile installation operations shall cease, and the Engineer be notified. Pile installation shall not recommence until corrective measures to prevent further settlement, uplift or lateral movement have been developed and implemented by the Contractor, with approval of the Engineer.

After the drilling of the steel monopile dolphins is complete, the Contractor shall submit an as-drilled survey showing actual location, pile tip and top elevation variation from plumb of each pile. The survey shall show deviation from plan location in two perpendicular directions and elevations of each pile to nearest ½ inch. The survey shall be prepared and certified by a licensed land surveyor.

All survey work shall be completed as set forth in §625 – *Survey Operations*.

H. Submittals

The Contractor shall submit the following as required to the Owner's Representative:

1. Vibration Monitoring Workplan as presented in Item 634.99020017
2. Baseline Existing Condition Surveys for Structures/Facilities
3. Baseline Optical Monitoring Survey Readings
4. Daily Progress Reports
5. Contingent Repair Workplan
6. Pile Installation Logs for each pipe pile installed

METHOD OF MEASUREMENT

This work shall be measured as the linear footage of steel monopile dolphins satisfactorily furnished and installed.

BASIS OF PAYMENT

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

ITEM 551.89010010 - STEEL MONOPILE DOLPHINS

All survey work performed shall be paid for under Item 625.01.

ITEM 551.92000001 – REMOVAL OF EXISTING TIMBER PILES

DESCRIPTION

The work under this item shall consist of the complete removal and disposal of the existing timber piles as located on the Construction Drawings and as directed by the Engineer.

MATERIALS

None specified.

CONSTRUCTION DETAILS

Existing submarine cables are located within the canal. Approximate locations are shown on the Construction Drawings. The Contractor shall verify the locations of all utilities prior to removal of the piles.

The Contractor shall remove from the site and dispose of the existing timber piles as shown on the Construction Drawings. The existing piles, including broken piles, shall be completely removed so as not to interfere with the installation of the new steel pipe pile walls being installed in accordance with the Construction Drawings.

METHOD OF MEASUREMENT

This work shall be measured by the number of timber piles removed.

BASIS OF PAYMENT

The unit price bid for each timber pile dolphin removed shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work.

ITEM 552.11000001 - PIPE PILE WALLS

DESCRIPTION

The work under this item shall consist of furnishing and installing pipe pile walls in accordance with the Construction Drawings and as directed by the Engineer.

MATERIALS

The Contractor shall furnish all labor, materials, tools, and equipment necessary for completion of this work.

A. Pipe Piles

All steel pipe piling shall conform to ASTM A572, Grade 50 unless otherwise reviewed and accepted by the Owner's Representative.

All steel piling shall be longitudinal or helical welded pipe with only complete joint penetration (CJP) welds conforming to the requirements of API 5L or AWS D1.1.

All pipe piling to be used for this work shall be open-ended unless otherwise directed by the Engineer. Seepage plugs to be placed inside of the installed pipe piles shall be Aquablok 3070SW© and installed in accordance with the manufacturer's recommendations.

Piles shall be filled in accordance with Item 203.06 – *Select Fill*.

Splices shall be butt-welded, full circumference.

B. Pipe Pile Connectors

All pipe pile connectors shall conform to ASTM A572, Grade 50 unless otherwise reviewed and accepted by the Owner's Representative.

Connectors shall have ball and socket interlocks and shall provide up to 19.4 kips/in of tensile strength. All interlocks shall be sealed to ensure water tightness and to protect against corrosion. Sealant used shall be approved by the NYSDOT Materials Bureau before application.

Connectors shall be continuously welded the full length of the piles to ensure there is a watertight seal. All welds shall be ¼" fillet welds minimum.

C. Pipe Pile Stops

All pile stops shall conform to ASTM A36 unless otherwise reviewed and accepted by the Owner's Representative.

All pipe pile stops shall be field welded to the piles as shown on the contract drawings.

D. Down-The-Hole (DTH) Drilling Equipment

All selected Down-The-Hole (DTH) equipment shall be consistent with the pile sizes and ground conditions at the site.

All DTH hammers to be used for this work shall be designed to maximize energy output while operating at high frequencies.

All DTH drill bits to be used for this work shall be designed to control the air used in drilling by preventing the air from escaping to the surroundings. All air shall be directed crosswise and there shall be no air channels forward to the drilled ground. All cuttings and flushing air shall be kept inside of the casing. No pressure on the ground shall occur as a result of the drilling operation. Back hammering and over-drilling shall be prevented. A heavy duty ring bit system shall be used in conjunction with the DTH drill bit in order to protect the pilot gauge buttons and to ensure that adequate room is drilled for female pipe pile connectors.

Coupling threads from the drill shall be of the same specification as that of the hammer.

F. Cement Grout

All grout to be used for this work shall meet the material requirements of §732—12 *Grout*.

G. Weep Holes

At the location shown on the Contract Drawings, weep holes shall be installed within the pipe piles. All weep hole pipes shall be Pipe 4 Std. and shall be welded to the pipe pile on both the inshore and outshore face of the pile. Weep holes shall be equipped with 4 Inch Jet Filter Assemblies as manufactured by Jet Filter Systems on both the inshore and outshore openings of the weep holes. The Jet Filter Assembly shall be installed in accordance with the manufacturer's requirements. The voids between the Jet Filter Assembly and the pipe pile wall shall be sealed with Splash Zone A-788 as manufactured by Carboline to ensure a watertight seal. Splash Zone A-788 shall be installed in accordance with the manufacturer's requirements.

CONSTRUCTION DETAILS

A. General

Existing submarine cables are located within the canal. Approximate locations are shown on the Construction Drawings. The Contractor shall verify the location of all utilities prior to the installation of the piles.

All steel pipe pile walls shall be installed in accordance with the Construction Drawings. Pipe pile locations and alignments shall be as presented therein unless otherwise directed by the Engineer.

All equipment to be used for this work shall be operated in accordance with the manufacturer's recommendations.

The Contractor shall provide adequate drainage for the existing permitted pipes that penetrate the existing bulkheads. Pipe piles located adjacent to existing outfalls shall be cut immediately after installation of the pile.

Prior to the top of pipe pile walls being cut down, seepage plugs shall be installed within each pipe pile and all piles shall subsequently be filled with select fill.

The pipe pile walls shall consist of continuous interlocking pipe piles drilled into place. Prior to the environmental cap being installed, the top of pipe pile walls shall be cut down to the design elevations.

Any design changes or field adjustments required during construction shall be approved by the Engineer prior to executing the change in work.

B. Placement of Piles

Any excavation required within the area where pipe pile walls are to be installed shall be completed prior to placing pipe piles. Piles properly placed and drilled shall be interlocked throughout their length with adjacent piles to form a continuous diaphragm throughout the length or run of pile wall.

Pipe piles shall be carefully located as shown. Piles shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot of length and true to line. The pile shall be placed so the face will not be more than 6 inches from vertical alignment at any point. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 1 inch low or 2 inches high vertically of the location indicated. Manipulation of piles to force them into position shall not be permitted. All piles shall be checked for heave. Heaved piles shall be reinstalled to the required tip elevation.

C. Drilling Operations

DTH drilling shall be utilized to achieve the minimum depths shown on the Construction Drawings.

Prior to operation, drill bit shanks and hammer threads shall be adequately lubricated for protection and easier break-out. The hammer shall be fitted to the drilling rig in such a way that no debris or dirt enters the hammer from the site, dirty tubes or from unclean air lines.

The drill bit shall rotate clockwise at all times during drilling and tool recovery to avoid uncoupling of the drill bit, hammer and drill pipe or damage to the drill bit from point loading on anything that may fall back into the bore-hole.

Maintain drilling equipment in proper alignment during DTH drilling operations by use of leads or guides attached to the hammer.

The Contractor shall submit records of the completed pipe pile installation operations, including a system of identification which shows the disposition of approved piling in the work, drilling equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling as required by the Owner's Representative. Prior to drilling piles, a horizontal line shall be painted on both sides of each pile at a fixed distance from the bottom so that it will be visible above the water line after installation. This line shall indicate the profile of the bottom elevation of installed piles and potential problem areas can be identified by abrupt changes in its elevation. Drill piles with the proper size hammer and by approved methods so as not to subject the piles to damage and to ensure proper interlocking throughout their lengths.

Adequate precautions shall be taken to ensure that piles are drilled plumb. If at any time the forward or leading edge of the pipe pile wall is found to be out-of-plumb in the plane of the wall, the piling being drilled shall be removed and re-aligned prior to continuing work or other approved corrective measures shall be taken to insure the plumbness of succeeding piles. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length.

Piles in each run or continuous length of pipe pile wall shall be drilled alternately in increments of depth to the required depth or elevation. No piles shall be drilled to a lower elevation than those behind it in the same run except when the piles behind it cannot be drilled deeper. If the pile next to the one being drilled tends to follow below final elevation it may be pinned to the next adjacent pile.

Pile installation logs shall be recorded and maintained submitted for each pipe pile installed. Indicate on the installation record: installation dates and times, pile locations, tip elevations, ground elevations, cut-off elevations, any unusual problems during installation including interruptions and their duration, locations and depths of obstructions, and mitigation of obstructions. All pile installation logs shall be submitted to the engineer.

Operations shall be conducted in a manner consistent with the Community Air Monitoring Program (CAMP) for the project. Adjustments/modifications shall be made to operations as needed to maintain compliance with CAMP requirements during all drilling activities.

D. Length of Piles

Pipe piling shall be drilled to the minimum depths shown on the Construction Drawings or to refusal. The Contractor shall submit the refusal criteria for driving piles based on the pile driving equipment to be used for the project. Acceptance of the refusal criteria is subject to the approval of the Owner's Representative. Pipe piles that meet refusal prior to achieving target depths shall be reported to the Owner's Representative for review and recommendation for remedial action.

If obstructions restrict drilling a pile to the specified depth and the Contractor demonstrates that removal or penetration is impractical, changes shall be made in the design alignment of the piling structure as directed to ensure the adequacy and stability of the structure. Pilings shall be drilled to depths shown and shall extend up to the elevation indicated for the top of piles. A tolerance of 2 inches above the indicated top elevation will be permitted. Piles shall not be drilled within 100 feet of concrete less than 7 days old.

E. Cement Grout

Aquablok 3070SW© shall be placed prior to and beneath any Grout to be placed as shown on the Construction Drawings. Grout shall be placed behind the pipe pile walls as shown on the Construction Drawings or as directed by the Engineer. Prior to placement, the underwater surface against which the grout is to be placed shall be cleaned of all foreign material such as grease, oil, or marine growth.

The Contractor shall submit a construction procedure to the Engineer for approval prior to placement. No work shall begin until the procedure is approved by the Engineer. The Contractor shall also submit to the Engineer for review and approval a list of all equipment to be used.

F. Site Stability

The Contractor shall protect existing bulkheads and upland structures from damage. Any property damages caused by the Contractor shall be replaced or repaired at no expense to the Owner.

G. Vibration Monitoring

Vibration monitoring shall be performed during all pile installation activities as presented in Item 634.99020017.

Measured peak particle velocity shall not exceed 0.5 in/sec measured along any axis. Measured peak particle acceleration shall not exceed 0.1 g measured along any axis. If the vibration tolerances are exceeded, work shall cease immediately and the Owner's Representative shall be notified.

H. Survey

Existing conditions surveys shall be completed for the bulkhead and all structures located within 200 ft of the pile installation operation prior to the commencement of any construction activity. Structures within this zone shall be photographed and documented as part of the survey. Pre-construction surveys shall be submitted prior to construction and post-construction surveys shall be submitted as part of the completion reports. If during construction activities conditions occur that additional photograph surveys are warranted to document concerns, the Contractor shall conduct additional surveys when requested by the owner or owner's representative.

The Contractor shall establish temporary benchmarks and optical survey markers on the top edge of the existing bulkhead and all bridges along RTA1. Baseline readings shall be taken to establish, spatially position, and verify the locations of the existing structures in accordance with Item 625.01 or as directed by the Engineer. Displacements shall be monitored to detect any settlement, uplift or lateral movement. Survey readings shall be recorded once per hour, and more frequently when deemed necessary by the Contractor, during pile installation operations. If readings for settlement, uplift or lateral movement of the existing structures/facilities equal to or greater than ¼" are recorded, all pile installation operations shall cease, and the engineer be notified. Pile installation shall not recommence until corrective measures to prevent further settlement, uplift or lateral movement have been developed and implemented by the Contractor, with approval of the Engineer.

After the drilling of the pipe pile wall is complete, the Contractor shall submit an as-drilled survey showing actual location, pile tip and top elevation variation from plumb of each pile. The survey shall show deviation from plan location in two perpendicular directions and elevations of each pile to nearest ½ inch. The survey shall be prepared and certified by a licensed land surveyor.

All survey work shall be completed as set forth in §625 – *Survey Operations*.

ITEM 552.11000001 - PIPE PILE WALLS

I. Submittals

The Contractor shall submit the following as required to the Owner's Representative:

1. Bulkhead Support Workplan
2. Vibration Monitoring Workplan as presented in Item 634.99020017
3. Baseline Existing Condition Surveys for Structures/Facilities
4. Baseline Optical Monitoring Survey Readings
5. Bulkhead Support Construction Records
6. Daily Progress Reports
7. Contingent Repair Workplan
8. Pile Installation Logs for each pipe pile installed

METHOD OF MEASUREMENT

This work shall be measured as the linear footage of pipe pile walls satisfactorily furnished and installed.

BASIS OF PAYMENT

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

All fill materials to be used for this work shall be paid for under Item 203.06.

All survey work performed shall be paid for under Item 625.01.

ITEM 564.05010011 – REMOVE, STORE, & REINSTALL STRUCTURAL STEEL

DESCRIPTION

The work shall consist of the removal, storage, and reinstallation of existing structural steel where indicated on the Contract Documents, including the removal of existing rivets where necessary, and installation of high strength bolts, nuts, and washers.

MATERIALS

Fasteners shall meet the requirements of the following Subsection of 700 Materials:

High Strength Bolts, Nuts, and Washers	715-14

CONSTRUCTION DETAILS

Prior to the beginning of disassembly work, the Contractor shall document the condition of the existing steel. The Engineer shall verify and certify the accuracy of the Contractor's documents. After the verification and certification, the Engineer shall be supplied with two certified copies of this documentation. All damaged, or otherwise unacceptable steel conditions, which are not so documented, shall be the Contractor's sole responsibility to repair to the satisfaction of the Engineer at no additional cost to the State.

All existing steel designated for removal, storage, and reinstallation shall be carefully match marked prior to dismantling.

Disassembly work shall be performed in accordance with the requirements of §202-3.04, modified as follows:

> All steel shall be stored in accordance with the requirements of the New York State Steel Construction Manual, Subsection 1401.

Reinstallation work shall be performed in accordance with the requirements of Section 14 and Section 10 of the New York State Steel Construction Manual, with modifications to the various Subsections as noted below:

> 1401 Not applicable
>
> 1405 Certified copies of the test results are not required.

All assembly connections shall be made by means of high strength bolts, unless otherwise directed by the plans. Any necessary welding work shall be pre-approved by the Engineer and shall meet the requirements of the New York State Steel Construction Manual.

Prior to installation, the contractor shall make any required modification to the structural steel where indicated on the Contract Documents.

ITEM 564.05010011 – REMOVE, STORE, & REINSTALL STRUCTURAL STEEL

METHOD OF MEASUREMENT

Measurement will be taken as each unit of existing steel, stored, and reinstalled.

BASIS OF PAYMENT

The unit price bid per each unit shall include the cost of all labor, materials, and equipment necessary to complete the work.

Progress payments will be made according to the following schedule:

1. Disassembly and Storage - Sixty percent of the measured quantity will be paid for after the steel has been stored.
2. Reinstallation - The remainder of the measured quantity will be paid for after the steel has been reinstalled as required.

ITEM 593.01000001 - MONOPILE DONUT FENDER SYSTEMS

DESCRIPTION

The work under this item shall consist of furnishing and installing monopile donut fender systems on all steel pipe dolphin structures in accordance with the Construction Drawings and as directed by the Engineer.

MATERIALS

The Contractor shall furnish all labor, materials, tools, and equipment necessary for completion of this work.

The fender system shall be the Monopile Donut Foam-Filled Marine Fenders 70 in diameter x 14ft height Standard Capacity as manufactured by Pacific Marine & Industrial or approved equal.

CONSTRUCTION DETAILS

All monopile donut fender systems shall be installed in accordance with the manufacturer's recommendations and as shown on the Construction Drawings.

The fender shall be raised above the monopile's top elevation for adequate clearance, and then lowered into place from above. The fender shall not be dropped into position while lines are secured to its end fittings.

When the donut fender is centered on the pile, the clearance between bearing surfaces and the pile shall be such that jamming or excessive cocking on the pile does not occur during berthing operations.

After installation, the fender shall be free-floating around the steel monopile dolphin with no moorings or connections.

METHOD OF MEASUREMENT

This work shall be measured as the lump sum of monopile donut fender systems satisfactorily furnished and installed.

BASIS OF PAYMENT

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

ITEM 634.99010017 – BUILDING CONDITION SURVEY
ITEM 634.99020017 – VIBRATION MONITORING (NONBLASTING)

DESCRIPTION

A. Building Condition Survey. This work shall consist of performing a building condition survey(s) and preparing permanent records as indicated in the contract documents prior to the commencement of work, after completion of work, and at locations and times during construction as directed by the Engineer.

B. Vibration Monitoring (Nonblasting). This work shall consist of performing vibration monitoring of background and construction activities and preparing daily and summary report(s) of vibration readings.

MATERIALS

A. Building Condition Survey. Provide general photography and video equipment, analog or digital, capable of superimposing the date and time on all images.

B. Vibration Monitoring (Nonblasting). Provide a 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions. Annual factory calibration is required throughout the duration of the work.

CONSTRUCTION DETAILS

A. General. The Contractor shall engage the services of a firm capable of furnishing a New York State licensed Professional Engineer to conduct a condition survey of the existing building(s) indicated in the contract documents in the Special Note entitled Vibration Criteria and an experienced vibration monitoring Consultant to measure peak particle velocities prior to, and during, construction operations. Submit as proof to the Deputy Chief Engineer Technical Services (DCETS) the experience and qualifications of the firm's personnel conducting the work.

B. Building Condition Survey. Provide, as a minimum, the following information:

1. Photographic and videotape documentation of the interior and exterior condition of the building(s).

2. Extent and location of existing signs of building distress such as cracks, spalling, signs of settlement, flooding, leaking, etc.

The Engineer may accompany the Contractor on each building condition survey for verification of the data recorded. Provide two copies of all documentation of each building condition survey to the Engineer.

C. Vibration Monitoring (Nonblasting). The DCETS may waive the requirements of vibration monitoring based on the results of the building condition survey.

Perform continuous vibration monitoring during construction operations when adjacent construction activities make monitoring prudent. The Contractor shall perform contract work in

a manner that will limit construction vibration at the specified locations to within the limits set within the contract documents.

1. Submittal of Written Vibration Monitoring Plan. Prior to performing work adjacent to specified locations, a written Vibration Monitoring Plan prepared by the Contractor shall be submitted to the Engineer a minimum of 10 work days in advance for approval. The Engineer will send a copy of the Vibration Monitoring Plan to the Geotechnical Engineering Bureau, Engineering Geology Section, for review and written comment. The vibration monitoring plan may be returned to the Contractor for revision or clarification.

The vibration monitoring plan shall include the necessary information to outline the recording collection. The vibration monitoring plan shall include, but not be limited to, the following items:

a. Contract Designations

- The name of vibration monitoring specialist(s).
- The scheduled start date and length of construction operations which require vibration monitoring.
- The limits of vibration monitoring work, including sites on or off State-owned right-of-way.
- The location of all structures to be monitored in proximity to the construction operation.
- The location of any underground utilities in proximity to the construction operation.

b. Experience and Equipment

- Submit proof and details, as references, of two projects in the past five years where the vibration monitoring consultant performing the work has satisfactorily monitored construction operations by recording maximum peak particle velocities (PPVs). Include contact information for each reference.
- Submit information on the required 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions, including: the manufacturer's name, model number, and documentation of factory calibration performed within the last 12 months.

c. Methods and Procedures

- The location of adjacent structures to be monitored and maximum allowable PPVs as indicated in the contract documents. If not otherwise specified, a maximum allowable PPV in accordance with the United States Bureau of Mines (USBM) Vibration Criteria (Figure 1) shall be observed at all structures.
- The location of seismograph(s) placements, as directed by the Contractor's Professional Engineer. Recording seismographs may be installed on selected structures.
- Appropriate details for anchoring the geophone(s).

- The procedure for tracking PPV throughout construction operations (e.g., Pile Driving Operations: pile tip vs. vibrations may be correlated through time of day. A record of the time of day at each depth interval, included on the pile driving records, would be required to correlate to a time-based readout of PPV).

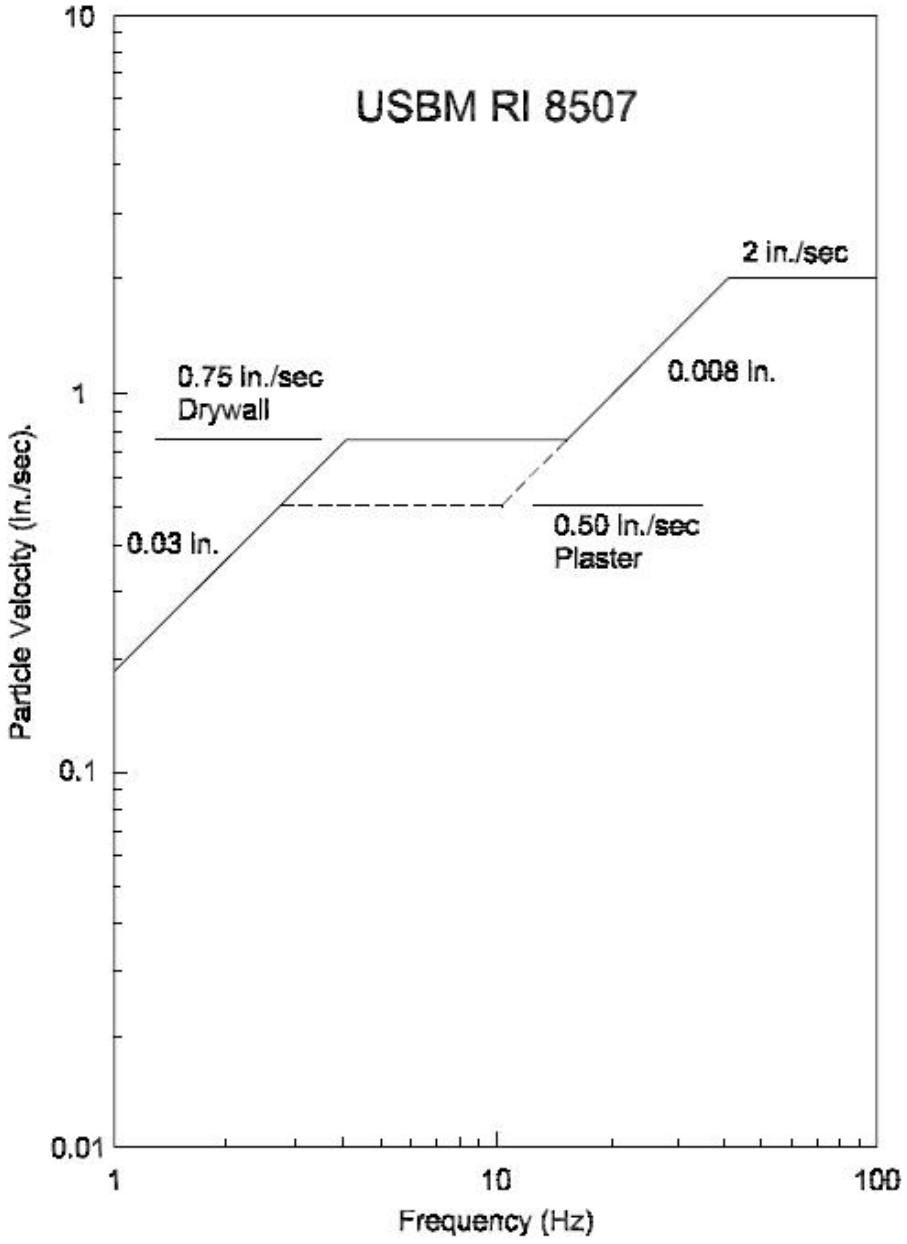

Figure 1—Safe Vibration Limit Recommendations for Residential Structures

Figure 1 – USBM Vibration Criteria (after Siskind et al, 1980)
The figure provides a "threshold damage" limit, defined as cosmetic damage (e.g., cracking) within the structure, categorized by both frequency ranges and particle velocity

2. Measuring Vibrations. The Contractor shall inform the Engineer immediately each time measured particle velocities exceed 85% of the allowable peak particle velocity. The Contractor shall make equipment or procedural modifications as required to avoid exceeding the allowable vibration intensity.

If the measured velocities exceed the maximum allowable PPVs, the Contractor shall stop operations immediately and revise equipment and procedures to reduce vibrations to allowable levels.

The Contractor shall be in communication with his monitoring firm's personnel during vibration monitoring at all locations to verify the data recorded.

The Contractor shall provide the Engineer with the results of daily vibration monitoring, one work day after the readings are taken. Upon completion of the construction operations for those locations requiring vibration monitoring, the daily submittals shall be synthesized into a final report.

If the seismographs show any indication of damage or vandalism, the seismographs shall be immediately recalibrated or replaced.

METHOD OF MEASUREMENT

A. Building Condition Survey. This work will be measured on a lump sum basis.

B. Vibration Monitoring (Nonblasting). This work will be measured on a lump sum basis.

BASIS OF PAYMENT

The unit price bid for building condition survey(s) and vibration monitoring shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

Vibration Monitoring (Nonblasting). Progress payments will be made for this item paid proportionally in accordance with the amount of work completed, measured on a workday basis.

Payment will be made under:

Item No.	Item	Pay Unit
634.99010017	Building Condition Survey	Lump Sum
634.99020017	Vibration Monitoring (Nonblasting)	Lump Sum