Battery Park City Authority

2nd Place, Belvedere and Chambers Street Sinkholes

April 25, 2013

Submitted by:

KS Engineers, P.C.

DIEGO ALAIMO
PROFESSIONAL ENGINEER
N.Y. LICENSE NO. 053085-1

KSE

12-1254

Estimate of Quantities and Scope of Work:
LOCATION No.: 1 – Second Place

Item Number:	Item Description:	Unit:	Quantity:	Price per Unit:	Total per Item:
1254/10-01	Mobilization	L.S.	1.00		
1254/10-02	Work Zone Safety Control	L.S.	1.00		
1254/10-03	Preconstruction Survey	L.S.	1.00		
1254/10-04	Remove and Dispose Existing Concrete Sidewalk, 4 ½ Inch Thick	Sq. Ft.	155.00		
1254/10-05	Remove and Dispose Existing Concrete Underlayment, 5 Inch Thick, In Asphalt Pavers Sidewalk Area	Sq. Ft.	206.00		
1254/10-06	Remove, Refurbish and Store Existing Asphalt Pavers, 2 ½ Inch Thick	Sq. Ft.	206.00		
1254/10-07	Remove, Refurbish and Store Belgium Block Pavers	Sq. Ft.	158.00		
1254/10-08	Remove Damaged Granite Curb Section	Linear Feet	6.00		
1254/10-09	Unclassified Excavation and Disposal	Cubic Yard	23.00		
1254/10-10	Excavation Protection Sheeting	Sq. Ft.	80.00		
1254/10-11	Select Granular Fill	Cubic Yard	15.00		
1254/10-12	Flowable Fill – Minimum 300 Lb per Sq. Inch Compressive Strength Concrete Mix	Cubic Yard	5.00		
1254/10-13	Sand Backfill	Cu. Yard	5.00		
1254/10-14	Concrete Underlayment for Asphalt Concrete Pavers, 4 ½ Inch Thick	Sq. Ft.	206.00		
1254/10-15	Asphalt Underlayment for Asphalt Concrete Pavers, 1 ½ Inch Thick	Sq. Ft.	206.00		
1254/10-16	Reinstall Asphalt Concrete Pavers (up to 20% of Replacement New Pavers to be Included in the Price Bid)	Sq. Ft.	206.00		
1254/10-17	Stone Screenings Underlayment for Belgium Block Pavers	Cubic Yard	2.00		
1254/10-18	Reinstall Belgium Block Pavers	Sq. Ft.	0.00		
1254/10-19	Replace Damaged Granite Curb Section	Linear Feet	6.00		
1254/10-27	Concrete Sidewalks and Driveways	Sq. Ft.	318.00		

Estimate of Quantities and Scope of Work:
LOCATION No.: 2 – Belvedere

Item Number:	Item Description:	Unit:	Quantity:	Price per Unit:	Total per Item:
1254/10-01	Mobilization	L.S.	1.00		
1254/10-02	Work Zone Safety Control	L.S.	1.00		
1254/10-03	Preconstruction Survey	L.S.	1.00		
1254/10-05	Remove and Dispose Existing Concrete Underlayment, 4 ½ Inch Thick, In Asphalt Pavers Sidewalk Area	Sq. Ft.	392.00		
1254/10-06	Remove, Refurbish and Store Existing Asphalt Pavers, 2 ½ Inch Thick	Sq. Ft.	392.00		
1254/10-09	Unclassified Excavation and Disposal	Cubic Yard	29.00		
1254/10-10	Excavation Protection Sheeting	Sq. Ft.	90.00		
1254/10-11	Select Granular Fill	Cubic Yard	9.00		
1254/10-12	Flowable Fill – Minimum 300 Lb per Sq. Inch Compressive Strength Concrete Mix	Cubic Yard	5.00		
1254/10-13	Sand Backfill	Cu. Yard	5.00		
1254/10-14	Concrete Underlayment for Asphalt Concrete Pavers, 4 ½ Inch Thick	Sq. Ft.	392.00		
1254/10-15	Asphalt Underlayment for Asphalt Concrete Pavers, 1 ½ Inch Thick	Sq. Ft.	392.00		
1254/10-16	Reinstall Asphalt Concrete Pavers (up to 20% of Replacement New Pavers to be Included in the Price Bid)	Sq. Ft.	392.00		
1254/10-20	Remove and Store Existing Top Soil	Sq. Ft.	180.00		
1254/10-21	Place Top Soil	Sq. Ft.	180.00		
1254/10-22	Remove, Refurbish and Store Existing Granit Slabs 2 ½ Inch Thick	Sq. Ft.	126.00		
1254/10-23	Reinstall Granit Slabs (up to 10% of Replacement New Slabs to be Included in the Price Bid, if necessary)	Sq. Ft.	126.00		
1254/10-24	Concrete Underlayment for Granite Slabs Sidewalk, 4 ½ Inch Thick	Sq. Ft.	126.00		
1254/10-25	Remove, Refurbish and Store Existing Granite Curb	Linear Feet	22.00		
1254/10-26	Reinstall Granite Curb (up to 10% of Replacement New Curbs to be Included in the Price Bid, if necessary)	Linear Feet	22.00		

Estimate of Quantities and Scope of Work:
LOCATION No.: 3 – Chambers Street

Item Number:	Item Description:	Unit:	Quantity:	Price per Unit:	Total per Item:
1254/10-01	Mobilization	L.S.	1.00		
1254/10-02	Work Zone Safety Control	L.S.	1.00		
1254/10-03	Preconstruction Survey	L.S.	1.00		
1254/10-04	Remove and Dispose Existing Concrete Sidewalk, 4 ½ Inch Thick	Sq. Ft.	6.00		
1254/10-05	Remove and Dispose Existing Concrete Underlayment, 5 Inch Thick, In Asphalt Pavers Sidewalk Area	Sq. Ft.	505.00		
1254/10-06	Remove, Refurbish and Store Existing Asphalt Pavers, 2 ½ Inch Thick	Sq. Ft.	505.00		
1254/10-07	Remove, Refurbish and Store Belgium Block Pavers	Sq. Ft.	116.00		
1254/10-08	Remove Damaged Granite Curb Section	Linear Feet	5.00		
1254/10-09	Unclassified Excavation and Disposal	Cubic Yard	32.00		
1254/10-10	Excavation Protection Sheeting	Sq. Ft.	100.00		
1254/10-11	Select Granular Fill	Cubic Yard	18.00		
1254/10-12	Flowable Fill – Minimum 300 Lb per Sq. Inch Compressive Strength Concrete Mix	Cubic Yard	5.00		
1254/10-13	Sand Backfill	Cu. Yard	9.00		
1254/10-14	Concrete Underlayment for Asphalt Concrete Pavers, 4 ½ Inch Thick	Sq. Ft.	505.00		
1254/10-15	Asphalt Underlayment for Asphalt Concrete Pavers, 1 ½ Inch Thick	Sq. Ft.	505.00		
1254/10-16	Reinstall Asphalt Concrete Pavers (up to 20% of Replacement New Pavers to be Included in the Price Bid)	Sq. Ft.	505.00		
1254/10-17	Stone Screenings Underlayment for Belgium Block Pavers	Cubic Yard	3.00		
1254/10-18	Reinstall Belgium Block Pavers	Sq. Ft.	116.00		
1254/10-19	Replace Damaged Granite Curb Section	Linear Feet	5.00		
1254/10-27	Concrete Sidewalks and Driveways	Sq. Ft.	6.00		

Estimate of Quantities and Scope of Work:
All THREE LOCATIONS

Additional Items to be provided by Contractors for Bid Evaluation:

Time and Materials Prices for Additional Work ONLY

Scope of Services: Mobilize and demobilize; excavate an area of the sinkhole to discover the causing problem; Remediate Problem as Recommended by Engineers, Provide all Necessary Labor, Materials *(See Note Below) and Equipment.

A	LABOR COST:	Unit	$ Per Unit
1	Laborer Foremen (1 Foremen x 4 Days x 8 Hr)	Per Hr	$ -
2	Laborer (1 Laborers x 4 Days x 8 Hr)	Per Hr	$ -
3	Operating Engineer (1 Operator x 4 Days x 8 Hr)	Per Hr	$ -
4	Mason	Per Hr	$ -
5	Teamster	Per Hr	$ -
C	**EQUIPMENT COST:**	**Unit:**	**$ Per Unit**
1	Utility/Compressor Truck with Small Tools including Operating Cost	Per Day	$ -
2	Aluminum Sheeting Box (12' Long x 8' Deep x 4' to 8' Wide	Per Day	$ -
3	Excavator Cat 450 including Operating Cost	Per Day	$ -
4	Dump Truck	Per Day	$ -

* **Materials cost will be reimbursed upon installation and invoices to be presented to BPCA with the 10% overhead plus 5% profit allowance.**

GENERAL PROVISIONS - MEASUREMENT AND PAYMENT

MEASURING QUANTITIES.

All contract payments, including the final, will be made for quantities of work performed and materials placed in accordance with the contract documents as determined by the measurements of the Engineer, and the resulting quantities shall be accepted as final, conclusive and binding upon the Contractor. Various methods of quantity computation may be used by the Engineer, including but not limited to: manual arithmetic calculations, manual measuring tools such as a planimeter, and computer tools/software. The Engineer will choose the computation method, and the method may vary by contract and by contract pay item as appropriate. The Engineer will choose the method by which the work will be measured, such as: measure from documents/data (contract plans, cross sections, CADD files, etc.) or measure from field survey of completed work, with the goal of obtaining reasonably accurate quantities of work for payment using a commensurate amount of effort and resources.

COMPENSATION FOR ALTERED QUANTITIES.

The BPCA reserves the right to order changes in quantities of contract pay items as is necessary to complete the work, in accordance with the intent of the contract documents.

A. Major Items. For Major Items (Any contract pay item for which the original unit bid price multiplied by the original item quantity exceeds $100,000.00), payment will be made for all extra work at the contract unit bid price for work up to 125% of the original contract quantity. For Major Item quantities less than 75% or more than 125% of the original contract quantity, consideration of contract adjustment will be in accordance to renegotiation procedures set by BPCA for Major Items.

Total payments made for all work on a Major Item that decreases to below 75% of the original contract item quantity, will not exceed the total payments which would have been made if the original contract quantity had been completed at the original unit price bid.

B. Minor Items. For Minor Items (Any contract pay item that does not meet the definition of a Major Item), payment will be made for extra work at the contract unit bid price, except for any extra work that is both: (1) more than 200% of the original contract quantity and (2) results in an increase of more than $1,000 from the original contract amount, will be in considered a Significant Change.

For Minor Items where the contract bid price does not exceed 125% of either the statewide or regional weighted average bid price, the contract bid price may be extended up to a increase of $5,000 from the original contract amount.

EXTRA WORK AND TIME RELATED COMPENSATION.

The Contractor will be compensated for extra work under existing unit prices in accordance with Compensation for Altered Quantities, by agreed price in accordance with Agreed Price Work, or by force account in accordance with Force Account Work.

A. Agreed Price Work. Agreed prices for new items of work or materials in accordance with one of the methods outlined below may be accepted by the Engineer and incorporated into an order-on-contract as the BPCA may deem them to be just and fair and beneficial to the Authority. An order-on-contract containing an agreed price not supported by one of the following may be subsequently rejected by the BPCA.

1. Original Contract Bid Price. The original contract bid price, adjusted for documented increase or decrease in material cost, equipment rate, mobilization, and/or site conditions.

2. Weighted Average Bid Price. Reference to the statewide or regional weighted average bid price for a minimum of 3 contracts for similar type, quantity, and/or location of work from the Weighted Average Item Price Report or other recent contracts, adjusted for documented increase or decrease in labor, materials, equipment, mobilization, and/or site conditions.

3. Average of 3 Bidders. For work in unusual circumstances or unusual site conditions, the average bid price for the 3 lowest responsible bidders presented in the Tabulation of Bids for that contract. If less than 3 responsible bids were received, this option shall not be used.

4. Price Analysis. A price analysis shall be based on an estimated breakdown of charges listed in Force Account Work below, using the equipment and other rates in effect when the agreed price is developed by the Contractor. The analysis shall be based on crew composition, material prices, equipment production and overall production rates that are reasonable in comparison with contract bid price work.

Equipment rates shall be used with no rate adjustment factor and no regional adjustment factor. An appropriate type and size of equipment similar to that available on the contract site, if present, shall be used.

Labor rates may be determined using 15% of wages and supplemental (fringe) benefits for

FICA, Medicare, paid holidays, Federal unemployment tax, and State unemployment insurance in lieu of a detailed accounting. Overhead and profit will not be allowed on the labor markup.

Due to the cost and effort associated with development, a price analysis should generally be reserved for extra work under an individual contract pay item or a single price analysis, of more than $1,000.

The Contractor shall provide a price analysis within 10 work days of request by the Engineer. The BPCA will accept or reject the Contractor's proposed agreed price within 10 work days of receipt of a complete price analysis.

B. Force Account Work. Where there are no applicable unit prices for extra work and agreed prices cannot be readily established or substantiated, the Contractor will be paid by Force Account for the actual, reasonable and verifiable cost of the items listed below. The Contractor shall maintain and submit force account records in accordance with §109-05C. Force Account Report.

1. Contractor Charges. At the preconstruction meeting, the Contractor should provide the Engineer documentation supporting its Commercial General Liability Insurance rates for the current period, and provide updates within 30 days after the renewal date, to assist in timely preparation and review of force account reports.

a. Labor. Necessary labor costs include wages, supplemental (fringe) benefits, payroll taxes, state unemployment insurance, workers compensation insurance and other such reasonable charges that are paid by the Contractor pursuant to existing written agreements with its employees and/or labor organizations. Each class of labor shall be billed separately at actual payroll rates; average rates based on different classes of labor will not be accepted. The wage rate for an individual worker may be up to 110% of the prevailing wage, provided the Contractor documents through certified payrolls that the worker has and continues to be paid more than the prevailing wage for contract work. No reimbursement will be made for travel, lodging, signing bonuses, or other similar payments made to workers.

At the Contractor's option, a labor markup of 15% of all wages, not including supplemental (fringe benefits), for FICA, Medicare, paid holidays, Federal unemployment tax, and State unemployment insurance in lieu of a detailed accounting. Overhead and profit will not be paid on the labor markup.

Workers compensation insurance rate will be the base rate and the territorial differential only established by the NYS Workers Compensation Insurance Rating Board, subject to the Construction Employment Limitation Program limits. No other additional charges or modifiers will be included.

Insurance and other costs incurred or limited on a weekly basis will be reimbursed based on the percentage of the employees weekly gross wages paid under force account.

b. Materials. Materials are necessary products incorporated in the temporary or permanent work, including transportation to the site. Transportation may be accounted for under materials as either a unit price for transportation or equipment/operator charges. Equipment charges for transportation of materials shall be accounted for as equipment in accordance with Section Equipment with no allowance

for overhead and profit. Materials will be measured as quantities incorporated, with no reduction for required overlap, and appropriate waste due to construction and/or installation.

Oxygen, acetylene, propane, welding rods, grinding wheels, saw blades, hammer and drill bits, drill steel, and tooth-bits consumed in progressing the work are considered to be materials for which reimbursement will be made. Other materials which are consumed in progressing the work are considered to be included in overhead and no separate reimbursement will be made. Material acquired by direct purchase shall be documented by bills or acceptable invoices. All prices on used material incorporated in either temporary or permanent work shall be billed at a fair value, less than the original cost when new. A reasonable salvage credit will be determined by the Engineer in coordination with the Contractor for substantial salvageable material recovered.

c. Equipment. Equipment, other than small tools, used by the Contractor shall be of suitable size and suitable capacity required for the work to be performed. If the Contractor elects to use equipment of a higher rate than the equipment suitable for the work, payment will be made at the rate applicable to the suitable equipment. The equipment actually used and the suitable equipment upon which the rate is based will be recorded as a part of the force account report. Usage will be recorded in hours to the nearest whole hour. The Engineer will determine the suitability of the equipment. If there is a differential in the rate of pay of the operator of oversize or higher rate equipment, the rate paid for the operator will likewise be related to the suitable equipment.

(1) Contractor Owned Equipment. The Contractor will be reimbursed for its ownership costs and for its operating costs for self owned equipment at the rates listed in the a Rental Rate Blue Book for Construction Equipment at published by PRIMEDIA Information, Inc. (hereafter referred to as the Blue Book) in effect at the time the work is performed.

a) Ownership Costs. The rates for ownership costs will reimburse the Contractor for all non-operating costs of owning equipment, including depreciation on the original purchase, major overhaul repairs, cost of facilities capital, normal risk insurance, property taxes, storage, licenses, record keeping costs, overhead, and profit.

In the event that the Contractor does not have a needed type or piece of equipment on the contract site, the Contractor will be paid for the reasonable cost of moving the equipment onto and away from the contract site.

The hourly rate for the first 8 hour shift will be the Blue Book monthly rate divided by 176 multiplied by the rate adjustment factor and then multiplied by the regional adjustment factor. The hourly rate for subsequent shifts during the same day will be 75% of the first shift hourly rate. Equipment required to be present, but idle, will be paid at 50% of the first shift hourly rate. Reimbursement will be made for the product of the hours of actual use or hours it is required to be present, and not available for mobilization elsewhere, multiplied by the hourly rate.

b) Operating Costs. The rate for operating costs includes preventative and field maintenance, fuel, lubricants, and other operating expendables. Operating cost does not include the operator=s wages. Reimbursement will be made for the product of the number of hours of actual use multiplied by the operating rate. The hourly rate will be paid for all hours of operation, including those during subsequent shifts on the same day.

c) No Established Rate. In the event that rates are not established in the Blue Book for a particular piece of equipment, the Contractor shall contact the Blue Book publisher to establish rates. If the publisher will not establish rates, the BPCA will establish rates for ownership costs and operating costs for that piece of equipment consistent with its cost and expected life.

(2) Rented Equipment. In the event that the Contractor does not own a specific type of equipment and must obtain it by rental, the Contractor will be paid for the time that the equipment is used to accomplish the work or is required to be present, plus the reasonable cost of moving the equipment onto and away from the contract site.

a) Rental Costs. The Contractor will be paid the invoiced rental rate for the equipment, not to exceed the Blue Book ownership rate.

b) Operating Costs. The Contractor will be paid for the operating cost of the equipment in accordance with Section B.1.c.(1)b) unless reflected in the rental price.

c) Rates Including Operator. In the event that the Contractor rents equipment with an operator or fully fueled and/or maintained equipment such as cranes, concrete pumpers, trucks, etc. payment will be made on the basis of an invoice for the rental of the equipment and the costs of moving to and from the site, provided the total rate is substantiated by area practice. The rate including operator will not exceed the total of the ownership rate and the operating rate from the Blue Book, and the prevailing wage rate of an appropriate operator, if an operator is supplied.

(3) Maximum Ownership/Rental Costs. The maximum amount paid for the ownership costs of Contractor owned or the rental costs of rented equipment, is limited to the original purchase price as listed in the a Green Guide for Construction Equipment at published by PRIMEDIA Information, Inc. If the ownership or rental reimbursement is limited by the original purchase price, the Contractor will be reimbursed for the operating cost per hour for each hour of actual use.

d. Sales Taxes. Sales taxes, if any, required to be paid on rented equipment or materials not permanently incorporated into the work.

e. Overhead. Overhead will be computed at ten percent (10%) of items B.1.a. Labor (but not including the premium portion of overtime) and §109-05B.1.b. Materials, and will be defined to include the following:

(1) Additional premium on bond, additional premium for insurance required by the BPCA other than Workers Compensation Insurance and Commercial General Liability Insurance;

(2) All salary and expenses of executive officers, supervising officers/ employees, superintendents, and clerical or administrative employees, including payroll taxes, unemployment insurance, workers compensation insurance, and charges that are paid by the Contractor to or on behalf of those employees pursuant to written agreement with its employee(s) and/or labor organizations;

(3) Minor equipment such as small tools, including shovels, picks, axes, saws, bars, sledges, lanterns, jacks, etc., and other miscellaneous supplies and services;

(4) Contractor's field office rental, utility charges, potable water, sanitation, cleaning, computers, CADD equipment, drafting equipment reproduction costs, etc.

f. Profit. Profit will be computed at ten percent (10%) of items Section B.1.a. Labor (but not including the premium portion of overtime) and Section B.1.b. Materials.

g. Commercial General Liability (CGL) Insurance. Commercial General Liability (CGL) insurance will be reimbursed at the rate paid by the Contractor in accordance with the method procured from its insurer.

(1) Contractors that pay commercial general liability on the basis of a percentage of payroll will be paid that percentage of item Section B.1.a. Labor.

(2) Contractors that pay commercial general liability on the basis of a percentage of gross sales will be paid that percentage of items Section B.1.a. through f.

2. Subcontractor Charges. When the work is performed by a Subcontractor, the Contractor will be paid the actual and reasonable cost of such subcontracted work as outlined above in Section B B.1.a through Section B.1.g, plus an additional overhead of five percent (5%) of the cost of items Section B.1.a. Labor and Section B.1.b. Materials.

3. Service Charges. When work is performed by, and a fee is paid to, a service provider, the Contractor will be paid the actual cost of the service fee plus five percent (5%) for contract supervision, overhead and profit. This 5% will be applied once to the service fee regardless of the firm making direct payments to the service provider.

C. Force Account Report. Payment for force account work will be made on the basis of the following reports. Reports shall be submitted in a format acceptable to the Department. Appropriate forms are available from the Department.

If the Engineer disagrees with the accuracy, applicability, or reasonableness of any portion of a Contractor's submission, he/she shall promptly notify the Contractor. The Engineer will make any notations, remarks or comments on the records that may assist in final payments and then sign and date to indicate receipt, but not necessarily concurrence.

1. Daily Summary. The Contractor shall deliver a daily summary of force account work to the Engineer not later than close of business on the work day following that for which the work is reported. This summary shall be dated and signed by the Contractor's authorized representative. The summary shall contain:

a. The contract number, other contract information, and the Contractor name/information.

b. A brief description of the work performed and the work location for that day.

c. A list of personnel by name, including the hours worked, and labor classification.

d. A list of materials used indicating the quantity and nature. The cost shall be documented later by proper receipts.

e. A list of equipment used indicating the number of hours used and the type, manufacturer, model, model year, size of equipment, and any required attachments.

2. Weekly Labor Summary. Within 5 calendar days after the end of each pay period, the Contractor should deliver to the Engineer a Force Account Summary of Labor used on the work, which shall include the name, labor classification, hours worked, hourly rate of pay, supplemental (fringe) benefits, and/or other items as shown on the certified payroll. If the Contractor does not provide the Engineer with Weekly Labor Summaries, no progress payments on that force account will be made.

3. Force Account Report Submission. On completion of the specific force account work, the Contractor shall deliver to the Engineer a Force Account Report, wherein all labor, materials, equipment, and other charges are shown and totaled. The Force Account Report shall be dated and signed by the Contractors authorized representative. When the Contractor and the Engineer agree on the Force Account Report, the Engineer will prepare and submit an order-on-contract containing the Force Account Report to the Regional Construction Engineer for approval.

4. Force Account Review. The BPCA will review the Force Account Report and make any notations, remarks or comments on this form that may assist in final payments. The emphasis of this review will be

on labor rates, payroll taxes, material costs, equipment rates, insurance rates, conformance with payment provisions of technical specifications, and overall documentation.

5. Late Submissions. In the event the Contractor fails to deliver the required force account documentation to the Engineer in a timely manner, and as a result the order-on-contract for the force account work is not fully approved at the date of final acceptance, the required final payment date will be extended by the number of calendar days between final acceptance and the issuance of this force account order-on-contract, attributable to the Contractor=s late force account submissions.

ELIMINATED MATERIALS.

Materials required by the contract documents and not incorporated into the work due to changes caused by field conditions or revisions to the design by the State after the material was ordered or purchased may be eligible for reimbursement. Materials will be eligible for reimbursement if they are determined by the BPCA to be unique to the contract, and meet one or more of the following conditions:

• The material order cannot be canceled or changed to reflect the revised quantity required.

• The material cannot be restocked or the cost of restocking is excessive.

• The Contractor or Subcontractor does not maintain a supply of the material.

• The cost of the material exceeds $1000.00 or five percent (5%) of the item, whichever is greater.

The Contractor will be reimbursed its material cost minus salvage value, or the material cost plus necessary delivery costs to a site identified by the Engineer, if the Department opts to take the material.

Overhead and profit will be paid once, at a maximum of five percent (5%) for all materials not incorporated into the work, regardless of whether the Contractor or the Subcontractor pays for the material and/or delivery costs.

Item 1254/10-01 - MOBILIZATION

DESCRIPTION.

Under this work the Contractor shall provide necessary bonds, insurance, and pre-financing and shall set up his necessary general plant, including shops, storage areas, office and such sanitary and other facilities as are required by local or state law or regulation.

MATERIALS.

Such materials as required for mobilization and that are not to be part of the completed contract shall be as determined by the Contractor, except that they shall conform to any pertinent local or State Law, regulation or code.

CONSTRUCTION DETAILS.

The work required to provide the above facilities and service for mobilization shall be done in a safe and workmanlike manner and shall conform with any pertinent local or State Law, regulation or code. Good housekeeping consistent with safety shall be maintained.

METHOD OF MEASUREMENT.

Payment for mobilization will be made on a lump sum basis.

BASIS OF PAYMENT.

The amount bid for mobilization shall not exceed four percent (4%) of the total contract bid price excluding the bid price for mobilization. Should the bidder exceed the foregoing four percent (4%), the BPCA will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

The amount bid shall include the furnishing and maintaining of services and facilities noted under DESCRIPTION SECTION, to the extent and at the time the Contractor deems them necessary for his operations, consistent with the requirements of this work and the respective contract.

The amount bid shall be payable to the Contractor with the first contract payment made for other contract work.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-01	Mobilization	Lump Sum

Item 1254/10-02 - WORK ZONE SAFETY CONTROL

DESCRIPTION

General.

Work zone traffic control shall consist of all work to provide for the safe and efficient movement of pedestrian, bicycle and vehicle traffic through or around work zones, and to protect workers and the public from damage to person and property which may result, directly or indirectly, from any construction operations, under the direction of a trained, responsible person, as shown in the contract documents, the MUTCD and as directed by the Engineer. The duration of this work shall be from the date any work is started on the contract site, including mobilization of equipment, signs, offices, and shops until the date of contract final acceptance. Temporary materials and components that are furnished by the Contractor shall remain the property of the Contractor.

Basic Work Zone Safety Control.

Work shall consist of controlling traffic over a reasonably smooth traveled way which shall be marked by signs, delineators, channelizing devices, pavement markings, and other devices as shown in the contract documents or as directed by the Engineer.

Work after sunset and before sunrise shall include additional requirements for nighttime operations including, but not limited to, a written plan for nighttime operations, additional worker and equipment protection, additional channelizing devices and contract site patrol.

The Contractor shall conduct its operations to ensure the safety and convenience of travelers and abutting property owners as well as the safety of all workers on the contract. Travelers include, but may not be limited to motorists, motorcyclists, bicyclists and pedestrians.

Maintain Public Access. Work shall consist of maintaining public access to intersecting roads, residences, business establishments, adjacent property, bus stops and transportation facilities for pedestrians, and bicyclists.

Construction Signs. Work shall consist of furnishing, installing, moving, deactivating, maintaining, and removing construction signs as directed by the Engineer.

Flagging and Traffic Control. Work shall consist of furnishing the necessary traffic control equipment and flaggers for adequate traffic control.

Interim Tubular Markers. Work shall consist of furnishing, installing, moving, and maintaining interim tubular markers attached to the pavement as directed by the Engineer.

Construction Barricades. Work shall consist of furnishing, installing, moving, maintaining, and removing construction barricades, as directed by the Engineer.

MATERIALS.

All materials used shall comply with the requirements of Materials Data Sheets and Manufacturing Specifications.

Construction Signs. Fabrication of all components shall produce a finished sign panel. Holes may be punched or drilled. Edges shall be smooth and true and free from burrs or ragged breaks. Sign panels, including face shape, color, dimensions, and characters shall be fabricated using colors, character series and sizes, symbols, route shields and borders as shown in the MUTCD or ordered by Engineer.

CONSTRUCTION DETAILS.

General. The Contractor shall each designate a trained, responsible person who has the primary responsibility and sufficient authority for implementing the work zone traffic control plan and other safety and mobility aspects as necessary. The Contractor's responsible person shall be appropriately experienced and trained in accordance with the level of decisions that the individual will be required to make, reflecting current industry practices and Authority requirements.

The pedestrians' safe access from the street or highway, sidewalks, walkways, or other accommodations shall be provided by Contractor to allow their safe passage as ordered by the Engineer. When sidewalks, walkways, or shoulders must be temporarily closed to facilitate construction operations, accommodations for safe pedestrian passage shall be maintained at all times, unless other temporary pedestrian accommodations are approved by the Engineer.

Maintain Public Access. The Contractor shall provide and maintain at all times safe and adequate ingress and egress for intersecting sidewalks, residences, business establishments, adjacent properties, bus stops and other transportation facilities for vehicles, pedestrians and bicycles; at existing or at new access points, consistent with the work, unless otherwise authorized by the Engineer. Whenever construction operations disrupt or interfere with normal traffic patterns, intersections, business establishment access points, and driveways shall be clearly marked using channelizing devices.

Where pedestrian facilities exist, or where pedestrian traffic is reasonably anticipated, the Contractor shall maintain pedestrian access on at least one side of the highway or street at all times, and ensure accessibility for persons with disabilities in accordance with the contract documents and consistent with provisions of the Americans With Disabilities Act. Pedestrian access may be provided using existing pedestrian facilities, temporary sidewalks or walkways, or alternate paths. Where a sidewalk is closed, it shall be marked with construction barricade and a SIDEWALK CLOSED sign. Advance warning signs and directional guidance shall be provided to direct pedestrians to alternate paths and crosswalks and to alert motorists. Potentially hazardous areas adjacent to sidewalks, walkways, or other areas used by

pedestrians shall be protected to prevent pedestrian intrusion in accordance with Restricted Areas Protection Specifications – New York State Standard Specifications Section 619-3.

Construction Vehicles and Equipment. All construction vehicles and equipment operating within the contract limits, whether in the work space, in the traffic space, in spoil areas, in storage areas, or any other areas of the contract, shall be operated at all times with due consideration for the safety of the public and workers.

All trucks with a GVWR greater than 10,000 lbs shall display a minimum 2 inch wide band of reflective sheeting on the front, rear and each side. The sheeting need not be continuous, but the sum of the length of the segments shall be at least one-half the length of the body or trailer. The centerline of the sheeting shall be between 15 inches and 60 inches above the ground. All equipment shall display a minimum 2 inch wide band of reflective sheeting on the front and rear (100 square inches per end minimum) as practicable.

All vehicles and equipment within the contract limits and on the roadway shall be equipped with, and operate, a rotating amber beacon which shall be visible from all directions for a minimum of 1,000 feet during daylight. Strobe lights will not be allowed. If visibility of the amber beacon is blocked by a portion of the vehicle or equipment, additional beacons shall be provided. Short-term delivery vehicles not equipped with rotating amber beacons shall display four-way emergency flashers when in the temporary traffic control zone. Beacons shall be mounted in a manner which does not cause glare for the driver or operator.

Any vehicle with a GVWR greater than 10,000 lbs and with restricted visibility to the rear shall be equipped with a operational audible backup alarm. Any vehicle with a non-operational backup alarm shall be taken out of service until the alarm is repaired.

Contract Site Patrol. The Contractor shall provide adequate personnel and supervision to conduct operations and patrol the contract site to ensure that conditions are adequate for public safety and convenience at all times. The Contractor shall patrol the site as often as necessary during working and non-working hours to adjust and maintain signs, channelizing devices, and other traffic control devices and safety features.

BASIS OF PAYMENT.

The lump sum price bid for basic work zone traffic control shall include all labor, materials and equipment necessary to complete the work.

Progress payments will be made at 20 percent of the lump sum price bid when 10 percent of the contract work, excluding basic work zone safety control, contingency items and mobilization, has been

completed. The remaining 80 percent will be paid in subsequent contract payments, in proportion to the amount of other contract work completed, less any non-payment for deficient work zone traffic control.

Deficient work zone traffic control credit will be taken by BPCA as an amount calculated as a total amount bid for this Item divided by the total length of construction (calendar days) multiplied on a number of occurrences.

Payment will be made under:

Item No.		Item	Pay Unit
Item 1254/10-02	**-**	**WORK ZONE SAFETY CONTROL**	**Lump Sum**

Item 1254/10-03 – PRECONSTRUCTION SURVEY

DESCRIPTION

Survey Operations. This work shall consist of providing all necessary surveying to establish, spatially position, measure, navigate to and verify the locations of existing and proposed features and measure quantities of items in accordance with the contract documents or as directed by the Engineer. This work includes but is not limited to the establishment or reestablishment of primary and secondary control, the stakeout of proposed features, the location or verification of existing items or of constructed items, and the coordination and sharing of engineering data with the Authority or other contract project Engineers.

MATERIALS

None specified

CONSTRUCTION DETAILS

None specified

BASIS OF PAYMENT

The price bid shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work. Progress payments will be made in proportion to the amount of work completed as determined by the Engineer.

Payment will be made under:

Item No.	Item Description	Pay Unit
1254/10-03	Pre-Construction Survey	Lump Sum

1254/10-04	**Remove and Dispose Existing Concrete Sidewalk, 4 ½ Inch Thick**
1254/10-05	**Remove and Dispose Existing Concrete Underlayment, 4 1/2 Inch Thick, In Asphalt Pavers Sidewalk Area**
1254/10-08	**Remove Damaged Granite Curb Section**

DESCRIPTION:

The work shall consist of the removal and disposal of concrete underlayment, reinforcement, if present, and any miscellaneous materials encountered, as shown on the contract plans.

MATERIALS:

Not specified.

CONSTRUCTION DETAILS:

Not specified.

METHOD OF MEASUREMENT:

The work shall be measured by the area of concrete underlayment, removed and disposed of. The quantities will be determined from field measurements.

BASIS OF PAYMENT:

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

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-04	Remove and Dispose Existing Concrete Sidewalk, 4 ½ Inch Thick	Sq. Ft.
1254/10-05	Remove and Dispose Existing Concrete Underlayment, 5 Inch Thick, In Asphalt Pavers Sidewalk Area	Sq. Ft.
1254/10-08	Remove Damaged Granite Curb Section	Linear Feet

1254/10-06	**Remove, Refurbish and Store Existing Asphalt Pavers, 2 ½ Inch Thick**
1254/10-16	**Reinstall Asphalt Concrete Pavers (up to 20% of Replacement New Pavers to be Included in the Price Bid)**
1254/10-15	**Asphalt Underlayment for Asphalt Concrete Pavers, 1 ½ Inch Thick**

DESCRIPTION

This work shall consist of furnishing and installing asphalt block pavement on asphalt concrete base in accordance with the contract documents and as directed by the Engineer.

MATERIALS

Base Course: The materials for the base course shall meet the requirements of a NYS Standard Specifications 25.0 Binder Course F9 HMA. The mixture shall be designed and produced in accordance with NYS Standard Specifications Section 401, Plant Production. The mixture shall be designed for <0.3 million ESALs (50 gyrations) in accordance with MM 5.16, Hot Mix Asphalt (HMA) Mixture Design and Mixture Verification Procedures.

The asphalt mixture may contain a maximum of 20% of Recycled Asphalt Pavement (RAP) by weight mixture. Before placement of the base course begins, the Contractor shall submit the job mix formula for the Engineer's approval.

Performance Graded (PG) Binder: Use a PG 64-22 in the production of the Base Course.

Alternate PG binder grades may be allowed by the Engineer in lieu of PG 64-22. The PG binder will meet the requirements outlined in NYS Standard Specifications, Section 702 Bituminous Materials, Table 702-1 Performance-Graded Binders for Paving.

Bituminous Setting Bed: The setting bed shall consist of PG 64-22 mixed with fine aggregate meeting the requirements of §703-01. Alternate PG binder grades may be allowed by the Engineer in lieu of PG 64-22. The PG binder will meet the requirements outlined in NYS Standard Specifications, Section 702 Bituminous Materials, Table 702-1 Performance-Graded Binders for Paving. The PG binder content shall be no less than 7.0% of the total batch weight. The mix shall be heated to approximately 325º F
Neoprene Modified Asphalt Adhesive: shall consist of 2% neoprene, grade WM1, oxidized asphalt with R & B softening point of 155ºF minimum and a penetration of 80, and 10% asbestos-free fibers.

Asphalt Block: Unless otherwise noted on the plans, all pavers shall be hexagonally shaped asphaltic concrete blocks, 8 inches between parallel sides and 2 inches in thickness, with a permissible tolerance of ±1/16 inch in any dimension.

The blocks shall be composed of approximately 6.5± 0.5% high melting point oxidized asphalt conforming to ASTM Designation D-312 for Type 3 asphalt and 94% graded crushed rock aggregate and mineral filler; at the temperature of 300° F the mix is compressed 4,000 lbs. per square inch by high speed hydraulic presses.

Top of exposed surface of blocks shall have a ground finish, exposing a small aggregate. Color shall be noted in the Contract Drawings.

Forms: The forms for this work shall be wood of an approved type and a minimum length of 10 feet for tangents and curves, unless otherwise shown on the plans.

All forms shall be straight, free from bends and warps at all times, and shall be cleaned thoroughly and oiled before pavement is placed against them. This cleaning and oiling shall be repeated daily as the forms are moved ahead. The forms shall rest firmly upon the thoroughly compacted subgrade throughout their entire length, shall be joined neatly and tightly and staked securely to line and grade at least 200 hundred feet in advance of the point of placement by using a least three (3) bracing pins or stakes to each 10-foot length of side form, so that they will resist the pressure of the pavement and the impact of the roller without springing.

Transporting: Shipments of material shall be made in tight vehicles previously cleaned of all foreign material and delivered to the work so that it will not become contaminated in any way.

Submittals: All submittals shall be in accordance with the requirements of the General

Conditions, Section C, Special Provisions, Article 11. The Contractor shall submit the following for the Landscape Architect's review and approval prior to manufacture. The Contractor shall submit samples of each type of paver they propose to use for approval by the Designer. The samples shall be clearly labeled with Contract No., manufacturer, and finish. All pavers used on the work shall conform to the approved samples.

Sample Pavement: Prior to installing the asphalt block pavement, the Contractor shall construct a 10-foot sample pavement that demonstrates the paving patterns and colors in accordance with the plans and specifications, in order to verify the aesthetic effect and quality of materials. The contractor shall notify the Landscape Architect and Engineer seven days in advance of the date when the sample pavement is to be constructed. The sample shall be located as directed by the Engineer and may be part of the final work. It shall contain mortar joints and expansion joints as included in the final work. The Contractor shall obtain written approval of the sample prior to commencing with the final work. If the sample is disapproved, it shall be removed and reinstalled as directed by the Engineer. The Contractor

shall maintain the approved sample pavement in an undisturbed condition as a standard for judging the completed work. After completion and approval of the finished work, the sample pavement shall be demolished and removed by the Contractor, or included as part of the work, as directed by the Engineer.

CONSTRUCTION DETAILS

Subgrade Preparation: The subgrade shall be compacted in accordance with NYS Standard Specifications, §203-3.11 Subgrade Area.

Spreading of Base Course:

The asphalt cement base course shall be laid by means of an approved mechanical spreader to a depth, which after compaction shall be equal to the specified depth. In areas where the use of a mechanical spreader is impractical, as determined by the Engineer, other approved means of spreading and compacting may be permitted. The use of hand rakes will not be permitted. The Contractor shall use lutes where necessary.

Rolling of Base Course:

The asphalt concrete base course when properly spread shall be rolled using 80 Series compaction method as specified in the NYS Standard Specification §402-3.07 Compaction. Rolling shall proceed continuously not in excess of the following rates:

Method of Placement Square Yd/Hr/Roller

Hand 800 Yd/Hr/Roller

Machine 1200 Yd/Hr/Roller

After compaction of the base course and before the placing of the asphaltic block, the binder course shall be checked for depressions and high spots. The Contractor shall check the entire surface using a 10-foot wood or metal straight edge. Any depressions or high spots greater than 3/16 inch shall be satisfactorily corrected before placing the asphalt block.

Bituminous Setting Bed: To install the setting bed over the surface of the base, place ¾-inch deep control bars directly over the base course. If grades must be adjusted, set wood chocks under depth control bars to proper grade. Set two bars parallel to each other approximately 11 feet long (2" x 6" board). The depth of control bars must be set carefully to bring the paver, when laid, to the proper grade.

Place some bituminous material between the parallel depth control bars. Pull this bed with the striking board over these bars several times. After each passage, low porous spots must be showered with fresh bituminous materials to produce smooth, firm and even setting bed. As soon as this initial panel is completed, advance the first bar to the next position in readiness for striking the next panel.

Carefully fill up any depressions that remain after removing the depth control bars and wood chocks.

Bed shall be spread in a continuous workmanlike manner. Installation of base in spotted, different and isolated areas will not be accepted. Bed depth greater than 1-1/8 inch will not be acceptable.

After setting bed has cooled, it shall be rolled by hand with a 100-lb roller to eliminate sponginess and to prepare the surface for the installation of the adhesive.

Setting bed shall be protected against all pedestrian traffic and construction equipment to insure a level surface for setting pavers.

Adhesive: The neoprene-modified asphalt adhesive shall be applied by mopping, squeegeeing or troweling over the top of the bituminous setting bed so as to provide a bond between the bituminous setting bed and the paver.

Setting Pavers: When modified asphalt adhesive is dry to touch, carefully place the pavers by hand, ground finish side up unless otherwise specified, in straight course, with hand tight joints and uniform top surfaces, keeping full alignment according to the patterns shown on the plans.

Pavers may vary slightly in shade and tonality. Installer shall work from at least four (4) pallets at a time in order to create a uniform blend of paver shades.

Joints between blocks shall have a maximum width of 1/8 inch.

All blocks shall be cleaned when placed on the pavement.

In no case shall the bituminous setting bed in front of the pavement be disturbed or walked on during the laying of the blocks.

Joint Filler: Upon the completion of the work of laying the blocks in each section to the satisfaction of the Engineer, the surface of the blocks shall be swept clean, and the joints filled with fine sand.

All joints shall be filled the same day as the blocks are laid. Filler shall not be applied if the blocks are wet or if the air conditions are such that the filler does not readily enter the joints.

Filler shall be well worked into the joints by means of squeegees or other approved devices operating slowly backward and forward. Squeegeeing shall continue until the joints are flush with top surface.

Immediately after the joints are filled, the pavement shall be lightly sprayed and cleaned.

Defects: Where defects in composition, compression or finished appear in the complete work, such finished areas shall be removed to the full depth of the course and the defective material replaced with the required thickness of pavement at the expense of the Contractor for such removing and replacing.

Cold Weather: Asphalt base course shall be mixed and placed in accordance with minimum placement temperature as specified by the Engineer.

Unless notified by the Engineer in writing, no material shall be mixed or placed when the temperature is at, or lower than 50 F.

Precipitation Probability: Placement of asphalt mixture shall not be scheduled when the Precipitation Probability, obtained by the Contractor from the U.S. Weather Bureau within three (3) Hours prior to the start of such operations, equals or exceeds 50%. The Contractor shall notify the Engineer of the exact time at which the above information was obtained.

METHOD OF MEASUREMENT

Payment will be measured by the number of square feet placed as shown in the contract documents and as ordered by the Engineer

BASIS OF PAYMENT

The price bid shall include all labor, material, equipment and incidental expenses necessary to complete the work, including production and placement of asphalt base and bituminous setting bed, neoprene adhesive and asphalt block pavers, all in accordance with the plans and specifications to the satisfaction of the Engineer.

Asphalt block curb, if required, will be paid separately under the item "Asphalt Block Curb".

Excavation will be paid for under its own item.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-06	Remove, Refurbish and Store Existing Asphalt Pavers, 2 ½ Inch Thick	Sq. Ft.
1254/10-16	Reinstall Asphalt Concrete Pavers (up to 20% of Replacement New Pavers to be Included in the Price Bid)	Sq. Ft.
1254/10-15	Asphalt Underlayment for Asphalt Concrete Pavers, 1 ½ Inch Thick	Sq. Ft.

1254/10-07	Remove, Refurbish and Store Belgium Block Pavers
1254/10-18	Reinstall Belgium Block Pavers
1254/10-27	Concrete Sidewalks and Driveways
1254/10-14	Concrete Underlayment for Asphalt Concrete Pavers, 4 ½ Inch Thick
1254/10-24	Concrete Underlayment for Granite Slabs Sidewalk, 4 ½ Inch Thick

DESCRIPTION

This work shall consist of the construction of a Portland Cement concrete sidewalk, an asphalt concrete sidewalk, an asphalt concrete driveway, bicycle paths, or furnishing and placing precast concrete paving, brick paving or grouted stone block paving. Furnish and install detectable warnings on sidewalk curb ramps and other locations as detailed in the contract documents or as directed by the Engineer.

All work shall be in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established by the Engineer.

MATERIALS

Materials shall meet the requirements specified in the following subsections of NYS Standard Specifications, Section 700 - Materials and Manufacturing:

Portland Cement NYS Standard Specifications, 701-01

Bituminous Materials (As specified) NYS Standard Specifications, 702-00

Asphalt Cement for Paving NYS Standard Specifications, 702-02 or 702-03

Fine Aggregates NYS Standard Specifications, 703-01

Coarse Aggregates NYS Standard Specifications, 703-02

Mortar Sand NYS Standard Specifications, 703-03

Cushion Sand NYS Standard Specifications, 703-06

Concrete Sand NYS Standard Specifications, 703-07

Mineral Filler NYS Standard Specifications, 703-08

Brick Pavers NYS Standard Specifications, 704-08

Stone Blocks NYS Standard Specifications, 704-09

Precast Concrete Driveway and Sidewalk Pavers NYS Standard Specifications, 704-13

Premoulded Resilient Joint Filler NYS Standard Specifications, 705-07

Masonry Mortar NYS Standard Specifications, 705-21

Wire Fabric for Concrete Reinforcement NYS Standard Specifications, 709-02

Fibers for Concrete Reinforcement 711-01

Form Insulating Materials for Winter Concrete (Blankets) NYS Standard Specifications, 711-07

Water NYS Standard Specifications, 712-01

Portland Cement Concrete Sidewalk and Driveways.

A. Reinforcement. Welded wire fabric reinforcement shall be made of W2.9 or W3 wire at 6 inch centers transversely and longitudinally.

B. Conventionally Formed Concrete. Conventionally formed concrete shall meet the requirements for Class D in accordance with NYS Standard Specifications, Section 501 “Portland Cement Concrete--General.” All concrete shall contain a water-reducing admixture meeting the requirements of §711-08 in such a quantity as to provide a minimum 10% reduction of the design water content by using a normal range water-reducer.

C. Machine Formed Concrete Sidewalks. Machine formed concrete shall meet the requirements for Class J in accordance with NYS Standard Specifications, Section 501 “Portland Cement Concrete--General” with the exception that fibers shall be incorporated in the mix.

D. Accelerated Cure Sidewalks and Driveways. When specified in the plans that an accelerated cure sidewalk and/or driveway is required at a commercial driveway, a mix design must be submitted to the BPCA / Engineer by the Contractor for approval a minimum of 14 days prior to anticipated sidewalk or driveway construction. Supply data the mix achieves a compressive strength of 2,000 psi in less than 24 hours. Also supply data the mix will have a scaling rating of one or less when tested in accordance with ASTM C672.

Belgium Block Paved Sidewalks and Driveways.

Belgium Block shall meet the requirements of NYS Standard Specifications, §704-08 and shall be the size(s), shape(s) and color(s) as specified in the contract documents.

Mortar for Belgium Block: Mortar for Belgium Block shall meet the requirements outlined in NYS Standard Specifications, §705-21 Masonry Mortar.

Sand-Cement Setting Bed: Sand-Cement Setting Bed shall consist of 1 part Portland Cement Type 2, NYS Standard Specifications, §701-01 and 6 parts of Fine Aggregate, §703-01 by volume.

Grouted Stone Block Paved Sidewalks and Driveways. Stone blocks shall meet the requirements of NYS Standard Specifications, §704-09 and shall be the size(s), shape(s) and color(s) as specified in the contract documents.

A. Sand-Cement Setting Bed. Sand-cement setting bed shall consist of 1 part Portland Cement Type 2, and 6 parts of Fine Aggregate, NYS Standard Specifications, §703-01 by volume.

B. Mortar for Stone Block Paving. Mortar for stone block paving shall meet the requirements outlined in NYS Standard Specifications, §705-21 Masonry Mortar.

CONSTRUCTION DETAILS

Concrete Sidewalk and Driveways.

When the contract includes 65 cubic yards or more of sidewalk and driveway concrete, provide an American Concrete Institute (ACI) certified concrete flatwork finisher to supervise all finishing. Provide proof of ACI flatwork certification to the Engineer prior to concrete placement. The general construction details for manufacturing and transporting concrete shall meet the requirements of NYS Standard Specifications, Section 501, Portland Cement Concrete

General. Concrete placement operations may be started when the ambient air temperature is 39°F or higher when measured in the shade within an accuracy of ± 2°F. Discontinue placement when the air temperature falls below 39°F. The temperature of the base material must be 39°F or higher. The base material shall not have any snow, ice, frost, or standing water on its surface. The use of insulating materials and heating equipment may be required before concreting begins. Do not place concrete in the rain. Install premoulded resilient joint filler, at all joints between sidewalk and curb, pavement, building, etc.

Sidewalks and driveways may be conventionally formed or machine formed.

Concrete reinforcement shall be welded wire fabric or fiber reinforcement except, at all commercial driveways both the sidewalk and the driveway must be reinforced with welded wire fabric. They may be additionally reinforced with fiber reinforcement. Fiber Specifications to be submitted to BPCA for approval.

When using fiber reinforcement it shall be added to the concrete at a rate of 2 pounds of fibers per cubic yard of concrete. Fibers shall be added to the concrete during batching under supervision of the BPCA, or using a method approved by the BPCA assigned Engineer. Batch an appropriate volume of concrete such that whole standard size bags or packages of fibers are used. It is the responsibility of the producer to indicate on each delivery ticket the amount of fibers added to the concrete.

A. Conventionally Formed Sidewalks and Driveways. Forms shall be free from warp, extend to the full depth of the sidewalk or driveway, and be secured so no displacement will occur during the placement of concrete. Reinforcement may be either fiber or wire fabric. When using wire fabric for concrete reinforcement, embed it at mid-depth in the slab.

Place the concrete in one course to the full depth shown in the contract documents. Immediately after placement of the concrete thoroughly compact the concrete with internal mechanical vibrating equipment. Internal mechanical vibrators shall be adequately powered, capable of transmitting vibration to the concrete in frequencies of not less than 5,000 vibrations per minute while inserted in concrete and shall produce a vibration of sufficient intensity to consolidate the concrete into place without separation of the ingredients. The vibrating element shall be vertically inserted in the concrete mass at a depth sufficient to vibrate the entire depth. It shall be withdrawn completely from the concrete before being advanced to the next point of application. Vibrate at evenly spaced intervals not farther apart than the radius over which the vibration is visibly effective and at a distance close enough to the forms to effectively vibrate the surface concrete. The time of vibration shall be of sufficient duration to accomplish thorough consolidation, produce dense, smooth surfaces free from aggregate pockets, honeycombing, and air bubbles; and to work the concrete into all angles and corners of the forms, however, over-vibration shall be avoided. Vibration shall be continued in one place until the concrete has become uniformly plastic, but not to the extent that pools of grout are formed. Vibration shall be supplemented by working or spading by hand in the corners and angles of forms and along form surfaces while the concrete is plastic. Vibrators shall not be used to push or distribute the concrete laterally.

The use of mechanical screeding or finishing equipment (such as a jitterbug) shall not be allowed.

Only hand screeding and finishing shall be allowed.

B. Machine formed Sidewalk. Machine formed paving consists of a single paver capable of placing, spreading, consolidating, screeding, and finishing the concrete such that hand finishing is kept to a minimum. Use equipment guided by a reference system that ensures the pavement is placed to the specified line, grade, and cross section. Use a self-propelled machine formed paver equipped with rigid side forms that laterally support the concrete and minimize edge slumping, a full-width finishing pan, and attached internal vibrators capable of consolidating the entire concrete placement.

The equipment proposed for use by the Contractor shall demonstrate the capability of placing the concrete in accordance with these specifications.

The reinforcement must be fibers. Fiber Specifications to be submitted to BPCA for approval.

C. Finishing. Only magnesium floats and trowels are allowed. The use of aluminum or steel finishing trowels and tools is prohibited. The concrete shall be finished to produce a smooth surface and then lightly broomed to a uniform texture. The edges and scored joints of all sidewalk slabs shall be tooled with an edging tool having a 1/4 inch radius.

Unless otherwise specified in the contract documents, the concrete surface shall be scored and tooled at intervals of 5 feet. Score the concrete a minimum 1/8 inch to a maximum 1/4 inch in width and to a minimum depth of one-third the total thickness.

D. Curing. Immediately after finishing, and not more than 30 minutes after concrete placement, apply a clear with fugitive dye membrane curing compound at a rate of 1 gallon per 150 square feet.

Do not apply curing compound in the rain. If rain damages the curing compound before it sets, reapply curing compound immediately after the concrete surface dries. Alternative curing methods shall be approved by the BPCA.

Concrete must be cured for a minimum of six days in colder weather. Colder weather and the methods of curing during colder weather are described as follows: If the ambient air temperature falls, or is expected to fall below 39°F anytime during the curing period of the concrete placement, a supply of blankets meeting NYS Standard Specifications, §711-07 Form Insulating Materials for Winter Concreting must be provided at the work site that is sufficient to cover all concrete placed. Use material capable of maintaining a surface temperature of 55°F. Apply the insulating material to prevent the newly placed concrete from being exposed to ambient air temperatures at the surface below 36°F during the curing period. Secure and overlap the insulation tight to the concrete surface to prevent air intrusion beneath the insulation.

Extend these materials a minimum of 12 inch beyond the edge of the concrete. Place recording surface thermometers between the concrete surface and the insulating material and 12 inch from the outside edge of concrete wherever insulation is used. Use four equally spaced thermometers for each day's placement. When insulation is needed it must remain in place for the curing period.

Do not subject the concrete to a temperature drop in excess of 50°F during the first 24 hours after removing the insulation. If the concrete temperature falls below 32°F or the concrete is damaged by cold weather as determined by the Engineer it shall be removed and replaced at the Contractor's expense.

Cure all driveways and sidewalks at driveways for a minimum of three days prior to opening to vehicle traffic. In colder weather, as defined above, extend the curing period to six days unless other provisions to determine strength are provided and approved by the BPCA.

If saw cutting is necessary use diamond blade saws capable of making straight cuts to the dimensions required. Saws must be equipped with cutting guides, blade guards, water cooling systems, dust controls, and cut depth control.

E. Accelerated Cure Sidewalks and Driveways. When specified in the plans that an accelerated cure sidewalk and/or driveway is required at a commercial driveway all the provisions for constructing sidewalks and driveways outlined above shall apply with the following exceptions: Only conventional forming with wire fabric reinforcing is allowed. Apply curing compound as outlined in "D" above. To reduce the time needed to reach the required opening compressive strength the concrete must be covered with blankets meeting NYS Standard Specifications, §711-07, Form Insulating Materials for Winter Concreting such that the concrete curing temperature reaches a minimum 59°F above ambient air temperature. Secure the insulation tight to the concrete surface to prevent air intrusion beneath the insulation. Extend these materials a minimum of 12 inches beyond the edge of the concrete. Place recording surface thermometers between the concrete surface and the insulating material and 12 inches from the edge of concrete wherever insulation is used. Use four thermometers for each day's placement. These thermometers may be equally spaced at one location or placed at separate locations depending on the nature of the placements. Also, use one recording thermometer for ambient air temperature. At the request of the Contractor external heat meeting the requirements of NYS Standard Specifications, 555-3.08

Provision of External Heat may be applied to the concrete.

Compressive strength cylinders for determining strength gain must be cast at the time of placement.

These cylinders must be kept insulated with the placement. Cylinders shall be broken at times requested by the Contractor until the minimum compressive strength of 2,000 psi is reached.

Alternate means to determine concrete maturity may be considered with approval of the BPCA by coordinating cylinder compressive strengths to concrete curing temperature.

Asphalt Concrete Sidewalks, Driveways, and Bicycle Paths. The provisions under NYS Standard Specifications, §402-3 Construction Details for Hot Mix Asphalt (HMA) Pavements, shall apply.

The sidewalks, driveways, and bicycle paths shall be constructed as indicated in the contract documents (including the NYS Standard Sheets).

Grouted Stone Block Paved Sidewalks and Driveways.

All grouted stone block pavers shall be laid in the pattern shown in the contract documents or as directed by the Engineer to provide a uniformly even surface. Joints between blocks shall be a maximum of 1 1/4 inch or as specified.

No blocks shall be laid or grouted in freezing weather.

Unless otherwise approved by the Engineer, a dry mixture of mortar as specified for Brick Paved

Sidewalks and Driveways, NYS Standard Specifications, §608-2.03, shall be swept over the stone blocks until the joints are completely filled and the joints lightly wetted with water prior to the mortar setting up. All grouted stone block paving shall be kept moist for four days after filling the joints with mortar. After the four day curing period, removal of remaining mortar film may be accomplished by the use of a light acid wash (10% ± solution of hydrochloric acid) followed by flushing clean with water, or as approved by the Engineer.

Care shall be taken to avoid the use of acid in areas where runoff could damage trees or other vegetation.

All blocks used over tree pits shall be laid in a 1 inch bed of cushion sand with sand filled joints.

A. Grouted Stone Block Paved Sidewalks and Driveways (Sand Setting Bed). Blocks shall be laid in a 3 inch bed of cushion sand over the specified subbase or subgrade.

B. Grouted Stone Block Paved Sidewalks and Driveways (Mortar Setting Bed). Blocks shall be laid in a bed of mortar with a minimum thickness of 1 inch over the specified concrete or bituminous subbase.

C. Grouted Stone Block Paved Sidewalks and Driveways (Sand-Cement Setting Bed).

Blocks shall be laid on a 2 inch setting bed of sand-cement over the specified subbase. The sand cement setting bed shall not be placed more than 4 hours prior to installing the block paving.

D. Grouted Stone Block Paved Sidewalks and Driveways (Optional Concrete Setting Bed). The Contractor shall have the option of installing Grouted Stone Block Paved Sidewalks and Driveways by one of the following methods:

1. Blocks shall be laid on a bed of cement concrete as specified in the contract documents. The blocks shall be laid in the cement concrete while it is still fresh as approved by the Engineer and they shall be firmly positioned to provide a uniformly even surface, and solid bedding under each stone block.

2. Blocks shall be laid as provided for under "Grouted Stone Block Paved Sidewalks and Driveways

(Mortar Setting Bed)" provided the finished surface shall conform to the lines and grades shown in the contract documents.

METHOD OF MEASUREMENT

Concrete Sidewalks and Driveways.

Portland Cement concrete sidewalks and driveways will be measured by the number of square feet of cement concrete necessary to construct sidewalks and driveways shown in the contract documents or as ordered by the Engineer.

Grouted Stone Block Paved Sidewalks and Driveways.

Grouted stone block paving shall be measured as the number of square feet placed as shown in the contract documents or as ordered by the Engineer.

BASIS OF PAYMENT

Concrete Sidewalks and Driveways.

The unit price bid per square feet shall include the cost of preparing the subgrade, all materials, equipment and labor necessary to complete the work "(including saw cutting and wire fabric reinforcement) as specified except that any necessary excavation and subbase course will be paid for under their appropriate items.

Payment at the unit bid price will be made after the concrete sidewalk or driveway, and curing application have been properly placed.

Grouted Stone Block Paved Sidewalks and Driveways.

The unit bid per square feet shall include the cost of furnishing all labor, materials and equipment necessary to complete the work, including setting bed material, as specified except that any necessary excavation and subbase course will be paid for under their appropriate items.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-07	Remove, Refurbish and Store Belgium Block Pavers	square feet
1254/10-18	Reinstall Belgium Block Pavers	square feet
1254/10-27	Concrete Sidewalks and Driveways	square feet
1254/10-14	Concrete Underlayment for Asphalt Concrete Pavers, 4 ½ Inch Thick	square feet
1254/10-24	Concrete Underlayment for Granite Slabs Sidewalk, 4 ½ Inch Thick	square feet

1254/10-09 Unclassified Excavation and Disposal

GENERAL

1.1 GENERAL DESCRIPTION OF WORK

A. Perform all required excavation within the limits of the right-of-way and adjacent thereto (except excavations specifically described and provided for elsewhere in the specifications.)

B. Remove, properly use, or dispose of all excavated materials.

C. Shape and finish all earthworks in conformance with lines and grades as shown on the plans or as specified by the ENGINEER.

D. Schedule work to avoid property owner inconvenience as practical during construction.

E. Exercise care in operating applicable equipment beneath or adjacent to trees, sidewalks, poles, and other existing features to prevent damage.

F. Restore obstructions removed to accommodate construction equipment or to facilitate excavation.

1.2 CLASSIFICATION

A. All street excavation shall be unclassified, regardless of material encountered.

B. Any reference to rock or any material on the plans, or in these specifications, is not to be constructed as classification of the excavation.

C. All excavation for manholes, inlets, retaining walls and other structures will be classified as structural excavation and will not be paid for separately. All structural excavation will be considered incidental to the contract bid items provided in the proposal.

MATERIALS

2.1 SUBGRADE

A. Use on-site material moved from cut areas to fill areas as approved by ENGINEER.

B. Use borrow materials from areas designated as needed.

DRAINAGE PROVISIONS

A. Interruptions of natural surface drainage, or flow of artificial drains shall be mitigated by the CONTRACTOR by use of temporary drainage facilities, as approved by the ENGINEER, to prevent damage to public or private interest.

B. Restore original drainage as soon as the work shall permit.

C. The CONTRACTOR shall be held liable for all damages which may result from neglect to provide for either natural or artificial drainage which his work may have interrupted.

EXECUTION

3.1 UNCLASSIFIED STREET EXCAVATION

A. Perform all excavation, embankment and grading required for pavement and/or curb and gutter as shown on plans.

B. Move suitable excavated material to areas requiring fill and place in accordance with these specifications. Determination of suitable material will be made by ENGINEER. Haul unsuitable material to waste sites.

C. Slope cut or fill sections uniformly from curb line to sidewalk or other controlling feature, as designated by ENGINEER. Smooth bank to provide a neat finished appearance.

D. Remove and replace unstable soils encountered during operations with suitable material.

Notify ENGINEER of suspected unsuitable material before commencing removal.

Authorized replacement with select material will be paid for by change order.

E. Replace gravel or rock driveway surfaces disturbed by grading with like material at no additional cost to the OWNER.

F. Strip, salvage and stockpile topsoil in sufficient quantity to allow a uniform 6-inch lift over all disturbed areas not otherwise surfaced. Topsoil is included in unclassified excavation.

G. Remove existing culvert pipe where shown as part of incidental to unclassified excavation.

3.2 UNSTABLE OR UNSUITABLE SUBGRADE

A. Excavate unstable subgrade at least 2 feet below grade where directed by ENGINEER.

B. Replace with suitable stable material approved by ENGINEER.

C. Compact to uniform density in 6-inch lifts, in accordance with Embankment specifications.

A. Payment will be as specified for unclassified excavation.

D. Conduct operations in such a manner such that measurements may be taken before any backfill, as required above, is placed.

3.3 EXCESS OR UNSUITABLE EXCAVATION

A. Dispose of excavation in excess of that needed or unsuitable for construction. As directed by

the ENGINEER, excess or unsuitable excavation may be used for widening of embankments,

or flattening of slopes, or as otherwise specified, if it will support vegetation.

B. Obtain approval of the ENGINEER as to disposition and method for disposal of excess or

unsuitable excavation.

MEASUREMENT AND PAYMENT

4.1 UNCLASSIFIED EXCAVATION

A. Unclassified excavation, as authorized, shall be measured in its original position and the volume determined by the average end area method. All work performed shall be paid for at the contract bid price per cubic yard for unclassified excavation.

B. When not listed as a separate contract pay item or incidental work will be for furnishing all materials – incidental to these work, labor, equipment, tools and incidentals required by the work, all in accordance with the plans and these specifications.

C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required by the work, all in accordance with the plans and these specifications.

BASIS OF PAYMENT

The price bid shall include all labor, material, equipment and incidental expenses necessary to complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-09	Unclassified Excavation and Disposal	Cubic Yard

1254/10-10 Excavation Protection Sheeting

DESCRIPTION

Excavation Protection System.

Under this work, the Contractor shall design, furnish, place, maintain and remove an excavation protection system (EPS) at locations shown on the plans or as ordered by the Engineer. Details of the EPS must conform to the requirements of 29CFR1926 and installation shall be in accordance with the State and Federal Safety Codes. A sloping (layback) option will not be allowed.

Sheeting, shoring, a shield system, i.e. trench box or trench shield or other pre-engineered protective system may be used to prevent cave-ins. The requirements of any protective system shall be as contained in 29CFR1926. It may be left in place only with the written permission of the Engineer.

The Contractor may submit to the Engineer a construction alternate other than that presented in the contract documents as a Value Engineering Change Proposal. Slope lay back will not be allowed. Any geotechnical analysis for a flexible support system shall be done in accordance with the procedures contained in the appropriate NYS publication, which is available upon request, from the BPCA assigned Engineer.

MATERIALS

Excavation Protection System.

The EPS installed under this item shall be of sufficient size and strength to meet the requirements of Title 29, Code of Federal Regulations, Part 1926, Safety and

Health Regulations for Construction, and the Live Load requirement as contained in the Standard Specifications for Highway Bridges adopted by AASHTO. Prior to use, the Contractor shall supply the Engineer with documentation of compliance.

All damage to the adjacent pavement or ground caused by the use of the chosen EPS (e.g. Voids beneath the pavement or shoulder, pavement or shoulder cracking or subsidence, ground settlement) shall be repaired to the satisfaction of the Engineer at no additional cost to the BPCA. Severe damage which directly affects the safety of the public shall be immediately repaired to the satisfaction of the Engineer.

The operation shall be halted until a satisfactory prevention method is instituted.

METHOD OF MEASUREMENT

Excavation Protection System.

The quantity of protection system to be paid for shall be the number of square feet obtained by multiplying the vertical length measured between the payment lines herein described, by the horizontal length of EPS shown on the plans or approved by the Engineer. The vertical length is that length measured between the upper and lower payment line. Unless otherwise specified on the plans, the upper payment line shall be the ground surface existing at the site prior to the beginning of the work, or as ordered, in writing, by the Engineer. Unless otherwise indicated on the plans or in the proposal, the lower payment line shall be the bottom of the excavation shown on the plans immediately adjacent to the protection system. The horizontal length shall be the actual length of protection system installed measured along the payment lines as shown on the contract plans. Both sides of the excavation shall be measured and computed for payment.

BASIS OF PAYMENT

Excavation Protection System.

The unit price bid per square foot for this work shall include the cost of furnishing all labor, materials and equipment necessary to complete this work, including driving equipment, waling, bracing, design services when employed, and removal of Excavation Protection System.

If the Engineer directs, in writing, that the EPS be left in place, this will be classified as extra work.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-10	**Excavation Protection Sheeting**	**Sq. Ft.**

1254/10-11 Select Granular Fill

1254/10-13 Sand Backfill

DESCRIPTION

A. General:

This work shall consist of furnishing select granular backfill materials.

B. Related Work:

- Utility Excavation and Backfill
- Roadway and Drainage Excavation
- Granular Materials
- Under-drains
- Coarse Aggregate for Use in Portland Cement Concrete
- Riprap and Slope Materials

MATERIALS

A. General:

This material shall be free from dirt, vegetable matter, cinder, ashes, refuse, organic matter or other unsuitable foreign substance. Frozen material may not be used.

B. Utility Trench Backfill:

Type 1, Type 2 or Type 3 material shall be a crushed limestone rock having a minimum of two fractured faces and meet the following gradation requirements by dry weight:

1. Type 1 - Bedding Material

Passing 1 inch sieve.....100%

Passing 3/4 inch sieve..... 90-100%

Passing 3/8 inch sieve..... 20-55%

Passing #4 sieve 0-10%

Passing #8 sieve 0-8%

2. Type 2 - Foundation Material

Passing a 3 inch sieve.....100%

Passing a 3/4 inch sieve..... 50-70%

Passing a #4 sieve 20-40%

Passing a #200 sieve 0-8%

3. Type 3 - Foundation Material

Passing a 3 inch sieve.....100%

Passing a 1 inch sieve.....0-15%

Passing a #4 sieve.....0-8%

C. Roadway Backfill and Utility Trench Special Foundation Material:

Roadway foundation backfill and utility trench special foundation backfill for stabilization of sub grade shall be a crushed rock with a minimum of two fractured faces and shall meet the following gradations:

1. Type 4 - Foundation Material

Passing the 8 inch sieve.....100%

Passing the 6 inch sieve.....65-85%

Passing the 3 inch sieve.....0-20%

Passing the #200 sieve.....0-5%

2. Stabilization Rock

Shall be further classified as follows:

Class I Stabilization Rock

Class II Stabilization Rock

Class III Stabilization Rock

Class IV Stabilization Rock

Class V Stabilization Rock

Each class of stabilization rock above shall meet the same corresponding Class I-V gradation requirements as riprap in NYS Standard Specifications, Section 109. Stabilization rock shall be a crushed rock with a minimum of two fractured faces.

D. Under drain Pipe Trench Backfill Material:

1. Rock used as backfill around under-drains shall be clean, washed and sound materials free of excess fines and deleterious materials as specified herein.

2. Rock used as backfill for under-drains or edge-drains shall be Type 1 Bedding Material. Rounded river rock meeting the Type 1 Bedding Material gradation shall be acceptable for installations located behind the curb. Installations located under or in front or the curb and gutter shall be a crushed rock with a minimum of two fractured faces.

E. Los Angeles Abrasion:

Abrasion loss shall not exceed 40 percent.

F. Sampling and Testing:

Sampling .....SD 201

Gradation.....SD 202

Fractured Faces .....SD 211

METHOD OF MEASUREMENT

Measurement for Select Granular Backfill materials, except as further defined below, shall be to the nearest 0.1 ton based on the total weight of the material furnished and installed as determined from valid weigh tickets.

Type 1. Bedding material for water and sewer pipe installations shall be considered as incidental to the pipe being installed. The Contractor and Engineer shall, on a daily basis, quantify the amount of type 1 bedding material installed along with the corresponding quantity of water and/or sewer pipe. The Contractor shall submit, daily to the Engineer, weigh tickets for type 1 bedding material.

The weigh tickets shall clearly state "Type 1 bedding material, incidental." All stockpiled

Type 1 bedding material used for water and sewer pipe installation shall be clearly identified on the project.

Type 1 bedding material used as foundation material or for uses other than bedding for water and sewer pipe shall be measured in accordance with the provisions above and shall be measured to the nearest 0.1 ton.

Under-drain Pipe Trench Backfill material shall be measured in accordance with Specifications

BASIS OF PAYMENT

Payment for Select Granular Backfill materials, except as further defined below, shall be made under the appropriate bid item for the material furnished and installed. Payment for select granular backfill materials shall include all associated costs of excavation and disposal of excavated materials, unless otherwise called for in the drawings or detailed specifications.

Type 1 bedding material for water and sewer piping installations shall be considered incidental to the pipe being installed. All associated costs of excavation and disposal of excavated material shall be considered incidental to the pipe installation, unless called for otherwise in the drawings and detailed specifications.

Type 1 bedding material used as foundation material or for a purpose other than pipe bedding shall be paid for in accordance with the provisions above and under the appropriate bid item.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-11	Select Granular Fill	Cubic Yard
1254/10-13	Sand Backfill	Cu. Yard

1254/10-12 Flowable Fill – Minimum 300 Lb per Sq. Inch Compressive Strength Concrete Mix

DESCRIPTION. The work shall consist of mixing and placing flowable fill at the locations shown in the contract documents.

Controlled Low Strength Material. Controlled Low Strength Material (CLSM) is an acceptable alternative to compacted soil backfill in confined spaces. CLSM consists of cement, water and, at the Contractor's option, fly ash, aggregate or chemical admixtures in any proportions such that the final product meets the strength and flow consistency requirements included in the specification. The mix is proportioned to be self leveling and does not require compaction. It is much lower in strength than concrete, making future excavation possible.

Lightweight Concrete Fill. Lightweight Concrete Fill is an engineered geotechnical material with a unique strength / density relationship which can be used to reduce loads on soft foundation soils, buried structures, or against retaining walls. Lightweight Concrete Fill consists of a Portland cement matrix containing uniformly distributed, non-interconnected air voids introduced by a foaming agent. The flowability and cementitious properties provide a product that is self leveling and does not require compaction.

MATERIALS.

Controlled Low Strength Material. Provide backfill material meeting the requirements for CLSM as stated in NYS Standard Specifications, §733-01 *Flowable Fill*.

Lightweight Concrete Fill. Provide backfill material meeting the requirements for Lightweight Concrete Fill as stated in NYS Standard Specifications, §733-01 *Flowable Fill*.

CONSTRUCTION DETAILS.

Controlled Low Strength Material.

A. CLSM Submittal. Submit to the Engineer (1) a mix design, with certified test results supplied by a qualified independent testing laboratory for the CLSM verifying the unconfined compressive strength meets the requirements of the specification, and (2) the methods of installation to be employed. Include in the CLSM placement sequence, a procedure to account for subsidence during the settling and curing process.

B. CLSM Production. Mix the materials at a stationary mixing plant which is either a continuous or a batch type plant. A batch is defined as the amount of material that can be mixed at one time.

Design the mix of materials to accurate proportions, either by volume or by weight, so that when the materials are incorporated in the mix a thorough and uniform mix will result.

If the CLSM can be placed within 30 minutes of the end of mixing, then open haul units may be used for transport. If it cannot be placed within 30 minutes after the end of mixing, it must be transported by a rotating drum unit capable of 2-6 rpm.

For work involving quantities of CLSM less than 2.5 yd^3, the Contractor may use a small portable mixer. Provide a mixer capable of mixing CLSM that has the specified unconfined compressive strength and flow consistency. Mix all components so as to produce a uniform product.

C. CLSM Placement - General. Do not place CLSM that is frozen, or place CLSM on frozen ground. Do not expose CLSM to freezing temperatures until after it has gained its requisite strength, abiding by the *Provisions for Curing in Cold Weather* in NYS Standard Specifications, 555 *Structural Concrete*.

If the CLSM is to be placed via pumps, the placement sequence shall be such that the equipment is able to access the entire volume to be filled without separating the mixture.

Keep CLSM encapsulated with soil or protected by other means so as to prevent erosion and environmental degradation.

D. CLSM Placement – at Structures, Culverts, Pipes, Conduits and Direct Burial Cables. Place the CLSM as directed by BPCA / Engineer.

When placing CLSM for pipe backfill, discharge the material onto the top and at the center of the pipe.

Do not place CLSM in contact with aluminum pipe, including connections, fixtures, etc., unless the aluminum has been thoroughly coated with Zinc Chromate Primer, NYS Standard Specifications §708-04 *Zinc Chromate Primer,* or an equivalent alternative as approved by the BPCA / Engineer.

Do not place CLSM containing fly ash in direct contact with cast iron or ductile iron pipes, fittings or appurtenances.

In situations where CLSM is used as backfill around pipe, take precautions to counteract the pipe's buoyancy.

E. CLSM – QA Testing. The BPCA Engineer will maintain a Quality Assurance (QA) program for CLSM. The BPCA Engineer will sample and test specimens of the CLSM during placement to compare its properties to the specification requirements and verifying the spread diameter and unconfined compressive strength of the in-place material. The QA program provides oversight of the

Contractors Quality Control (QC) process, to reveal changes which may occur in the approved mix design.

Several scenarios may develop as a result of the QA testing.

1. The properties are shown to meet the requirements of the specification for the type(s) identified in the contract documents. No action will be taken.

2. The properties are shown to be outside the requirements of the specification for the type(s) identified in the contract documents.

    a. If the results are within an acceptable margin as determined by the BPCA through an independent analysis of the site specific conditions, the material may remain in-place contingent upon an agreed credit. If a credit cannot be agreed upon, the scenario reverts to 2.b.

    b. If the results are not within an acceptable margin as determined by the BPCA through an independent analysis of the site specific conditions, the entire lift (and all overlying lifts) of material will be removed and replaced at the Contractor's expense.

Lightweight Concrete Fill.

A. Lightweight Concrete Fill Submittal. Submit to the Engineer (1) a mix design, with certified test results supplied by a qualified independent testing laboratory for the Lightweight Concrete Fill verifying the wet cast density and unconfined compressive strength meets the requirements of the specification for the type(s) identified in the contract documents, and (2) the methods of installation to be employed.

B. Lightweight Concrete Fill Production. Generate foam in accordance with the manufacturer's recommendations for inclusion into the mix.

Mix the materials at a stationary mixing plant which is either a continuous or a batch type plant. A batch is defined as the amount of material that can be mixed at one time. Design the mix of materials to accurate proportions, either by volume or by weight, so that when the materials are incorporated in the mix, a thorough and uniform mix will result.

Locate equipment such that the mixed product is capable of being pumped into place properly.

C. Lightweight Concrete Fill - Placement. A representative of the supplier of the foaming agent shall be on site during the initial placement and at such times as requested by the Engineer to advise the Contractor on his operation. The lightweight concrete fill shall be placed in lifts not to exceed 24 in. unless otherwise approved by the Engineer. Subsequent lifts shall be placed only after a minimum 12 hour waiting period has been observed.

At the end of each pour, exposed surfaces shall be roughened with a stiff broom or scored with a tool. The Lightweight Concrete Fill shall be placed on supporting surfaces which have been cleaned of loose debris, sand, dust, or other foreign materials to the satisfaction of the Engineer.

Do not place Lightweight Concrete Fill that is frozen, or place Lightweight Concrete Fill on frozen ground. Do not expose Lightweight Concrete Fill to freezing temperatures until after it has gained its requisite strength, abiding by the *Provisions for Curing in Cold Weather* in NYS Standard Specifications, Section 555 *Structural Concrete*.

D. Lightweight Concrete Fill – QA Testing. The BPCA maintains a Quality Assurance (QA) program for Lightweight Concrete Fill. The Department will sample and test specimens of the Lightweight Concrete Fill material during placement to compare its properties to the specification requirements and verifying the wet cast density and unconfined compressive strength of the in-place material. The QA program provides oversight of the Contractors Quality Control (QC) process, to reveal changes which may occur in the approved mix design.

Several scenarios may develop as a result of the QA testing.

1. The properties are shown to meet the requirements of the specification for the type(s) identified in the contract documents. No action will be taken.

2. The properties are shown to be outside the requirements of the specification for the type(s) identified in the contract documents.

    a. If the results are within an acceptable margin as determined by the BPCA through an independent analysis of the site specific conditions, the material may remain in-place contingent upon an agreed credit. If a credit cannot be agreed upon, the scenario reverts to 2.b.

    b. If the results are not within an acceptable margin as determined by the BPCA through an independent analysis of the site specific conditions, the entire lift (and all overlying lifts) of material will be removed and replaced at the Contractor's expense.

METHOD OF MEASUREMENT.

Controlled Low Strength Material. CLSM will be measured for payment in cubic yards measured to the nearest 0.1 cubic yard computed from the payment lines shown on the contract documents.

A deduction will be made for pipes (based on nominal diameters) and other features when the combined cross-sectional area exceeds 1 ft^2.

No additional quantity shall be measured for payment to make up losses due to foundation settlement, compaction, erosion or any other cause.

Cross sectioning, for the purpose of determining quantities for payment, will be employed only where payment lines are not shown on the contract documents or NYS Standard Sheets, and cannot be reasonably established by the Engineer.

Lightweight Concrete Fill. Lightweight Concrete Fill will be measured for payment in cubic yards measured to the nearest 0.1 cubic yard computed from the payment lines shown on the contract documents.

BASIS OF PAYMENT.

Controlled Low Strength Material. The unit price bid shall include the costs of all labor, material, and equipment necessary to satisfactorily complete the work.

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

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-12	Flowable Fill – Minimum 300 Lb per Sq. Inch Compressive Strength Concrete Mix	Cubic Yard

1254/10-19 Replace Damaged Granite Curb Section
1254/10-25 Remove, Refurbish and Store Existing Granite Curb
Reinstall Granite Curb (up to 10% of Replacement New
1254/10-26 Curbs to be Included in the Price Bid, if necessary)

GENERAL

1.01 SCOPE OF WORK

A. Work under this section consists of furnishing all material, labor, tools, equipment, and supervision necessary to install granite curb, curb corners, transition curb, and curb inlets. The curb shall be vertical or sloped granite curb (so called granite edge) as specified on plans or directed by BPCA Engineer.

B. The contractor shall be responsible for removing and resetting existing granite curbing/edging and furnishing and installing new granite curbing, in accordance with these specifications and in close conformity with the lines and grades shown on the Contract Drawings and as approved by the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. SITE WORK

B. FIELD CONCRETE

MATERIALS

2.01 GRANITE CURBING

A. New granite curbing shall meet the requirements of the NYS Standard Specifications, Subsection 501.

B. Vertical granite curbing shall be Type VA4.

C. Slopped granite curb (edging) shall be Type SB.

D. Transition curbing shall be placed at the ends and beginnings of curbing, at drain inlets, and at handicap ramps.

E. If curb, curb corners, or curb inlets of different quarries is used, curbing of each quarry shall be segregated and set together to give a uniform appearance.

EXECUTION

3.01 SALVAGE OF CURBING

A. The Contractor shall carefully remove, store, and clean all curbing specified for resetting. The Contractor shall replace all existing curbing that is to be reset which is lost, damaged, or destroyed as a result of his operations, at no expense to the BPCA.

3.02 EXCAVATING TRENCH

A. The trench for the curb shall be excavated to a width of eighteen (18) inches. The sub-grade of the trench shall be at a depth below the proposed finished grade of the curb equal to six (6) inches plus the depth of the curbstone.

3.03 PREPARATION OF FOUNDATION

A. The foundation for the curbing shall consist of a cement concrete bed placed on the gravel subbase as shown on the details.

B. The foundation for curb inlets shall consist of a full bed of Portland cement mortar on the supporting back wall of the catch basin or gutter inlet and with sufficient gravel on each side to support the overhang. The trench for the gravel foundation shall be at least six (6) inches in depth and eighteen (18) inches in width. This trench shall be filled with gravel and thoroughly tamped to the required grade.

C. The trench for curb corners shall be excavated so that there is a foundation of gravel which, when thoroughly compacted, will be six (6) inches in depth and extending six (6) inches beyond the front and back of the curb corner to the full depth of the foundation.

3.04 SETTING CURBING

A. Curb and curb corners shall be set on a concrete foundation as shown on the Contract Drawings, and shall be fitted together as closely as possible.

B. All spaces under the curb and curb corners shall be filled with concrete so that the curb and curb corners will be completely supported throughout their lengths. The curb shall be set to the line and grade required as shown on the plans, unless otherwise directed.

BASIS OF PAYMENT

The price bid shall include all labor, material, equipment and incidental expenses necessary to complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-19	Replace Damaged Granite Curb Section	Linear Feet
1254/10-25	Remove, Refurbish and Store Existing Granite Curb	Linear Feet
1254/10-26	Reinstall Granite Curb (up to 10% of Replacement New Curbs to be Included in the Price Bid, if necessary)	Linear Feet

1254/10-21 Place Top Soil
1254/10-20 Remove and Store Existing Top Soil Sq. Ft.

GENERAL - TOPSOIL

STRIPPING, SALVAGING, AND SPREADING

The BPCA policy for replacement of topsoil is detailed in Section 10A-1 of the Design Manual.

In general, for projects covered by NPDES General Permit No. 2 (effective 10/1/12 to 10/1/17), there should be a minimum of 12 inches of topsoil replacement in all areas not to be covered by concrete, asphalt or gravel.

The areas of stripping, salvaging, and spreading of topsoil should be identified on the plans, special provisions, or right-of-way contracts. These documents should be checked for continuity. The right-of-way contract shall be the controlling document. The plans will also designate if Contractor-furnished topsoil is anticipated.

Monitoring Topsoil Removal

Acceptable methods of determining topsoil excavation are:

- Setting stakes at regular intervals at ground elevation as a reference for depth of removal.
- Removing a scraper width strip at periodic intervals or leaving a narrow strip between scraper paths, thereby obtaining a reference for depth of removal.
- Grid system elevation checks before and after topsoil removal.
- Any other method which will result in the assurance that required topsoil is removed within reasonable conformity to the plans and specifications.

Based on a 12-inch depth of topsoil to be removed and paid for, reasonable conformity will be an average depth over the borrow of 12 inches plus 2.4 inches. If a different depth is specified, it would be that depth plus up to 20% more.

The specifications state that this item is to be a computed quantity item based on the depth and area involved rather than a measured quantity. On projects where monitoring of the quantity of topsoil removal may be difficult (i.e. urban projects), a plan quantity agreement may be appropriate.

Topsoil on Roadway Cuts and Embankments

Where sand pockets are encountered on backslopes and where sand is used for embankment, every effort is made by the Engineer to place topsoil on these areas. Where these situations are overlooked, every effort should be made by the project engineer to obtain topsoil for use as cover for the sand areas.

Cultural Resource Protection

During the topsoil removal phase, or at the start of the excavation operation, you may uncover remains of historical or cultural importance. This could be bones (human or animal), Indian relics, etc. If these are found on the project, follow procedures in NYS Standard Specifications.

Payment for Topsoil

As topsoil is removed and stockpiled, the contractor may be paid for one half of the quantity stockpiled. At the time the topsoil is spread and finish graded, the remaining one half may be paid on a progress estimate.

Consideration should be given to stripping a portion of a borrow at a time to provide erosion control and prevent the stripping of areas which might not be needed.

METHOD OF MEASUREMENT

The quantity to be measured for payment will be in cubic yards to the nearest 0.1 cubic yard of topsoil placed.

BASIS OF PAYMENT

The price bid shall include all labor, material, equipment and incidental expenses necessary to complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-21	Place Top Soil	Cubic Yard
1254/10-20	Remove and Store Existing Top Soil	Sq. Ft.

1254/10-22	**Remove, Refurbish and Store Existing Granite Slabs 2 ½ Inch Thick**
1254/10-23	**Reinstall Granit Slabs (up to 10% of Replacement New Slabs to be Included in the Price Bid, if necessary)**
1254/10-17	**Stone Screenings Underlayment for Belgium Block Pavers**

DESCRIPTION:

The work under this item consists of reconstructing existing granite sidewalks in accordance with these specifications and in conformity with the lines and grades shown on the plans or as directed by the BPCA Engineer.

MATERIALS:

Granite:
The stone shall be removed refurbished and reused. If Contractor damages any slabs he will have to replace them at no additional cost to BPCA.

The stone shall be a free stone (meaning solid, no black lines showing with grain) – only matching existing color stone will be acceptable. Natural color variations that are characteristic of the deposit will be permitted. Any sidewalk panels containing discoloration other than cleanable surface stains must be approved by the Engineer prior to inclusion in the work.

Sidewalk panels shall be matching existing granite stone dimensions. Minimum thickness shall be 2 1/5 inches and the maximum being 4 ½ inches. No spalted edges that are undercut with more than a 22 degree angle from top will be acceptable. All stone shall be free of open seams. Natural cleft surfaces should be " 1/8 inch from arris plane. Pieces should be cut to size, full dimension " ¼ inch in length, width, and being square.

Stone Dust:

Stone dust setting bed materials and joint filler shall consist of hard, durable, uncoated particles of soil or rock, free from lumps of clay and all deleterious substances.

The setting bed material shall meet the following gradation requirements:

Sieve Size Percent Passing By Weight:

¼" sieve	-	100% passing
#10 sieve	-	50-85% passing
#40 sieve	-	20-45% passing
#200 sieve	-	3-10% passing

CONSTRUCTION DETAILS:

The stone dust setting bed and granite slabs shall be placed on compacted subbase as shown on the plans. The stone dust setting bed thickness will vary according to actual thickness of granite slabs. Total thickness of stone dust setting bed and granite slabs shall be 6 inches.

Granite slabs is to be set on stone dust setting bed with approximately 3/8 inch to ½ inch joint to be swept full with screenings. When setting stones the screening should be leveled to match bottom of the profile of the stone to be laid. After stone is set they should be tamped with handle of sledge hammer or block of wood to vibrate stone into bed. If stones are low after being tamped, they must be repicked and stone dust added under full area of stone, raising and packing edges will not be acceptable. All stones must set in full bed of stone dust with no voids.

Any stone that rocks from corner to corner must be picked and leveled to desired grade.

Any stones with chipped corners or spalted edges will be rejected.

Damage to adjacent sidewalks by the contractor=s operation shall be repaired to the satisfaction of the BPCA Engineer at the contractors expense.

METHOD OF MEASUREMENT:

The granite slabs sidewalks shall be measured by the number of square feet reinstalled or replaced as shown on the plans or as directed by the Engineer.

BASIS OF PAYMENT:

The unit price bid per shall include the cost of furnishing all labor, materials, and equipment including stone dust setting bed, necessary to complete the work as shown on the plans or as directed by the Engineer.

Payment will be made under:

Item No.	Item	Pay Unit
1254/10-17	Stone Screenings Underlayment for Belgium Block Pavers	Cubic Yard
1254/10-22	Remove, Refurbish and Store Existing Granite Slabs 2 ½ Inch Thick	Sq. Ft.
1254/10-23	Reinstall Granite Slabs (up to 10% of Replacement New Slabs to be Included in the Price Bid, if necessary)	Sq. Ft.