Department of Public Works Nassau County, N.Y.
Bid Sheets for Contract: S35125-01G

Item No.	Engineers Estimate	Unit	Item Description			
1	1	LS	Clearing and Grubbing	For:		
1M/F	1	LS	Mobilization with Field Office	For:		
2SS	1		Unclassified Excavation	For:		
4B	700	CY	Cement Concrete Breaking (Structures)	For:		
5C	100	CY	Selected Fill	For:		
7	14360	SY	Preparing Fine Grade	For:		
9	900	CY	Topsoil (Supplied)	For:		
12A-4-15	8	LF	Reinforced Concrete Pipe, Class IV, 15 Inch Diameter	For:		
12A-4-36	8	LF	Reinforced Concrete Pipe, Class IV, 36 Inch Diameter	For:		
12B-15	1	EA	Reinforced Concrete Pipe End Sections - 15" Diameter	For:		
12B-36	1	EA	Reinforced Concrete Pipe End Sections - 36" Diameter	For:		
12DIP-8	16	LF	Ductile Iron Culvert Pipe - 8" Diameter	For:		
14	4	EA	Connections to Existing Drainage Facilities	For:		
17A	31	CY	Class A Concrete For Structures	For:		
17GG	2	CY	Class GG Concrete (Underwater Placement)	For:		
18	95	CY	Gravel for Paths	For:		
19	1770	CY	Screened Gravel, Loose Measure	For:		
26	30	LF	Concrete Curb	For:		

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Bid Sheets for Contract: S35125-01G

Item No.	Engineers Estimate	Unit	Item Description			
28	685	SF	Cement Concrete Driveways and Driveway Aprons	For:		
33	900	LB	Bar Reinforcement for Structures	For:		
36D	15	TON	Asphalt Concrete Type 1A (Top & Binder)	For:		
58RPC	110	LF	Saw Cutting Existing Roadway Pavement & Concrete	For:		
91	8	SY	Concrete Block Paving	For:		
96ACB	2600	SF	Cellular Concrete Mattress	For:		
96H	460	CY	Stone Filling (Heavy)	For:		
96M	4870	CY	Stone Filling (Medium)	For:		
97	84	CY	Grouted Rip-Rap	For:		
102	1	LS	Work Zone Traffic Control	For:		
104PC-6	410	LF	Polyolefin Coated Chain Link Fencing 6' High	For:		
111	6	SY	Removal and Replacement of Pavements	For:		
117	740	LF	Temporary Fence	For:		
117SC	1	LS	Security Fence with Gate at Construction Entrance	For:		
121	390	CY	Drybound Base Course	For:		
136	1	LS	Survey Stakeout	For:		
141	4500	LF	Silt Fence	For:		
141A	25	LF	Hay Bales/Straw Bales	For:		

Department of Public Works Nassau County, N.Y.
Bid Sheets for Contract: S35125-01G

Item No.	Engineers Estimate	Unit	Item Description			
141C	10	EA	Silt Protection for Curb Inlet Drainage Structures	For:		
141SS-D	75	SY	Construction Entrance - Temporary	For:		
158A	13,150	SF	Geotextile Cloth	For:		
158B-SP	5885	SY	Permanent Turf Reinforcement Mat	For:		
361C-1SS	60	EA	Planting Shrubs	For:		
367-2SS	1.70	ACRE	Hydroseeding Specialized Wetland Mix	For:		
420SS	40	LF	Swedged Railing System	For:		
500	50	SF	Concrete Spall and Face Repairs	For:		
501	30	LF	Concrete Face Crack Repairs	For:		
519	60	CY	Sand Bags In Place	For:		
				For:		
				For:		
				For:		

*Force Bid

ITEM 2SS - UNCLASSIFIED EXCAVATION

THE SPECIFICATIONS FOR ITEM 2 SHALL APPLY WITH THE FOLLOWING MODIFICATIONS:

8. Method of Measurement. Payment for unclassified excavation will be on a lump sum basis for all work satisfactorily completed as per the plans and specifications or as ordered by the engineer. The contractor shall satisfy him/herself of the existing conditions and the availability of material required. No extra payment will be made for the removal of unsuitable material unless an unsuitable excavation item is included in this project. No extra payment will be made for importation of fill in borrow situations unless a fill item is included in this project.

9. Basis of Payment. The price bid shall be on a lump sum basis and shall include the cost of furnishing all labor, material, equipment and the performance of all operations, including furnishing and adding water if required, all grading, dewatering, and placing and compacting embankment of fill. No additional payment will be allowed for rehandling material.

END ITEM 2SS

ITEM 18 – GRAVEL FOR PATHS

DESCRIPTION

Under this Item, the Contractor shall furnish and place in accordance with the contract plans gravel for paths.

MATERIALS

The bluestone shall be furnished to meet the following sizes:

Percentage by Weight Passing Square Openings

¼”	100%
No. 4	90-100%
1/8”	75-90%
No. 20	30-50%
No. 40	20-40%
No 80	10-25%
No. 200	5-15%

Top course material shall consist of ¼ inch minus bluestone screenings, free from clay lumps, organics, or other deleterious materials. Fines shall be evenly mixed throughout the aggregate. Screening shall be graded within the following limits

METHOD OF MEASUREMENT

The quantity to be paid for will be the number of cubic yards, loose measure of screened bluestone furnished and incorporated in the work to the payment lines shown on the plans or directed by the Engineer.

BASIS OF PAYMENT

The unit price bid per cubic yard, loose measure, shall include the cost of all labor material and equipment necessary to complete the work.

END ITEM 18

ITEM 96ACB– CELLULAR CONCRETE MATTRESS

1.1 SCOPE OF WORK. The work covered under this Item consists of furnishing all labor, equipment, and materials, and performing all operations in connection with the installation of cellular concrete mattresses in accordance with the lines, grades, design, and dimensions shown on the drawings and as specified herein.

1.2 REFERENCES. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

American Society for Testing and Materials (ASTM) Publications.

ASTM C 33-93	Concrete Aggregates
ASTM C 140-96B	Sampling and Testing Concrete Masonry Units
ASTM C 476-95	Grout for Masonry
ASTM D 698-78	Moisture Density Relationship of Soils

U.S. Federal Highway Administration (FHWA) and U.S. Bureau of Reclamation (USBR) Report.

FHWA-RD-89-199 Hydraulic Stability of Articulated Concrete Block Revetment Systems During Over-topping Flow.

1.3 DELIVERY, STORAGE, AND HANDLING OF MATERIALS.

1.3.1 Delivery and Storage. Materials delivered to the site shall be inspected for damage, unloaded and stored with the minimum of handling. Materials shall be kept free of dirt and debris.

1.3.2 Handling. Materials shall be handled in such a manner as to ensure delivery to the site in sound, undamaged condition. Synthetic geotextiles that are not to be installed immediately shall be protected from the direct sunlight and in accordance with the applicable portions of the Section entitled GEOTEXTILES USED AS FILTERS.

1.4 SUBMITTALS. The following shall be submitted in accordance with the Section entitled SUBMITTAL PROCEDURES.

1.41 Shop Drawings. At least 30 days prior to the start of any installation of the cellular concrete mats, the Contractor shall submit to the owner shop drawings for the layout and details of the cellular concrete mats. The cellular concrete mats layout shall be to the lines and grades shown on the drawings. The shop drawings shall include layout, layout sequence, anchor details, mat junction details, anchor to mat connection details, and details for grade change.

1.4.2 Representative Samples. The sources from which the Contractor proposes to obtain materials shall be selected well in advance of the time when the materials will be required in the work. Product literature and suitable samples of the cellular concrete mattresses, cable, fittings, anchors and filter fabric shall be submitted to the owner for approval, prior to delivery of any such material to the site of the work. All samples shall be obtained by the Contractor and delivered at his expense to a point designated by the owner at least 10 days in advance of the time when the placing of the concrete mattresses is expected to begin. The contractor shall submit the cellular concrete block revetment system Manufacturer's certification that the revetment system and components meet the requirements of this specification.

1.4.3 Documentation of Testing. The contractor shall provide to the owner test results documenting that the revetment system has been tested under controlled flow conditions for hydraulic performance characteristics in accordance with FHWA-RD-89-199, utilizing a 2:1 slope in the direction of flow.

PART 2 – MATERIALS

2.1 MATERIALS FOR CELLULAR CONCRETE BLOCKS.

2.1.1 Concrete shall conform to ACI requirements for normal weight concrete and shall have a minimum compressive strength of 4,000 psi at 28 days when tested in accordance with ASTM C 140-96B.

2.1.2 Aggregate shall meet the requirements of ASTM C 33 except for grading. Aggregate grading shall be reasonably consistent and shall be well graded from the maximum size, which can be conveniently handled with available equipment.

2.2 CELLULAR CONCRETE BLOCKS shall be either wet cast using concrete as specified herein, or formed by a vibratory block forming machine. Cellular concrete blocks shall be interlocking; and penetrations shall be included for revetment cables as necessary to bind the individual blocks into mattresses. Cable penetrations shall prevent any exposure of cables to potential UV degradation within the dimensions of the individual blocks (i.e., cables shall not pass through open areas within the dimensions of individual blocks). The blocks shall be open or closed cell, as shown in the plans, and capable of articulation when formed into mattresses.

2.2.1 Design Requirements. The weight of the block shall have the following minimum requirements:

OPEN CELL UNITS	Dimensions In.			Block		Unit Coverage Sq. Ft.	Open Area %
	H	W	L	Unit Weight Lbs.	System Weight Lbs./Sq. Ft.		
SD-400 OC	4.00	15.50	17.40	51-57	29-32	1.78	20
SD-475 OC	4.75	15.50	17.40	62-67	35-38	1.78	20
SD-600 OC	6.00	15.50	17.40	81-88	46-50	1.78	20
SD-800 OC	8.00	15.50	17.40	108-118	61-67	1.78	20
SD-900 OC	9.00	15.50	17.40	120-129	68-73	1.78	20

2.3 CELLULAR CONCRETE MATTRESSES shall be SHOREBLOCK® SD or approved equal. SHOREBLOCK® SD can be obtained from SHORETEC, L.L.C. from ACF Environmental. Cellular concrete mattresses shall be pre-manufactured as an assembly of concrete blocks when connected into mattresses by the use of revetment cables. The assembled mattresses shall be open or closed cell as shown in the drawings.

2.3.1 Size of Cellular Concrete Mattresses. The Cellular concrete blocks and cables and fittings shall be fabricated at the manufacturer's plant or another approved location into mattresses with a width of up to 8 feet and a length that is capable of being transported without special permitting.

2.4 REVETMENT CABLE. The concrete blocks shall be bound into mats by the use of polyester revetment cable and fittings.

2.4.1 Polyester Revetment Cable shall be constructed of high tenacity, low elongating, and continuous filament polyester fibers. Cable shall consist of a core construction comprised of parallel fibers contained within an outer jacket or cover. The weight of the parallel core shall be between 65 to 70 percent of the total weight of the cable. Longitudinal cables shall be sized to provide a minimum cable strength to mat weight ratio of 5:1 for safe material lifting/handling. Additionally, all revetment cable shall have the following minimum physical characteristics:

DIRECTION	NOMINAL CABLE DIAMETER	APPROXIMATE AVG. STRENGTH LB.	WEIGHT/100 FT. (LB.)
Longitudinal & Transverse	¼"	3,700	2.47

2.4.2 Elongation Requirements specified below are based upon stabilized new, dry cable. Stabilization refers to a process in which the cable is cycled fifty (50) times between a load corresponding to 200D^2 and a load equal to 10, 20, or 30 percent of the cable's approximate average breaking strength. Relevant elongation values are as shown on the table below. The tolerance of these values is ± 5 percent.

	% BREAKING STRENGTH		
	10%	20%	30%

Permanent Elongation (while working)	0.7	1.8	2.6
Elastic Elongation	0.6	1.4	2.2
Total Stretch	1.3	3.2	4.8

2.4.3 Revetment Cable shall exhibit good to excellent resistance to most concentrated acids, alkalis and solvents. Cable shall be impervious to rot, mildew and degradation associated with marine organisms. The materials used in the construction of the cable shall not be affected by continuous immersion in fresh or salt water.

2.4.4 Cable and Fittings. Selection of cable and fittings shall be made in a manner that ensures a minimum of 5:1 design safety factor for mattresses being lifted from both ends, thereby forming a catenary. Fittings such as sleeves, stops, and washers shall be in accordance with the manufacturer's recommendations unless otherwise shown on the plans.

2.5 EARTH ANCHORS. Cellular concrete mattresses shall be anchored at the top and at the exposed sides of the ends of the revetment system by fastening the exposed revetment cables to the anchors driven into the anchor trench as shown on the plans. Anchors shall have a minimum pull resistance of 2,000 pounds and shall be attached to the cellular concrete block revetment system in a manner that will achieve little or no slack in the revetment cable. Anchors shall be of the helical or flexible type and shall be installed at intervals as shown in the plans. Material options for the cellular concrete mattress anchors shall be cast-aluminum, galvanized steel or galvanized ductile cast-iron.

2.6 STRUCTURAL GROUTING shall be required where gaps in the concrete mats occur. Any surface where the clear span between mats is 3 inches or greater shall be grouted. All cable ties and anchoring shall be completed prior to placing grout. The grout shall be coarse and proportioned in accordance with ASTM C 476. The quantity of the mixing water shall be the minimum necessary to obtain a uniform mixture and to permit placing. Grout shall be thoroughly compacted in place and struck off to adjacent surface.

2.7 GEOTEXTILE FILTER FABRIC shall be STF P12 as manufactured by Synteen Technical Fabrics or approved equal. Geotextile filter fabric shall separate the soil and stone and shall be placed along the bottom and the sides of the stone bedding as shown on the contract plans.

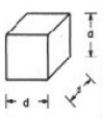
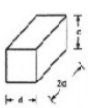
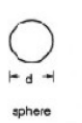
2.8 GEOGRID shall be HSP2 Geosynthetic as manufactured by ACF environmental or approved equal. Geogrid shall be placed between the washed stone and the concrete cellular mattress.

2.9 WASHED STONE shall consist of well graded stone placed as protective material on stream-banks, in channels and elsewhere required. The gradation of materials furnished for use as stone filling shall be

Fine Stone filling as specified in Figure 620-1, and will be accepted or rejected based on a visual examination of the material by the Engineer.

The Figure below entitled “Approximate Shape” is incorporated to assist the Engineer and the Contractor to evaluate the gradation of materials considered for use as Stone Filling (Fine).

FIGURE 620-1 STONE FILLING GRADATION REQUIREMENTS			
Stone Filling Item	**See Notes**	**Stone Size[1]**	**Percent of Total by Weight**
Fine	2, 3, 4	Smaller than 8 inch	90 - 100
		Larger than 3 inch	50 - 100
		Smaller than No. 10 Sieve	0 - 10
Light	2, 3, 4	Lighter than 100 pounds	90 - 100
		Larger than 6 inch	50 - 100
		Smaller than 1/2 inch	0 - 10
Medium	2, 4	Heavier than 100 pounds	50 - 100
		Smaller than 6 inch	0 - 10
Heavy	2, 4, 5	Heavier than 600 pounds	50 - 100
		Smaller than 6 inch	0 - 10

APPROXIMATE SHAPE					
Specified Weights and Sizes					
600 pounds	d = 18 inches	d = 23 inches	d = 15 inches	d = 23 inches	d = 27 inches
300 pounds	d = 15 inches	d = 18 inches	d = 12 inches	d = 18 inches	d = 21 inches
150 pounds	d = 12 inches	d = 15 inches	d = 9 inches	d = 15 inches	d = 17 inches
100 pounds	d = 10 inches	d = 13 inches	d = 8 inches	d = 13 inches	d = 15 inches
d = 8 inches	50 lbs.	25 lbs.	100 lbs.	25 lbs.	16 lbs.
d = 6 inches	20 lbs.	10 lbs.	40 lbs.	10 lbs.	7 lbs.

NOTES:

1. Stone sizes, other than weights, refer to the average of the maximum and minimum dimensions of a stone particle as estimated by the engineer.
2. Materials shall contain less than 20 percent of stones with a ratio of maximum to minimum dimension greater than three.
3. Materials shall contain a sufficient amount of stones smaller than the average stone size to fill in the spaces between the larger stones.
4. Heavier gradings of this item may be required on some projects, in which case the requirements will be stated on the plans or in the proposal.

PART 3 - EXECUTION

3.1 FOUNDATION PREPARATION.

3.1.1 Construction Methods. Areas on which filter fabric and cellular concrete mattresses are to be placed shall be constructed to the lines and grades shown on the drawings. The subgrade for the cellular

concrete mats shall be free of voids, pits, or depressions and shall be proof-rolled to a minimum of 90% of the ASTM D 698 density. Voids, pits or depressions shall be brought to grade by backfilling in accordance with the applicable portions of the project specifications. All obstructions, such as roots and projecting stones larger than 1 inch remaining on the surface, shall be removed and all of the soft or low density pockets of material removed must be filled with selected material and compacted to a minimum of 90% of the ASTM D 698 density. Special consideration for buried obstructions (i.e. stumps, debris, etc.) will be as shown on the drawings.

3.1.2 Excavation and Preparation for anchor trenches, side trenches, and toe trenches or aprons shall be done in accordance to the lines, grades and dimensions shown on the drawings.

3.1.3 Inspection and Approval. Immediately prior to placing the filter fabric and cellular concrete mattresses, the prepared area shall be inspected by the owner's representative and approval obtained before any fabric or mattresses are placed thereon.

3.2 INSTALLATION OF CELLULAR CONCRETE MATTRESSES.

3.2.1 General. Cellular Concrete Mattresses shall be placed within the limits shown on the drawings. The cellular concrete mats or blocks shall be placed on the filter fabric in such a manner as to produce a relatively planar surface. No more than 200 linear feet of filter fabric shall be laid before being covered with concrete mattresses, and any fabric installed more than 2 days shall be lifted and the surface of the slope inspected for any slope defects. The owner may require any uncovered fabric to be lifted after heavy rainfall to inspect for slope damage. Final acceptance and approval of the installation will be made by the owner. The Contractor shall hold the owner harmless from liability of any kind arising from the use of any patented or non-patented invention used in the performance of this work.

3.2.2 Placement of Prefabricated Mattresses shall be done with mats attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The mats shall be placed side-by-side and/or end-to-end so that the mats abut each other. The maximum space or gap between mattresses shall be 3 inches, except that local wider gaps may be accepted if the length of the gap is less than 3 feet and the entire gap is grouted. No overlapping of mats will be accepted and no blocks shall project vertically more than 1 inch beyond the adjacent blocks. All placements of mats shall be in accordance with the manufacturer's recommendations and the Contractor's approved shop drawings.

3.2.3 Individual Concrete Blocks that are hand placed shall be subject to the spacing and level parameters specified in Subparagraph: Placement of Prefabricated Mattresses above. Revetment cables shall be threaded into the blocks as the placement proceeds and fastened with approved sleeves, fittings or fasteners.

3.2.4 Prior to installation of earth anchors, as shown on the plans, the geotextile filter fabric shall be cut to allow for the penetration of the anchor.

3.2.5 Filter Fabric for the cellular concrete mattresses shall be installed in accordance with the Section entitled GEOTEXTILES USED AS FILTERS. Adjacent layers of filter fabric shall have a minimum of two feet of overlap. Fabric shall be secured with 6" x 1" x 6" steel pins prior to placement of cellular concrete mattresses.

3.3 FINISHING.

3.3.1 Surface Treatment. If required on the plans, the voids of the cellular concrete mats for the limits shown on the drawings shall be filled with topsoil. The soil should then be seeded in accordance with the Section entitled TURF.

3.3.2 Inspection and Approval. Immediately prior to the placement of any required surface treatment per section 3.3.1, the owner shall inspect the installed cellular concrete mattresses for defects and/or damage. Individual blocks which are cracked and the weight reduced below 1/3 of the original individual block weight shall be replaced or grouted per section 2.6 prior to the placement of any required surface treatment.

3.4 CONTRACTOR QUALITY CONTROL.

3.4.1 The Contractor shall inspect for compliance with contract requirements and record the inspection of all operations including but not limited to the following, as applicable:

1. Preparation of surface to receive cellular concrete mattresses.
2. Individual concrete blocks and filter fabric soundness and free of defects.
3. Cables and fittings - breaking strength.
4. Assembly of cellular concrete blocks bound by cables to form cellular concrete mattresses.
5. Placement of mattresses and filter fabric on the prepared subgrade.
6. Embedment of cables in the anchor trenches, side trenches, and toe trenches.

METHOD OF MEASUREMENT

Payment for this item will be made on a square foot basis.

BASIS OF PAYMENT

The square foot price bid for this item shall include all costs for furnishing, hauling, and placing the cellular concrete mattresses as specified herein and as shown on the drawings. The unit price bid for this Item shall also include, excavation, backfilling and compaction, dewatering, geotextile filter fabric, geogrid, washed stone and required anchors.

END ITEM 96ACB

ITEM 96F- STONE FILLING (FINE)
ITEM 96L – STONE FILLING (LIGHT)
ITEM 96M – STONE FILLING (MEDIUM)
ITEM 96H – STONE FILLING (HEAVY)
ITEM 96 EH – STONE FILLING (EXTRA HEAVY)

1. Description. This work shall consist of furnishing all plant, labor, equipment, and materials to place a protective covering of erosion-resistant material on embankment slopes, streambanks, at culvert inlets or outlets on bottoms and side slopes of channels, at structure foundations, and at other locations shown on the plans or as directed by the Engineer. The work shall be done in accordance with these specifications and in conformity with the lines, grades, thicknesses, and typical sections shown on the plans or established by the Engineer.

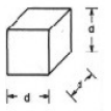
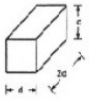
2. Materials. Stone filling shall consist of well graded stone placed as protective material on stream-banks, in channels and elsewhere, as required.

The gradation of materials furnished for use as stone filling shall be as specified in Figure 620-1, and will be accepted or rejected based on a visual examination of the material by the Engineer. The contractor may utilize existing stones found within the limits of the channel within the proposed stone linings as long as they meet the size requirements of the table below.

The Figure below entitled "Approximate Shape" is incorporated to assist the Engineer and the Contractor to evaluate the gradation of materials considered for use as Stone Filling.

FIGURE 620-1 STONE FILLING GRADATION REQUIREMENTS

Stone Filling Item	See Notes	Stone Size[1]	Percent of Total by Weight
Fine	2, 3, 4	Smaller than 8 inch	90 - 100
		Larger than 3 inch	50 - 100
		Smaller than No. 10 Sieve	0 - 10
Light	2, 3, 4	Lighter than 100 pounds	90 - 100
		Larger than 6 inch	50 - 100
		Smaller than 1/2 inch	0 - 10
Medium	2, 4	Heavier than 100 pounds	50 - 100
		Smaller than 6 inch	0 - 10
Heavy	2, 4, 5	Heavier than 600 pounds	50 - 100
		Smaller than 6 inch	0 - 10

APPROXIMATE SHAPE					
Specified Weights and Sizes					
600 pounds	d = 18 inches	d = 23 inches	d = 15 inches	d = 23 inches	d = 27 inches
300 pounds	d = 15 inches	d = 18 inches	d = 12 inches	d = 18 inches	d = 21 inches
150 pounds	d = 12 inches	d = 15 inches	d = 9 inches	d = 15 inches	d = 17 inches
100 pounds	d = 10 inches	d = 13 inches	d = 8 inches	d = 13 inches	d = 15 inches
d = 8 inches	50 lbs.	25 lbs.	100 lbs.	25 lbs.	16 lbs.
d = 6 inches	20 lbs.	10 lbs.	40 lbs.	10 lbs.	7 lbs.

NOTES:

1. Stone sizes, other than weights, refer to the average of the maximum and minimum dimensions of a stone particle as

estimated by the engineer.

2. Materials shall contain less than 20 percent of stones with a ratio of maximum to minimum dimension greater than three.
3. Materials shall contain a sufficient amount of stones smaller than the average stone size to fill in the spaces between the larger stones.
4. Heavier gradings of this item may be required on some projects, in which case the requirements will be stated on the plans or in the proposal.

Item 96EH -Extra Heavy Stone: Heavier than 2,000 lbs = 50-100%

Smaller than 6 inch = 0 – 10%

3. Construction Details

The ground surface on which bank or channel protection is to be placed shall be free of brush, trees, stumps, and other objectionable material and shall be dressed to a smooth surface. All soft or spongy material shall be removed to the depth shown on the plans or as directed by the Engineer and replaced with approved material. Protection for structure foundations shall be provided as early as the foundation construction permits. The type of protection shall be placed in accordance with these specifications and the contract documents.

Stone filling shall be placed in a manner that will produce a reasonable well-graded mass of stone with smaller stone fragments filling the space between the larger ones, so as to result in the minimum practicable percentage of voids. The final section of stone filling shall be in conformance with the lines, grades, and thicknesses shown on the plans. Stone filling used for bank or channel protection shall be placed to its full course thickness in one operation, unless otherwise directed by the Engineer or specified in the special provisions, and in such a manner that the underlying material will not be displaced or worked into the layer of stone filling. Placement of stone upon finished bedding material, when used, shall be carefully controlled to avoid disruption and damage to the layer of bedding material. The stone shall be so placed and distributed that there will be no pockets of uniform size material.

The desired distribution of the various sizes of stone throughout the mass shall be obtained by selective loading of the material at the quarry or other source; by controlled dumping of successive loads during final placing; or by other methods of placement which will produce the specified results. Rearranging of individual stones by mechanical equipment or by hand will be required to the extent necessary to secure the specified results. When stone filling is dumped under water, methods shall be used that will minimize segregation.

4. Method of Measurement

The quantity to be paid for under each of these items shall be the number of cubic yards computed from the payment lines shown on the plans, or as directed by the Engineer.

5. Basis of Payment

The unit price bid per cubic yard for each of these items shall include the costs of furnishing all materials, labor and equipment necessary to satisfactorily complete the work, except that any necessary excavation will be paid for under its appropriate pay item.

END ITEM 96

ITEM 117SC SECURITY FENCE WITH GATE AT CONSTRUCTION ENTRANCE

1. DESCRIPTION

Under this item, the Contractor shall remove the necessary length of the existing galvanized chain link fence and hedges at the proposed construction entrance location and install a temporary security fence at the construction entrance as shown on the Construction Staging Plans. Additionally, upon completion of construction, this item will include the removal of the security fence and gate and restoration of the existing galvanized chain link fence.

2. MATERIALS

During construction operations, it is the contractor's responsibility to provide the "Greentree" property with a temporary fence and gate at the construction entrance that provides a security level equal to or greater than the existing galvanized chain link fence on Shelter Rock Road. The gates at the construction entrance must be equipped with a suitable locking system.

Shop drawings for the proposed security fence with gate at the construction entrance shall be submitted to the Engineer for approval prior to the start of construction operations.

3. CONSTRUCTION METHODS

Installation of the proposed security fence and gate must be done to the satisfaction of the Engineer.

4. METHOD OF MEASUREMENT & BASIS OF PAYMENT

Payment will be made at the lump sum price bid for this item. The lump sum price bid shall include the cost of furnishing all labor, equipment, materials and other incidentals necessary to satisfactorily complete the required work including but not limited to removal of the existing section of perimeter fence and hedges at the construction entrance and installation of construction security fence and gate. Additionally, upon completion of construction activities, this item includes removal of the security fence and gate and restoration of the existing galvanized chain link fence. Restoration of the hedges will be paid under Item 361C-1SS.

END ITEM 117SC

ITEM 141SS – D – CONSTRUCTION ENTRANCE - TEMPORARY

1. DESCRIPTION:

This work shall consist of furnishing, installing, inspecting, maintaining, and removing construction entrance as shown on the contract documents and as directed by the Engineer.

2. MATERIALS:

Construction entrances shall consist of a geotextile, crushed stone or gravel and, if necessary, drainage pipe to maintain ditch flow.

A. Geotextile. Geotextiles shall meet the requirements of New York State Department of Transportation Material Specification §737-01 E. Geotextile Stabilization ,Strength, Class 1.

B. Crushed Stone or Gravel. Crushed stone or gravel shall have a thickness of not less than 6" of coarse aggregate material and as directed by the Engineer-in-Charge.

C. Drainage Pipe. The Contractor shall provide a drainage pipe sized with sufficient capacity to carry ditch flow. The pipe dimension shall be consistent with the modified soil erosion and sediment control plan approved by the Engineer. The drainage pipe may consist of new or used material in satisfactory condition and suitable for the intended use. The Engineer-in-Charge will reject any materials determined to be unsatisfactory.

3. CONSTRUCTION DETAILS.

Construction entrances shall be placed where shown in the contract documents and constructed in accordance with the standard sheets, New York Standards and Specifications for Erosion and Sediment Control book dated August 2005/detail pages 5A75 and 5A76 or as otherwise approved by the Engineer.

The Contractor shall grade, including excavating or placing fill, to prepare the original ground surface for the placement of a stabilized pad of at least six (6) inches of coarse aggregate (1"-4") material, underlain by a geotextile. The design criteria for the entrance shall be as follows:

- Width – 12 foot minimum for one way/24 foot for single access into site.
- Length – As required, but not less than 50 feet/residential single lot 30 foot minimum
- Mountable berm – 3 feet with a 5:1 slope onto existing pavement

If necessary, a drainage pipe shall be installed to maintain the capacity of the ditch. The pipe dimension shall be consistent with the modified soil erosion and sediment control plan approved by the Engineer-in-Charge. All areas cut or filled and not stabilized by the construction entrance material shall be covered with an erosion control treatment (temporary mulch, temporary seed and mulch, etc.) and shall be included in this pay item.

When wheel washing is performed, the washing area shall be located away from the construction entrance/exit in an area which will drain into an approved sediment control measure(s). The construction entrance/exit shall be maintained in a condition which will prevent tracking or flowing of sediment onto a paved public roadway. All sediment spilled, dropped, washed or tracked onto

paved public roadway shall be removed immediately. In the event the entrance/exit is no longer performing properly (i.e. the entrance/exit aggregate becomes clogged with sediment), the Contractor shall top-dress the entrance/exit with additional coarse aggregate material.

4. METHOD OF MEASUREMENT

The work will be measured as the number of square yards to the nearest square yard of construction entrance/exit installed.

5. BASIS OF PAYMENT

The unit price bid for construction entrance/exit-temporary shall include the cost of all labor, material and equipment necessary to satisfactorily complete the work.

Progress payments will be made at seventy five percent (75%) of the unit price bid upon installation of the construction entrance/exit. The remaining twenty-five percent (25%) will be paid after soil disturbance areas have been fully restored with established topsoil and hydroseed.

END ITEM 141SS-D

ITEM 158B-SP PERMANENT TURF REINFORCEMENT MAT

1. DESCRIPTION

Under this item the Contractor shall completely cover the exposed side slopes above the riprap channel as shown on the contract plans or as directed by the engineer with permanent turf reinforcement mat (TRM).

2. MATERIALS

The turf reinforcement mat used shall conform to the specifications of Enkamat 7010 as manufactured by Colbond, www.colbond-geosynthetics.com or approved equal and shall meet the following specifications.

a. The TRM shall be made from 100% synthetic material and contain no biodegradable or photodegradable components or materials.

b. The TRM shall be a homogeneous, three dimensional matrix made of continuous monofilament yarns which are thermally fused at the crossover points to provide a structure that will maintain its three dimensional stability without laminated or stitched layers. No nettings or stitching shall be permitted. The TRM shall have a sufficient area holding capacity and a minimum 95% open space available for soil, FGM and root interaction. The TRM shall not lose its structural integrity and shall not unravel or separate when TRM is cut in the field.

c. The TRM shall exhibit no buoyancy factor (i.e., the specific gravity of the fibers used should be greater than 1.0) so as to allow the TRM to maintain intimate contact with the soil (particularly between fasteners) under low flow or submersed conditions.

d. The TRM when infilled shall meet the following property values;

Physical	**Test Method**	**Values**
Mass per unit area	ASTM 6566	8.0 oz/yd2
Thickness	ASTM 6525	0.40 in
Tensile Strength	ASTM 6818	170 lb/ft
Light Penetration	ASTM 6567	1.0%
Ground cover	ASTM 6567	99.0%
Absorption	ASTM D1117	498.0%
UV Resistance	ASTM D7238 & D 6818	80.0%
Resiliency	ASTM D6524	80.0%
Permissible Vegetated Shear	ASTM D6460	8.0 lb/ft^2
Permissible Vegetated Velocity	ASTM D6460	16.0 fps
Permissible Unvegetated Shear	ASTM D6460	3.3 lb/ft^2
Permissible Unvegetated Velocity	ASTM D6460	12.0 ft/s

3. CONSTRUCTION METHODS

PREPARATION

a. The installation site shall be prepared by clearing, grubbing excavation or filling the area to the design grade.

b. The surface to receive the TRM shall be prepared to relatively smooth conditions free of obstructions, rocks, dirt clods, roots, stumps, depressions, debris and soft or low density pockets of material. The material shall be capable of supporting a vegetative cover.

c. Erosion features such as rills, gullies, etc. must be graded out of the surface before TRM deployment. Smooth roll drum compaction will be required before deploying TRM to make sure the TRM make immediate contact with the soil and to ensure that the soil has been compacted.

d. Cut trenches for initial anchor trenches, termination trench and longitudinal anchor trenches (12 inches wide and 12 inches in depth) as shown on the drawings.

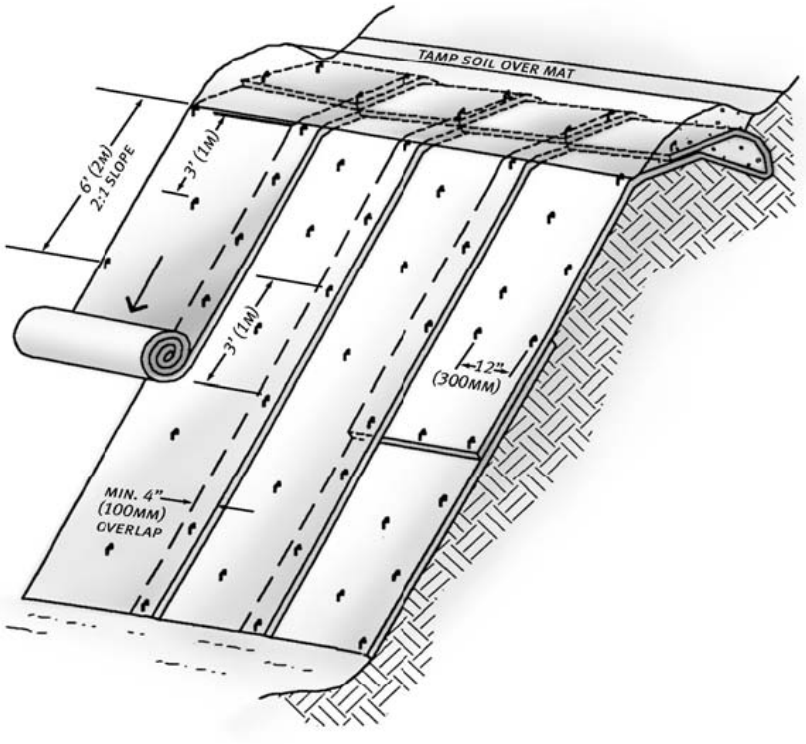
INSTALLATION

a. Care shall be taken during installation to avoid damage occurring to the TRM as a result of the installation process. Should the TRM be damaged during installation, a TRM patch shall be placed over the damaged area extending 3 feet beyond the perimeter of the damage.

b. **Anchor Trench:** Anchor trenches are required to securely fasten the Enkamat to the ground surface. In channel applications, the initial anchor trench is installed at the beginning of the channel and intermediate check slots are spaced at approximately 25 feet* intervals downstream depending on flow conditions and whether you soil fill or not. The Enkamat is installed into the bottom of the trench and fastened with pins spaced 3 feet apart. The anchor trench / intermediate check slots are then backfilled and compacted in a manner as to not damage the Enkamat.

   * In lieu of excavated check slots, a double row of pins [or a number 1 or 2 rebar pinned across the mat] may be used at 25-foot intervals.

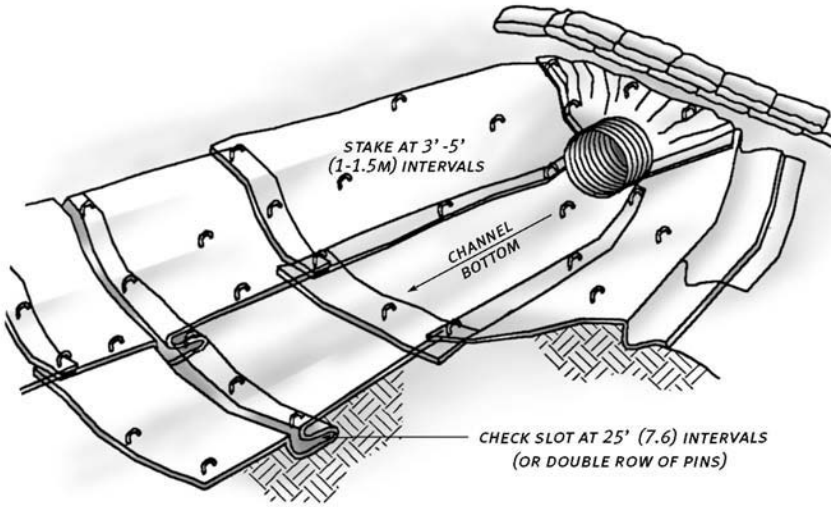
c. **Enkamat Installation:** Roll the Enkamat down the slope or channel. The overlap between rolls is 3 to 4 inches. The splice between rolls is between 2 and 3 feet. Shingle the roll in the direction of water flow. Install pins down the center of each mat (mat is 3.25 feet wide) staggering them between the outside pins with a spacing interval of 3 to 5 feet. Pins patterns will vary depending upon application, soil type, slope or channel slope, geometry, etc. A rule of thumb for estimating the amount of pins required for a project is: 1:1 to 2:1 slopes 3-4 pins per square yard; 3:1 and lesser slopes 2-3 pins per square yard. Always install two rows of pins spaced 1.5x1.5 feet apart at all roll splice locations.



d. **Anchoring Devices:** 11-8 gauge of a 6" x 1" x 6" metal pins. When surface soil conditions are loose, use 8" x 1" x 8" or 12" x 1.5" x 12" metal pins, 8" - 18" pins with 1.5" diameter washer, or 12-30" J-Shape pins (bent rebar) having a ¼" diameter. Drive pins or pins flush with the ground surface.

e. **Soil Filling:** There are two options when installing Enkamat-soil filling or non-soil filling. Soil filling Enkamat accelerates performance because the Enkamat, soil and the new vegetation interact together to resist shear forces when water is flowing through the channel or on top of a slope. If soil filling is utilized spread ½ to ¾ inches of fine soil into the mat to completely fill it. A typical condition where non-soil filling is used would be to collect sediment when water is flowing through the channel from an up-gradient source.

f. **Seeding:** For non-soil filling applications, broadcast seed or hydroseed over the installed Enkamat. Make sure hydromulch occurs after seeding to ensure the seed reaches the topsoil. If soil filling, seed after filling is completed. You may also seed before and after soil filling to create a better established root structure and increase vegetation strength. Check with your local seeding consultant to verify appropriate seed and fertilizer mixture.



5. METHOD OF MEASUREMENT

The Contractor shall be paid the unit price bid per square yard area covered by the fabric, measured in its final position, as required by the plans and specifications and/or as directed by the Engineer. No additional quantity of material will be paid for areas where there is overlapping fabric.

6. BASIS OF PAYMENT

The unit price bid per square yard for this item shall include the cost of furnishing all labor, equipment, materials and incidentals necessary to satisfactorily complete the required work.

END ITEM 158B-SP

361C-1SS - PLANTING SHRUBS

DESCRIPTION:

Under this Item the Contractor shall furnish and place plants as indicated on the plans and all other areas as ordered by the Engineer. Work for these items shall take place immediately after final grades have been established as specified in this contract.

PLANTING:

All plant location shown on the plans are approximate and the exact location will be determined by the Consulting Landscape Architect and the Engineer-in-Charge, when all areas are backfilled and final grades established.

GENERAL:

PLANTING:
The landscape plant list shall be as follows:

- Ligustrum Ovalifolium – California Privet
- Quantity – 60 each
- Size – 4' – 5' height
- Root – 10-gallon container
- Planting in two parallel rows five foot on centers with 30 in each row.

All plants shall be container grown. The contractor shall submit all sources of nursery stock prior to the start of work to the Consulting Landscape Architect, and the Engineer-in-Charge.

All plant material shall be subject to inspection and rejection by the EIC / Consulting Landscape Architect, before shipment to the project site and/or upon arrival at the project site if plant material does not meet the specifications, invoices for the material are not provided, and if water is not applied immediately following planting, as per the watering specifications. No plants shall be stored on site longer than 24 hours, and if not planted the contractor shall water and protect plant materials offsite. Those plants not installed within the 24 hours shall be marked by the Engineer/Landscape Architect to document the period between delivery and installation. All plants marked and showing symptoms of stress shall be rejected by the Engineer/Landscape Architect and removed from the project. It is the contractor's responsibility to maintain all plant material in a state of good health at all times before and after installation.

PLANTING MATERIALS:

BACKFILL:
Approved backfill material **(NYSDOT approved supplier)** shall be submitted for approvals prior to delivery to the site. Container grown shrubs shall be planted in

approved backfill soil, with the incorporation of an approved organic material equal to one quarter (1/4) the pit volume A.O.B.E.

PLANTING SEASON:

UPLAND DECIDUOUS B&B MATERIAL: March 1 to May 1
October 15 to December 15

All landscape planting installed outside the contract planting dates, not directed in writing by the Engineer-in-Charge / Consulting Landscape Architect, shall be at the contractor's own risk and watered with a bio stimulant liquid complex of seaweed extract, humic acid extract enzymes, and non-ionic wetting agents or an approved equal. All rates are as specified by the manufacturer.

Plants that are not protected as specified or that have not been planted within two (2) calendar days of delivery shall be rejected as ordered by the Engineer (A.O.B.E). All 2" plugs shall be moist at all times prior to planting; and plants that are visibly dry shall be rejected and removed from the site immediately.

LAYOUT – SETBACK RESTRICTIONS:

Layout shall be done by the contractor with final review and/or approval by the Engineer-in-Charge/Consulting Landscape Architect. All shrub beds shall be laid out, outlined in the field using spray paint, as approved by the Engineer in Charge.
All plants shall be planted in double offset rows five foot on centers or as directed by the Consulting Landscape Architect.

PLANT PIT DIAMETER:

The minimum plant pit diameter shall bear the following relationship to the diameter of the root spread or root balls of the plants to be planted in them unless otherwise specified in the contract documents.

Root Ball Diameter	Plant Pit Diameter
0-24"	Twice the root/ball diameter
24" – 48"	Equal to the root/ball diameter + **24"**
> 48"	1-1/2 times the root/ball diameter

All areas of pavement removal to be planted shall have the soil made loose and friable to a depth of **36 "**

PLANTING BEDS:

All shrub planting areas are considered planting beds and shall be mulched.
Planting bed areas shall be loose and friable a minimum depth of **8 inches**.
All beds shall be made weed free prior to planting through repeated methods as approved by the Landscape Architect.

DISPOSAL OF EXCESS SOIL:

As material is excavated from the shrub pits, shall be immediately removed from the planting areas and disposed of in a manner acceptable to the Engineer.

SETTING PLANTS:

The Contractor shall submit a work order to establish the number of days to obtain materials, start dates, completion schedule, schedule of planting operations, within 10 working days prior to the start of work.

All substitutions and changes shall be in writing by the contractor to the Engineer-in-Charge / Consulting Landscape Architect.

The contractor shall not be allowed to plant unless the planting schedule and watering schedule area approved and all materials, invoices are approved by Engineer-in-Charge / Consulting Landscape Architect.

GENERAL:

For all shrubs, saucers shall be constructed **3 inches** larger than the pit sizes. Saucers shall remain in place for the duration of the contract. At least three watering's for the compaction of the planting soil, after setting plans and before applying mulch shall be provided by the Engineer-in-Charge/Consulting Landscape Architect.

All the provisions for planting plants shall be accomplished within five (5) calendar days after the plant is set in the pit except that the Engineer-in-Charge(EIC) shall take into consideration unexpected interruptions in work due to emergencies, storms, etc. severe enough to stop work. Scheduled non-work days such as weekends, holidays, etc. shall not be a reason for extending the five (5) day limitation.

If this sequence is not adhered to and as a result the operations subsequent to setting and backfilling are not being accomplished within the specified time, the Engineer-in-Charge may stop all setting and backfilling of plants, and any other planting operations he may deem necessary, until such time as he is satisfied that the sequence of planting operations is again on schedule.

PRUNING:

No Landscape Plant material shall be pruned prior to shipment to the site, unless inspected in the nursery by the Consulting Landscape Architect. All plant material shall meet specified sizes after pruning.

MULCHING:

A four (4) **inches** layer of mulch shall be uniformly placed in the area of all shrub beds. After mulching, **ORGANIC** fertilizer (10-6-4) shall be evenly applied to all mulched areas at a rate of **3 oz.** of fertilizer per square meter. A second application of 10-6-4, at the same rate shall be made on the mulched areas at the end of the Period of Establishment.

WATERING:

All plants shall be watered immediately following planting. Watering for compaction shall be limited to two (2) watering's within one day, with a minimum allowance of five (5) hours draw down time.

Plants shall have a minimum of 14 watering's between April 1 and October 1 (every other week). The intervals between watering operations can be modified in writing by the Landscape Architect. Each watering shall provide **2 gallons/ sq. ft. (3**" layer of **water**). Approximate quantities for the full contract consist of 14 watering's, with each watering as follows:

All landscape material planted out of seasons shall be watered with a bio stimulant liquid complex of seaweed extract, humic acid extract, enzymes and non-ionic wetting agents, as approved by the Landscape Architect. The price for this work shall be included in the cost of the landscape items and shall be applied as per the manufacturer's recommendations.

WEEDING:

Plant bed weeding shall begin on June 1 and planting beds shall be weed free by July 1 and begin again on August 14 and planting beds shall be weed free by September 1.

PERIOD OF ESTABLISHMENT:

The Contractor shall be required to continue the work specified under the one (1) year Period of Establishment, following the satisfactory completion of the planting on the contract as confirmed in writing by the Engineer/Consulting Landscape Architect, or for the duration of the contract, whichever is later. The Period of Establishment applies to all plantings, unless otherwise specified. This includes replacement of dead material before the end of each spring and fall planting season for one year.

REQUIREMENTS:

All plants that are dead, missing, or in an unhealthy or badly impaired condition, as determined in writing by the Consulting Landscape Architect shall be removed and replaced with new healthy plant material as specified within two (2) weeks of that determination or during the first two (2) weeks of the succeeding planting season if the determination is not made during a favorable planting season. All plants shall receive the same care as required for the original plants through the Period of Establishment.

BASIS OF PAYMENT:

The unit price bid per each plant shall include the cost of excavating plant pits, furnishing all planting materials, disposal of excess subsoil, tilling of planting beds, furnishing of plants, furnishing and placing topsoil, mulch, inspecting, planting, pruning, staking, guying, anchoring, wrapping, weeding, watering, restoration, replacing and maintaining all shrubs, distributing fertilizer over plan pits and all other work, including maintenance, incidental thereto in accordance with the specifications to the satisfaction of the Engineer.

In all locations where utilities are located, the Contractor shall dig the pits by hand where required, which shall be included in the price bid.

In the event, Contractor cannot procure the material as shown, listed, they should refer to the Town in writing for any alternative approach and/or suggestions.

No extra payment will be made for excavation of plant pits in areas where rock, stumps or other undesirable material is encountered.

No payments shall be made to the contractor until all plantings have been fully planted, fertilized, mulched, and watered.

Watering during the Period of Establishment will be paid for until final acceptance. No separate payment will be made for watering after final acceptance.

END OF ITEM 361C-1SS

ITEM 367-2SS – HYDROSEEDING SPECIALIZED WETLAND MIX

ESTABLISHMENT AND PERFORMANCE

1.0 DESCRIPTION:

1.1 The work shall consist of ground preparation and specialized wetland mix establishment in accordance with the contract documents and as directed by the Engineer.

1.2 Ground preparation includes preparing the subsoil and furnishing and installing topsoil. Specialized wetland mix establishment includes furnishing and installing seeds, Flexterra HP-FGM Mulch, applying water sufficient for seed germination and plant establishment, and weed removal, as directed by the Engineer – in - Charge.

2.0 MATERIALS.

2.1 Topsoil (Item 9)

Topsoil may be naturally occurring or may be manufactured. If naturally occurring topsoil exists on the site, it shall be the surface layer of soil at a depth specified in the contract documents or approved by the Engineer (EIC)/ Consulting Landscape Architect. Manufactured topsoil is a mixture of materials comprised of a mineral (soil) component that by itself does not exhibit the properties and characteristics of topsoil and an organic material component. Manufactured topsoil shall have a pH, organic matter content, and USDA soil class texture, similar to naturally-occurring soils in the project area. Copies of test submitted for topsoil on this project shall be hand delivered to the EIC for approvals. No deliveries shall be made until the test results are verified and approved by the EIC/Consulting Landscape Architect.

Topsoil shall be free from refuse, material toxic or otherwise deleterious to plant growth, subsoil, sod clumps or other viable propagules of invasive plants, woody vegetation and stumps, roots, brush, refuse, stones, clay lumps or similar objects. Construction and demolition debris as classified under 6 NYCRR Part 360, other than uncontaminated land clearing debris, shall not be used to manufacture or amend topsoil. Sod and herbaceous growth such as grass and non-invasive weeds need not be removed but shall be thoroughly broken up and mixed with the soil during handling and manufacturing operations.

2.2 SEEDS:

Specialized wetland mix seed shall be fresh, recleaned seed of the latest crop.
Detail Specifications for Seeds shall meet the following requirements:
Ernmx-137 Specialized Wetland Mix for Shaded OBL-FACW Areas, or an approved equal authorized by the EIC/Consulting Landscape Architect.

Latin Name	Common Name	%Mix
Carex vulpinoidea	Fox Sedge, PA Ecotype	33.00%
Carex lurid	Lurid Sedge, PA Ecotype	22.00%
Elymus virginicus	Virginia Wildrye, PA Ecotype	20.00%
Carex scoparia	Blunt Broom Sedge, PA Ecotype	15.70%

Helopsis helianthoides	Oxeye Sunflower, PA Ecotype	2.00%
Carex intumescens	Star Sedge, PA Ecotype	1.60%
Carex stipata	Awl Sedge, PA Ecotype	1.00%
Juncus effuses	Soft Rush	1.00%
Carex crinite	Fringed Sedge, PA Ecotype	0.80%
Verbena urticifolia	White Vervain, PA Ecotype	0.80%
Solidago rugose	Wrinkleleaf Goldenrod, PA Ecotype	0.70%
Vernonia noveboracensis	New York Ironweed, PA Ecotype	0.50%
Juncus tenuis	Path Rush, PA Ecotype	0.30%
Lobelia siphilitica	Great Blue Lobelia, PA Ecotype	0.30%
Scripus syperinus	Wollgrass, PA Ecotype	0.30%

TOTAL POUNDS OF BULK SEED PER ACRE **20 LBS.**

Approved variety equals shall be accepted by the Consulting Landscape Architect when requested, in writing, by the Contractor prior to the start of work.
All seed mixes shall be delivered in standard size bags of vendor, showing the weight, analysis, an analysis date and name of the vendor. It shall be stored as directed by the EIC, in such a manner that its effectiveness will not be impaired.
The Contractor shall furnish a certified report from an approved seed testing laboratory showing a test purity, viability, and weed seed content of the specialized wetland mix seed he proposes to use. He shall also furnish and deliver a representative sample of the mixed seed to the laboratory approved by the Town. No seed shall be delivered and used at the contract site until there is approval of the seed mix has been given to the Engineer, but such approval does not constitute final acceptance. The Engineer reserves the right to reject on or after delivery any such material which does not in his opinion meet these specifications based upon report of test of samples made by the Town's outside testing laboratory. All laboratory testing of turf seed shall be at the Contractor's own expense.

2.3 Commercial Fertilizer:

Commercial fertilizer (10-6-4) shall have the following composition by weight: Nitrogen fifty (50) percent of total shall be derived from urea form furnishing a minimum of 3.5% water insoluble nitrogen (3.5% WIN).
The Contractor shall furnish a certified report from an approved testing laboratory and representative samples of the Commercial Fertilizer (10-6-4) he proposed to use. No Commercial Fertilizer (10-6-4) shall be delivered and used at the contract site until approval of the sample by the EIC, such approval does not constitute final acceptance. The EIC reserves the rights to reject on or after delivery any material which does not in his opinion meet these specifications. The price bid shall include furnishing and delivery of the sample to the laboratory.

2.4 Ground Limestone:

Ground Limestone (Calcium Carbonate) shall have the following analysis. At least fifty (50) percent shall pass a 200-mesh sieve; at least seventy (70) percent shall pass a

100-mesh sieve; and one hundred (100) percent shall pass a 10-mesh sieve. Total carbonates shall not be less than eighty (80) percent or 44.8% calcium oxide equivalent; for the purpose of calculations shall be considered as Calcium Carbonates.

2.5 Methods:

The area to be seeded shall be cleared of sticks, stones (one inch and larger), and other objectionable materials, smoothly graded, and lightly harrowed or otherwise cultivated or loosened to a depth of three (3) inches, if the bed surface is excessively compact condition, to place it in a suitable condition for immediate application of grass seed.

The seeding shall be done by a "one-step-method" whereby water, hydro-mulch, grass seed, fertilizer, and dolomitic limestone will be applied at the same time using either a "Finn Hydroseeder", Bowie Hydro-Mulcher", "Reinco Aqua-Mulcher" or equivalent equipment approved by the EIC.

The Contractor, at his own expense, shall erect all barricades, signs, fences, etc., and provide watchmen as might be necessary for the protection of the Public during the seeding operation, as well as the seeded grass areas until they are accepted.

If any surface other than the area to be seeded is coated with the noted mixture, it will be cleaned immediately by the Contractor at his expense.

2.6 Mulching:

Mulch material shall be Flexterra HP-FGM. The mulch shall be spread uniformly in a continuous blanket of sufficient thickness to completely hide the soil from view at the rate of approximately two-three tons per acre. The rate of application is considered the minimum rate.

The Contractor shall care for the mulched areas until final acceptance of the project, and as directed by the EIC/Consulting Landscape Architect.

2.7 Maintenance of specialized wetland mix:

The Contractor shall maintain the seeded area without additional payment until a uniform stand of specialized wetland mix, approximately two and one-half (2 ½) inches high has been obtained. Any areas which have been damaged or fail to show a uniform stand of specialized wetland mix shall be re-fertilized and reseeded with the original mixture at the Contractor's expense until all the designated areas are covered with specialized wetland mix.

The Contractor shall properly water, protect, if necessary, the areas until a satisfactory uniform stand is obtained.

3.0 MEASUREMENT AND PAYMENT:

3.1 Basis for Acceptance:

Areas will be accepted when:

- At least 95 percent of the ground surface is covered uniformly with established permanent specialized wetland mix species;
- Specialized wetland mix shall be an average minimum height of 5 inches
- Specialized wetland mix shall exhibit healthy green color.

3.2 Method of Measurement:

The quantity to be measured for payment will be in acres on all areas including slope areas, to the nearest tenth of an acre of specialized wetland mix established and accepted.

3.3 Basis of Payment:

The unit price bid shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work, including the handling, storing, stockpiling and placement of topsoil, seed, mulch, mulch anchorage, water, and weed removal. Payment of 40% of the bid price will be paid when seed and Flexterra HP – FGM mulch are in place. The remaining 60% of the bid price will be paid after specialized wetland mix establishment is accepted.

END OF ITEM 367-2SS

ITEM 420SS –SWEDGED RAILING SYSTEM

1. DESCRIPTION

Under this Item, the Contractor shall furnish and install Swedged Railing System in accordance with the plans, specifications and/or as directed by the Engineer.

2. MATERIALS

A. SWEDGED RAILING SYSTEM

1. Swedged Railing System shall be the Sterling Dula Swedged Railing System, Contemporary Picket Railing as manufactured by Kane Architectural Innovations, 2250 Powell Avenue, Erie, PA 16506 (800-773-2439), or approved equal.
2. All tube and pipe to be 6063-T5 or T6, 6061-T6 alloy aluminum.
3. All fasteners to be aluminum or stainless steel.
4. Finish shall be Black Powder Coating
5. Railing assemblies (including top rail, bottom rail, pickets, post and connections) shall be designed to conform to all applicable building codes and loading requirements, including but not necessarily limited to the following:
    a. IBC International Building Code
    b. ASTM E985, standard specification for permanent metal railing systems and rails for buildings.
    c. ADA, Americans with disabilities act accessibility guidelines.
    d. AWS D1.2, American Welding Society
    e. NAAMM, National Association of Architectural Metal Manufacturers

B. FABRICATION

1. Railing shall be shop fabricated and assembled per approved shop drawings to the greatest extent possible. Assembly shall be in a neat, craftsman like manner in accordance with the highest industry standards.
2. Joints to be coped and tig welded by certified welders (AWS D1.2). Welds to be ground smooth.
3. Changes in direction to be made by bending, if possible, or by mitering and welding.
4. Field splices to be minimized as much as possible, depending on parameters set by material, finish and shipping. Field splices to be made with internal splice sleeves pop riveted into ends of pipe.
5. Swedged pickets are to be hydraulically pressed in top and bottom rails, into hole sized for interference fit, locking pickets into place.
6. General contractor shall coordinate railing post spacing with concrete pedestal to be cast-in-place in the field to which railing base plate is to be connected.
7. General contractor to verify dimensions on site prior to fabrication.

3. CONSTRUCTION DETAILS

A. INSTALLATION PROCEDURES

1. Install work in accordance with the contract documents, final shop drawings, and manufacturer's instructions.
2. Erect work plumb, square and level, free from distortion or defects detrimental to appearance or performance.
3. Provide anchorage connection in accordance with the railing manufacturer's instructions or as shown on the plans.

4. METHOD OF MEASUREMENT

The quantity to be paid for under this item shall be the number of linear foot of Swedged Railing System installed and accepted in accordance with the specifications and drawings measured along the center of the top rail.

5. BASIS OF PAYMENT

Payment shall be measured as described above and shall be paid for at the contract unit price per number of linear foot bid as called for in this proposal. This price shall constitute full compensation for furnishing all labor, materials, equipment necessary to satisfactorily complete the work as shown on the contract drawings and described in this specification including, fabricated railings and all hardware necessary for a complete and professional installation.

END ITEM 420SS

ITEM 500 – CONCRETE SPALL & FACE REPAIRS

1. DESCRIPTION

Under this Item, the Contractor shall make repairs to the existing concrete as shown on the contract drawings as well as described below. Spall repairs shall be performed where existing concrete has deteriorated to the point of falling away. Face repairs shall be made where cracks run along the face of the headwall.

2. MATERIALS

Acceptable materials shall be as listed below or approved equal:

2.1. Duracrete II VOFT cement based repair mortar as manufactured by Kaufman Products Inc., Baltimore, Maryland (410) 354-8600

2.2. SureGrout non-shrinking grouting compound as manufactured by Kaufman Products Inc., Baltimore, Maryland (410) 354-8600

2.3. SurePoxy HM EPL epoxy bonding agent as manufactured by Kaufman Products Inc., Baltimore, Maryland (410) 354-8600

SUBMITTALS

2.4. Product Data: Submit manufacturer's product data and installation instructions including details of application.

2.5. Quality Assurance/Control Submittals: Submit manufacturer's certificate that products meet or exceed specified requirements.

3. CONSTRUCTION DETAILS

Apply epoxy material according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being used.

3.1. Area around the damaged sections shall be cut a minimum ½" deep using a 4 1/2" angle grinder with a dry-cut diamond blade and dust collection system to comply with current OSHA regulations for silica dust.

3.2. Chip out and remove all the concrete within the saw cut areas. Any reinforcing steel exposed during concrete removal shall be undercut to fully expose. Wire brush the reinforcing steel to remove any heavy corrosion and loose particles of concrete. If more than 50% of the steel has been lost, the Engineer shall determine whether to replace the steel reinforcing in kind. Contractor shall splice new reinforcement to existing steel reinforcement, then coat with grout or epoxy resin.

3.3. Prior to beginning concrete repair, areas should be dampened. Mix SurePoxy HM EPL Epoxy Bonding Agent per manufactures instructions and apply liberally to the reinforcing steel and to the concrete substrate within the saw cut areas.

3.4. For small areas, while Bonding Agent is still wet, mix and apply Duracrete II VOFT, a rapid setting, vertical & overhead concrete repair mortar. Fill areas completely and finish.

3.5. For larger areas, forming shall be required. Dampen concrete substrate; Mix and apply SurePoxy HM EPL; Install forms and then mix and place SureGrout Non-shrink Grout combined with 25 pounds of 3/8" coarse aggregate and placed like a "form & pour concrete."

3.6. Repair areas should be protected and cured properly for at least 72 hours after repairs are completed.

4. METHOD OF MEASUREMENT

This work will be measured by the number of square feet of repairs made to the concrete headwall in accordance with the contract plans and these specifications.

5. BASIS OF PAYMENT

The unit bid price for concrete spall & face repairs shall include the cost of all labor, materials, and equipment necessary to complete the work as shown on the contract drawings and described in this specification. Disposing of concrete debris shall be included under the unit price bid for this Item.

END ITEM 500

ITEM 501 – CONCRETE FACE CRACK REPAIRS

1. DESCRIPTION

Under this Item, the Contractor shall make crack repairs to the existing concrete headwall as shown on the contract drawings as well as described below.

2. MATERIALS

Acceptable materials shall be as listed below or approved equal:

2.1. SurePoxy HM GEL epoxy bonding agent as manufactured by Kaufman Products Inc., Baltimore, Maryland (410) 354-8600

2.2. SurePoxy HM SLV crack healer/penetrating sealer as manufactured by Kaufman Products Inc., Baltimore, Maryland (410) 354-8600

2.3. SurePoxy HMLV penetrating sealer as manufactured by Kaufman Products Inc., Baltimore, Maryland (410) 354-8600

SUBMITTALS

2.4. Product Data: Submit manufacturer's product data and installation instructions including details of application.

2.5. Quality Assurance/Control Submittals: Submit manufacturer's certificate that products meet or exceed specified requirements.

3. CONSTRUCTION DETAILS

The Contractor shall blow out and clean the longitudinal cracks before applying any materials to the repair locations. Apply all materials according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being used. For cracks that extend through to the bottom of the headwall, or cracks along the vertical face, the Contractor shall seal the crack with SurePoxy HM GEL to allow the SurePoxy HM SLV/SurePoxy to build up and form the repair. Injection ports shall be required to inject material when SurePoxy HM GEL is used.

Repair areas should be protected and cured properly for at least 72 hours after repairs are completed.

4. METHOD OF MEASUREMENT

This work will be measured by the number of linear feet of repairs made to the concrete headwall in accordance with the contract plans and these specifications.

5. BASIS OF PAYMENT

The unit bid price for concrete headwall crack repairs shall include the cost of all labor, materials, and equipment necessary to complete the work as shown on the contract drawings and described in this specification.

END ITEM 501

ITEM 519 – SAND BAGS IN PLACE

1. Description.

Under this item the Contractor shall furnish and place bagged sand around structures, in and around stream beds or at any location deemed necessary as shown on the plans or ordered by the Engineer where it is necessary to divert or stem the flow of water.

2. Materials.

Sand shall be of any grade but shall not contain gravel, stone, clay, loam or any deleterious lumpy material. The sand shall be placed in heavy cloth or burlap bags (plastic will not be allowed), each bag having not less than one cubic foot capacity.

3. Construction Details.

Bags of sand shall be placed where shown on the plans and shall provide a thickness not less than that shown or ordered by the Engineer.

4. Method of Measurement.

The quantity of bagged sand to be paid for under this item shall be the amount of bagged sand placed, measured in cubic yard in its final position within payment limit either shown on the plans or as directed by the Engineer.

5. Basis of Payment.

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

END ITEM 519

(On Construction firms letterhead)

Date Issued: _____

Dear Resident:

We are sorry to inconvenience you, but in order to proceed with construction for _____ we must close and/or limit your access to your driveway. As work progresses, you will be notified on a daily basis when and how your particular residence will be affected. We assure you that every effort will be made to minimize the impact to you relative to this construction.

Our current schedule calls for the project related work to be performed in your area during the week of _____. A copy of this letter with specific dates and time for this work will be delivered at least twenty-four (24) hours in advance in order that you will have sufficient opportunity to plan for accessibility to your vehicles.

If additional information is necessary, you may contact any of the representatives listed below.

Thank you for your patience.

Contractor	_____	Phone:	_____
Inspector	_____		_____
Project Manager	_____	Phone:	_____

_____

(On Construction firms letterhead)

Date Issued: _____

CONSTRUCTION NOTIFICATION
24 HOUR NOTICE

Date & Type of Construction: _____
How will residence be affected: _____
Approximate time of Construction: _____

Driveway access (will) (will not) be permitted.