Item No.	Engineers Estimate	Unit	Item Description	Unit Price Written in words		
1X	35	SY	Clearing and Grubbing	For:	Contingent	
2	100	CY	Unclassified Excavation	For:	Contingent	
3	35	CY	Trench, Culvert and Bridge Excavation	For:	Contingent	
4A	70	SY	Cement Concrete Breaking (Pavement)	For:	Contingent	
4B	20	CY	Cement Concrete Breaking (Structures)	For:	Contingent	
5C	105	CY	Selected Fill	For:	Contingent	
7	70	SY	Preparing Fine Grade	For:	Contingent	
12A-4	50	LF	Reinforced Concrete Pipe, Class IV	For:	Contingent	
12DIP-12	50	LF	Ductile Iron Culvert Pipe-12 Inch Diameter	For:	Contingent	
12DIP-14	50	LF	Ductile Iron Culvert Pipe-14 Inch Diameter	For:	Contingent	
12H	4500	LF	Cleaning Existing Drainage System	For:		
12H-X	275	EA	Cleaning Existing Catch Basin	For:		
13A	10	CY	Catch Basins	For:	Contingent	
13B	10	CY	Manholes	For:	Contingent	
14	5	EA	Connections to Existing Drainage Facilities	For:	Contingent	
15	10	EA	Altering Catch Basins	For:		
15X	25	EA	Rehabilitation of Catch Basin	For:		

Department of Public Works Nassau County, N.Y.
Bid Sheets for Contract: H61587-PR16

Item No.	Engineers Estimate	Unit	Item Description	Unit Price Written in words		
16X	30	EA	Altering Brick Manholes	For:		
17A	10	CY	Class A Concrete For Structures	For:	Contingent	
24	20	CY	Cement Concrete Pavement	For:	Contingent	
24V	25	CY	Concrete Valley Gutter	For:	Contingent	
26	2600	LF	Concrete Curb	For:		
26CG	525	LF	Monolithic Concrete Curb and Gutter	For:		
27	7200	SF	Cement Concrete Sidewalk	For:		
27DW	350	SF	Dectectable Warning Surface	For:		
28	1750	SF	Cement Concrete Driveways and Driveway Aprons	For:		
29	1100	SF	Driveway Restoration	For:		
30	1450	SY	Metal Reinforcement For Concrete Pavement	For:	Contingent	
31	355	LF	Transverse Joint Supports	For:	Contingent	
32A	180	EA	Longitudinal Joint Ties (Pavement)	For:	Contingent	
32X	180	EA	Joint Ties (Grout Type)	For:	Contingent	
32X-1	810	EA	Load Transfer Device For Cement Concrete Pavement Repairs	For:	Contingent	
33	860	LB	Bar Reinforcement for Structures	For:	Contingent	
34	25500	LB	Miscellaneous Metals	For:		

Item No.	Engineers Estimate	Unit	Item Description	Unit Price Written in words		
35	40	LF	Resetting Guide Railing	For:	Contingent	
36CX	155	TON	Asphalt Concrete Truing and Leveling Course TYPE 1A (For Cracks in	For:		
36DRAR	26000	TON	Rut Avoidance Asphalt Concrete TYPE 1A (Top RA Resurfacing)	For:		
42-1	20	LF	Concrete Median Barrier	For:	Contingent	
42-2	2	EA	Concrete Median Barrier End Section	For:	Contingent	
42-3	20	LF	Half Section Concrete Barrier	For:	Contingent	
42-4	2	EA	Half Section Concrete Barrier End Section	For:	Contingent	
58A	80	LF	Saw Cutting Existing Non-Roadway Asphalt	For:	Contingent	
58RPC	2200	LF	Saw Cutting Existing Roadway Pavement & Concrete	For:	Contingent	
102D	300	DAY	Flashing Arrow Board	For:		
102PVMS	300	DAY	Portable Variable Message Sign	For:		
102X	100	DAY	Work Zone Traffic Control (Day)	For:		
102Y	30	DAY	Work Zone Traffic Control (Night)	For:		
111	1800	SY	Removal and Replacement of Pavements	For:		
112	80	EA	Adjusting Manholes	For:		
114	200	EA	Adjustment of Water Valve Box Elevation	For:		
115	4700	LF	Butt Joints	For:		

Department of Public Works Nassau County, N.Y.
Bid Sheets for Contract: H61587-PR16

Item No.	Engineers Estimate	Unit	Item Description	Unit Price Written in words		
116A	270000	SY	Profiling and Removal of Asphalt Pavement	For:		
116C	80	SY	Profiling and Removal of Concrete Pavement	For:	Contingent	
121	80	CY	Dry Bound Base Course	For:	Contingent	
122	2	EA	Test Holes	For:	Contingent	
129	20	CY	Cement Concrete For Pavement Repairs	For:	Contingent	
132	100	EA	Plowable Raised Reflectorized Pavement Markers	For:		
133A	355	LF	Cleaning and Resealing of Longitudinal Joints in Portland	For:	Contingent	
133B	80	LF	Sealing of Transverse Joints In Cement Concrete Pavement	For:	Contingent	
133XF	7000	LF	Clean and Fill Joints and Cracks	For:		
136S	20	DAY	Survey Stakeout (PER DAY)	For:		
137	825	LF	Remove Existing Traffic Markings	For:	Contingent	
138	530	SY	Asphalt Joint Repairs	For:	Contingent	
141B	185	EA	Silt Protection for Surface Inlet Drainage Structures	For:		
141C	185	EA	Silt Protection for Curb Inlet Drainage Structures	For:		
150	20	LF	Box Beam Guide Railing	For:	Contingent	
152	2	EA	Box Beam Guide Rail End Assembly	For:	Contingent	
199*	1	LS	Interim Payments (Force)	For: Two hundred thousand dollars and zero cents	$200,000.00	

Item No.	Engineers Estimate	Unit	Item Description	Unit Price Written in words		
199A*	1	LS	Asphalt Price Adjustment (Force)	For: Ten thousand dollars and zero cents	$10,000.00	
200	80	LF	Heavy Post, Plastic and Synthetic Blocked Out Galvanized Corrugated Steel Beam Guide Railing	For:	Contingent	
202	2	EA	Anchorage Units for Heavy Post Blocked Out Corrugated Beam Guide Railing for Driveways	For:	Contingent	
203	2	EA	Anchorage Units for Heavy Post Blocked Out Corrugated Beam Guide Railing for Highways	For:	Contingent	
216	80	LF	Removal of Existing Guide Rail	For:	Contingent	
368	840	SY	Topsoil and Grass Seed	For:		
372A	5	EA	TREE REMOVAL -A- (<6" Caliper)	For:	Contingent	
372B	5	EA	TREE REMOVAL -B- (6" - <12" Caliper)	For:	Contingent	
372C	5	EA	TREE REMOVAL -C- (12" - <24" Caliper)	For:	Contingent	
372D	5	EA	TREE REMOVAL -D- (24" - <36" Caliper)	For:	Contingent	
372E	2	EA	TREE REMOVAL -E- (36" - <48" Caliper)	For:	Contingent	
373A	5	EA	STUMP REMOVAL -A- (4" - <6" Diameter)	For:	Contingent	
373B	5	EA	STUMP REMOVAL -B- (6" - <12" Diameter)	For:	Contingent	
373C	5	EA	STUMP REMOVAL -C- (12" - <24" Diameter)	For:	Contingent	
373D	5	EA	STUMP REMOVAL -D- (24" - <36" Diameter)	For:	Contingent	

Item No.	Engineers Estimate	Unit	Item Description	Unit Price Written in words		
373E	2	EA	STUMP REMOVAL -E- (36" - <48" Diameter)	For:	Contingent	
374A	5	EA	STUMP GRINDING -A- (4" - <6" Diameter)	For:	Contingent	
374B	5	EA	STUMP GRINDING -B- (6" - <12" Diameter)	For:	Contingent	
374C	5	EA	STUMP GRINDING -C- (12" <24" Diameter)	For:	Contingent	
374D	2	EA	STUMP GRINDING -D- (24" <36" Diameter)	For:	Contingent	
419S-075	80	LF	Furnish and Install 3/4" Dia. Steel Conduit	For:	Contingent	
420R	5	EA	Regrade a Pullbox Frame and Cover	For:	Contingent	
422L	15900	LF	Furnish and Install Loop Wire	For:		
422LS	5300	LF	Furnish and Install Loop Saw Cut	For:		
422SHE	5	EA	Adjust Traffic Magnetic Vehicle Detector	For:	Contingent	
619.0901	168000	LF	Temporary Pavement Markings, Stripes, Traffic Paint	For:		
680.54	500	LF	Inductance Loop Installation	For:		
680.72	1500	LF	Inductance Loop Wire	For:		
685.072001NA	115000	LF	Highly Reflectorized White Epoxy Pavement Stripes – 20 mils (Triple Drop)	For:		
685.072002NA	105	EA	Highly Reflectorized White Epoxy Pavement Letters – 20 mils (Triple Drop)	For:		
685.072003NA	180	EA	Highly Reflectorized White Epoxy Pavement Symbols – 20 mils (Triple Drop)	For:		

Item No.	Engineers Estimate	Unit	Item Description	Unit Price Written in words		
685.072004NA	26500	LF	Highly Reflectorized White Epoxy Cross Hatching -20 mils (Triple Drop)	For:		
685.072005NA	39000	LF	Highly Reflectorized White Epoxy Pavement Stripes (Special Markings) 20 mils (Triple Drop)	For:		
685.072006NA	91000	LF	Highly Reflectorized Yellow Epoxy Pavement Stripes – 20 mils (Triple Drop)	For:		
685.072007NA	7100	LF	Highly Reflectorized Yellow Epoxy Pavement Stripes (Cross Hatching) 20 mils (Triple Drop)	For:		
744*	1	LS	Force Account Work	For: One hundred thousand dollars and zero cents	$100,000.00	
762	80	LB	INTEGRAL COLOR PIGMENT FOR CEMENT CONCRETE	For:	Contingent	
763	80	SF	IMPRINTING ON CONCRETE PAVEMENT OR SIDEWALK	For:	Contingent	

Nassau County Priority Resurfacing – Phase 16
Nassau County, New York

CONTRACT NO. H61587-PR16

SPECIAL PROVISIONS

1. An approved set of plans will be provided to the contractor for each work order showing the limits and scope of work. Work order will note time of completion. Extension of time will only be granted for each work order if requested with proper reason acceptable to the Commissioner.

2. The contractor is alerted that several work orders may be issued at the same time and work shall be performed concurrently.

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Addenda Notes and Modification to the Nassau County Specifications

NOTE: Where a standard Nassau County item has been modified for use under this agreement for payment purposes all the provisions of the standard item will apply unless indicated otherwise herein.

ITEM 1X - CLEARING AND GRUBBING

Please refer to Item No. 1 of the Nassau County Standard Specifications (2009)

(except for C and D).

C. Method of Measurement.

The quantity to be paid for under this item will be the number of square yards of clearing and grubbing provided in accordance with the Plans and Specifications as determined by the Engineer.

D. Basis of Payment.

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

ITEM 12H-X – CLEANING EXISTING DRAINAGE SYSTEM CATCH BASIN

All the provisions of Item 12H, "Cleaning Existing Drainage System" shall apply with the following modifications and/or additions:

1. Description

Under this Item the Contractor shall clean existing catch basins and surface inlets where shown on the Plans and/or as directed by the Engineer.

2. Construction Details

The existing catch basins and/or surface inlets shall be cleaned by removing all debris to the bottom of the basin. Special care shall be taken not to undermine the walls of the structures.

The removal of asphalt pavement from the asphalt removal and asphalt paving operations shall not be included in this Item. The Contractor will be required to remove this asphalt debris at his own expense.

3. Method of Measurement

The quantity to be paid for will be the number of each catch basin and surface inlet cleaned in accordance with the Plans and Specifications.

No payment will be made for asphalt material that went into the basins from the asphalt removal and/or asphalt pavement operation and this material must be removed at the Contractor's own expense.

4. Basis of Payment

The unit price bid for this item shall include the cost of furnishing all labor.

ITEM 16X - ALTERING BRICK MANHOLES

All the provisions of Item 16A, 16B & 16C of the County of Nassau Department of Public Works 2009 Standard Specifications and Detail Sheets for Civil Engineering and Site Development Construction, as currently revised, shall apply with the following modifications and/or additions:

The contractor will adjust municipality owned electric pull boxes and manholes under Item 16X-Adjusting Manholes.

A. Description

a. A 7' x 7' square area shall be saw cut full depth in the existing pavement around each manhole casting that is to be adjusted, thus allowing approximately two feet of space for the use of a plate tamper on the new base asphalt. In the event a transverse or longitudinal joint in the concrete pavement is encountered, a minimum of six feet of pavement must remain, otherwise the Item 111 limit will be the joint.

b. All loose brick and mortar under the casting must be removed and replaced before any new material is used.

c. Final adjustment will be made with use of metal or solid plastic shims and quick set mortar.

d. Surface inlets that cannot be adjusted with inserts will be done as indicated above.

B. Method of Measurement

The number of manholes to be paid for under this item will be the number altered in accordance with the Plans and Structure Sheet, as specified herein and ordered by the Engineer

C. Basis of Payment

The unit price bid shall include the cost of all labor, material and equipment necessary to complete the work except new head-frame castings, metal covers and all other metals furnished and installed as ordered by the Engineer will be paid for under Item 34 – Miscellaneous Metal

ITEM 36CX – ASPHALT CONCRETE TRUING AND LEVELING COURSE TYPE 1A (FOR CRACKS IN ASPHALT PAVEMENT)

All provisions of Item 36C, "Asphalt Concrete Truing and Leveling Course Type 1A" shall apply with the following modifications and/or additions:

A. Description

This item will be utilized to fill all joints and cracks greater than one-inch (1") in the existing pavement, as outlined in Item 107, Cleaning, Filling & Sealing Existing Joints & Cracks in Asphalt Pavement.

ITEM 102X – WORK ZONE TRAFFIC CONTROL (Day)

ITEM 102Y – WORK ZONE TRAFFIC CONTROL (Night)

A. Description

The Standard Specifications for Item 102 shall apply with the following modifications:

During night time operations, the contractor shall supply portable lights, on the road and equipment in order to satisfactorily light up the work area A.O.B.E.

B. Method of Measurement and Basis of Payment

Measurement and payment under this item will be made on a per day/night Basis.

ITEM 133XF – CLEAN AND FILL JOINTS AND CRACKS

All the provisions of Item 133, "Clean and Fill Joints and Cracks" of the NCDPW2009 Standard Specifications and as amended shall apply with the following modifications:

1. Description

Under this Item the Contractor shall clean, seal and fill all joints and cracks ¼" to 1" wide in the existing pavement prior to resurfacing as shown on the Plans and/or as directed by the Engineer.

2. Materials

a. The materials shall conform to the requirements listed below and shall be mixed to a mortar consistency, Mortar Sand – M3A. CATONIC ASPHALT EMULSION Tests on Emulsion.

	Min.	Max.
Viscosity, Saybolt Furol, 77F (25C), Sec	20	100
Viscosity, Saybolt Furol, 122F (50C), Sec	-	-
Storage Stability Test, 1 Day (Difference in percent Residue)	-	1
Stone Coating Test	-	-
Particle Charge Test	Positive Note 1	
Sieve Test, percent	-	0.10
Cement Mixing Test (percent)	-	2.0
Residue by Distillation, percent	57	-
Oil Distillate, Volume Total Emulsion, percent	-	-

b. Tests on Residue from Distillation Test

	Min.	Max.
Penetration, 77F (25C), 100g, 5 sec	40	90

c. Tests on Asphalt Base for Emulsion

	Min.	Max.
Penetration, 77F (25C), 100g, 5 sec	60	100
Solubility in trichloroethylene, percent	99.0	-
Dutility, 77F (25C) 5 cm/min, cm	50	-
Flash Point, degrees F	435	-
Flash Point, degrees C	225	-

d. Suggested Temperature Range

	Min.	Max.
Mixing, degrees F	75	150
Mixing, degrees C	24	66
Spraying, degrees F	75	150
Spraying, degrees C	24	66

e. Note: If the Particle Charge Test result is inconclusive, material having a maximum pH value of 6.7 will be acceptable.

3. Construction Details

All unsealed and inadequately sealed joints and cracks, as determined by the Engineer, shall be subjected to a compressed air stream of at least 80 psig measured at the source. Joints and cracks in the pavement as designed by the Engineer, shall be cleaned of all dirt and loose material holding the cleaning jet 1-inch (1") above the pavement surface. Old joint and crack sealer remaining after such cleaning operation need not be removed. The cracks shall be kept clean until the sealing, filling and paving operations are completed.

Joints and cracks in the existing pavement from one-quarter-inch (1/4") to one-inch (1") wide shall be sealed with a bituminous material meeting the above requirements. This work shall be completed at least 24 hours but not more than two weeks in advance of the paving operations.

4. Method of Measurement

This work will be measured by the number of **linear feet** of joints sealed.

5. Basis of Payment

The amount bid for this Item shall include the cost of furnishing all labor, materials, tools, equipment and incidentals necessary to satisfactorily complete the required work. **Asphalt used to fill cracks and/or joints greater than one-inch (1") shall be paid under Item 36CX, "Asphalt Concrete Type 1A Truing and Leveling."**

ITEM 136S - SURVEY STAKEOUT (PER DAY)

A. Description.

1. Under this Item the Contractor shall do all necessary surveying required to construct all elements of the Project as shown on the Plans and Specifications and as ordered by the Engineer. This shall include, but shall not be limited to, stakeout, layout and elevations for the highway, structures and forms as shown and required, consistent with the current practices of the County and shall be performed by competently qualified personnel acceptable to the Commissioner of Public Works.

B. Materials.

1. All instruments, equipment, stakes and any other material necessary to perform the work satisfactorily, shall be provided by the Contractor. All stakes used shall be of a type approved by the Engineer. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times.

C. Construction Details.

1. The Contractor shall trim trees, brush and other interfering objects, not inconsistent with the Plans, from survey lines in advance of all survey work to permit accurate and unimpeded work by the Contractor's stakeout survey crews and the County's cross-section survey crews.
2. The exact position of all work shall be established from control points, baseline transit points or other points of similar nature which are shown on the Plans and/or modified by the Engineer. Any error, apparent discrepancy or absence in or of data shown or required for accurately accomplishing the stakeout survey shall be referred to the Engineer for interpretation or furnishing when such is observed or required.
3. The Contractor shall place two offset stakes or references at each centerline or theoretical grade line control point (PC, PT, and/or Angle Point), henceforth called centerline, and at such intermediate locations as the Engineer may direct. From computations and measurements made by the Contractor, these stakes shall be clearly and legibly marked with the correct centerline station and offset distance so as to permit the establishment of the exact centerline location during construction. If markings become faded or blurred for any reason, the markings shall be restored by the Contractor and at the request of the Engineer.
4. The Contractor shall locate and place all cut, fill, slope, fine grade or other stakes and points, as the Engineer may direct for the proper progress of the work. All control points shall be properly guarded and flagged for easy identification.
5. Drainage structures shall be staked out by the Contractor at the locations and elevations shown on the Plans or specified by the Engineer. All required Rights-of-Way and easement limits shall be established, staked and referenced by the Contractor concurrent with the construction stakeout survey. Rights-of-Way and easement limits shall be staked by or under the direction of a Licensed Land Surveyor or exempt Professional Engineer approved by the Commissioner of Public Works. The Contractor shall supply proof to the Engineer that such work is being performed by or supervised by a Licensed Land Surveyor or exempt Professional Engineer.

6. The Contractor shall be responsible for the accuracy of the work of this Item and shall maintain all reference points, stakes, etc. throughout the life of the contract. Damaged or destroyed points, bench marks or stakes, or any reference points made inaccessible by the progress of the construction shall be replaced or transferred by the Contractor. Any of the above points that may be destroyed or damaged shall be transferred by the Contractor before such damage or destruction occurs. All control points shall be referenced by ties to acceptable objects and recorded. Any alterations or revisions in the ties shall be so noted and the information furnished to the Engineer immediately. All stakeout survey work shall be referenced to the centerline shown on the Plans.
7. All computations necessary to establish the exact position of the work from control points, shall be made and preserved by the Contractor. All computations, survey notes and other records necessary to accomplish the work shall be neatly made. Such computations, survey notes and other records shall be made available to the Engineer upon request and shall become the property of the County and delivered to the Engineer not later than the date of acceptance of the contract.
8. The Engineer may check all or any portion of the stakeout survey work or notes made by the Contractor. Any necessary correction to the work shall be made immediately by the Contractor at no cost to the County. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work.
9. The Contractor will not be permitted to take preconstruction and/or final cross-sections to be used for payment purposes.
10. During the progress of the construction work, the Contractor will be required to furnish all of the surveying and stakeout incidental to the proper location by line and grade for each phase of the work. For paving and any other operation requiring extreme accuracy, the Contractor will re-stake with pins or other acceptable hubs located directly adjacent to the work at a spacing directed by the Engineer. Fills required to pave intermediate courses of asphalt shall be painted on the existing pavement, all dimensions referring to finished grade.
11. Any existing stakes, iron pins, survey monuments or other markers defining current or existing property lines that may be disturbed during construction shall be properly tied into fixed reference points before being disturbed and accurately reset in their proper position upon completion of the work.
12. Upon the completion of construction, after all possibility of disturbance is past, the Contractor shall reestablish, layout and retie the centerline control points with a minimum of four ties per control point, as permanently as possible with drill holes and wings in concrete curbs and sidewalks and PK nails in asphalt pavement to the satisfaction of the Engineer. The contractor shall supply a drawing of each of the above noted control points, including, but not limited to: Station, type of point (PK nail, drill hole excreta), coordinates in the same system used by the County on the project plans, and 4 ties, with the distance measured and recorded to 0.01, to the described tie points. Survey notes signed and stamped by a New York State Licensed Land Surveyor showing the station and description of the control points, and the location and description of the ties shall be furnished to the Engineer, in a drawing size to be agreed to before final submittal.

D. Method of Measurement and Basis of Payment.

1. The price bid for this item will be made on a daily (8hrs/day) basis and shall include the cost of furnishing all labor, equipment, instruments, materials and other incidentals necessary to satisfactorily complete the required project including, but not limited to, surveying, stakeout and retie of the control points. Daily unit price rate shall be prorated for less than 8 hrs of survey work in a day, as determined by the Engineer.

ITEM 150 - BOX BEAM GUIDE RAILING
ITEM 151 - BOX BEAM MEDIAN BARRIER

A. Description.

1. Under this item, the Contractor shall furnish and install galvanized steel box beam guide railing and median barrier in accordance with the plans, specifications and as ordered by the Engineer.

B. Materials.

1. **Rails.**
   a. Rails shall be cold-formed welded and seamless structural tubing. Posts shall be American Standard Beam Section. The posts, splice tongues and plates shall conform to ASTM A36, Structural Steel. The rails shall conform to ASTM A500, Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes, Grade B, except as modified below.
   b. All rail shall be tested in accordance with ASTM E436 ¬ Standard Method for Drop-weight tear tests of Ferritic steels; except as modified below.
   c. The tests shall be done after all galvanizing and associated operations have been performed on the rail. The testing shall be conducted at a temperature of -18 Degrees C. without removing the galvanizing, on 2" X 9" specimens supported to achieve a 7" span.
   d. The percent shear area will be determined by testing nine (9) specimens, three (3) from each of three (3) sides not containing a weld. The shear areas of the three specimens from the side with the lowest average shear area shall be disregarded and the final average based on the remaining six specimens. If the average percent shear area falls below 50, the material represented by these tests shall be rejected.
   e. To facilitate acceptance and rejection of material the manufacturer of the structural shape shall, before galvanizing, identify the product with the steel heat number, or some number which is traceable to the heat number, and his own unique identification code. The identification method shall be such that it can be read after the structural shape is galvanized. The identification information shall be placed on the structural shape at intervals not to exceed four feet.
   f. No mill transverse welds will be permitted on the rail sections. Longitudinal welds shall be made by the resistance, gas shielded arc, submerged arc or plasma arc welded process; shall be sound, free from defects, and shall not be repaired. The welded joint, in cold-formed welded rail, shall have a minimum tensile strength specified for the railing when tested according to the tensile strap test of test of ASTM Method E8. Fabrication welding shall comply with the requirements set forth under "welding" in the N.Y.S. Steel Construction Manual.
   g. Rails shall be galvanized in accordance with 719-01 of the N.Y.S. Specifications Type I, Galvanized Coatings and Repair Methods. Slots and round holes may be Subsequently drilled, punched, burned, or cut and re-galvanized according to the paragraph below on "Re-galvanizing Iron and Steel Using a Flame Sprayed Coating System". This repair procedure shall also apply to curved rail sections and splice plates as required.
   h. Re-galvanizing Iron and Steel Using a Flame Sprayed Coated System
      1) Those areas to be sand blasted shall be blasted with silica sand or crushed garnet of such gradation that sand shall be mesh size 20 to 40 with a minimum of 40%

retained on a 30 mesh screen (U.S. Standard Sieve series). Pressure of not less than 75 psi shall be maintained at the blast generator.

2) A sample steel plate shall be blasted until the surface cannot be further cleaned or roughened. This plate shall be used for visual comparison and any areas that do not meet this standard as to roughness or cleanliness shall be re-blasted.
3) The wire used in spraying shall be 15 gauge 1/8" or 3/16" diameter, zinc 99.0% purity. Air pressure at the Air Control Unit shall be 60 psi and there shall be no more than 35 feet of 3/8" I.D. hose between the Air Control Unit and the gun.
4) The metal coating shall be applied at a minimum thickness of .0045". At least one coating shall be applied within 4 hours of blasting and the surface must be completely coated within 8 hours of blasting.
5) The specified thickness of coating shall be applied in multiple layers and in no case shall less than two passes be made over every part of the surface.

2. **Posts.**
   a. The posts, splice tongues, plates and all hardware shall be fabricated and ready for assembly before galvanizing. The posts, splice tongues and plates shall be galvanized in accordance with 719-01, of the N.Y.S. Specifications, Type I, Galvanized Coatings and Repair Methods. Hardware shall be galvanized in accordance with 719-01 of the N.Y.S. Specifications Type II, Galvanized Coatings and Repair Methods.

3. **Bolts.**
   a. Bolts and nuts shall conform to ANSI B 18.2.1 and B 18.2.2, and washers shall conform to ANSI B 18.22.1.

C. Construction Details.

1. Posts and rails shall be erected in the position and manner indicated on the plans as ordered by the Engineer.

   a. Rail sections shall be at least 18'-0" in length, and rail splices shall be a minimum of 18" from the centerline of any beam slot.
   b. Necessary precautions shall be taken by the Contractor that all utilities and structures are safeguarded against damage. Damage incurred shall be satisfactorily repaired by the Contractor at no expense to the County.
   c. Box-beam barrier shall be continuous at all entrance walks. Where a post location fails within the limits of a concrete walk, the concrete shall be neatly removed as directed by the Engineer and legally disposed of. The area shall then be restored to conform to the adjoining area.
   d. Unpaved Shoulders - Posts shall be driven in all cases where driving is feasible. The driving shall be accomplished with approved methods and equipment that will leave the posts in their final position, free of any distortion, burring or any other damage.

D. Method of Measurement.

1. The quantity of guide railing or median barrier measured for payment will be the number linear feet measured along the axis of the railing and between its extreme outer limits as shown on the plans and/or Standard Sheets or as directed by the Engineer. If shop curved guide railing or median barrier is specifically called for in the Contract Plans and Proposal, the quantity of guide railing or median barrier shall be the number of linear feet measured

along the axis of the curved railing between the point of beginning of curvature and the point of ending of curvature as defined by the Engineer. If the railing is anchored to a structure instead of an anchorage unit or end assembly unit, the railing will be measured up to the structure.

a. Where curved guide railing or median barrier is specifically called for on the Contract Plans or ordered in writing by the Engineer and no provision for such curved beam railing is included in the contract proposal, the quantity of railing measured for payment will be as described above plus an additional allowance of 33 1/3% of the curved lengths at a factor of 1.0 measured along the horizontal centerline of the beam. Curved beam guide railing or median barrier is defined as that which will require shop working to attain the required curvature and not that curvature which may be attained by springing or bending in the field.

E. Basis of Payment.

1. The unit price bid per linear foot for the above work shall include the cost of all labor, equipment and material necessary to complete the work, including all costs necessary to attain the required curvature
2. Payment for guide rail and median barrier shall include the unit price bid and the measured quantity multiplied by the payment factor for the various typical post spacing listed in Table I.
3. When posts are driven through Asphalt Concrete or Bituminous treated material, any repairs to damaged paved or treated areas shall be at the Contractor's expense.
4. Progress payments will be made when the metal railing and/or metal barrier is erected in the position and manner indicated on the Standard Sheets and in a manner approved by the Engineer, exclusive of bituminous repair and final alignment. Payment will be made, at the unit price bid, for 90% of the quantity erected. The balance of the quantity erected will be paid for upon proper repair to the bituminous surfaces and alignment of the metal railing and/or metal barrier to the specified tolerances.

ITEM 152 - BOX BEAM GUIDE RAIL END ASSEMBLY
ITEM 153 - BOX BEAM MEDIAN BARRIER END ASSEMBLY-TYPE A OR B

A. Description.

Under this item, the Contractor shall furnish and place galvanized steel box beam guide rail and median barrier end assemblies in accordance with the Plans, Specifications, the Standard Sheet and as ordered by the Engineer.

B. Materials.

All material shall conform to the material requirements of Item 150 and shall consist of the box beam, accessory hardware, complete deadman in place, the necessary excavation and backfill, all as detailed on the Plans and/or Standard Sheet.

C. Construction Details.

End assemblies shall be installed as shown on the Plans and/or the Standard Sheet and as ordered by the Engineer.

D. Method of Measurement.

The quantity of end assembly units to be paid for will be the actual number of units installed in accordance with the Plans, Standard Sheets and/or as directed by the Engineer.

E. Basis of Payment.

The unit price bid for each end assembly unit shall include the cost of furnishing all labor, materials and equipment necessary to complete the work including the necessary concrete, excavation and backfill.

ITEM 200 - HEAVY POST, PLASTIC AND SYNTHETIC BLOCKED OUT GALVANIZED CORRUGATED STEEL BEAM GUIDE RAILING

A. Description.

1. Under this Item the Contract shall furnish and install heavy steel post, plastic and synthetic blocked out galvanized steel beam guide railing as shown on the Plans in accordance with the Specifications and/or ordered by the Engineer.

B. Construction Details.

1. General. Posts and railing shall be erected in the position and manner indicated on the Plans and Standard Sheets and in a manner approved by the Engineer.
2. Posts shall be driven unless otherwise specified by the Engineer. The driving shall be accomplished with approved equipment and methods that will leave the posts in their final position, free of any distortion, burring or other damage.
3. When posts are driven through asphalt concrete or a bituminous treated material, the Contractor shall take care to prevent damage to the paved or treated areas. Large holes and voids caused by driving the posts shall be filled and compacted with a bituminous treated material or asphalt concrete similar to that damaged. The small area adjacent to the post disturbed during installation or where gaps exist at the post after pavement repairs shall be sealed with a bituminous material approved by the Engineer, at no cost to the County.

C. Materials.

1. Beams, Posts, Sections and Accessory Hardware.
   a. Beams and terminal sections shall be fabricated as shown on the plans. When beams and terminal sections are galvanized by the hot-dip method in accordance with ASTM A123, they shall be blanked to the proper shape, fabricated and ready for assembly before galvanizing. No punching, drilling, cutting or welding will be permitted after galvanizing. Bolt holes in the beam at the post bolt and elsewhere as necessary shall be enlarged or slotted to permit expansion and contraction and to facilitate erection. The beams shall be straight unless otherwise required by the plans or specifications and of uniform section. The edges shall be rolled to eliminate sharp edges.
   b. Beams and terminal sections shall be made from 12 gauge or heavier sheet. Beams, terminal sections, SL and SH posts shall be rolled from new billet open hearth, electric furnace or basic oxygen steel. All connections or splices shall be made with flat, round-headed galvanized bolts and galvanized nuts conforming to ASTM Designation A307 and as shown on the plans.
   c. Strength. The minimum yield point and elongation of steel used in the manufacture of beam and terminal sections shall be 50,000 psi and 12% in 2” gage length respectively.
   d. Galvanizing.
   e. Beams and terminal sections shall be galvanized in accordance with ASTM A 123. Bolts, nuts and washers shall be galvanized in accordance with ASTM A 153.
      1) As an alternative to ASTM123 galvanizing beam guide rail and terminal sections may be galvanized by a process or system of continuous galvanizing substantially in

conformance with ASTM A525 except the minimum check limits for the weight of coating as determined by the triple post and single spot tests shall be 4.0 and 3.0 ounces per square foot respectively (total amount both sides of sheet).

2) All the requirements for beam and terminal sections as stated herein shall apply to this continuous galvanizing method except sampling, shop inspection and test procedures shall be as directed by the Laboratory.

2. The posts shall be as detailed on the Standard Structure Sheet for guide railing.
   a. SL Posts shall conform to ASTM A 245, Grade C.
   b. SH Posts shall conform to ASTM A36.
   c. WF and I Beam Posts shall conform to ASTM A36
   d. The above posts shall be galvanized in accordance with ASTM A 123.
   e. No posts shall be installed without the prior approval of the Chief Engineer.
3. Hardware. All post connection bolts shall be in conformance with ASTM A 307 and details shown on the plans and shall be galvanized in accordance with ASTM A 153.
4. Plastic and Synthetic Block-Outs. The plastic and synthetic material block-outs are used to provide a uniform offset distance from the corrugated beam rail to the heavy post. The block-out shall have the same general dimensions as detailed in the Department Standard Sheets. The block-out shall not contain excessive voids that would compromise its physical strength. The material shall be designated for outdoor exposure and shall include chemical additives to resist UV degradation. If the product contains recycled materials, they shall be environmentally friendly and non-hazardous. Blocks shall contain no materials that will negatively affect their field performance, such as materials that absorb moisture.
5. Certification. When shop inspection is not provided, each shipment of guide rail to a project site shall be accompanied by a certificate of chemical analysis and physical tests for the heat of base metal used in fabricating beams, SL and SH posts and terminal sections as well as a certificate of compliance with the galvanizing requirements of this specification.

D. Method of Measurement.

1. The quantity of heavy steel post, plastic and synthetic blocked out galvanized steel beam guide railing to be paid for under this Item shall be the number of linear feet center to center of end posts furnished and installed in accordance with these specifications, the plans and the orders of the Engineer.
2. An allowance of 4 linear feet will be paid for each end terminal section.
3. Where curved beam type guide railing is specifically called for on the plans or ordered in writing by the Engineer and no special item for such curved beam type guide railing is included in the contract proposal, the quantity of guide railing to be paid for will be as described above plus an additional allowance of 33-1/3% of the curved lengths measured along the horizontal center line of "valley" of the beam. Curved Beam Type Guide Railing is defined as that which will require shop working to attain the required curvature. Railing curved by springing in the field is not to be considered as Curved Beam Type Guide Railing.

E. Basis of Payment.

1. The unit price bid per linear foot shall include the cost of all labor, equipment and material necessary to satisfactorily complete the work, including all costs to attain the required curvature. Payment for guide rail shall include the unit price bid and the measured quantity multiplied by the payment factor for various typical post spacing and lengths listed below.

PAYMENT FACTORS FOR POST SPACING

Post Spacing	Post Length	Payment Factor
6'-3"	5'-6"	1.0
6'-3"	7'-0"	1.3
3'-1 1/2"	5'-6"	1.8
3'-1 1/2"	7'-0"	2.3
1'-6"	7'-0"	3.3

ITEM 202 - ANCHORAGE UNITS FOR HEAVY POST BLOCKED OUT CORRUGATED BEAM GUIDE RAILING FOR DRIVEWAYS
ITEM 203 - ANCHORAGE UNITS FOR HEAVY POST BLOCKED OUT CORRUGATED BEAM GUIDE RAILING FOR HIGHWAYS

A. Description.

Under this item the Contractor shall furnish and install anchorage units for heavy post blocked out corrugated beam guide railing in accordance with the Plans, Specifications and as ordered by the Engineer.

B. Materials.

The materials shall conform to the material requirements of Item 35BO, Heavy Post, Plastic and Synthetic Block-Out Galvanized Corrugated Steel Beam Guide Railing, M6 Structural Steel, M17 Bar Reinforcement for Cement Concrete. Concrete shall meet the requirements of Class A Concrete for structures. All steel shall be galvanized in accordance with ASTM A 123.

C. Construction Details.

1. WF Beam Posts shall be driven, unless otherwise specified by the Engineer, by approved methods and equipment that will leave the posts in their final position, free of any distortion, burring or other damage.
2. When posts for guide railing are to be driven through asphalt or adjacent to a stabilized shoulder course, extreme care shall be taken to prevent damage to the paved or shoulder course. Large holes and voids caused by driving the posts shall be filled and compacted with a bituminous treated material or asphalt concrete similar to that damaged. The small area adjacent to the post disturbed during installation or where gaps exist at the post after pavement repairs shall be sealed with a bituminous material approved by the Engineer, at no cost to the County.

D. Method of Measurement.

1. Anchorage units will be measured by the actual number of anchorage units installed in accordance with the Plans, Specifications or as directed by the Engineer

E. Basis of Payment.

1. The unit price bid for each anchorage unit shall include the cost of furnishing all labor, materials, equipment and incidentals as necessary to satisfactorily complete the work.

ITEM 216 - REMOVAL OF EXISTING GUIDE RAIL

A. Description.

1. Under this item the Contractor shall remove existing guide rail where and as shown on the plans and/or as ordered by the Engineer.

B. Removal Details.

1. The Contractor shall remove the existing guide rail, posts, bolts, nuts, washers, and concrete footings, etc., and deliver to a designated County maintenance garage or dispose of as ordered by the Engineer.

C. Method of Measurement.

1. The quantity to be paid for under this item will be the number of linear feet measured prior to the removal of the existing guide rail.

D. Basis of Payment.

1. The price bid per linear foot of removal shall include the cost of all labor, equipment, tools, storage delivery and/or disposal of the guide railing including the filling in of any voids.

ITEM 685.0720XXNA – HIGHLY REFLECTORIZED EPOXY PAVEMENT MARKINGS, 20 MILS (TRIPLE DROP)

DESCRIPTION:

Under this work the contractor shall furnish and apply highly reflectorized epoxy pavement markings in accordance with these specifications, the Contract Documents, the MUTCD with the NYS Supplement, or as ordered by the Engineer.

Items for Special Markings include stop bars and crosswalks.
Yield line symbols are isosceles triangles with height equaling 1.5 times the base dimension:

- A small yield line symbol shall have a base dimension of one foot.
- A large yield line symbol shall have a base dimension of two feet.
- Yield line symbols are to be installed with the Apex of the triangle oriented towards oncoming traffic.

The epoxy marking material shall be hot-applied by spray methods onto bituminous and portland cement concrete pavement surfaces at the thickness and width shown on the Contract Documents. The triple drop system shall consist of a combination of highly reflective composite optics, defined as a structural center core surrounded by high index microcrystalline ceramic beads, wet/night visibility beads, and standard glass beads. The cured epoxy marking shall be an adherent, highly reflectorized stripe that will provide wet night retro-reflectivity.

MATERIALS REQUIREMENTS:

White and Yellow Epoxy Reflectorized Pavement Markings	727-03
Glass Beads for Pavement Markings	727-05

Microcrystalline Ceramic Beads. The Microcrystalline Ceramic Beads must meet the following requirements:

- Composed of highly reflective particles having a structural center core surrounded by high refractive index microcrystalline ceramic beads and designed to be applied to epoxy pavement marking paint.
- Refractive index of 2.30 minimum when tested using the liquid oil immersion method.
- Either white or yellow tinted as required.
- Appearance in Table 1, below or approved equal.

TABLE 1

Product Name	Manufacturer Location
3M Series 70E-White 3M Series 71E-Yellow	3M Traffic Control Materials Division Brownwood, TX

Packaging and Shipment. Shipped and packaged in accordance with commercially accepted standards. Clearly display the name of the product, the name and address of the manufacturer, the quantity of material, the date of manufacture, and the date of expiration or the shelf life, on each container or on the shipping invoice.

ITEM 685.0720XXNA – HIGHLY REFLECTORIZED EPOXY PAVEMENT MARKINGS, 20 MILS (TRIPLE DROP)

Basis of Approval. Approvals will be based upon independent lab analysis and field testing in accordance to this specification and Department directives. The Contractor shall submit independent lab analysis to Director of Materials and arrange for field testing through the General Engineering Section of the Materials Bureau. If the product passes the requirements of this specification, it will be added to the Department's Approved List.

Basis of Acceptance. Epoxy Paint and Glass Beads for Pavement markings will be accepted on the basis of the appearance of the product on the Department's Approved List. Wet-Night Reflective Elements will be accepted based on manufacturer's certification that the product meets the requirements of this specification.

EPOXY PAINT APPLICATION EQUIPMENT

In general, a mobile applicator shall be a truck mounted, self-contained pavement marking machine, specifically designed to apply epoxy resin materials and reflective glass spheres in continuous line patterns. The applicating equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of cross hatching and other special patterns as directed by the Engineer.

At any time throughout the duration of the project, the Contractor shall provide free access to his epoxy applicating equipment for inspection by the Engineer or his authorized representative.

The Engineer may approve the use of a portable applicator in lieu of mobile truck mounted accessories for use in applying special markings only, provided such equipment can demonstrate satisfactory application of reflectorized epoxy markings in accordance with these specifications.

Mobile applicating equipment shall be capable of installing up to 19 miles of epoxy reflectorized pavement markings in an eight hour day and shall include the following features:

1. Individual tanks for the storage of Part A and Part B of the epoxy resin.

2. Individual tanks for the storage of Standard Glass beads, Wet-Night Visibility Spheres, and Microcrystalline Ceramic Beads. Each tank shall have a minimum capacity of 3000 lbs.

3. Heating equipment of sufficient capacity to maintain the individual epoxy resin components at the manufacturer's recommended temperature for spray application.

4. Individual dispensers for the simultaneous application of Standard Glass Beads, Wet-Night Visibility Spheres, and Microcrystalline Ceramic Beads.

5. Metering devices or pressure gauges on the proportioning pumps, positioned to be readily visible to the Engineer.

6. All necessary spray equipment, mixers, compressors, and other appurtenances for

the placement of epoxy reflectorized pavement markings in a simultaneous sequence of operations as described in the Construction Details of this specification.

CONSTRUCTION DETAILS

General

Before any pavement marking work is begun, contractor shall submit a schedule of operations for the approval of the Engineer.

At least five (5) days prior to the start or work, the Contractor shall provide the Engineer with the manufacturer's written instructions for:

- Applying epoxy paint with Microcrystalline Ceramic Beads including but not be limited to, material mixing ratios and application temperatures

The Contractor shall provide and retain an on site manufacturer's representative to provide guidance regarding construction methods, and oversight of Microcrystalline Ceramic Beads application. The services of the manufacturer's representative shall be retained by the Contractor until the release by the Engineer.

When pavement markings operations are carried out under traffic, the Contractor shall provide all necessary flags, markers, signs, etc. in accordance with the MUTCD to maintain and protect traffic, and to protect marking operations and the markings until thoroughly set as per manufacturer's procedures.

Epoxy Paint Application

Pavement markings shall be applied in the general direction of traffic. Applications against the direction of traffic flow shall not be allowed.

Atmospheric Conditions. Epoxy pavement markings shall only be applied during conditions of dry weather and on thoroughly dry pavement surfaces. At the time of installation, the pavement surface temperature shall be a minimum of 50^{o}F and the ambient temperature shall be a minimum of 50^{o}F and rising. The Engineer shall be the sole determiner as to when atmospheric conditions and pavement surface conditions are such to produce satisfactory results.

Surface Preparation. The Contractor shall clean all surfaces by air blasting to remove all loose residues. Include power brooming or manual brooming, if necessary, to remove all loose residue. Make sure all pavement surfaces are free of oil, dirt, dust, grease, salt, and similar foreign materials at the time of application. The cost of cleaning these contaminants shall be included in the bid price of this item. If water blasting is used, allow the surface to thoroughly dry to the satisfaction of the Engineer, before application of any epoxy paint.

Application of Epoxy Reflectorized Pavement Markings

ITEM 685.0720XXNA – HIGHLY REFLECTORIZED EPOXY PAVEMENT MARKINGS, 20 MILS (TRIPLE DROP)

Epoxy reflectorized pavement markings shall be applied at the width, thickness, and pattern designated in the Contract Documents.

New PCC Surfaces: Do not apply permanent epoxy pavement markings on new PCC surfaces until at least 30 days after placement, or such time as determined by the Engineer, to allow adequate cure of the PCC.

New Asphalt Surfaces: Do not apply permanent epoxy pavement markings on new asphalt pavement surfaces until at least 14 days after placement.

Marking operations shall not begin until applicable surface preparation work is completed and approved by the Engineer, and the atmospheric conditions are acceptable to the Engineer.

Pavement markings shall be applied by the following simultaneous operation:

1. The pavement surface is air-blasted to remove dirt and residues.

2. The epoxy resin, mixed and heated in accordance with the manufacturer's recommendations, is uniformly hot-sprayed onto the pavement surface at the minimum specified thickness. Epoxy paint shall be applied at the wet film thickness specified in the contract documents.

3. Standard Glass Beads, Wet-Night Visibility Spheres, and Microcrystalline Ceramic Beads are injected into or dropped onto the liquid epoxy marking. The first drop shall be Microcrystalline Ceramic Beads at a rate per manufacturer's recommendation; the second drop shall be Wet-Night Visibility Spheres at a rate of 5 pounds per gallon; and the third drop shall be Standard Glass Beads at a rate of 8 pounds per gallon.

4. The Contractor shall be responsible for removing, to the satisfaction of the Engineer, all tracking marks, spilled epoxy, and epoxy markings applied in unauthorized areas**.**

Defective Epoxy Pavement Markings

Repair defective markings, as determined by the Engineer and at no additional cost to the County, as follows:

1. Repair Method for insufficient film thickness; insufficient line width; and inadequate Standard Glass Bead, Wet-Night Visibility Sphere, and Microcrystalline Ceramic Bead coverage and/or retention:

   Prepare the surface of the defective epoxy marking by grinding or blast cleaning. No other cleaning methods will be allowed. Surface preparation shall be performed to the extent that a substantial amount of the reflective glass spheres are removed and a roughened epoxy marking surface remains as determined by the Engineer.

   Remove loose particles and foreign debris by brooming or blasting with compressed air

just prior to reapplication of markings in accordance with this specification.

2. Repair Method for uncured or discolored epoxy and/or insufficient bond to pavement surface or existing durable marking:

   Uncured epoxy shall be defined as applied material that fails to cure (dry) in accordance with the requirements of §727-03 Epoxy Paint or applied material that fails to cure (dry) within a reasonable time period under actual field conditions, as defined by the Engineer.

   Discoloration shall be defined as localized areas or patches of brown, grayish or black colored epoxy marking material. These areas often occur in a cyclic pattern and often are not visible until several days or weeks after markings are applied.

   The defective epoxy marking shall be completely removed and cleaned to the underlying pavement surface in accordance with the requirements of Section 635 - Cleaning and Preparation of Pavement Surfaces, at the Contractor's expense.

   The extent of removal shall be the defective area plus any adjacent epoxy pavement marking material extending one meter in any direction.

   After surface preparation work is complete, repair shall be made by reapplying epoxy over the cleaned pavement surface in accordance with the requirements of this specification.

   Other defects not noted above, but determined by the Engineer to need repair, shall be repaired or replaced as directed by and to the satisfaction of the Engineer. All work in conjunction with the repair or replacement of defective epoxy reflectorized pavement markings shall be performed by the Contractor at no additional cost to the County.

METHOD OF MEASUREMENT

Pavement striping (regular lines, cross hatching and special markings) will be measured in feet along the centerline of the pavement stripe and will be based on a 4 inch wide stripe. Measurement for striping with a width greater than the basic 4 inches, as shown on the plans or directed by the Engineer, will be made by the following method:

$$\frac{\text{Plan Width of Striping (inches)}}{\text{Feet}} \times 4 \text{ inches}$$

This includes stripes 6 inches and wider, such as hatch lines, crosswalk bars and stop bars.

Letters and symbols will be measured by each unit applied. A unit will consist of one letter or one symbol. Example: “SCHOOL” would be paid as six units. Double and triple headed arrows will be measured as a single unit, but the “X” in railroad grade crossing markings (M.U.T.C.D. figure 8B-7) will be measured by linear feet of 4-inch stripe.

BASIS OF PAYMENT

ITEM 685.0720XXNA – HIGHLY REFLECTORIZED EPOXY PAVEMENT MARKINGS, 20 MILS (TRIPLE DROP)

The unit bid price, shall include all labor, materials, and equipment to complete the work including the cost of cleaning and waste disposal associated with the preparation, installation and application of epoxy paint with standard glass beads and Microcrystalline Ceramic Beads. The cost for maintaining and protecting traffic during the marking operations shall be included in the price bid.

No payment will be made for the repair or replacement of defective epoxy reflectorized pavement markings.

PAY ITEM NO.	***DESCRIPTION***	***PAY UNIT***
685.072001NA	Highly Reflectorized White Epoxy Pavement Stripes – 20 mils (Triple Drop)	Foot
685.072002NA	Highly Reflectorized White Epoxy Pavement Letters – 20 mils (Triple Drop)	Each
685.072003NA	Highly Reflectorized White Epoxy Pavement Symbols – 20 mils (Triple Drop)	Each
685.072004NA	Highly Reflectorized White Epoxy Cross Hatching -20 mils (Triple Drop)	Foot
685.072005NA	Highly Reflectorized White Epoxy Pavement Stripes (Special Markings) 20 mils (Triple Drop)	Foot
685.072006NA	Highly Reflectorized Yellow Epoxy Pavement Stripes – 20 mils (Triple Drop)	Foot
685.072007NA	Highly Reflectorized Yellow Epoxy Pavement Stripes (Cross Hatching) 20 mils (Triple Drop)	Foot
685.072008NA	Highly Reflectorized White Epoxy Pavement Yield Line Symbols - Small - 20 mils (Triple Drop)	Each
685.072009NA	Highly Reflectorized White Epoxy Pavement Yield Line Symbols - Large - 20 mils (Triple Drop)	Each

ITEM 744 - FORCE ACCOUNT WORK

A. Description.

1. The amount estimated for the work under this Item is approximate and may be less or greater than the amount of the force account work indicated on the bid sheets. The amount will be based on the Force Account Work actually performed during the term of the contract with prior written approval of the Commissioner.

2. The use of this Item will require prior authorization of the County for each individual Force Account Work to be performed under this contract.

B. Materials and Construction Details.

1. Materials incorporated into the force account work shall be approved by the Engineer prior to installation. When no applicable contract unit prices exist, material costs shall be reimbursed based upon acceptable receipts and/or invoices plus markup, as per the requirement of contract documents, and as approved by the Commissioner of Public Works.

C. Method of Measurement.

1. All Force Account work performed under this Item shall be either:

a. agreed upon unit price with backup

b. agreed upon lump sum cost with detailed backup

c. not to exceed agreed prices with detailed backup (final cost may be lower but will never exceed the agreed price)

d. on a Time and Material basis plus applicable overhead and profit as stipulated within the Contract Documents and will be inspected and measured by the Engineer on a daily basis and signed off by the Contractor.

D. Basis of Payment.

1. Under this Item, all provisions as incorporated in the Contract concerning payment for extra or additional work are applicable. Total payment for this Item is subject to the requirements and conditions of this contract.

2. The amount to be paid for each type of Force Account Work per work order shall be based (see Method of Measurement, Section C.1.) upon the actual work satisfactorily completed and/or materials/machines furnished and approved in accordance with the requirements of the Contract documents.

ITEM 762 - INTEGRAL COLOR PIGMENT FOR CEMENT CONCRETE

A. Description.

1. Under this item, the contractor shall furnish and mix color pigment into cement concrete at locations shown on the plans, or as directed by the Engineer.

B. Materials.

1. The pigment shall conform to "Integral Colors" as supplied by "Stampcrete International Ltd.", of Centereach, N.Y., or approved equal. The color to be used shall be as indicated on the plans or as directed by the Engineer.

C. Construction Details.

1. The pigment shall be added to, and thoroughly mixed into, the cement concrete prior to placement, to insure a consistent color throughout the concrete. Pigment shall be added at the rate of 12 pounds per cubic yard of concrete, or in accordance with the manufacturer's instructions, or as directed by the Engineer.

D. Method of Measurement.

1. The quantity to be paid under this item will be the number of pounds of pigment added to the cement concrete mix.

E. Basis of Payment.

1. The unit price bid shall include the cost of all labor, materials, and equipment necessary to complete the work, including cleaning residue of color pigment from the concrete truck. Imprinting and cement concrete will be paid for under their respective items.

ITEM 763 - IMPRINTING ON CONCRETE PAVEMENT OR SIDEWALK

A. Description.

1. Under this item the contractor shall modify the surface of newly placed cement concrete pavement or sidewalk to create a pattern as specified in the plans and/or as directed by the Engineer.

B. Construction Details.

1. Cement concrete pavement or sidewalk shall be placed at locations and dimensions shown on the plans and/or as directed by the Engineer, in accordance with Items No. 24, 27, 30, 32A, 32X and 7 as described in the Standard Specifications. At the appropriate time in the concrete curing process (as detailed in the specific treatment directions) the concrete surface shall be imprinted, stamped, or rolled such that the specified pattern is obtained. The contractor shall submit the recommended method of operation, containing dimensions of forms and/or rollers, timing of installation, and any other pertinent information to the Engineer for approval. Immediately after the surface finishing has been completed, the Impervious Membrane Method of curing shall be implemented, as detailed in the latest edition of the New York State Department of Transportation Standard Specifications.
2. Suppliers and/or Installers - Possible technology to complete this work is available from, but not limited to:
    a. Bomanite Corporation, P.O. Box 599, Madera, California 93639
    b. Quick Imprint Systems, P.O. Box 7, Goodman, Mo., 64850
    c. Stampcrete International Ltd., Centereach, N.Y., 11720

C. Method of Measurement.

1. The quantity to be paid under this item will be the number of square feet of imprinting on cement concrete pavement or sidewalk, in accordance with the plans and specifications, or as directed by the Engineer.

D. Basis of Payment.

1. The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials, equipment and incidentals necessary to complete the imprint work to the satisfaction of the Engineer. Cement concrete pavement or sidewalk will be for paid under their respective items.

SECTION 013560
SAFE AND HEALTHFUL WORKING CONDITIONS

PART 1 GENERAL

1.1 SUMMARY

A. This section describes the requirements for safe and healthful working conditions as an integral part of the project construction.

1.2 DEFINITION

A. Safety staff shall mean the safety professional and his/her safety representative(s) or the safety person.

1.3 GENERAL REQUIREMENTS

A. In prosecuting the work of this Contract, the Contractor shall provide working conditions on each operation that shall be as safe and healthful as the nature of that operation permits. The various operations connected with the work shall be so conducted that they will not be unsafe or injurious to health; and the Contractor shall comply with all regulations and published recommendations of the New York State Department of Labor and all provisions, regulations and recommendations issued pursuant to the Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and with laws, rules, and regulations of other authorities having jurisdiction, with regard to all matters relating to safe and healthful working conditions.

1. Compliance with governmental requirements is mandated by law and considered only a minimum level of safety performance.

2. All work shall also be performed in accordance with safe work practice, and contractor's Health and Safety Plan, as approved by the Construction Manager in writing.

B. The Contractor shall be responsible for the safety of the Contractor's employees, the public, and all other persons at or about the site of the work. The Contractor shall be solely responsible for the adequacy and safety of all construction methods, materials, equipment, and the safe prosecution of the work.

C. The Contractor shall employ a properly qualified safety professional familiar with all work under this contract whose duties shall be to initiate, review, and cause implementation of measures for the protection of health and prevention of accidents.

D. The safety staff shall be provided with an appropriate office on the job site to maintain and keep available safety records, up-to-date copies of all pertinent safety rules, regulations and governing legislation, material safety data sheets, and the site safety plan including information concerning foreseeable emergency conditions, location of emergency and telephone contacts for supportive actions.

E. The Contractor shall stop work whenever a work procedure or a condition at a work site is deemed unsafe by the safety staff.

1.5 SUBMITTALS

A. The Contractor shall submit a Health and Safety Plan (HASP), prepared prior to the start of any construction for acceptance by the CM, in writing.

1. The HASP shall be available to workers on site and be submitted to the Engineer and Owner at least two (2) weeks before the beginning of any field work.

2. Copies of the plan shall be provided to the Contractors' insurers and their risk managers, if any, by the Contractor.

B. Within thirty (30) days of receiving a "Notice to Proceed", the Contractor shall submit the name of a safety professional, employed by the Contractor, responsible for project safety management, and of the safety representative(s) who will work under his/her direction.

C. Documentation and/or personal references confirming the qualifications may also be required.

1. The persons proposed as a safety person, safety professional, or safety representative(s), may be rejected by the Engineer for failure to have adequate qualifications or other cause.

D. In addition, the Contractor shall submit the names, addresses, and telephone numbers of three (3) supervisory personnel who may be contacted in the event of an emergency occurring during non-working hours.

1.6 QUALIFICATIONS

A. Safety Professional:

1. Certification by the Board of Certified Safety Professional as a Certified Safety Professional.

2. Minimum of five (5) years of professional safety management experience in the types of construction and conditions expected to be encountered on the site.

B. Safety Person:

1. Qualifications of the safety person must include a minimum of five (5) years of relevant construction experience, two (2) years of which are related to safety management.

C. The Safety staff shall be completely experienced with OSHA requirements and knowledgeable of all applicable health and safety requirements of all governing laws, rules and regulations as well as of good safety practice. The safety staff shall not include the project manager, engineer, or superintendent, or anyone else working on the project. The safety staff shall have no other duties except those directly related to safety.

PART 2 PRODUCTS

2.1 HEALTH AND SAFETY PLAN

A. The Contractor shall commit to writing a specific site Health and Safety Plan before the start of any construction for acceptance by the Construction Manager.

2.2 ACCIDENT REPORTS

A. The Contractor shall promptly (within the hour of the incident) report to the Construction Manger all accidents involving injury to personnel or damage to equipment and structures, investigate these accidents and prepare a preliminary report and submit within twenty-four (24) hours of the accident. The Contractor must submit a final accident report to the Construction Manager as follows:

1. The summary report, due by the tenth (10^{th}) day of the incident, shall include descriptions of corrective actions to reduce the probability of similar accidents.

2. In addition, the Contractor shall furnish to the Engineer, a copy of all accident and health or safety hazard reports received from OSHA or any other government agency, within one (1) day of receipt, and attach the final plan.

B. In addition to the reports which the Contractor is required to file under the provisions of the Workman's Compensation Law, he/she shall submit to the Engineer on or before the tenth (10^{th}) day of each month, a report giving the total force employed on his/her Contract in man-days during the previous calendar month, the number and character of all accidents resulting in loss of time or considered reportable by OSHA, and any other information on classification of employees, injuries received on the work, and disabilities arising therefrom, that may be required by the Engineer.

1. The submittal shall also contain an audit report for the prior month, including the safety training conducted, the above equipment logs, records of the condition of the work areas, safety and health records, OSHA and ANSI Z16.1 incidence rates for frequency and severity of recordable accidents, and an evaluation of the effectiveness of the HASP with any changes necessary.

2. The safety professional or safety person and the Contractor shall sign this audit report. The Engineer will review these reports for Contractor's compliance with the safety provisions of the Contract.

2.3 SAFETY AND RESCUE EQUIPMENT

A. The Contractor shall have proper safety and rescue equipment, adequately maintained and readily available, for any foreseeable contingency. This equipment shall include such applicable items as: proper fire extinguishers, first aid supplies, safety ropes and harness, stretchers, water safety devices, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, combustible gas detectors, etc.

B. This equipment shall be kept in a protected area and checked at scheduled intervals. A log shall be maintained indicating who checked the equipment, when it was checked, and that it was acceptable. This equipment log shall be updated monthly and be submitted with the monthly report. Equipment that requires calibration shall have copies of dated calibration certificates on site.

C. Substitute safety and rescue equipment must be provided while primary equipment is being serviced or calibrated.

2.4 PROTECTIVE EQUIPMENT

A. All personnel employed by the Contractor or his subcontractors or any visitors whenever entering the job site shall be required to wear appropriate personal protection equipment required for that area. The Contractor shall provide all necessary personal protective equipment as requested by the Engineer for his/her designated representatives.

PART 3 EXECUTION

3.1 SAFETY STAFF DUTIES

A. The safety professional shall visit and audit all work areas as frequently as necessary (a minimum of once a week) and shall be available for consultation whenever necessary. The safety staff shall have full authority to implement and enforce the Health and Safety Plan to take immediate action to correct unsafe, hazardous, or unhealthful conditions.

B. A member of the safety staff must be at the job site full time (a minimum of eight (8) hours per working day) whenever work is in progress. When multiple shift work is in progress, more than one (1) safety representative may be required. The safety staff shall as a minimum:

1. Schedule safety training programs as required by law, the safety plan, and good safety practice. An outline of materials to be covered shall be provided with the safety plan. All employees shall be instructed on the recognition of hazards, observance of precautions, of the contents of the safety plan and the use of protective and emergency equipment.

2. Determine that operators of specific equipment are qualified by training and/or experience before they are allowed to operate such equipment.

3. Develop and implement emergency response procedures. Post the name, address, and hours of the nearest medical doctor; name and address of nearby clinics and hospitals, and the telephone numbers of the appropriate ambulance service, fire, and the police department.

4. Post all appropriate notices regarding safety and health regulations at locations which afford maximum exposure to all personnel at the job site.

5. Post appropriate instructions and warning signs in regard to all hazardous areas or conditions which cannot be eliminated. Identification of these areas shall be based on experience, on site surveillance, and severity of hazard. Such signs shall not be used in place of appropriate workplace controls. In order to alert the workers “Safety First” signs should be posted, as ordered by the Engineer at no extra cost.

6. Ascertain by personal inspection that all safety rules and regulations are enforced. Make inspections at least once a shift to ensure that all machines, tools, and equipment are in a safe operating condition, and that all work areas are free of hazards. Take necessary and timely corrective actions to eliminate all unsafe acts and/or conditions, and submit to the

Engineer each day, a copy of his/her findings on the inspection check list report forms established in the safety plan.

7. Submit to the Engineer, copies of all safety inspection reports and citations from regulating agencies and insurance companies within one (1) work day of receipt of such reports.

8. Provide safety training and orientation to authorized visitors to ensure their safety while occupying the job site.

9. Perform all related tasks necessary to achieve the highest degree of safety that the nature of the work permits.

3.2 MEASUREMENT OF PAYMENT

A. No separate payment for the article "Safe and Healthful Working Conditions" will be made. The costs of same will be included in the various bid items.

END OF SECTION 013560

(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	_____	Phone:	_____
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.