

Department of Public Works Nassau County, N.Y.

Bid Sheet for Contract: H61587-04Q

FOR INFORMATIONAL PURPOSES ONLY - DO NOT USE FOR BIDDING

Item No	Engineers Estimate	Item Description			
1X	50.00 SY	Clearing and Grubbing	For:		
2-A	100.00 CY	Unclassified Excavation (0 to 25 CY)	For:		
2-B	150.00 CY	Unclassified Excavation (26 to 100 CY)	For:		
2-C	200.00 CY	Unclassified Excavation (101 CY and over)	For:		
3-A	100.00 CY	Trench, Culvert and Bridge Excavation (0 to 25 CY)	For:		
3-B	150.00 CY	Trench, Culvert and Bridge Excavation (26 to 100 CY)	For:		
3-C	200.00 CY	Trench, Culvert and Bridge Excavation (101 CY and over)	For:		
4A	50.00 SY	Cement Concrete Breaking (Pavement)	For:		
4B	50.00 CY	Cement Concrete Breaking (Structures)	For:		
5B	20.00 CY	Borrow Fill	For:		
5C	100.00 CY	Selected Fill	For:		
6	50.00 CYM	Trucking	For:		
7	200.00 SY	Preparing Fine Grade	For:		
9	50.00 CY	Topsoil (Supplied)	For:		
9R	50.00 CY	Topsoil (Rehandled)	For:		

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Item No	Engineers Estimate	Item Description			
10A	50.00 SF	Temporary Sheetting and Bracing	For:		
10A-1	50.00 SF	Excavation Protection System	For:		
12A-4-12	20.00 LF	Reinforced Concrete Pipe Class IV, 12 Inch Diameter	For:		
12A-4-15	20.00 LF	Reinforced Concrete Pipe Class IV, 15 Inch Diameter	For:		
12A-4-18	20.00 LF	Reinforced Concrete Pipe Class IV, 18 Inch Diameter	For:		
12A-4-24	20.00 LF	Reinforced Concrete Pipe Class IV, 24 Inch Diameter	For:		
12A-4-30	20.00 LF	Reinforced Concrete Pipe Class IV, 30 Inch Diameter	For:		
12A-4-36	20.00 LF	Reinforced Concrete Pipe Class IV, 36 Inch Diameter	For:		
12B-12	2.00 EA	Reinforced Concrete Pipe End Section- 12" Diameter	For:		
12B-15	2.00 EA	Reinforced Concrete Pipe End Sections - 15" Diameter	For:		
12B-18	2.00 EA	Reinforced Concrete Pipe End Sections - 18" Diameter	For:		
12B-24	2.00 EA	Reinforced Concrete Pipe End Sections - 24" Diameter	For:		
12B-30	2.00 EA	Reinforced Concrete Pipe End Sections - 30" Diameter	For:		
12B-36	2.00 EA	Reinforced Concrete Pipe End Sections - 36" Diameter	For:		
12DIP-12	20.00 LF	Ductile Iron Culvert Pipe 12 Inch Diameter	For:		

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Item No	Engineers Estimate	Item Description			
12DIP-14	20.00 LF	Ductile Iron Culvert Pipe 14 Inch Diameter	For:		
12DIP-16	20.00 LF	Ductile Iron Culvert Pipe 16 Inch Diameter	For:		
12DIP-18	20.00 LF	Ductile Iron Culvert Pipe 18 Inch Diameter	For:		
12DIP-24	20.00 LF	Ductile Iron Culvert Pipe 24 Inch Diameter	For:		
12DIP-30	20.00 LF	Ductile Iron Culvert Pipe 30 Inch Diameter	For:		
12H	1,000.00 LF	Cleaning Existing Drainage System	For:		
13A	15.00 CY	Catch Basins	For:		
13B	15.00 CY	Manholes	For:		
13C	2.00 EA	Area Drains	For:		
14	10.00 EA	Connections to Existing Drainage Facilities	For:		
15	5.00 EA	Altering Catch Basins	For:		
15X	30.00 EA	Rehabilitate Catch Basin	For:		
16A	5.00 EA	Altering Brick Manholes (Corbel Top with Frame Head)	For:		
16B	5.00 EA	Altering Brick Manholes (Slab Top with Frame Head)	For:		
16C	5.00 EA	Altering Brick Manholes (Slab Top with Ring Head)	For:		
16SS-1	20.00 EA	Change Elevations of Sanitary Sewer	For:		

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Item No	Engineers Estimate	Item Description			
		Manholes-Minor Adj			
16SS-2	10.00 EA	Change Elevations of Sanitary Sewer Manholes-Major Adj	For:		
16SS-3	20.00 EA	Change Elevations of Drain Manholes and Drop Inlets-Minor Adjustments	For:		
16SS-4	10.00 EA	Change Elevations of Drain Manholes and Drop Inlets-Major Adjustments	For:		
16X	20.00 EA	Altering Brick Manholes	For:		
17A-A	25.00 CY	Class A Concrete For Structures (0 to 25 CY)	For:		
17A-B	50.00 CY	Class A Concrete For Structures (26 to 50 CY)	For:		
17A-C	100.00 CY	Class A Concrete For Structures (51 to 100 CY)	For:		
17A-D	200.00 CY	Class A Concrete For Structures (101 CY and Over)	For:		
17D-A	25.00 CY	Class D Concrete For Structures (0 to 25 CY)	For:		
17D-B	50.00 CY	Class D Concrete for Structures (26 to 50 CY)	For:		
17D-C	100.00 CY	Class D Concrete for Structures (51 to 100 CY)	For:		
17D-D	200.00 CY	Class D Concrete For Structures (101 CY and Over)	For:		
17F-A	25.00 CY	Class F High Early Strength Concrete (0 to 25 CY)	For:		

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Item No	Engineers Estimate	Item Description			
17F-B	50.00 CY	Class F High Early Strength Concrete (26 to 50 CY)	For:		
17F-C	100.00 CY	Class F High Early Strength Concrete (51 to 100 CY)	For:		
17F-D	200.00 CY	Class F High Early Strength Concrete (101 CY and Over)	For:		
17PPCC	25.00 CY	Pervious Portland Cement Pavement	For:		
22C-A	300.00 TON	Base Course Asphalt Concrete-Type Dense Base (0 to 25 TONS)	For:		
22C-B	500.00 TON	Base Course Asphalt Concrete-Type Dense Base (26 to 50 TONS)	For:		
22C-C	500.00 TON	Base Course Asphalt Concrete-Type Dense Base (51 to 100 TONS)	For:		
22C-D	500.00 TON	Base Course Asphalt Concrete-Type Dense Base (101 TONS and Over)	For:		
24	10.00 CY	Cement Concrete Pavement	For:		
24V	10.00 CY	Concrete Valley Gutter	For:		
26	1,000.00 LF	Concrete Curb	For:		
26CG	100.00 LF	Monolithic Concrete Curb and Gutter	For:		
26CW	50.00 LF	Concrete Curb Wall	For:		
26F	50.00 LF	Concrete Curb - Type Flush	For:		
26PL	50.00 LF	Concrete Curb for Parking Lot	For:		

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Item No	Engineers Estimate	Item Description			
26S	100.00 LF	Concrete Curb - Special	For:		
26SP-C	50.00 LF	Concrete Curb-Type C	For:		
27	2,000.00 SF	Cement Concrete Sidewalk	For:		
27DW	400.00 SF	Detectable Warning Surface	For:		
27M	100.00 LF	Concrete Mowing Strip- 16" Wide	For:		
27MS	100.00 LF	Concrete Mowing Strip > 16" to 36" Wide	For:		
28	200.00 SF	Cement Concrete Driveways and Driveway Aprons	For:		
29	300.00 SF	Driveway Restoration	For:		
30	100.00 SY	Metal Reinforcement for Concrete Pavement	For:		
31	10.00 LF	Transverse Joint Supports	For:		
32A	10.00 EA	Longitudinal Joint Ties (Pavement)	For:		
32B	10.00 EA	Longitudinal Joint Ties (Curbing)	For:		
32X	10.00 EA	Joint Ties (Grout Type)	For:		
32X-1	100.00 EA	Load Transfer Device For Cement Concrete Pavement Repairs	For:		
33	250.00 LB	Bar Reinforcement for Structures	For:		
33X	100.00 LB	Epoxy Coated Bar Reinforcement for Structures	For:		

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Item No	Engineers Estimate	Item Description			
34	1,000.00 LB	Miscellaneous Metals	For:		
35	100.00 LF	Resetting Guide Railing	For:		
35T	100.00 LF	Timber Guide Rail	For:		
36C	400.00 TON	Asphalt Concrete T & L Course-Type1A (Top & Binder)	For:		
36CX	400.00 TON	Asphalt Concrete Truing and Leveling Course TYPE 1A (For Cracks in Asphalt Pavement)	For:		
36D	400.00 TON	Asphalt Concrete, Type 1A (Top & Binder)	For:		
36DRAR-S-A	300.00 TON	Rut Avoidance Asphalt Concrete TYPE 1A (Top RA Resurfacing) (Special) (0 to 25 TONS)	For:		
36DRAR-S-B	500.00 TON	Rut Avoidance Asphalt Concrete TYPE 1A (Top RA Resurfacing) (Special) (26 to 50 TONS)	For:		
36DRAR-S-C	500.00 TON	Rut Avoidance Asphalt Concrete Type 1A (Top RA Resurfacing) (Special) (51 to 100 Ton)	For:		
36DRAR-S-D	500.00 TON	Rut Avoidance Asphalt Concrete Type 1A (Top RA Resurfacing) (Special) (101 and Over)	For:		
36HMA	100.00 TON	9.5 F1 Top Course HMA, 70 Series Compaction	For:		
36PAP	200.00 SY	Pervious Asphalt Pavement	For:		

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Item No	Engineers Estimate	Item Description			
36T	100.00 TON	Temporary Pavement	For:		
42-1	100.00 LF	Concrete Median Barrier	For:		
42-2	2.00 EA	Concrete Median Barrier End Section	For:		
42-3	100.00 LF	Half Section Concrete Barrier	For:		
42-4	2.00 EA	Half Section Concrete Barrier End Section	For:		
58A	200.00 LF	Saw Cutting Existing Non-Roadway Asphalt	For:		
58RPC	300.00 LF	Saw Cutting Existing Roadway Pavement and Concrete	For:		
64	300.00 LF	Reset Existing Fence	For:		
102D	100.00 DAY	Flashing Arrow Board	For:		
102PVMS	200.00 DAY	Portable Variable Message Sign	For:		
102X*	100.00 DAY	Work Zone Traffic Control (DAY)	For:	\$1,000.00	
102Y*	75.00 NGHT	Work Zone Traffic Control (NIGHT)	For:	\$1,400.00	
107	500.00 LF	Cleaning, Filling & Sealing Existing Joints & Cracks in Asphalt Pavement	For:		
110	10.00 CF	Masonry Pipe Plugs	For:		
111	500.00 SY	Removal and Replacement of Pavements	For:		

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Item No	Engineers Estimate	Item Description			
111P	200.00 SY	Removal and Replacement of Existing Pathways	For:		
112	10.00 EA	Adjusting Manholes	For:		
113	10.00 EA	Adjustment Of Surface Inlets	For:		
114	10.00 EA	Adjustment of Water Valve Box Elevation	For:		
115	200.00 LF	Butt Joints	For:		
116A	3,000.00 SY	Profiling and Removal of Asphalt Pavement (Paving by Contractor will follow under respective items)	For:		
116AM	500.00 SY	Profiling and Removal of Asphalt Pavement (Paving by Others will follow)	For:		
116C	200.00 SY	Profiling and Removal of Concrete Pavement	For:		
117T-6	100.00 LF	Temporary Fence 6 Ft. High	For:		
121	200.00 CY	Dry Bound Base Course	For:		
122	20.00 EA	Test Holes	For:		
125	100.00 OZ.	Chemical Admixture For Concrete	For:		
126A	50.00 LF	New Stone Block Curb	For:		
126B	50.00 LF	Reset Existing Stone Block Curb	For:		
129	100.00 CY	Cement Concrete For Pavement Repairs	For:		

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Item No	Engineers Estimate	Item Description			
132	50.00 EA	Plowable Raised Reflectorized Pavement Markers	For:		
133A	10.00 LF	Cleaning and Resealing of Longitudinal Joints in Portland Cement Concrete Pavement	For:		
133B	10.00 LF	Sealing of Transversal Joints in Cement Concrete Pavement	For:		
134	10.00 LF	Sawing and Sealing Bituminous Concrete Overlays	For:		
136S	20.00 DAY	Survey Stakeout (Per Day)	For:		
137	100.00 LF	Remove Existing Traffic Markings	For:		
138	100.00 SY	Asphalt Joint Repair	For:		
139	50.00 SY	Sawcutting Longitudinal or Transverse Grooves in Existing Roadway Pavement	For:		
140	100.00 LF	Temporary Pavement Delineation	For:		
141	100.00 LF	Silt Fence	For:		
141A	100.00 LF	Hay Bales/Straw Bales	For:		
141B	25.00 EA	Silt Protection For Surface Inlet Drainage Structures	For:		
141C	25.00 EA	Silt Protection For Curb Inlet Drainage Structures	For:		
150	100.00 LF	Box Beam Guide Railing	For:		

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Item No	Engineers Estimate	Item Description			
151	100.00 LF	Box Beam Median Barrier	For:		
152	5.00 EA	Box Beam Guide Rail End Assembly	For:		
153	5.00 EA	Box Beam Median Barrier End Assembly - Type A or B	For:		
175	100.00 SY	Stabilized Mixed-In-Place Recycled Base Course	For:		
175AE	100.00 GL	Asphalt Emulsion	For:		
176	100.00 SY	Milled In-Place Recycled Base Course	For:		
178W	500.00 LF	Pavement Markings, Painting & Striping (White)	For:		
178Y	500.00 LF	Pavement Markings, Painting & Striping (Yellow)	For:		
179A	100.00 LF	Steel Edging	For:		
179B	100.00 LF	Reset Existing Steel Edging	For:		
185A	100.00 LF	Relocate Residential Sprinkler System	For:		
200	50.00 LF	Heavy Post, Plastic and Synthetic Blocked Out Galvanized Corrugated Steel Beam Guide Railing	For:		
202	10.00 EA	Anchorage Units for Heavy Post Blocked Corrugated Beam Guide Railing for Driveways	For:		
203	5.00 EA	Anchorage Units for Heavy Post Blocked Corrugated Beam Guide Railing for Highways	For:		

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Item No	Engineers Estimate	Item Description			
216	200.00 LF	Removal of Existing Guide Rail	For:		
363	100.00 SY	Grass Seeding	For:		
365	100.00 SF	Sodding	For:		
367	100.00 ACRE	Hydro-Seeding	For:		
368	300.00 SY	Topsoil and Grass Seed	For:		
372A	5.00 EA	Tree Removal - A - (<6" Caliper)	For:		
372B	5.00 EA	Tree Removal - B - (6" - <12" Caliper)	For:		
372C	5.00 EA	Tree Removal - C - (12" - <24" Caliper)	For:		
372D	5.00 EA	Tree Removal - D - (24" - <36" Caliper)	For:		
372E	5.00 EA	Tree Removal - E - (36" - <48" Caliper)	For:		
373A	5.00 EA	Stump Removal -A- (4" - <6" Caliper)	For:		
373B	5.00 EA	Stump Removal - B- (6" -<12" Caliper)	For:		
373C	5.00 EA	Stump Removal -C- (12" - <24" Caliper)	For:		
373D	5.00 EA	Stump Removal -D- (24" - <36" Caliper)	For:		
373E	5.00 EA	Stump Removal -E- (36" - <48" Caliper)	For:		
374A	5.00 EA	Stump Grinding-A- (4" - <6" Caliper)	For:		

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Item No	Engineers Estimate	Item Description			
374B	5.00 EA	Stump Grinding-B- (6" - <12" Caliper)	For:		
374C	5.00 EA	Stump Grinding-C- (12" - <24" Caliper)	For:		
374D	2.00 EA	Stump Grinding-D- (24" - <36" Caliper)	For:		
374E	2.00 EA	Stump Grinding-E- (36" - <48" Caliper)	For:		
378	100.00 LF	Mechanical Barrier Root Control System - 24" Depth	For:		
419S-075	200.00 LF	Furnish and Install 3/4 Inch Diameter Steel Conduit	For:		
420-1	5.00 EA	Furnish & Install Standard Pullbox	For:		
420R	2.00 EA	Regrade a Pullbox Frame and Cover	For:		
422L	2,000.00 LF	Furnish and Install Loop Wire	For:		
422LS	750.00 LF	Furnish and Install Loop Saw Cut	For:		
424-21	2.00 EA	Remove Single Lane Magnetic Detector	For:		
424-22	2.00 EA	Remove Single Lane Magnetic Housing	For:		
424-25	2.00 EA	Remove Pullbox	For:		
424-26	2.00 EA	Remove Multi-Lane Magnetic Vehicle Detector	For:		
450	2.00 EA	Furnish and Install Post Mounted Signs	For:		
451	2.00 EA	Furnish and Install Post Mounted Handicap	For:		

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Item No	Engineers Estimate	Item Description			
		Parking Signs			
502	100.00 SF	Highway Sealing and Surface Coating (Latex)	For:		
515	50.00 LF	Sawcutting Grooves in Existing Asphalt or Concrete Pavement	For:		
522	5.00 EA	Triangular Guide Rail Delineator	For:		
540	4.00 EA	Steel Bollards	For:		
685.0720 0110	1,000.00 LF	White Epoxy Reflectorized Pavement Stripes - 20 mils (Wet Night Visibility Spheres)	For:		
685.0720 0210	100.00 EA	White Epoxy Reflectorized Pavement Letters - 20 Mils (Wet Night Visibility Spheres)	For:		
685.0720 0310	100.00 EA	White Epoxy Reflectorized Pavement Symbols - 20 Mils (Wet Night Visibility Spheres)	For:		
685.0720 0410	1,000.00 LF	White Epoxy Reflectorized Pavement Stripes (Cross Hatching) - 20 mils (Wet Night Visibility Spheres)	For:		
685.0720 0510	1,000.00 LF	White Epoxy Reflectorized Pavement Stripes (Special Markings) - 20 mils (Wet Night Visibility Spheres)	For:		
685.0720 0610	1,000.00 LF	Yellow Epoxy Reflectorized Pavement Stripes - 20 mils	For:		

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		(Wet Night Visibility Spheres)			
685.0720 0710	1,000.00 LF	Yellow Epoxy ReflectORIZED Pavement Stripes (Cross Hatching) - 20 mils (Wet Night Visibility Spheres)	For:		
685.0720 0810	100.00 EA	White Epoxy ReflectORIZED Pavement Markings Yield Line Symbols- Small- 20 Mils (Wet Night Visibility Spheres)	For:		
685.0720 0910	100.00 EA	White Epoxy ReflectORIZED Pavement Markings Yield Line Symbols- Large- 20 Mils (Wet Night Visibility Spheres)	For:		
744*	1.00 LS	Force Account Work	For:	\$100,000.00	
762	100.00 LB	Integral Color Pigment for Cement Concrete	For:		
763	500.00 SF	Imprinting on Cement Concrete Pavement or Sidewalk	For:		
764	100.00 SF	Colored and Imprinted Asphalt	For:		
765	10.00 EA	Furnish & Install Concrete Parking Bumper	For:		
768	100.00 LF	Furnish and Install Armorless Bridge Joint System	For:		
769A	10.00 EA	Type "A" Catch Basin Insert-Filter Type (Combination Inlet)	For:		
769B	10.00 EA	Type "B" Catch Basin Insert - Filter Type (Curb Inlet Only)	For:		

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Item No	Engineers Estimate	Item Description			
770A	10.00 EA	Type "A" Catch Basin Insert - Sediment Control Type (Combination Inlet)	For:		
770B	10.00 EA	Type "B" Catch Basin Insert - Sediment Control Type (Curb Inlet Only)	For:		
771A	10.00 EA	Type "A" Catch Basin Insert - Sediment Control Type with Pathogen Filtration (Combination Inlet)	For:		
771B	10.00 EA	Type "B" Catch Basin Insert - Sediment Control Type with Pathogen Filtration (Curb Inlet Only)	For:		

ITEM 1X - CLEARING AND GRUBBING

The requirements for Item 1 of Nassau County *2009* Standard Specifications shall apply with the following modifications:

A. 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.

B. 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 2 – UNCLASSIFIED EXCAVATION

The requirements for Item 2 of the Nassau County 2009 Standard Specifications shall apply with the following modification:

Item 2-A	-	0 CY to 25 CY
Item 2-B	-	26 CY to 100 CY
Item 2-C	-	101 CY and over

ITEM 3 – TRENCH, CULVERT AND BRIDGE EXCAVATION

The requirements for Item 3 of the Nassau County 2009 Standard Specifications shall apply with the following modification:

Item 3-A	-	0 CY to 25 CY
Item 3-B	-	26 CY to 100 CY
Item 3-C	-	101 CY and over

DRAINAGE PIPES – ITEMS 12XX

12A-4-12 – 12” REINFORCED CONCRETE PIPE, CLASS IV

12A-4-15 – 15” REINFORCED CONCRETE PIPE, CLASS IV

12A-4-18 – 18” REINFORCED CONCRETE PIPE, CLASS IV

12A-4-24 – 24” REINFORCED CONCRETE PIPE, CLASS IV

12A-4-30 – 30” REINFORCED CONCRETE PIPE, CLASS IV

12A-4-36 – 36” REINFORCED CONCRETE PIPE, CLASS IV

12B-12 – REINFORCED CONCRETE PIPE END SECTION, 12” DIAMETER

12B-15 – REINFORCED CONCRETE PIPE END SECTION, 15” DIAMETER

12B-18 – REINFORCED CONCRETE PIPE END SECTION, 18” DIAMETER

12B-24 – REINFORCED CONCRETE PIPE END SECTION, 24” DIAMETER

12B-30 – REINFORCED CONCRETE PIPE END SECTION, 30” DIAMETER

12B-36 – REINFORCED CONCRETE PIPE END SECTION, 36” DIAMETER

12DIP-12 - DUCTILE IRON CULVERT PIPE - 12 DIAMETER

12DIP-14 - DUCTILE IRON CULVERT PIPE - 14 DIAMETER

12DIP-16 - DUCTILE IRON CULVERT PIPE - 16 DIAMETER

12DIP-18 - DUCTILE IRON CULVERT PIPE - 18 DIAMETER

12DIP-24 - DUCTILE IRON CULVERT PIPE - 24 DIAMETER

12DIP-30 - DUCTILE IRON CULVERT PIPE - 30 DIAMETER

A. Description.

All requirements of the above listed items from Nassau County 2009 Standard Specifications shall apply except for change in pipe sizes.

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 17A – CLASS A CONCRETE FOR STRUCTURES

Under this item the Contractor will be required to place any or all of the Concrete Items as covered under Item 17A of the Nassau County Standard Specifications (2009)

Under this item the Contractor will be paid under the following schedule on each work order:

Item 17A-A	-	0 CY to 25 CY placed
Item 17A-B	-	26 CY to 50 CY placed
Item 17A-C	-	51 CY to 100 CY placed
Item 17A-D	-	101 CY & over placed

ITEM 17D - CLASS D CONCRETE FOR STRUCTURES

Under this item the Contractor will be required to place any or all of the Concrete Items as covered under Items 17D of the Nassau County Standard Specifications (2009).

Under this item the Contractor will be paid under the following schedule on each work order:

ITEM 17D-A -	0 CY to 25 CY placed
ITEM 17D-B -	26 CY to 50 CY placed
ITEM 17D-C -	51 CY to 100 CY placed
ITEM 17D-D -	101 CY & over placed

ITEM 17F - CLASS F HIGH EARLY STRENGTH CONCRETE

Under this item the Contractor will be required to place any or all of the Concrete Items as covered under Items 17F of the Nassau County Standard Specifications (2009).

Under this item the Contractor will be paid under the following schedule on each work order:

ITEM 17F-A	-	0 CY to 25 CY placed
ITEM 17F-B	-	26 CY to 50 CY placed
ITEM 17F-C	-	51 CY to 100 CY placed
ITEM 17F-D	-	101 CY & over placed

ITEM 17PPCC – PERVIOUS PORTLAND CEMENT CONCRETE

A. DESCRIPTION:

Furnish and place non-reinforced pervious Portland cement concrete in accordance with the plans and specifications. Common applications include, but not limited to, parking lots, shoulders, bicycle paths, sidewalks and driveways.

B. MATERIALS:

Pervious Portland cement concrete shall be manufactured in accordance with the requirements of NYSDOT Standard Specifications, Section 501-2, with the following modifications:

Design a pervious Portland cement concrete mixture as specified in this document. Produce a homogeneous mixture of cement, pozzolan (fly ash or GGBFS), coarse aggregate, set retarding water reducing admixture, water reducing admixture, viscosity modifying admixture (VMA) and water.

Coarse aggregate gradation shall meet the requirements of size 1 or 1A in table 703-4 of the NYSDOT Standard Specifications, Section 703-AGGREGATES. Aggregate/cement ratio shall be in the range of 4:1 to 4.5:1.

Use Type I, II or I/II cement. Cementitious content shall be a minimum of 520 lb/yd³ for size 1 aggregate, and a minimum of 580 lb/ yd³ for size 1A aggregate. Water/cementitious ratio shall be in the range of 0.27 – 0.34.

At least one (1) week prior to placement of the test panel, provide the Regional Materials Engineer with the following:

1. List of all materials and source numbers.
2. Proposed mix design batch weights, including design unit weight.
3. Proposed production facility and location.

C. CONSTRUCTION DETAILS:

All the provisions of NYSDOT Standard Specifications, Section 501-3 shall apply with the following modifications:

The Contractor shall provide a minimum of one National Ready Mix Concrete Association (NRMCA) Certified Pervious Concrete Technician at the placement site.

Mix the concrete in approved transit mix trucks. Load trucks to a maximum of 80% of the rated mixer capacity.

Thoroughly wet the entire subbase surface for a minimum of 2 hours immediately prior to placement. Remove all standing water prior to placement.

The NRMCA Certified Technician shall check each truck for uniformity during discharge. Mix water shall be such that the cement paste displays a “wet metallic sheen” without

causing the paste to flow from the aggregate. Additions of water to the mix, as directed by the Certified Technician, shall be followed by 20 mixing revolutions.

The concrete shall be deposited as close to its final position as practicable and such that fresh concrete enters the mass of previously placed concrete. The practice of discharging onto subbase and pulling or shoveling to final placement is not allowed.

Unless otherwise approved by the Engineer in writing, the Contractor shall provide mechanical equipment of either slipform or form riding with a following compactive unit that will provide a minimum of 10 psi vertical force. The pervious concrete pavement will be placed to the required cross section and shall not deviate more than $\pm \frac{1}{4}$ inch in 10 feet from profile grade.

Preferred method of strike off and compaction is the use of a form riding roller screed (i.e. NRMCA "One step method"). If allowed by the Engineer, the NRMCA "two step method" may be employed. If the two step method is used, strike off the concrete to approximately $\frac{3}{8}$ in. to $\frac{3}{4}$ in. above the forms to allow for compaction. After strike off, compact the concrete to the height of the forms. Compaction shall be accomplished by rolling over the concrete with a steel roller, compacting the concrete to the height of the forms. Concrete shall be covered with minimum 6 mil plastic prior to rolling to prevent aggregate pull outs. Compaction shall be completed within 15 minutes of placement. Edges near forms shall be compacted using a 1 ft. by 1 ft. steel tamp, a float, or other similar device to prevent raveling of the edges. If vibration, internal or surface applied, is used, it shall be shut immediately when forward progress is halted for any reason.

After mechanical or other approved strike-off and compaction operation, no other finishing operation will be allowed.

The Contractor will be restricted to pavement placement widths of a maximum of fifteen (15') feet unless the Contractor can demonstrate competence to provide pavement placement widths greater than the maximum specified, to the satisfaction of the Engineer.

Curing procedures shall begin within 15 minutes after placement. The pavement surface shall be covered with polyethylene curing covers meeting NYSDOT Standard Specifications, Section 711-04, or other pre-approved covering material. Overlap curing covers a minimum of 18 inches. Prior to covering, a fog or light mist shall be sprayed above the surface. The cover shall overlap all exposed edges and shall be fully secured throughout the curing period (without using dirt) to prevent dislocation due to winds or adjacent traffic conditions. The polyethylene covering shall remain on the surface for the full duration of the cure time. Supply form insulating materials when the air temperature is expected to fall below 40°F at any time during the curing period.

Cure Time:

- a. Minimum of 7 days.
- b. No truck traffic shall be allowed for 10 days (no passenger car/light trucks for 7 days).

Jointing: Control (contraction) joints shall be installed at maximum 20-foot intervals. They shall be installed at a depth of least 1/4 the thickness of the pavement. It is recommended that these joints be installed in the plastic concrete with a rolling joint tool. Saw cut joints, if used, should be installed as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking (normally immediately after curing). Transverse construction joints shall be installed whenever placing is suspended a sufficient length of time that concrete may begin to harden. In order to assure aggregate bond at construction joints, a bonding agent suitable for bonding fresh concrete shall be brushed, rolled, or sprayed on the existing pavement surface edge. Isolation (expansion) joints will not be used except when pavement is abutting slabs or other adjoining structures.

Testing, Inspection, and Acceptance

I. Test panel(s):

At least one week prior to use, the Contractor shall place, joint, and cure a test panel, a minimum of 100 sq. ft. at the required project thickness, designed in-place unit weight, and finish. The test panel will be constructed at a location designated by the Engineer and will remain in place for the duration of the project to be used as a reference for acceptance of the pavement surface.

1. Satisfactory performance of the test panels will be determined by:
 - i. Void Structure: 15% minimum; 25% maximum as per ASTM C1688.
 - ii. Unit weight (Density): Unit weight shall be within 5 lb/ft³ of the design unit weight as per ASTM C1688.
 - iii. Infiltration Rate: Infiltration rate shall be a minimum of 100 in./hr as per ASTM C1701. Perform this test after 7 day cure.
 - iv. Compacted Thickness: Core the test panel at a minimum of 7 days and determine the compacted thickness as per ASTM C42. Compacted thickness shall be within 1/4" of the specified thickness.
2. If the test panel does not meet performance criteria, it shall be removed and redone at the Contractor's expense, and the failed test panel disposed of in an appropriate manner.

- II. The test panel will not be incorporated into the work, and will be removed when ordered by the Engineer.

II. Testing:

During production, the following shall be conducted at the Contractor's expense:

1. A minimum of one test for each day's placement of pervious concrete in accordance with ASTM C 1688 to verify unit weight and percent void content. Unit weight shall be within 5 lb/ft³ of the design unit weight.
2. In a slipform paving operation, determine plastic thickness according to NYSDOT Standard Specifications, Section 502- 3.08. Perform this test at the frequency indicated in the NYSDOT Standard Specifications, Section 502-3.08, but at a minimum of twice per day. Fixed form thickness shall be determined by measuring from grade to top of forms prior to paving. Thickness shall be within 1/4" of the specified thickness.

3. Infiltration Rate: Test as per ASTM C1701 after 7 day cure at a minimum of three locations chosen by the Engineer. Infiltration rate shall be a minimum of 100 in./hr.

Should any of these test results fall outside of the specified limits, the concrete shall be removed, replaced, and retested at no additional cost.

D. METHOD OF MEASUREMENT:

This work will be measured as the number of cubic yards of pervious Portland cement concrete satisfactorily furnished and placed in accordance with the plans, specifications, and orders of the Engineer.

E. BASIS OF PAYMENT:

The unit price bid per cubic yard shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work, including preparing the subbase, saw cutting, and providing a test panel(s), except that any necessary excavation and subbase course will be paid for under their appropriate items.

ITEM 22C - BASE COURSE ASPHALT CONCRETE - TYPE DENSE BASE

Under this item the Contractor will be required to place any or all of the Asphalt Items as covered under Item 22C-2 of the Nassau County 2009 Standard Specifications.

Under this item the Contractor will be paid under the following schedule on each work order:

ITEM 22C-A -	0 Ton to 25 Ton placed
ITEM 22C-B -	26 Ton to 50 Ton placed
ITEM 22C-C -	51 Ton to 100 Ton placed
ITEM 22C-D -	101 Ton & over placed

ITEM 26S - CONCRETE CURB (SPECIAL)

A. Description.

1. Under these Items the Contractor shall cast-in-place concrete curb of various types to match existing and/or conform to those types listed above as shown on the Plans, appropriate Standard Detail Sheets, or as ordered by the Engineer.

B. Materials.

1. The concrete placed under this item for conventionally formed curb shall be Class A, and for machine-formed curb, Class J, and shall conform in all respects to the requirements of PART THREE, SECTION A. The details of concrete materials permitted in this Item are shown in Table 1, "Concrete Mixtures" in Article 2 of Section A. Bar reinforcement shall conform to the requirements of M17.
2. Class F High Early Strength concrete or Class C concrete may be substituted for Class A concrete, if such substitution is approved by the Engineer. Class F concrete shall meet the requirements of Item 17F, and Class C concrete shall meet the requirements of Item 17C. No substitution may be made for Class J concrete.

C. Construction Details.

1. The concrete curb shall be cast in place in sections approximately 20' long and provision made at each joint for expansion of 1/4". Where joint supports are used between curb and reinforced concrete pavement or concrete foundation course, construction joints shall be located at approximately 20' intervals and/or opposite each joint in the pavement. Expansion joints 3/4" in thickness shall be located opposite each pavement expansion joint. Expansion joints 1/2" in thickness shall be installed in the curb at the beginning and end of all curb returns, all sharp curves, at each side of drainage structures or castings, at each side of driveway curb cuts and between curb and sidewalk or other abutting structures.
2. Expansion joint filler shall be pre-molded bituminous material conforming to M32. It shall be cut to fit the cross-section of the curb and shall be accurately installed and firmly secured in position.
3. All forms shall be set true to line and grade and held rigidly in position. They shall be either of metal or of acceptable planed and matched lumber, and shall be of such construction as to allow for inspection for grade and alignment and that will produce a smooth surface on the finished curb.
4. The concrete shall be compacted by means of an approved immersion type, mechanical vibrator of a size and weight sufficient to vibrate the entire concrete mass thoroughly without damaging or misaligning the forms. The vibrator shall be introduced into the concrete at one foot intervals for a period not to exceed two seconds for each immersion. When directed the concrete shall be compacted by working or spading by hand along the faces of the rear and front forms or pavement edge for the full depth. All compacting shall be performed while the concrete is in a plastic state and shall be to such extent as will secure a dense mass with even and uniform surfaces free from aggregate pockets or honeycomb.
5. The back forms shall be left in place at least 24 hours or until the concrete has set sufficiently so that, in the judgment of the Engineer, they can be removed without injury to

the curb. After the concrete has attained its initial set, the face forms shall be removed and the exposed faces of the curb shall be immediately tooled, rubbed down and finished to a smooth, true and uniform surface as directed but no plastering will be permitted. For this work, only skilled finishers shall be employed. All joints shall be retooled for the full depth subsequent to the completion of the facing work.

6. At the Contractor's option, either M34 quilted covers, M34A polyethylene coated burlap blankets, M34B polyethylene curing covers or M34C waterproof paper blankets shall be used in curing concrete curb. Other methods of curing may be used only if so indicated on the Plans, in the Itemized Proposal or permitted in writing by the Engineer.
7. The Contractor shall protect the curb, keep it in true alignment and first class condition until the completion of the contract. Any curb which is damaged at any time previous to the final acceptance of the work or which is unsatisfactory shall be removed and replaced with acceptable curb at the Contractor's own expense.

D. Method of Measurement.

1. The quantity to be paid for under this item will be the number of linear feet of curb placed in accordance with the Plans, Specifications and orders of the Engineer.

E. Basis of Payment.

1. The price bid per linear foot shall include the cost of furnishing all labor, materials and equipment necessary to complete the work satisfactorily, including bar reinforcement and all grading including removal of existing curb unless otherwise shown on the Plans or in the Proposal.
2. Payment will be made at the unit price bid regardless of any approved substitution for the classes of concrete.

ITEM 27MS - CONCRETE MOWING STRIP > 16" - 36" WIDE

All provisions of Item 27, "Cement Concrete Sidewalk" from the Nassau County 2009 Standard Specifications shall apply with the following modifications:

A. Description.

1. Under this Item the Contractor shall construct a one course cement concrete mower strip with properly prepared sub-grade where and to the lines, grades, and details indicated on the plans in accordance with the specifications and/or orders of the Engineer.
2. The Contractor shall restore six (6") inches of grass area on either side of the mower strip in accordance with Item 368 - Topsoil and Grass Seeding. Payment shall be made under Item 27MS.

B. Method of Measurement.

The quantity to be paid for under this Item shall be the number of linear feet of cement concrete mowing strip measured in place and completed in accordance with the Plans and Specifications.

C. Basis of Payment.

The unit price bid per linear foot for this Item shall include the cost of all labor, materials, tools and incidentals necessary to satisfactorily complete the required work, including but not limited to mowing strip installation and grass area restoration.

ITEM 33X – EPOXY COATED BAR REINFORCEMENT FOR STRUCTURES

A. Description

1. The work under this item shall conform to the applicable requirements of Item 33 - Bar Reinforcement of the Nassau County Standard Specifications, except as modified by the plans and/or by the specifications, as stated herein.

B. Materials

1. Reinforcement.
 - a) This shall meet the requirements of ASTM A615 Grade 60.
2. Epoxy Coating Material.
 - a) The epoxy coating material shall be an organic, powdered epoxy resin that is applied by the electrostatic method. The epoxy coating materials shall be approved by the County.
3. Patching Material.
 - a) Patching or repair materials shall be supplied by the epoxy coating manufacturer. The patching material shall be compatible with the epoxy coating, inert in concrete, and shall be suitable for use in making field repairs.
4. Coating Application.
5. Surface Preparation.
 - a) The surface of bars to be coated shall be blast cleaned in accordance with the Steel Structures Painting Council – Surface Preparation Specifications No. 10 (SSPC-SP10), Near White Blast Cleaning. After blasting, the cleaned surface of the bar shall be defined by SSPC-Vis1, Pictorial Standards ASa 2- 1/2, BSa 2-1/2, or CSa 2-1/2, as applicable.
6. Coating Application.
 - a) The powdered epoxy resin coating shall be electro-statically applied in accordance with the recommendations of the coating manufacturer. The epoxy coating may be applied before or after fabrication of the reinforcing bars.
7. Coating Thickness.
 - a) The epoxy coating shall be applied as a smooth, uniform coat. After curing, the coating thickness shall be 7 plus/minus 2 mils. Coating thickness shall be controlled by taking measurements on a representative number of bars from each production lot. Coating thickness measurements shall be conducted by the method outlined in ASTM G12.
8. Continuity of Coating
 - a) The coating shall be checked visually after cure for continuity. It shall be free from holes, voids, contamination, cracks and damaged areas.
 - b) The coating shall not have more than two holes (pinholes not visible to the naked eye) in any linear foot of the coated bar. A hole detector shall be used, in accordance with

manufacturer's instructions, to check the coating for holes.

9. Coating Cure

- a) The coating applicator shall check each production lot to determine that the entire production lot of coated bars is in a fully-cured condition.

10. Flexibility of Coating

- a) The flexibility of the coating shall be evaluated on a representative number of bars selected from each production lot. The coated bar shall be bent 120 degrees (after rebound) around a 6-inch diameter mandrel. The bend shall be done at a uniform rate and may take up to one minute to complete. The test specimens shall be at the thermal equilibrium between 20 and 30 degrees C (68-85 degrees F) at the time of testing.
- b) No cracking of the coating shall be visible to the naked eye on the outside radius of the bent bar.

11. Plant Inspection

- a) The County reserves the right to have its authorized representative to observe the preparation, coating and testing of the reinforcement bars.
- b) The representative shall have free access to the plant and any work done when access has been denied shall be automatically rejected.

C. Construction Details

1. Shop Repair of Coated Bars

- a) Epoxy coated reinforcement bars which do not meet the requirements for Coating Thickness, Continuity of Coating, Coating Cure or Flexibility of Coating shall not be repaired.
- b) Reinforcement bars with these defects shall be replaced or alternately, stripped of epoxy coating, re-cleaned and recoated in accordance with the requirements of this specification.
- c) Coating breaks due to fabrication and handling shall be repaired with patching material if the defective area is greater than the cross-sectional area of the reinforcement bar. Defects which are smaller than the cross-sectional area need not be repaired.
- d) The repair of coating breaks shall be limited to bars on which the total of the defective coating bar does not exceed 5 percent of the surface area of the reinforcement bar. Bars with greater than 5 percent damage shall be replaced or alternately, stripped of epoxy coating, re-cleaned and recoated in accordance with this specification.

2. Handling

- a) All systems for coated bars shall have padded contact areas for the bars, wherever possible. All building bands shall be padded and all bundles shall be lifted with a strong back, multiple supports or a platform bridge so as to prevent bar to bar abrasion from sags in the bar bundle. The bars or bundles shall not be dropped or dragged.

D. Method of Measurement

The quantity to be paid for under this item is the number of pounds of bar reinforcement exclusive of chairs, fastenings and supports, that is incorporated in the work as shown on the Plans or as ordered by the Engineer. The weight of bar reinforcement will be computed by utilizing the unit weight for each size bar given in the "Table of Standard Weights". If the Engineer allows the substitution of larger bars than have specified, or splices not shown on the Plans or specifically ordered by him, payment will be only for weight of steel which would have been required if the specified size and length of bar had been used.

E. Basis of Payment

The unit price bid, per pound, for this item shall include the cost of furnishing all labor, materials and equipment necessary to complete the work. The cost of furnishing and placing chairs, fastenings and supports shall be included in the unit price bid for this item.

ITEM 35T - TIMBER GUIDE RAIL

A. Description.

Under this item the Contractor shall furnish and install Timber Guide Rail at the location(s) indicated on the Plans and in accordance with the Specifications and appropriate Standard Detail Sheet and as directed by the Engineer.

B. Materials and Construction Details.

1. Lumber shall be of the size and type shown on the plans. Rails and posts shall be dried after treatment and shall not have over 15% moisture content or not over 19% air-dried. Lumber shall be Southern Yellow Pine No. 1 Dense SR (1500 F) and grade stamped.
2. All lumber shall be straight, smooth and free of splinters. Where exposed, all lumber shall have an eased edge and straight edges.
3. The lumber shall be subject to inspection and approval by the Engineer after arrival on the site.
4. All lumber used shall be treated with ACQ - Ammoniacal Copper Quaternary produced in accordance with ACQ Preserve Standard ACQ 01-02 and the appropriate AWWA Standard (Category UC1, UC2, UC3A, UC3B, UC4A, UC4B, U1 AND T1). The ACQ retention rate shall be a minimum of 0.60 lbs/cf.
5. Concrete for footings shall conform to Class A concrete 1-2-4 mix as specified in Item 17A, but payment shall be made under this item. Footings shall be cast rough in the ground and pitched above grade to shed water. The cost of excavation and backfilling for footings shall be paid for under this item.
6. The Contractor shall install the Timber Guide Rail in accordance with the Plans, Specifications and direction of the Engineer.

C. Measurement and Payment.

1. The quantity to be paid for under this item shall be the actual linear feet of Timber Guide Rail furnished and installed as indicated on the Plans, as required by the Specifications or where directed by the Engineer.
2. The unit prices bid for Timber Guide Rail under this item shall include the cost of all labor, tools, materials, equipment and other incidentals required to satisfactorily complete the required work as indicated on the Plans, as required by the Specifications or where directed by the Engineer.

**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” from the Nassau County 2009 Standard Specifications 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 36DRAR-S - RUT AVOIDANCE ASPHALT CONCRETE TYPE IA
(Top RA Resurfacing) (SPECIAL)**

Under this item the Contractor will be required to place any or all of the Asphalt Items as covered under Item 36DRAR of the Nassau County 2009 Standard Specifications.

Payment under this item will be made under the following payment schedule for each work order:

ITEM 36DRAR-S-A -	0 Ton to 25 Ton placed
ITEM 36DRAR-S-B -	26 Ton to 50 Ton placed
ITEM 36DRAR-S-C -	51 Ton to 100 Ton placed
ITEM 36DRAR-S-D -	101 Ton & over placed

ITEM 36HMA – 9.5 F1 TOP COURSE HMA, 70 SERIES COMPACTION

A. Description

All the provisions of Item 402.097104 from the NYSDOT Standard Specifications, Sections 401 and 402 shall apply.

ITEM 36PAP — PERVIOUS ASPHALT PAVEMENT

PART 1— GENERAL

1.1 DESCRIPTION

- A. This section includes the following:
1. Subgrade preparation.
 2. Installation of infiltration beds.
 3. Porous bituminous base course and paving.
 4. Geomembrane and filter fabrics
 5. Metal edge and edge stone

1.2 SYSTEM DESCRIPTION

- A. Provide porous pavement according to the materials, workmanship, and other applicable requirements of the standard specifications of the state or of authorities having jurisdiction.

1.3 SUBMITTALS

- A. Product Data: Submit a list of materials proposed for work under this Section including the name and address of the materials producer and the location from which the materials are to be obtained.
- B. Material Certificates: Certificates signed by the materials producer and the paving subcontractor, stating that materials meet or exceed the specified requirements.
- C. Samples:
1. Coarse aggregates for choker course in labeled plastic bag.
 2. Coarse aggregate for infiltration bed in labeled plastic bag.
 3. Non-woven geotextile 12x12" square.
- D. Product Analysis:
1. Sieve analysis for infiltration bed coarse aggregate.
 2. Sieve analysis for choker course.
 3. Asphalt Mix: The asphalt mixing plant shall certify the aggregate mix. The certification letter from the mixing plant will include the following:
 - a. Abrasion loss factor.
 - b. Polymer additive.
 - c. Binder drain down.
 - d. Tensile strength ratio.
 - e. Resistance to stripping by water.
 - f. Asphalt content in the mix.
 4. Polymer Additive: The polymer-modified asphalt supplier shall supply a certification letter before the mix is placed on the project. The certification letter from the supplier will include the following:
 - a. Type of elastomeric polymer used to modify the asphalt.
 - b. Information on the storage and stability of the polymer modified asphalt.

- c. Recommended mixing and compaction temperatures.
- d. A statement saying that the polymer modified asphalt will comply with these specifications.

1.4 QUALITY ASSURANCE

- A. **Installer Qualifications:** Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.
- B. **Manufacturer Qualifications:** Contractor will engage a firm experienced in manufacturing porous asphalt similar to that indicated for this Project and with a record of successful in-service performance.
 - 1. Firm shall be a registered and approved paving mix manufacturer with authorities having jurisdiction or with the DOT of the state in which the Project is located.
- C. **Pre-installation Conference:** Conduct conference at project site to review methods and procedures related to porous paving including, but not limited to, the following:
 - 1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture porous asphalt.
 - 2. Review condition of substrate and preparatory work performed by other trades.
 - 3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
 - 4. Review and finalize construction schedule for paving and related work. Verify availability of materials, paving Installer's personnel, and equipment required to execute the work without delays.
 - 5. Review inspection and testing requirements, governing regulations, and proposed installation procedures.
 - 6. Review forecasted weather conditions and procedures for coping with unfavorable conditions.
- D. **Field Quality Control:**
 - 1. The full permeability of the pavement surface shall be tested by application of clean water at the rate of at least 5 gpm over the surface, using a hose or other distribution devise. Water used for the test shall be clean, free of suspended solids and deleterious liquids and will be provided at no extra cost to the Owner. All applied water shall infiltrate directly without puddle formation or surface runoff, and shall be observed by the Engineer and Owner.
 - 2. **Testing and Inspection:** Employ at Contractor's expense an inspection firm acceptable to the Engineer and Owner to perform soil inspection services, staking and layout control, and testing and inspection of site grading and pavement work. Inspection and list of tests shall be reviewed and approved in writing by the Engineer prior to starting construction. All test reports must be signed by a licensed Engineer.
 - 3. **Test in-place base and surface course** for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable work as directed by the Owner.
 - 4. **Surface Smoothness:** Test finished surface for smoothness and even drainage, using a ten-foot to centerline of paved area. Surface will not be accepted if gaps or ridges exceed 3/16 of an inch.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in clean, dry, protected location and within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.6 PROJECT CONDITIONS

A. Protection of Existing Improvements:

- 1. Protect adjacent work from splashing of paving materials. Remove all stains from exposed surfaces of paving, structures, and grounds. Remove all waste and spillage.
- 2. Do not damage or disturb existing improvements or vegetation. Provide suitable protection where required before starting work and maintain protection throughout the course of the work.
- 3. Restore damaged improvements, including existing paving on or adjacent to the site that has been damaged as a result of construction work, to their original condition or repair as directed to the satisfaction of the Owner, and authority having jurisdiction at no additional cost.

B. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:

- 1. Porous bituminous paving mixtures: Minimum ambient temperature is 55 degrees Fahrenheit.
- 2. Pavement Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient temperature of 40 degrees F for oil-based materials, 50 degrees F for water-based materials, and not exceeding 95 degrees F.

1.7 REFERENCES

- A. Annual Book of ASTM Standards, 1997 or latest edition; American Society for Testing and Materials, Philadelphia, PA.
- B. Standard Specifications, latest edition; New York State Department of Transportation.
- C. Standards of the American Association of State Highway and Transportation Officials (AASHTO), 1998 or latest edition.

PART 2-PRODUCTS

2.1 MATERIALS

A. Coarse Aggregate for Infiltration Beds:

- 1. All aggregates within infiltration beds shall meet the following:
 - a. Maximum Wash Loss of 0.5%.
 - b. Minimum Durability Index of 35.
 - c. Maximum Abrasion of 10% for 100 revolutions and maximum of 50% for 500 revolutions.

2. Unless otherwise approved by the Engineer, coarse aggregate for the groundwater infiltration beds shall be crushed, washed, uniformly graded stone clean and free of fines with the following

U.S. Standard Sieve Size	Percent Passing
2-1/2" (61 mm)	100
2" (50 mm)	90-100
1-1/2" (37.5 mm)	35-70
1" (25 mm)	0-15
1/2" (12.5 mm)	0-5

3. If the above gradation cannot be met, the following gradation (AASHTO size number 5) is acceptable with approval of the Engineer and a minimum void space of 40% after compaction.

U.S. Standard Sieve Size	Percent Passing
1-1/2" (37.5 mm)	100
1" (25 mm)	90-100
3/4" (19. mm)	20-55
1/2" (12.5 mm)	0-10
3/8" (9.5 mm)	0-5

B. Choker Base Course:

1. Aggregate for the choker base course shall be crushed, washed, stone clean and free of fines with the following gradation (AASHTO size number 57):

U.S. Standard Sieve Size	Percent Passing
1-1/2" (37.5 mm)	100
1" (25 mm)	95-100
1/2" (12.5 mm)	25-60
4 (4.75 mm)	0-10
8 (2.36 mm)	0-5

C. Non-woven geotextile shall be Mirafi 160N, or approved equal with the following characteristics:

1. Grab Tensile Strength: 1601bs (0.71 kN); ASTM D 4632,
2. Tear Strength: 60 lbs (0.27 kN); ASTM D 4533.
3. Puncture Resistance: 95 lbs (0.42 kN); ASTM D 4833.
4. Water Flow Rate: 110 gpm per sq. ft. (4477 Us per sq. m); ASTM D 4491.
5. Apparent Opening Size: 70 US Sieve size (0.212 mm); ASTM D 4751.
 - a. Permittivity 1.4 sec-1; ASTM 4491

D. Porous Bituminous Asphalt:

1. Bituminous surface course for porous paving shall be two and one-half (2.5) inches thick with a bituminous mix of 5.5% to 6% by weight dry aggregate. In accordance with ASTM D6390, drain down of the binder shall be no greater than 0.3%. If more absorptive aggregates, such as limestone, are used in the mix then the amount of bitumen is to be based

on the testing procedures outlined in the National Asphalt Pavement Association's Information Series 131 - "Porous Asphalt Pavements" (2003) or NYSDOT equivalent.

2. Use neat asphalt binder modified with an elastomeric polymer to produce a binder meeting the requirements of PG 76-22. The elastomeric polymer shall be styrene-butadiene-styrene (SBS), or approved equal, applied at a rate of 3% by total weight of the binder. The composite materials shall be thoroughly blended at the asphalt refinery or terminal prior to being loaded into the transport vehicle. The polymer modified asphalt binder shall be heat and storage stable.
3. Aggregate in the asphalt mix shall be minimum 90% crushed material and have a gradation of:

U.S. Standard Sieve Size	Percent Passing
1/2" (12.5 mm)	100
3/8" (9.5 mm)	92-98
4 (4.75 mm)	32-38
8 (2.36 mm)	12-18
16 (1.18 mm)	7-13
30 (600 nth)	0-5
200 (75 Om)	0-3

4. Add hydrated lime at a dosage rate of 1.0% by weight of the total dry aggregate to mixes containing granite. Hydrated lime shall meet the requirements of ASTM C 977. The additive must be able to prevent the separation of the asphalt binder from the aggregate and achieve a required tensile strength ratio (TSR) of at least 80% on the asphalt mix.

The asphaltic mix shall be tested for its resistance to stripping by water in accordance with ASTM D-3625. If the estimated coating area is not above 95 percent, anti-stripping agents shall be added to the asphalt.

- E. Metal Edge — 1/4" x 5" commercial grade stainless steel metal edge with anchor stake 32" on center.
- F. Geomembrane — 30 mil HDPE
- G. Edge Stone — shall be #2 washed gravel — 3/4" to 1 1/2" stone size.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Infiltration Beds:
 1. Owner shall be notified at least 24 hours prior to all infiltration bed and porous paving work.
 2. Subgrade Preparation:
 - a. The subgrade bed bottom shall be benched and back pitched in accordance with the plan details.
 - b. Existing subgrade under bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to geotextile and stone bed placement.
 - c. Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 inches with a york rake or equivalent and light tractor.

- d. Bring subgrade of stone infiltration bed to line, grade, and elevations indicated. Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of stone.
- e. Install geomembrane where pervious pavement will abut standard asphalt pavements
- 3. Infiltration Bed Installation:
 - a. Upon completion of subgrade work, the Engineer shall be notified and shall inspect at his/her discretion before proceeding with infiltration bed installation.
 - b. Geotextile and infiltration bed aggregate shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of geotextile at no extra cost to the Owner.
 - c. Place geotextile in accordance with manufacturer's standards and recommendations. Adjacent strips of geotextile shall overlap a minimum of sixteen inches (16"). Secure geotextile at least four feet (45 outside of bed and take steps necessary to prevent runoff or sediment from entering the storage bed.
 - d. Install coarse aggregate in 8-inch maximum lifts. Lightly compact each layer with equipment, keeping equipment movement over storage bed subgrades to a minimum. Install aggregate to grades indicated on the drawings.
 - e. Install equalizer pipe and observation well. Install equalizer pipe at lowest elevation of lowest bench. Observation well location shall be determined in the field and cap shall be set flush with finished grade.
 - C. Install choker base course (see Materials section) aggregate evenly over surface of stone bed, sufficient to allow placement of pavement, and notify Engineer for approval. Choker base course shall be sufficient to allow for even placement of asphalt but no thicker than 1-inch in depth.
 - g. Following placement of bed aggregate, the geotextile shall be folded back along all bed edges to protect from sediment washout along bed edges. At least a four-foot edge strip shall be used to protect beds from adjacent bare soil. This edge strip shall remain in place until all bare soils contiguous to beds are stabilized and vegetated. In addition, take any other necessary steps to prevent sediment from washing into beds during site development. When the site is fully stabilized with vegetation, temporary sediment control devices shall be removed.

B. Porous Bituminous Asphalt:

- 1. Transporting Material:
 - a. Transporting of mix to the site shall be in vehicles with smooth, clean dump beds that have been sprayed with a non-petroleum release agent.
 - b. The mix shall be covered during transport to control cooling.
- 2. Porous bituminous asphalt shall not be stored in excess of 90 minutes before placement.
- 3. Asphalt Placement:
 - a. The porous bituminous surface course shall be laid in one lift directly over the storage bed and stone base course to a 2.5-inch finished thickness.
 - b. The laying temperature of the bituminous mix shall be between 300 degrees Fahrenheit and 350 degrees Fahrenheit (based on the recommendations of the asphalt supplier).
 - c. Installation shall take place when ambient temperatures are 55 degrees Fahrenheit or above, when measured in the shade away from artificial heat.
 - d. The use of a remixing material transfer device between the trucks and the paver is highly recommended to eliminate cold lumps in the mix.

- e. The polymer-modified asphalt is difficult to rake. A well-heated screed should be used to minimize the need for raking.
 - f. Compaction of the surface course shall take place when the surface is cool enough to resist a 10-ton roller. One or two passes are required for proper compaction. More rolling could cause a reduction in the surface porosity which is unacceptable.
- 4. After final rolling, no vehicular traffic of any kind shall be permitted on the surface until cooling and hardening has taken place, and in no case within the first 48 hours. Provide barriers as necessary at no extra cost to the Owner to prevent vehicular use; remove at the discretion of the Engineer. Work shall be done expertly throughout, without staining or injury to other work.
 - 5. Transition to adjacent pavements shall be merged neatly with flush, clean line. Contractor shall install edge gravel where shown on the plans Metal edging shall be used where indicated on the plans. Metal edge and gravel shall be flush with top of asphalt to allow excess flow to run into swale. Finished paving shall be even, without pockets, and graded to elevations shown on drawing.
 - 6. Porous pavement beds shall not be used for equipment or materials storage during construction, and under no circumstances shall vehicles be allowed to deposit soil on paved porous surfaces.
 - 7. Repair of Damaged Paving:
 - a. Any existing paving on or adjacent to the site that has been damaged as a result of construction work shall be repaired to the satisfaction of the Owner without additional cost to the Owner.
 - 8. Grade Control:
 - a. Establish and maintain required lines and elevations. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks and free of low spots to form puddles. All areas must drain.
 - b. If, in the opinion of the Owner, based upon reports of the testing service and inspection, the quality of the work is below the standards which have been specified, additional work and testing will be required until satisfactory results are obtained.

PART 4 - MEASUREMENT

- 4 Method of Measurement. The quantity to be paid for under this item shall be the number of square yards of pervious asphalt installed complete, measured in place, acceptably completed in accordance with the Plans and Specifications.

PART 5 - PAYMENT

- 5 Basis of Payment. The unit price bid for this item shall include the cost of furnishing all labor, materials, tools, equipment and incidentals necessary to satisfactorily complete the entire work including subgrade preparation, fine grading, infiltration beds, porous bituminous paving, geotextiles, geomembrane, metal edge and edge stone in accordance with the Plans and Specifications.

ITEM 102X-WORK ZONE TRAFFIC CONTROL (Day)

All requirements for Item 102 from the Nassau County 2009 Standard Specifications shall apply, with the following modifications:

A. Description

Work Zone Traffic Control (Day) shall be applicable on a per work order basis for construction operations performed during day time and/or for work zone traffic control devices that remain in place during non-work hours. No work shall commence until all appropriate traffic devices have been placed and functioning.

If in the judgment of the Engineer, traffic is not properly and adequately maintained, no payment will be made to the contractor for those days/nights. The price bid shall include the cost of furnishing all labor, materials, tools, and equipment necessary to satisfactorily complete the required work.

B. Method of Measurement and Payment

Measurement and payment under this item shall be made on a per day (24 hour) Basis.

ITEM 102Y -WORK ZONE TRAFFIC CONTROL (Night)

All requirements for Item 102X shall apply, with the following modifications:

A. Description

This item shall be applicable for construction operations performed at night. During night time construction operations, the contractor shall supply portable lights (light towers) and equipment in order to satisfactorily light up the work area per latest edition of Manual on Uniform Traffic Control Devices (MUTCD) standards and/or A.O.B.E.

B. Method of Measurement and Payment

Measurement and payment under this item shall be made on a per night basis when construction operations are performed at night. There shall be no additional payment for furnishing and placing portable lights and/or nighttime labor wage differential and the additional cost shall be deemed included in the bid price for this item.

**ITEM 116AM – PROFILING AND REMOVAL OF ASPHALT
(PAVING BY OTHERS WILL FOLLOW)**

Under this Item, the Contractor shall remove and dispose of existing asphalt surface pavement as out lined in Item 116A of the Nassau County 2009 Standard Specifications with the stipulation that the paving of the road will be performed by others.

ITEM 117T-6 - TEMPORARY FENCE - 6' HIGH

A. Description.

Under these Items the Contractor shall furnish and install Six (6') Foot High Temporary Fence in accordance with the Plans, Specifications or directed by the Engineer.

B. Construction Details.

1. Fabric.

- a. All chain link fence fabric shall be 2" mesh, 9 gauge galvanized steel chain link fabric in accordance with ASTM F 668. Zinc coated steel wire shall have a minimum core wire break strength of 1,290 psi. Fabric selvages shall be knuckled top and bottom. The zinc coating shall be a minimum 1.20 oz. per square foot.

2. Line Posts.

- a. Line Posts shall be 2" diameter and manufactured to the following specifications:
 - 1) **Class A, Schedule 40 Pipe.** Posts shall be standard weight Schedule 40 Pipe, manufactured in accordance with ASTM F 1083.
 - 2) **Class B, Steel Tubing.** Posts shall be manufactured by one of the following methods with the steel conforming to ASTM A569M or ASTM A607 with a minimum yield strength of 50,000 psi:
 - a) Furnace butt welded, continuous welded
 - b) Cold rolled and electric resistance welded
 - c) Seamless
 - b. Line posts shall be set at maximum of 10'-0" on centers.
 - c. Posts shall be driven a minimum of 24" into the ground.
 - d. Post Ties: Post tie spacing shall be 14" on centers and within 6" from the top and bottom of the fabric as herein specified.
 - e. Each Line Post shall be fitted with a properly fastened steel cap.
3. **Fittings.** All fittings shall be hot dipped galvanized in accordance with ASTM F 626.
 4. An allowance of ten (10) linear feet will be added for each Terminal Post - end, corner, angle, pull and gate post and will be complete with knee bracing and all of the necessary hardware components.
 5. Method – all provisions as per Item 117 shall apply.

C. Measurement and Payment.

1. The quantity to be paid for under these Items shall be the total number of linear feet of Six (6') Foot High Temporary Fence measured in final position furnished and installed.

2. The unit price bid per linear foot for these Items shall include the cost of all labor, tools, materials, equipment and other incidentals necessary to satisfactorily erect, maintain and remove the fence as directed by the Engineer.

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 502 - HIGHWAY SEALING AND SURFACE COATING (LATEX)

A. Scope

This specification covers the materials and construction procedures for sealing shrinkage cracks and spelling in roadways and sidewalks, and providing a surface coating to prevent further deterioration. To accomplish these goals, a latex admixture shall be used in mortars and concrete.

B. Materials

The material used to surface coat the roadways and sidewalks is a 42% solids, organic polymer latex admixture (sika latex or equal). A white milky mixture it contains air-detraining agents.

C. Mixing

The mixes to be used should be mixed in the following proportions:

a. Mortar

Cement - 94 lb., (one bag) 7 Type II or Type III
Sand 3 1/4 cubic ft.
Latex 4 gal.
Water - as required

b. Concrete

Cement - 94 lb. (one bag) Type II or Type III
Sand - 2 % cu. ft.
Crushed stone or gravel, % in. max. size - 2 cu. ft.
Latex - 4 gal.
Water-as required

c. With mixer running, add materials in the following order:

- (1) Latex
- (2) Aggregate
- (3) Cement
- (4) Water as required

D. Construction Procedure

- a. All surfaces to be coated must be cleaned free of dust, laitance, scale, oil, grease, curing compounds, impregnations, waxes, foreign particles, painted lines, and disintegrated material, by sandblasting or using mechanical abrasion methods. Particular care must be used to ensure that cracks are free of any substance that may prevent sealing or a successful bond between the surface coating and the concrete.
- b. At time of placement, substrate should be damp with no free standing water. Place mortar or concrete in area to be resurfaced, and brush into surface with a

stiff bristled broom. Care should be exercised to see that mortar is brushed into surface at all edges. Before scrub coat has a chance to dry, additional mortar or concrete should be placed and struck off to a smooth even surface. The latex mortar should then be screed, bull floated and/or troweled. Over finishing should be avoided.

- c. As soon as the finish is placed and to avoid any damage, area should be cured with damp burlap or white-pigmented polyethylene film. Curing should continue for 24 hours.
- d. Under normal temperature conditions, area may be opened to foot traffic after 24 hours; to light traffic after 2-4 days' and to heavy traffic after 3-5 days.
- e. Latex-modified Portland-cement mixtures are more difficult to finish than non-modified mixtures. A hard, steel trowel finish is almost impossible to achieve. Avoid overworking or over finishing surface. Do not use air entraining cements with latex.

E. Basis of Payment.

- a. Sealing and surface coating shall be paid on a square foot basis. The price bid shall include the cost of furnishing all labor, materials, tools and equipment necessary to satisfactorily complete the required work in accordance with the specifications and/or as directed by the Engineer.
- b. No additional payment will be made for cleaning the existing pavement or sidewalk, but the cost shall be included in the square foot paid for the sealing and surface coating.
- c. The Contractor shall conform to the requirements of Items 102X (DAY) or 102Y (NIGHT) – Work Zone Traffic Control. A minimum of one lane of traffic in each direction shall be maintained at all times. The cost of Work Zone Traffic Control shall be paid for under Items 102X or 102Y.

ITEM 515 - SAWCUTTING GROOVES IN EXISTING ASPHALT OR CONCRETE PAVEMENT

A. Description.

Under this item the Contractor shall cut grooves in existing pavement to conform with the details as shown on the contract plans and/or as directed by the Engineer.

B. Method.

The Contractor shall broom the pavement surface prior to saw-cutting the grooves. He shall keep the roadway clean and free from all residue and debris that may occur from his operation. Upon completion and final acceptance of the contract, all grooves shall be clean and free from any materials washed into them to the satisfaction of the Engineer.

C. Method of Measurement.

The quantity to be paid for under this item will be the number of linear feet of actual grooves sawcut in the existing asphalt or concrete pavement.

D. Basis of Payment.

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

ITEM 522 - TRIANGULAR GUIDE RAIL DELINEATOR

A. Description:

1. This item is to be used on Corrugated Beam Guide Rail, Heavy Post Blocked-Out Corrugated Beam Guide Rail, and Heavy Post Blocked-Out Corrugated Beam Median Barriers. The Triangular (trapezoid) shaped galvanized steel bracket delineator faced with reflective sheeting are placed within the depressed portion of the corrugated beam guide rail visible to vehicles.
2. Specifications are as follows: Triangular shaped slotted bracket - 12 gauge galvanized steel - approximately 5" X 2 3/4"

B. Material:

1. Reflective Material shall be Hi-Intensity Grade Sheeting.
2. Colors:
 - a) **Front/Back:** White/Yellow, White/Red, Yellow/Red, White/Blank, and Yellow/Blank as specified on the plans or ordered by Engineer.
 - b) **Size:** Top - 5", Bottom - 2 3/4", Height - 2 1/4" Effective Reflex Area approximately 8 square inches.

C. Construction Details:

1. The appropriate color, galvanized steel triangular guide rail delineator should be placed within the center of the depressed portion of the corrugated beam guide rail utilizing the existing 5/8" X 1 %" hex head steel full body bolt. The delineator bracket will be bolted between the flat plate washer and the front of the guide rail in accordance with the manufacturer's specifications and as directed by the Engineer.

D. Method of Measurement:

1. The quantity to be paid for under this item shall be the actual number of triangular guide rail delineators furnished and installed in accordance with the plans, specifications and as directed by the engineer.

E. Basis of Payment:

1. The unit price per each bid for this Item shall include all materials, labor, tools, equipment and incidentals necessary to complete the required work.

ITEM 540 - STEEL BOLLARDS

A. Description.

1. Under this item, the contractor shall furnish and install steel bollards in strict accordance with the approved manufacturer's printed directions utilizing the proper anchorage and attachments as designated by the manufacturer at the locations shown on the drawings or as directed by the Engineer.

B. Materials.

1. The contractor shall submit complete and accurate shop drawings, catalog cuts, details or illustrated literature for the Engineer's approval. No installation shall be made prior to approval of the Engineer.

C. Installation.

1. Steel Bollards shall be installed in accordance with the plans and specifications, manufacturer's recommendations, and as directed by the Engineer. No installation shall begin until shop drawings, catalog cuts, details or illustrated literature are submitted and approved by the Engineer.

D. Submittals.

1. Product Data: Shop drawings, catalog cuts, details, illustrated literature, specifications and installation instructions.

E. Method of Measurement.

1. The quantity to be measured for payment shall be the number of steel bollards installed in their entirety.

F. Basis for Payment.

1. The unit price bid per steel bollard shall include the cost of furnishing all labor, material, and equipment necessary to satisfactorily complete the work, to the acceptance of the Engineer.

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(WET NIGHT VISIBILITY SPHERES)
ITEM 685.0720XX10 - EPOXY REFLECTORIZED PAVEMENT MARKINGS 20 MILS THICK
(WET NIGHT VISIBILITY SPHERES)

DESCRIPTION:

Under this work the contractor shall furnish and apply epoxy reflectorized pavement markings in accordance with these specifications, the Contract Documents, the NYSMUTCD, 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. Following a simultaneous application of Standard Glass Beads (Type 2) and Wet/Night Visibility Beads (Type 1), the cured epoxy marking shall be an adherent reflectorized stripe that will provide wet night retro-reflectivity.

MATERIALS REQUIREMENTS:

Epoxy Paint	727-03
Glass Beads for Pavement Markings	727-05

Reflective Glass Spheres

Retro-reflective beads shall be a double drop system of glass spheres consisting of Standard Beads (Type 2) and Wet/Night Visibility Beads (Type 1) as defined in §727-05 Glass Beads for Pavement Markings.

EPOXY APPLYING 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 applying 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 applying 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.

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Mobile applying 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 (Type 2) and Wet/Night Visibility (Type 1) glass spheres. 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 (Type 2) and Wet/Night Visibility (Type 1) glass spheres. Each dispenser shall be capable of applying spheres at a minimum rate of 10 lbs/gal of epoxy resin composition.
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 Construction Details, D. Application of Epoxy ReflectORIZED Pavement Markings.

CONSTRUCTION DETAILS

A. General

All pavement markings shall be placed as shown on the Contract Documents and in accordance with the New York State, Manual of Uniform Traffic Control Devices (MUTCD).

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

At least five (5) days prior to starting striping, the Contractor shall provide the Engineer with the epoxy manufacturer's written instructions for use. These instructions shall include, but not be limited to, material mixing ratios and application temperatures.

When pavement markings are applied 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.

The application of pavement markings shall be done in the general direction of traffic. Striping against the direction of traffic flow shall not be allowed.

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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.

When necessary the Contractor shall establish marking line points at 30 foot intervals throughout the length of the pavement or as directed by the Engineer.

B. Atmospheric Conditions

Epoxy pavement markings shall only be applied during conditions of dry weather and on substantially dry pavement surfaces. At the time of installation the pavement surface temperature shall be a minimum of 50°F and the ambient temperature shall be a minimum of 50°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.

C. Surface Preparation

The Contractor shall clean the pavement and existing durable markings to the satisfaction of the Engineer.

Surface cleaning and preparation work shall be performed only in the area of the epoxy markings application.

At the time of application all pavement surfaces and existing durable markings shall be free of oil, dirt, dust, grease and similar foreign materials. The cost of cleaning these contaminants shall be included in the bid price of this item.

In addition, concrete curing compounds on new portland cement concrete surfaces and existing painted pavement markings on both concrete and bituminous pavement surfaces shall be cleaned and paid for in accordance with §635 Cleaning and Preparation of Pavement Surfaces for Pavement Markings.

D. Application of Epoxy ReflectORIZED Pavement Markings

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

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

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recommendations, is uniformly hot-sprayed onto the pavement surface at the minimum specified thickness.

3. Standard (Type 2) and Wet/Night Visibility (Type 1) reflective glass spheres are injected into or dropped onto the liquid epoxy marking. Standard beads (Type 2) shall be applied first immediately followed by the application of Wet/Night Visibility beads (Type 1). Each type shall be applied at a minimum rate of 10 lbs/gal of epoxy resin (minimum total application = 20 lbs/gal).

E. Defective Epoxy Pavement Markings

Epoxy reflectORIZED pavement markings, which after application and curing are determined by the Engineer to be defective and not in conformance with this specification, shall be repaired. Repair of defective markings shall be the responsibility of the Contractor and shall be performed to the satisfaction of the Engineer as follows:

1. Insufficient film thickness and line width; insufficient glass bead coverage or inadequate glass bead retention.

Repair Method. 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.

Immediately after surface preparation remove loose particles and foreign debris by brooming or blasting with compressed air.

Repair shall be made by restriping over the cleaned surface in accordance with the requirements of this specification and at the full thickness indicated on the Contract Documents.

2. Uncured or discolored epoxy*; insufficient bond (to pavement surface or existing durable marking).

Repair Method. 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 three feet 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.

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*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.

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 State.

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:

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

BASIS OF PAYMENT

The accepted quantities of markings will be paid for at the contract unit price, which shall include the cost of furnishing all labor, materials and equipment to satisfactorily complete the work. The cost for maintaining and protecting traffic during the marking operations shall be included in the price bid. The cost of removal of concrete curing compounds and existing pavement markings will be paid under separate items and are not included in this item.

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

<u>PAY ITEM NO.</u>	<u>DESCRIPTION</u>	<u>PAY UNIT</u>
685.07150110	White Epoxy Reflectorized Pavement Stripes – 15 mils	Foot

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685.07150210	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Pavement Letters - 15 mils	Each
685.07150310	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Pavement Symbols – 15 mils	Each
685.07150410	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Cross Hatching -15 mils Thick	Foot
685.07150510	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Pavement Stripes (Special Markings) 15 mils Thick (Wet Night Visibility Spheres)	Foot
685.07150610	Yellow Epoxy ReflectORIZED Pavement Stripes – 15 mils	Foot
685.07150710	(Wet Night Visibility Spheres) Yellow Epoxy ReflectORIZED Pavement Stripes (Cross Hatching) 15 mils Thick (Wet Night Visibility Spheres)	Foot
685.07150810	White Epoxy ReflectORIZED Pavement Yield Line Symbols - Small - 15 mils	Each
685.07150910	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Pavement Yield Line Symbols - Large - 15 mils (Wet Night Visibility Spheres)	Each
685.07200110	White Epoxy ReflectORIZED Pavement Stripes – 20 mils	Foot
685.07200210	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Pavement Letters – 20 mils	Each
685.07200310	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Pavement Symbols – 20 mils	Each
685.07200410	(Wet Night Visibility Spheres) White Epoxy ReflectORIZED Pavement Stripes (Cross Hatching) 20 mils Thick (Wet Night Visibility Spheres)	Foot
685.07200510	White Epoxy ReflectORIZED Pavement Stripes (Special Markings) 20 mils Thick (Wet Night Visibility Spheres)	Foot

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685.07200610	Yellow Epoxy ReflectORIZED Pavement Stripes – 20 mils (Wet Night Visibility Spheres)	Foot
685.07200710	Yellow Epoxy ReflectORIZED Pavement Stripes (Cross Hatching) 20 mils Thick (Wet Night Visibility Spheres)	Foot
685.07200810	White Epoxy ReflectORIZED Pavement Yield Line Symbols - Small - 20 mils (Wet Night Visibility Spheres)	Each
685.07200910	White Epoxy ReflectORIZED Pavement Yield Line Symbols - Large - 20 mils (Wet Night Visibility Spheres)	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
 - d. Or equal

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.

ITEM 764 - COLORED AND IMPRINTED ASPHALT

A. Description.

1. This work shall consist of furnishing and installing Colored and Imprinted Asphalt System, as manufactured by, Integrated Paving Concepts Inc., #102 - 17957 - 55 Ave. Surrey, BC V3S 6C4, Phone: (604) 574-7510, FAX: (604) 574-7520 or approved equal. Colored and Imprinted Asphalt System shall be installed on new Asphalt Concrete pavement installed as part of this contract under other items. The surface of the HMA shall be patterned and colored to create the appearance of hand laid decorative paving stones by an authorized StreetPrint™ applicator. Two areas will receive this treatment. First is roadway pavement that has been overlaid with new asphalt concrete pavement. The second is new mowstrip asphalt within raised median areas. Asphalt pavement texturing is a highly specialized process that requires the skill of a qualified applicator working with the proper equipment and applying highly specialized coating(s) designed specifically for application to asphalt pavement.

B. References.

1. ASTM D-4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester. ASTM D-4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser. ASTM D522-93A Standard Test Method for Mandrel Bend Test of Attached Organic Coatings. ASTM G-155 QUV Accelerated Weathering Environment. Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials. ASTM D-2486 MEK rub test for chemical resistance. ASTM E-303 British Pendulum test for friction. EPA 24 ASTM D3960-05 Volatile Organic Compounds.

C. Submittals.

1. The documents shall be submitted to the Engineer prior to installation:
 - a. Proof of applicator's ability. A copy of the current year license as provided to the proposed applicator issued by a recognized authority in the execution of asphalt pavement texturing work.
 - b. Failing that, at least 3 reference sites and written references from 3 previous customers for work performed by this applicator.
 - c. A list of the major equipment to be used in the execution of the Work. This list will include the asphalt pavement reheat machinery, spray equipment, compactor(s) and templates.
 - d. The name of the coating(s) and the coating supplier's name.
 - e. Certified performance test results of the coating materials as outlined in Table 1.
 - f. Confirmation of coating color(s).

D. Materials.

1. Coatings.

- a. Properly designed asphalt pavement coatings have been scientifically formulated to provide the optimal balance of performance properties for a durable, long lasting color and texture to asphalt pavement surfaces. Some of these key properties include wet wear durability, crack resistance, fade resistance, adhesion, and friction properties. These properties must be backed up by a Certificate of Analysis from an independent laboratory or an equal document that certifies these performance properties.
- b. The asphalt pavement coating must be environmentally safe and meet EPA requirements for Volatile Organic Compounds (VOC).
- c. Only use asphalt pavement coatings from qualified pavement coating suppliers who can provide proof of these required performance properties.

2. Minimum Performance Properties of Asphalt Coating.

- a. The following table outlines the minimum required performance properties of the asphalt pavement coating. These performance properties must be ascertained by a Certificate of Analysis issued by an approved testing facility

Characteristic	Test Specification	Minimum Required Results
Durability Taber Abrasion (cycles to wear-through)	ASTM D-4060 Abrasion Resistance of Organic Coatings (wet wear) 7 day cure, 24 hour soak; H-10 wheel	Wear Index (WI) < 5.0
Color stability		Brick color $\Delta E < 1.5$
Flexibility: Mandrel Bend	ASTM D 522-93A Flexibility as measured by Mandrel bend 0.5mm thick sample passes 10 mm at 21°C 0.5mm thick sample passes 125mm at -18°C	
Chemical resistance	ASTM D-2486 Modified MEK scrubs 16 dry mils, number of scrubs until 50% substrate exposed	> 5000
Adhesion to Asphalt	ASTM D-4541	Substrate Failure
Friction Wet	ASTM E-303 British Pendulum Tester	> 55
Environmental Sensitivity	EPA 24 ASTM D3960-05 Volatile Organic Compounds	VOC < 150

Table 1: Required Performance Properties of Asphalt Pavement Coating.

3. Equipment.

- a. The following specialized equipment shall be used in the execution of the Work.
 - 1) Metal wire rope templates are used to create the desired imprint pattern. Only use templates that have been supplied by a manufacturer who has the proven expertise in manufacturing these templates for this type of application.
- b. Asphalt pavement reheat equipment specifically designed for asphalt pavement texturing is to be used in the execution of this work. The primary asphalt pavement re-heat equipment must cycle the heat application and must allow the equipment operator to check the pavement surface temperature during the

heating process, These controls are necessary to enable the pavement temperature to be elevated gradually, giving the operator the ability to ensure that the pavement is not overheated or adversely affected. Heaters without these controls are strictly prohibited as the primary re-heats equipment.

- c. Hand-held portable heating devices may be used only for areas where It is difficult to operate the re-heat machine. These may not be used as the primary pavement re-heating device.
- d. Finishing tools that are designed to enable the applicator to complete the imprinting of the asphalt pavement in areas which may be inaccessible to the template such as curbs and manhole covers are permitted.
- e. Vibratory Plate Compactors shall be used for pressing the templates into the heated asphalt pavement to create the specified pattern.
- f. Specialized coating spray equipment must be used in the application of the coating and must be capable of applying the coating to the asphalt pavement surface in a thin, controlled film which will optimize the drying and curing time of the coating. More specifically, the spray equipment pump must be capable of providing a continuous recirculation of the coating in order to keep the solids within the coating in suspension.

E. Construction Details.

1. **General.** The Colored and Imprinted Asphalt System shall be supplied and installed by a Qualified Applicator in accordance with the plans and specifications or as directed by the Owner. Do not begin the Work until confirmation of the Applicator's qualifications is provided.
2. **Surface Preparation.** The asphalt pavement surface shall be dry and free from all foreign matter, including but not limited to dirt, dust, de-icing materials, and chemical residue.
3. **Layout.** Layout of the pattern for imprinting into the surface of the asphalt pavement shall be as per the drawings and specifications.
4. **Heating the Asphalt Pavement.** The Applicator shall use asphalt pavement reheat equipment as described above. The optimal pavement temperature for imprinting the template is dependent upon mix design, modifiers used in the mix, the age of the pavement and weather. The surface temperature of the pavement should not exceed 325°F as determined by an infra-red thermometer reading taken after the heat is applied to the asphalt pavement. In order to achieve the proper depth of imprint it is important to elevate the asphalt pavement temperature to a minimum depth of 1/2 inch (12.5mm) without burning the pavement surface. This can only be accomplished using asphalt pavement reheat equipment that is specifically designed for this Work.
5. **Surface Imprinting.** The pavement surface shall be dry and free from all foreign matter, including but not limited to dirt, dust, de-icing materials, and chemical residue. Once the asphalt pavement has reached imprinting temperature, the templates shall be placed in position and pressed into the surface using vibratory

plate compactors. The top of the template is to be flush with the surrounding asphalt pavement and can then be removed. Areas that have an imprint depth less than 3/8 inch shall be re-heated and re-stamped prior to applying the coatings. Hand tooling is a permitted method to achieve proper imprint depth in areas difficult to get at with the template.

6. Application of Asphalt Pavement Coating Guidelines

- a. The qualified applicator shall refer to the asphalt pavement coating supplier's recommendations for methods of application. Special care and attention must be paid to ensure asphalt pavement coatings are applied in environmental conditions that permit proper cure.
 - b. The coating application shall proceed as soon as possible upon completion of the imprinting of the asphalt pavement. The pavement surface shall be completely dry and thoroughly cleaned prior to application of the asphalt pavement coating(s).
 - c. Depending upon the condition and age of the pre-existing pavement, primer may be required. Refer to the asphalt pavement coating supplier's specifications.
 - d. The qualified applicator shall use spray equipment specifically designed for the application of the coating(s) as outlined in Section 2.3 above.
 - e. Refer to the asphalt pavement coating supplier's recommendations for coating coverage rate, number of recommended passes and recommended film thickness.
7. **Opening to Traffic.** Minimally, the surface coating must be 100% dry before traffic is permitted. Refer to the asphalt pavement coating supplier's guide.

F. Method of Measurement.

1. The installation of the Colored and Imprinted Asphalt System will be measured by the number of square feet of hot mix asphalt satisfactorily imprinted, colored and sealed in accordance with the plans, this specification and as approved by the Engineer.

G. Basis of Payment.

1. The unit price bid per square foot shall include the cost of test panels, maintenance kit and the furnishing all labor, materials, equipment and tools necessary to complete the work. The asphalt pavement will be paid for under separate individual items. Areas where the Colored and Imprinted Asphalt System is deemed unacceptable by the Engineer will not be measured for payment. The contractor will be directed by the Engineer to re-apply the Colored and Imprinted Asphalt System to the satisfaction of the Engineer before payment is made. Milling and re-Installation of asphalt top course and reapplication of misapplied Colored and Imprinted Asphalt System will be done at the contractor's expense.

ITEM 765 - FURNISH & INSTALL CONCRETE PARKING BUMPER

A. Description.

1. Under this item, the contractor shall furnish and install precast cement concrete parking bumpers at locations shown on the plans, or as directed by the Engineer.

B. Materials.

1. Precast parking bumpers shall be manufactured for the intended purpose by a company or firm specializing in the manufacture of precast concrete parking bumpers. Provide precast concrete parking bumpers of half octagonal cross section, with dimensions approved by the Engineer. Unless indicated otherwise, provide bumpers of 6 foot length.
2. Bumpers shall be manufactured of 4000 p.s.i minimum reinforced concrete, to withstand constant use and rough service. Each bumper shall be reinforced with two No. 4 deformed steel reinforcing bars, minimum.
3. Each bumper to be installed on at-grade asphalt pavement shall be manufactured with two holes to accommodate the anchor rebar. Bumpers to be installed on concrete slabs shall be manufactured without holes.
4. Epoxy Adhesive: Adhesive for anchoring bumpers to pavement shall be an epoxy adhesive manufactured for the purpose, complying with ASTM C 881/C 881M, Type IV, Grade 3, Class B or C. Use Class B whenever the surface temperature is from 40 to 60 degrees F. Use Class C whenever the surface temperature is above 60 degrees F. Whenever the surface temperature is below 40 degrees F, go home and wait until such time that the surface temperature is above 40 degrees F.
5. Steel Bars for Installation: Epoxy-coated rebar, No. 5 size, conforming item 33X.
6. Submit shop drawings of bumpers, including plan layout and installation details, for approval.
7. Product data: Submit manufacturers' product data of precast bumpers and epoxy adhesive for approval

C. Construction Details.

1. No installation shall begin until shop drawings, catalog cuts, details or illustrated literature, and installation details are submitted and approved by the Engineer.
2. The pavement surface shall be prepared as per epoxy adhesive manufacturer's instructions prior to installation.
3. Precast concrete bumpers shall be anchored and secured in position on at-grade asphalt pavements, as indicated, with an appropriate epoxy adhesive as specified above and two No. 5 epoxy-coated rebar (24" long each, recessed 1/4" below the top of the bumper after installation).
4. Precast concrete bumpers shall be secured in position on concrete pavements, as indicated, with an appropriate epoxy adhesive as specified above.

D. Method of Measurement.

1. The quantity to be paid under this item will be the number of parking bumpers installed in accordance with this specification.

E. Basis of Payment.

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

ITEM 768 - FURNISH & INSTALL ARMORLESS BRIDGE JOINT SYSTEM

A. Description.

1. The system shall consist of components shown on a NYSDOT Approved Materials Detail Sheet for a Manufacturer and System whose name appears on the NYSDOT Materials Bureau Approved List. The required method of installation will be shown on the NYSDOT Approved Materials Detail Sheet.
2. **Terminology.** Materials Detail Sheet (MDS). A sheet approved by the NYSDOT DCES and containing all material requirements and installation information for Armorless Bridge Joints which are included on the NYSDOT Materials Bureau Approved List

B. Materials.

1. The material requirements shall be as shown on the NYSDOT Approved Materials Detail Sheet corresponding to a Manufacturer and System listed on the NYSDOT Materials Bureau Approved List.
2. Shop drawings will be required for any joint system supplied as part of this work. All shop drawings shall note the name and address of the joint system (or segment) fabricator as well as the location where the joint system (or segments) are to be fabricated.

C. Construction Details.

1. **Manufacturer's Representative.** The joint system shall be installed in strict accordance with the manufacturer's instructions and the NYSDOT Approved Materials Detail Sheet. In the event of a conflict, the terms of the NYSDOT Approved Materials Detail Sheet shall rule. A representative of the bridge joint system manufacturer shall be present prior to placement to inspect the prepared surfaces and remain at the job during all phases of the installation. The representative shall be fully conversant in all respects with the correct installation methods. The representative shall be responsible to advise both the Engineer and the Contractor on properly installing the joint system. The representative may be excused from the project site at the discretion of the NCDPW project manager.
2. **Preparation.** All surfaces shall be prepared as per the NYSDOT Approved MDS. At a minimum, the preformed recess which is to receive the joint system shall be air blown using air free of water and oil or vacuum-cleaned so that all loose or foreign matter is removed prior to installation of the system. The substrate shall be dry for a minimum of 24 hours prior to installation for the joint system.
3. **Storage Inspection and Handling.** The joint system shall be stored, inspected and handled in accordance with the NYSDOT Approved Materials Detail Sheet.
4. **Installation Inspection.** All installation work shall be subject to the Engineer's inspection.
5. **Watertight Integrity Test.** At least five work days after the joint system has been fully installed the Contractor shall test the entire (full length) joint system for watertight integrity. The entire joint system shall be covered with water, either ponded or flowing, for a minimum duration of 15 minutes.

6. The concrete surfaces under the joint shall be inspected during this 15 minute period, and also for a minimum of 45 minutes after the supply of water has stopped, for any evidence of dripping water or moisture. Water tightness shall be interpreted to be no free dripping water on any surface on the underside of the joint. Patches of moisture shall not be cause for non-acceptance.
7. Should the joint system exhibit evidence of water leakage at any place whatsoever, the Contractor shall locate the place(s) of leakage and take all measures necessary to seal the leak. A subsequent water integrity test shall be performed subject to the same conditions and consequences as the original test. No additional payment will be made for corrective actions.

D. Method of Measurement.

1. Measurement will be made as the number of feet of joint system completely installed, measured horizontally and vertically along the centerline of joint system between the outer limits as indicated on the contract plans.
2. The words “completely installed” shall be interpreted to mean the joint system in place with the following operations completed where applicable:
 - a. All sealant in its proper position.
 - b. All nuts tightened or retightened as required.
 - c. Concrete placed and finished.
 - d. Elastomeric concrete placed and finished.
 - e. Water-tight integrity tests

E. Basis of Payment.

1. The unit price bid per foot shall include all labor, materials and equipment necessary to complete the work.

ITEM 769A – Type “A” Catch Basin Insert- Filter Type (Combination Inlet)

ITEM 769B – Type “B” Catch Basin Insert- Filter Type (Curb Inlet Only)

A. Description.

1. Under each of these items the Contractor shall furnish and install cartridge type catch basin inserts to collect and retain sediment and debris prior to entering the storm water system.

B. Submittals.

1. The manufacturer shall develop and furnish a worksheet to be used by the installer(s) to measure and certify the actual condition of the catch basin which will receive the catch basin insert.

C. Delivery, Storage & Handling.

1. All materials shall be protected during loading, transporting, and unloading, in accordance with the manufacturer's recommendations.

D. Materials.

1. The catch basin insert to be used in Type A and B catch basins shall comply with the following specifications:
 - a. Physical Properties:
 - 1) Material:
 - a) Adjustable Flange and Deflector
 - b) Splash Guard: Neoprene Rubber (Trim to Fit)
 - c) Plastic or polypropylene basket
 - d) Protected by-pass to retain re-suspended material
 - e) Support Hardware
 - 2) Performance Characteristics & Removal Rates:
 - a) Debris Capacity: 4.0 Cu-Ft
 - b) Filtered Flow Rate: 0.5 cfs
 - c) Bypass Flow Rate: 4.0 cfs
 - d) Sediment Removal: Remove \geq 50% of sub 100 micron
 - e) Hydrocarbons, Oil & Grease: Remove \geq 80%
 - f) Phosphorous: Remove \geq 50%
 - g) Nitrogen Compounds: Remove \geq 40%
 - h) Bacteria: Remove \geq 70%
 - 3) Under this item the catch basin insert manufacturer is required to submit test data to the County (with supporting documentation) specifically indicating that the proposed

devices have been proven to achieve the performance characteristics and removal rates specified herein. No materials may be ordered until the County has accepted said documentation, in writing.

b. Serviceability:

1) Catch Basin Insert Maintenance

- a) The catch basin inserts shall be serviceable from the street level only; maintenance shall not require "confined space" entry into the catch basin.
- b) The consumables (filters) shall be designed to enable replacement from the street level only; maintenance shall not require "confined space" entry into the catch basin.

E. Method of Measurement.

- 1. The quantity to be paid for under these two items shall be the number of catch basin insert assemblies that are furnished and installed.

F. Basis of Payment.

- 1. The unit price bid for each item(s) shall include the cost of furnishing and installing one (1) complete catch basin insert assembly which shall consist of all materials including one set of filters and the metal framework to be installed inside the catch basin.

G. Warranty.

- 1. The equipment, materials, and products furnished under this item shall be guaranteed against defective design, materials, workmanship and operation for a period of one (1) year from the date the equipment is placed into problem free operation. The date of problem free operation will be determined by the Owner's representative. Upon receipt of notice from the Owner of failure of any part of the equipment, material, or product during the guarantee period, the affected item shall be repaired or replaced (if necessary), at the sole cost and expense of the Contractor, and at no additional cost to the County.

REV	DESCRIPTION	DATE	APPROVED
A	FIRST RELEASE	8/24/14	

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NOTES:

1. WEIGHT (EMPTY): 40 LB. MAX.
2. MATERIAL:
 - A) STORMBASIN SUPPORT FLANGE AND DEFLECTOR: ALUMINUM ALLOY 6063-T6
 - B) CORNER DEFLECTOR (PLASTIC): POLYPROPYLENE POLYETHYLENE COPOLYMER
 - C) BASIN (PLASTIC): POLYPROPYLENE POLYETHYLENE COPOLYMER
 - D) RUBBER SUPPORT PLATE: ALUMINUM ALLOY 5052-H32
 - E) SUPPORT HARDWARE: CRES 300 SERIES OR EQUAL
 - F) OIL BOOM, 3" DIAMETER: POLYPROPYLENE
 - G) GULL WING SUPPORT FLANGE: 6063-T6, CLEAR ANODIZE
3. PERFORMANCE CHARACTERISTICS (TYP):
 - A) DEBRIS CAPACITY: 4.0 CU-FT
 - B) FILTERED FLOW RATE (CLEAN HIGH FLOW CARTRIDGE): 520 GPM (1/16 CFS)
 - C) PROTECTED BYPASS FLOW RATE: 1207 GPM (2.7 CFS)
 - D) TOTAL BYPASS FLOW RATE: UNRESTRICTED
4. PROTECTED BYPASS PREVENTS RE-SUSPENSION OF FLOATABLES
5. USE WITH FABCO REPLACIBLE FILTER CARTRIDGES ONLY, FABCO P/N 9718-7-000.
6. VISIT FABCO INDUSTRIES WEBSITE FOR COMPLETE INSTALLATION INSTRUCTIONS. WWW.FABCO-INDUSTRIES.COM

PROTECTED BYPASS, TYPICAL

DOVETAIL ADJUSTMENT FEATURE (TYPICAL EACH FLANGE)

DETAIL 1

REFERENCE VIEW

NO.	QTY.	PART NUMBER	DESCRIPTION	DATE OF MATERIALS
1	1	10130-2	STORMBASIN	8/24/14

DATE OF MATERIALS	DATE OF MATERIALS	DATE OF MATERIALS	DATE OF MATERIALS
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ITEM 770A - Type “A” Catch Basin Insert- Sediment Control Type (Combination Inlet)

ITEM 770B - Type “B” Catch Basin Insert- Sediment Control Type (Curb Inlet Only)

A. Description.

1. Under each of these items the Contractor shall furnish and install geotextile technology catch basin inserts to collect and retain sediment and debris prior to entering the storm water system.

B. Submittals.

1. The manufacturer shall develop and furnish a worksheet to be used by the installer(s) to measure and certify the actual condition of the catch basin which will receive the catch basin insert

C. Delivery, Storage & Handling.

1. All materials shall be protected during loading, transporting, and unloading, in accordance with the manufacturer's recommendations.

D. Materials.

The catch basin insert to be used in both the Type A and B installations shall comply with the following specifications.

1. Physical Properties.

a. Material:

1) Adjustable Flange and Deflector

- a) Splash Guard: Neoprene Rubber to redirect water from curb opening to the insert
- b) Woven Polypropylene Geotextile bag, replaceable oil boom
- c) Protected by-pass to retain re-suspended material
- d) Lifting Tabs
- e) Mounting kit and support hardware

2) Performance Characteristics:

- a) Debris Capacity: 6.0 Cu-Ft
- b) Filtered Flow Rate: 5.0 cfs
- c) Bypass Flow Rate: 3.4 cfs

3) Oil Absorbing Boom:

- a) Absorbent Material: 100% polypropylene, non-biodegradable
- b) Hydrophobic Media
- c) Absorption Capacity: 3.0 gal (max)
- d) Dimensions: 3" diameter x 100" long

2. Serviceability.
 - a. Catch Basin Insert Maintenance
 - 1) The catch basin inserts shall be serviceable from the street level only; maintenance shall not require “confined space” entry into the catch basin.
 - 2) The consumables (filters) shall be designed to enable replacement from the street level only; maintenance shall not require “confined space” entry into the catch basin.

E. Method of Measurement.

1. The quantity to be paid for under these two items shall be the number of catch basin insert assemblies that are furnished and installed.

F. Basis of Payment.

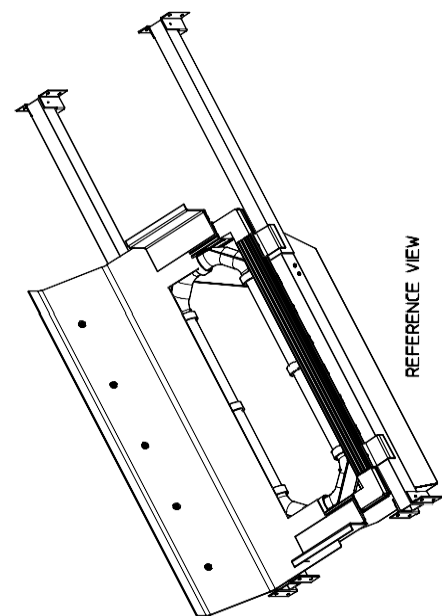
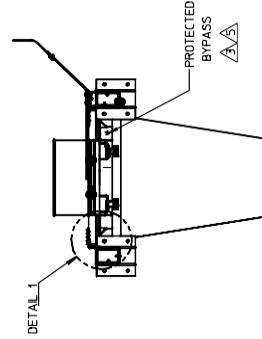
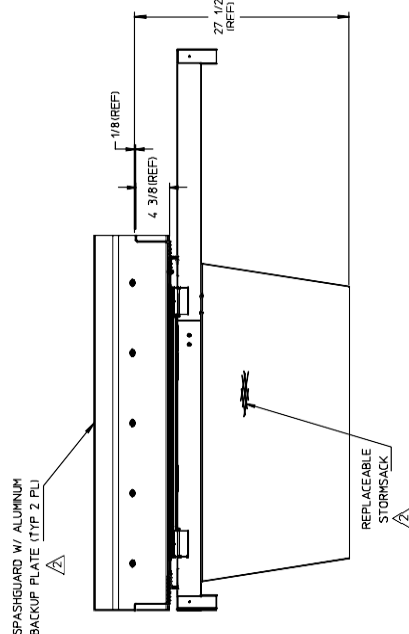
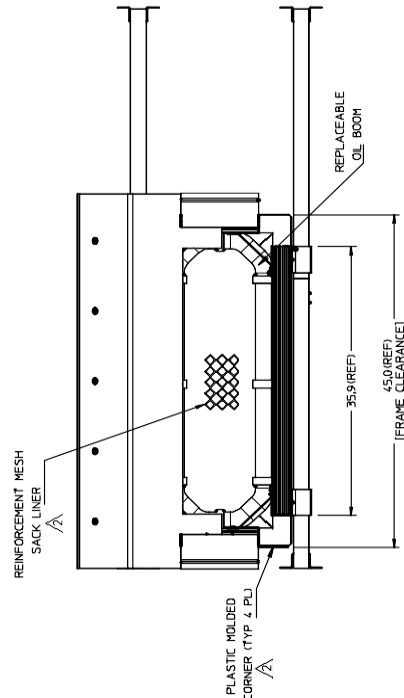
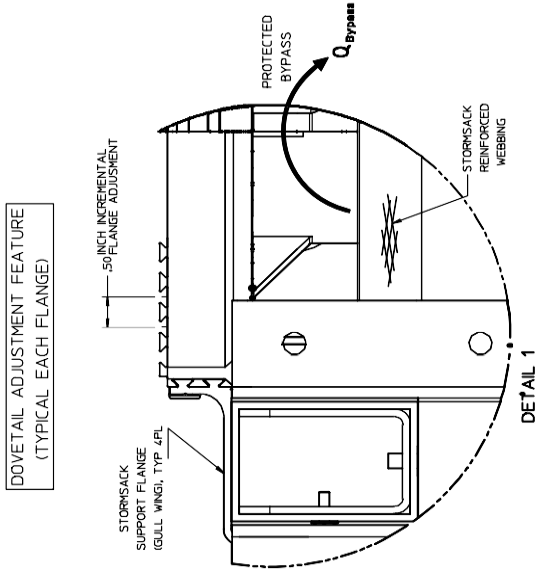
1. The unit price bid for each item(s) shall include the cost of furnishing and installing one (1) complete catch basin insert assembly which shall consist of all materials including one set of filters and the metal framework to be installed inside the catch basin.

G. Warranty.

1. The equipment, materials, and products furnished under this item shall be guaranteed against defective design, materials, workmanship and operation for a period of one (1) year from the date the equipment is placed into problem free operation. The date of problem free operation will be determined by the Owner’s representative. Upon receipt of notice from the Owner of failure of any part of the equipment, material, or product during the guarantee period, the affected item shall be repaired or replaced (if necessary), at the sole cost and expense of the Contractor, and at no additional cost to the County.

NOTES:

1. WEIGHT (EMPTY): 50 LB MAX.
2. MATERIAL:
 - A) STORMSACK SUPPORT FLANGE AND DEFLECTOR: ALUMINUM ALLOY 6063-T6
 - B) CORNER DEFLECTOR: PLASTIC POLYPROPYLENE POLYETHYLENE COPOLYMER
 - C) GEOTEXTILE SACK: WOVEN POLYPROPYLENE, 20 US STD SEIVE SIZE
 - D) SUPPORT PLATE: ALUMINUM ALLOY 5052-H32
 - E) SUPPORT HARDWARE: CRES 300 SERIES OR EQUAL
 - F) OIL BOOM 3" DIAMETER, POLYPROPYLENE
 - G) MESH LINER: HOPE, DIAMOND PATTERN
3. PERFORMANCE CHARACTERISTICS (TYP):
 - A) DEBRIS CAPACITY: 71 CU-FT
 - B) FILTERED FLOW RATE (INITIAL): 3440 GPM (17.7 CFS)
 - C) FILTERED BYPASS FLOW RATE: 1472 GPM (3.1 CFS)
 - D) TOTAL BYPASS FLOW RATE: 1472 GPM (3.1 CFS)
4. COVERED BYPASS PREVENTS RE-SUSPENSION OF FLOATABLES
5. USE WITH FABCO REPLACEABLE STORMSACKS ONLY. FABCO P/N 9748-1-200. CONTACT FABCO REPRESENTATIVE FOR ALTERNATE STORMSACK SIZES.
6. VISIT FABCO INDUSTRIES WEBSITE FOR COMPLETE INSTALLATION INSTRUCTIONS. WWW.FABCO-INDUSTRIES.COM



NO		QTY	PART NUMBER	DESCRIPTION	BILL OF MATERIALS		REMARKS	
				14-125 1/2" DIA. 10'0" LONG 14-125 1/2" DIA				

ITEM 771A – Type “A” Catch Basin Insert- Sediment Control Type with pathogen filtration (Combination Inlet)

ITEM 771B – Type “B” Catch Basin Insert- Sediment Control Type with pathogen filtration (Curb Inlet Only)

A. Description.

1. Under each of these items the Contractor shall furnish geotextile technology catch basin inserts to collect and retain sediment and debris prior to entering the storm water system.

B. Submittals.

1. The manufacturer shall develop and furnish a worksheet to be used by the installer(s) to measure and certify the actual condition of the catch basin which will receive the catch basin insert.

C. Delivery, Storage & Handling.

1. All materials shall be protected during loading, transporting, and unloading, in accordance with the manufacturer’s recommendations.

D. Materials.

1. The catch basin insert to be used in both the Type A and B installations shall comply with the following specifications:
 - a. Physical Properties:
 - 1) Material:
 - a) Adjustable Flange, Deflector and Treated Media
 - b) Treated Polyether Open-Cell Foam for Bacteria Reduction
 - c) Splash Guard: Neoprene Rubber to redirect water from curb opening to the insert
 - d) Inner woven polypropylene geotextile pre-filter bag, with outer polypropylene pocket to house treated foam.
 - e) Replaceable oil boom
 - f) Protected by-pass to retain re-suspended material
 - g) Lifting Tabs
 - h) Mounting kit and support hardware
 - 2) Performance Characteristics:
 - a) Debris Capacity: 6.0 Cu-Ft
 - b) Filtered Flow Rate: 5.0 cfs
 - c) Bypass Flow Rate: 3.4 cfs

- 3) Oil Absorbing Boom:
 - a) Absorbent Material: 100% polypropylene, non-biodegradable
 - b) Hydrophobic Media
 - c) Absorption Capacity: 3.0 gal (max)
 - d) Dimensions: 3" diameter x 100" long
- b. Serviceability:
 - 1) Catch Basin Insert Maintenance
 - a) The catch basin inserts shall be serviceable from the street level only; maintenance shall not require "confined space" entry into the catch basin.
 - b) The consumables (filters) shall be designed to enable replacement from the street level only; maintenance shall not require "confined space" entry into the catch basin.

E. Method of Measurement.

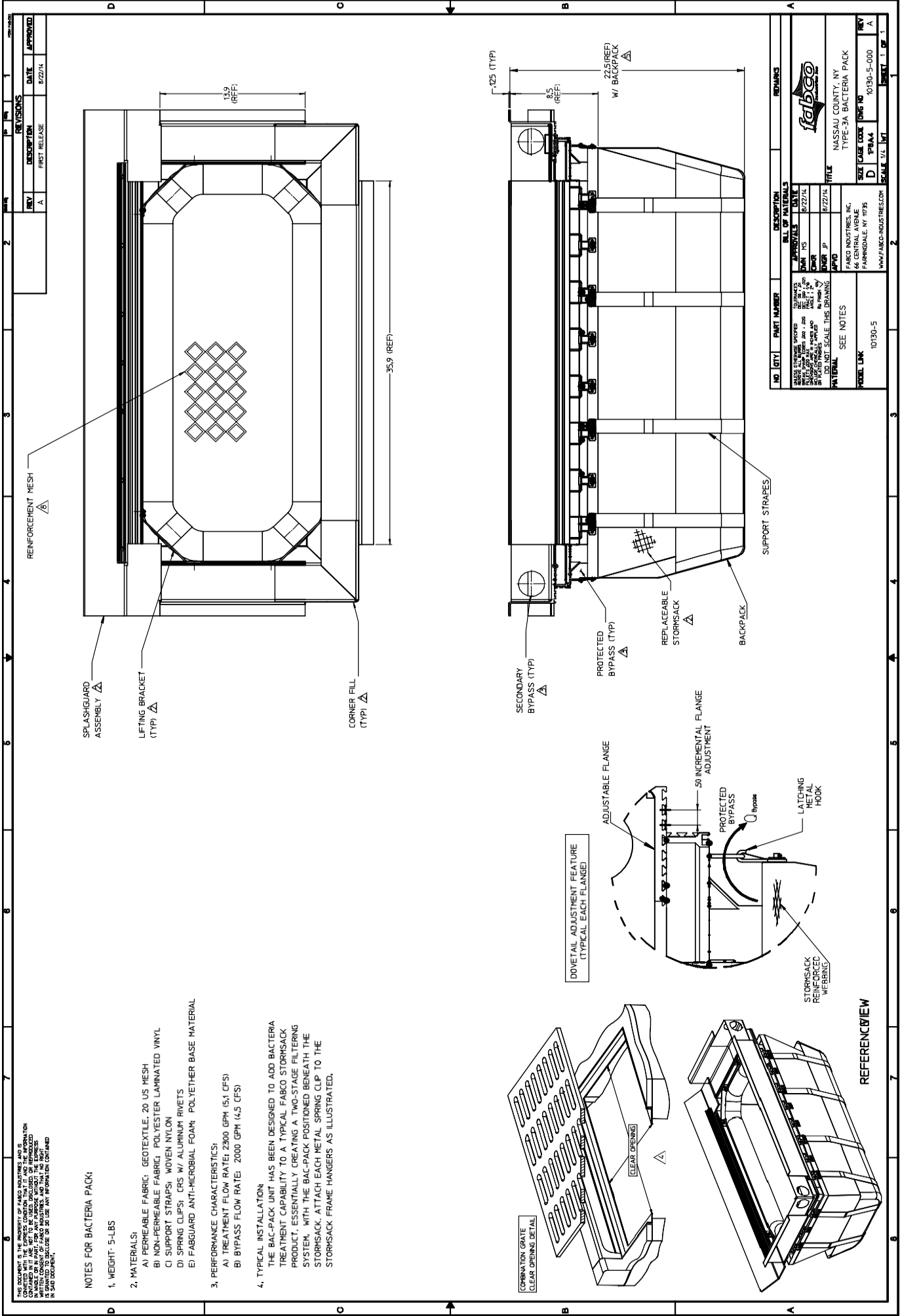
- 1. The quantity to be paid for under these two items shall be the number of catch basin insert assemblies that are furnished to the County or its Municipalities.

F. Basis of Payment.

- 1. The unit price bid for each item(s) shall include the cost of furnishing one (1) complete catch basin insert assembly which shall consist of all materials including one set of filters and the metal framework to be installed inside the catch basin.

G. Warranty.

- 1. The equipment, materials, and products furnished under this item shall be guaranteed against defective design, materials, workmanship and operation for a period of one (1) year from the date the equipment is placed into problem free operation. The date of problem free operation will be determined by the Owner's representative. Upon receipt of notice from the Owner of failure of any part of the equipment, material, or product during the guarantee period, the affected item shall be repaired or replaced (if necessary), at the sole cost and expense of the Contractor, and at no additional cost to the County.



REVISIONS		
REV	DESCRIPTION	DATE
A	FIRST RELEASE	8/21/14

Diagram illustrating the typical installation of the support strap hanger. The main view shows the hanger being attached to a frame with a spring clip. A circular inset provides a magnified view of the hanger's internal mechanism, showing the spring clip and the support strap hanger.

Labels in the diagram include:

- SPRING CLIP /A/
- FRAME HANGER /A/
- SUPPORT STRAP /A/
- TYPICAL INSTALLATION /A/

-
- Diagram illustrating the assembly of the rear of the printer. The main view shows the printer body with the frame hanger and spring clip assembly being attached. A circular inset provides a magnified view of the spring clip (labeled 'SPRING CLIP 1/2') being inserted into the frame hanger (labeled 'FRAME HANGER 1/2').

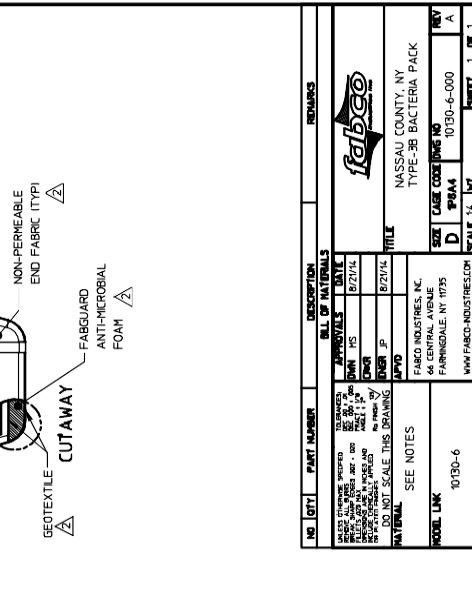
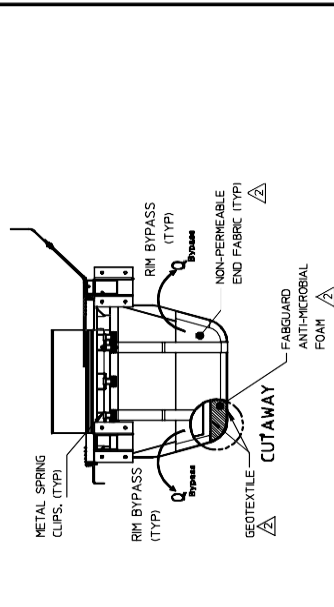
TYPICAL INSTALLATION

Δ_1

Δ_2

FRAME
HANGER

Diagram illustrating a typical installation of the support strap. The strap is shown being attached to a metal bracket labeled "HANGER".

[illegible]