FOR INFORMATIONAL USE ONLY - DO NOT USE TO PREPARE A BID

BID SCHEDULE OF PRICES

REHABILITATION OF BANNISTER CREEK BRIDGE

VILLAGE OF LAWRENCE, NASSAU COUNTY, NY

BIN 5520290

H63029-26GR PIN 0762.06

ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
201.06	LS	1	CLEARING AND GRUBBING FOR _____				
203.02	CY	1,055	UNCLASSIFIED EXCAVATION AND DISPOSAL FOR _____				
203.02000001	CY	90	UNCLASSIFIED EXCAVATION AND DISPOSAL, OTHER LOCATIONS FOR _____				
203.06	CY	430	SELECT FILL FOR _____				
203.07	CY	806	SELECT GRANULAR FILL FOR _____				
206.01	CY	17	STRUCTURE EXCAVATION FOR _____				
206.0201	CY	62	TRENCH AND CULVERT EXCAVATION FOR _____				
206.05	EA	5	TEST PIT EXCAVATION FOR _____				
207.20	SY	125	GEOTEXTILE BEDDING FOR _____				
209.11010024	EA	7	TEMPORARY CATCH BASIN INSERT - TRASH, SEDIMENT, AND DEBRIS REMOVAL FOR _____				

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209.1501	LF	853	TURBIDITY CURTAIN - TEMPORARY FOR _____				
304.10119917	CY	96	SUBBASE COURSE, TYPE 1011-2 FOR _____				
404.0189	TN	75	TRUE & LEVELING F9, ASPHALT, 80 SERIES COMPACTION FOR _____				
404.0981	TN	539	9.5 F1 TOP COURSE ASPHALT, 80 SERIES COMPACTION FOR _____				
404.1989	TN	298	19 F9 BINDER COURSE ASPHALT, 80 SERIES COMPACTION FOR _____				
404.2589	TN	191	25 F9 BINDER COURSE ASPHALT, 80 SERIES COMPACTION FOR _____				
404.3789	TN	24	37.5 F9 BASE COURSE ASPHALT, 80 SERIES COMPACTION FOR _____				
407.0102	GAL	1,033	DILUTED TACK COAT FOR _____				
418.7603	LF	1,460	ASPHALT PAVEMENT JOINT ADHESIVE FOR _____				
490.30	SY	2,880	MISCELLANEOUS COLD MILLING OF BITUMINOUS CONCRETE FOR _____				
520.05000010	LF	28	SAW CUTTING PCC AND COMPOSITE PAVEMENT FOR _____				

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520.09000010	LF	1,008	SAW CUTTING ASPHALT CONCRETE FOR _____				
552.13	SF	9,216	TEMPORARY STEEL SHEETING FOR _____				
552.17	SF	8,582	SHIELDS AND SHORING FOR _____				
553.020001	EA	2	COFFERDAMS (TYPE 2) FOR _____				
555.80020001	LF	676	CRACK REPAIR BY EPOXY INJECTION (RESTORATION) FOR _____				
557.1011	SY	600	STRUCTURAL APPROACH SLAB WITH INTEGRAL WEARING SURFACE- TYPE 1 FRICTION FOR _____				
558.02	SY	600	LONGITUDINAL SAWCUT GROOVING OF STRUCTURAL SLAB SURFACE FOR _____				
559.04	SF	22,761	PROTECTIVE SEALING OF CONCRETE WITH COATING TYPE PROTECTIVE SEALER FOR _____				
564.510001	LB	9,487	STRUCTURAL STEEL FOR _____				
567.64000116	LF	226	REPLACING COMPRESSION SEAL FOR EXISTING BRIDGE JOINTS FOR _____				

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ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
568.51	LF	68	STEEL BRIDGE RAILING (FOUR RAIL) FOR _____				
568.70	LF	136	TRANSITION BRIDGE RAILING FOR _____				
570.01	LS	1	LEAD EXPOSURE CONTROL PLAN FOR _____				
570.02	DC	3,000	MEDICAL TESTING FOR _____	$1	.00	$3,000	.00
570.03	DC	400	PERSONAL EXPOSURE MONITORING SAMPLE ANALYSIS FOR _____	$1	.00	$400	.00
570.04	CW	2	DECONTAMINATION FACILITIES FOR _____				
570.090001	LS	1	ENVIRONMENTAL GROUND PROTECTION FOR _____				
570.100001	LS	1	ENVIRONMENTAL WATERWAY PROTECTION FOR _____				
570.160001	LS	1	CLASS B CONTAINMENT FOR PAINT REMOVAL FOR _____				
571.03	LB	4,100	DISPOSAL OF HAZARDOUS PAINT WASTE CONTAINING LEAD FOR _____				
579.02	SF	30	REINFORCING BAR EXPOSURE FOR _____				

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ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
580.01	CY	7	REMOVAL OF STRUCTURAL CONCRETE FOR _____				
581.01	SF	5,880	REMOVAL OF BITUMINOUS CONCRETE OVERLAY (BRIDGE) FOR _____				
582.0051	CY	25	REMOVAL AND REPLACEMENT OF STRUCTURAL CONCRETE FOR _____				
582.0061	SF	1,161	REMOVAL OF STRUCTURAL CONCRETE - REPLACEMENT WITH VERTICAL AND OVERHEAD PATCHING MATERIAL FOR _____				
586.0201	EA	218	DRILLING AND GROUTING BOLTS OR REINFORCEMENT BARS FOR _____				
587.01	LF	65	BRIDGE RAILING REMOVAL AND DISPOSAL FOR _____				
595.50000018	SF	475	SHEET-APPLIED WATERPROOFING MEMBRANE FOR _____				
603.6102	LF	18	REINFORCED CONCRETE PIPE CLASS IV, 15 INCH DIAMETER FOR _____				
603.6103	LF	411	REINFORCED CONCRETE PIPE CLASS IV, 18 INCH DIAMETER FOR _____				
604.07260011	EA	5	CONNECTION TO EXISTING DRAINAGE FACILITIES FOR _____				

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ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
604.501012	LF	20	SPECIAL DRAINAGE STRUCTURE (TYPE A CATCH BASIN - 48") FOR _____				
604.501014	LF	8	SPECIAL DRAINAGE STRUCTURE (TYPE A CATCH BASIN - 72") FOR _____				
604.501022	LF	10	SPECIAL DRAINAGE STRUCTURE (MANHOLE - 48") FOR _____				
606.10	LF	341	BOX BEAM GUIDE RAILING FOR _____				
606.100002	LF	9	BOX BEAM GUIDE RAILING (SHOP BENT OR SHOP MITERED) FOR _____				
606.120101	EA	2	BOX BEAM END PIECE FOR _____				
606.120201	EA	2	BOX BEAM GUIDE RAILING END ASSEMBLY, TYPE IIA FOR _____				
606.73	LF	110	REMOVING AND DISPOSING BOX BEAM GUIDE RAILING FOR _____				
607.30020010	LF	141	STEEL CHAIN LINK FENCE WITH TOP RAIL, 6FT HIGH FOR _____				
607.96000008	LF	110	REMOVE AND DISPOSE EXISTING FENCE FOR _____				

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ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
607.99870011	LF	169	REMOVE EXISTING CHAIN-LINK FENCE FOR _____				
608.0101	CY	11	CONCRETE SIDEWALKS AND DRIVEWAYS FOR _____				
608.01030008	SY	45	REMOVAL AND REPLACEMENT OF CONCRETE SIDEWALK AND SUBBASE COURSE FOR _____				
608.020102	TON	9	HOT MIX ASPHALT (HMA) SIDEWALKS, DRIVEWAYS AND BICYCLE PATHS, AND VEGETATION CONTROL STRIPS FOR _____				
608.21	SY	5	EMBEDDED DETECTABLE WARNING UNITS FOR _____				
609.0401	LF	422	CAST-IN-PLACE CONCRETE CURB TYPE VF6 FOR _____				
609.0407	LF	205	CAST-IN-PLACE CONCRETE CURB TYPE T4 FOR _____				
610.1402	CY	28	TOPSOIL - ROADSIDE FOR _____				
610.1403	CY	18	TOPSOIL - LAWNS FOR _____				
610.1601	SY	378	TURF ESTABLISHMENT - ROADSIDE FOR _____				

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ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
610.1602	SY	155	TURF ESTABLISHMENT - LAWNS FOR _____				
614.060104	EA	1	TREE REMOVAL OVER 4 INCHES TO 6 INCHES DIAMETER BREAST HEIGHT - STUMPS GRUBBED FOR _____				
619.01	LS	1	BASIC WORK ZONE TRAFFIC CONTROL FOR _____				
619.080101	LF	200	REMOVE PAVEMENT MARKING STRIPES, TRAFFIC PAINT FOR _____				
619.0901	LF	7,640	TEMPORARY PAVEMENT MARKINGS STRIPES (TRAFFIC PAINT) FOR _____				
619.110511	EA	2	(PVMS) STANDARD SIZE - FULL MATRIX (LED) NO OPTIONAL EQUIPMENT SPECIFIED, NO CELLULAR COMMUNICATIONS REQIRED FOR _____				
619.1716	LF	1,880	TEMPORARY POSITIVE BARRIER - CATEGORY 6 (PINNING REQUIRED) FOR _____				
619.1719	EA	215	WARNING LIGHTS ON TEMPORARY POSITIVE BARRIERS FOR _____				
619.24	LS	1	NIGHTTIME OPERATIONS FOR _____				
619.67020010	LS	1	TEMPORARY HIGHWAY LIGHTING SYSTEM FOR _____				

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ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
620.04	CY	90	STONE FILLING (MEDIUM) FOR _____				
625.01	LS	1	SURVEY OPERATIONS FOR _____				
633.11	SY	5,711	CLEANING EXISTING PAVEMENT AND/OR SHOULDER FOR _____				
633.12	LS	1	CLEANING, SEALING AND/OR FILLING CRACKS FOR _____				
635.0103	LF	910	CLEANING AND PREPARATION OF PAVEMENT SURFACES - LINES FOR _____				
637.13	MNTH	18	ENGINEER'S FIELD OFFICE - TYPE 3 FOR _____				
637.34	DC	5,000	OFFICE TECHNOLOGY AND SUPPLIES FOR _____ DOLLARS CENTS	$1	.00	$5,000	.00
639.2X00NC	LS	1	CPM (CRITICAL PATH METHOD) SCHEDULE WITH MONTHLY UPDATE (MIN. PER UNIT IS $100,000.00) FOR _____				
645.5101	SF	5	GROUND-MOUNTED SIGN PANELS WITHOUT Z-BARS FOR _____				
645.5102	SF	45	GROUND-MOUNTED SIGN PANELS LESS THAN OR EQUAL TO 32 SF, WITH Z-BARS FOR _____				

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ITEM NUMBER	UNIT	QTY.	ITEMS OF WORK WITH UNIT PRICES WRITTEN IN WORDS				
645.81	EA	6	TYPE A SIGN POST FOR _____				
647.31	EA	1	RELOCATE SIGN PANEL, SIGN PANEL ASSEMBLY SIZE I (UNDER 30 SQUARE FEET) FOR _____				
647.41	EA	1	REMOVE AND STORE SIGN PANEL, SIGN PANEL ASSEMBLY SIZE I (UNDER 30 SQUARE FEET) FOR _____				
647.61	EA	6	REMOVE AND DISPOSE SIGNS, GROUND MOUNTED TYPE A SIGN SUPPORTS AND FOUNDATIONS - SIZE I (UNDER 30 SQUARE FEET) FOR _____				
655.07030010	EA	2	CAST FRAME F3, WITHOUT CURB BOX AND WITH RETICULINE GRATE G3 FOR _____				
655.0706	EA	2	CAST FRAME F3, UNMOUNTABLE CURB BOX CU3 & RETICULINE GRATE G3 FOR _____				
655.1202	EA	1	MAHHOLE FRAME AND COVER FOR _____				
655.16000011	EA	4	REMOVE AND DISPOSE OF FRAMES AND GRATES FOR _____				
655.25010005	EA	4	FURNISH AND/OR INSTALL INLET ASSEMBLY, AS SPECIFIED FOR _____				

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670.2003	LF	98	GALVANIZED STEEL CONDUIT, 2" FOR _____				
670.3030	EA	3	PULLBOXES OVER 15 CUBIC FEET, INSIDE VOLUME (LIGHTING) FOR _____				
670.7010	LF	219	SINGLE CONDUCTOR CABLE, 10 GAGE FOR _____				
670.7501	LF	121	GROUND WIRE NO. 6 AWG. FOR _____				
680.83200010	LS	1	LOCATE AND MARKOUT INFORM AND STATE LIGHTING FACILITIES FOR _____				
685.07200110	LF	1,480	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS(WET NIGHT VISIBILITY SPHERES) FOR _____				
685.07200410	LF	200	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES (CROSS HATCHING)2 0 MILS THICK (WET NIGHT VISIBILITY SPHERES FOR _____				
685.07200610	LF	730	YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS(WET NI GHT VISIBILITY SPHERES) FOR _____				
685.07200710	LF	300	YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES (CROSS HATCHING) 20 MILS THICK (WET NIGHT VISIBILITY SPHERES) FOR _____				

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697.03	DC	400,000	FIELD CHANGE PAYMENT FOR _____	$1	.00	$400,000	.00
698.04	DC	10,000	ASPHALT PRICE ADJUSTMENT FOR _____	$1	.00	$10,000	.00
698.05	DC	200	FUEL PRICE ADJUSTMENT FOR _____	$1	.00	$200	.00
699.040001	LS	1	MOBILIZATION FOR _____				

General Notes

1) Specifications and Standards

All work included in the contract shall be in accordance with the September 1, 2025, Standard Specifications (US Customary) and Drawings, as modified and amended in the Contract Specifications and Drawings.

a. New York State, Department of Transportation Standard Specifications.

b. New York State, Department of Transportation "Special" Specifications.

c. New York State, Department of Transportation "Special" Specifications for the County of Nassau, State of New York.
Contractor is directed to the installation detail sheets included in the plans for specific details regarding installation in accordance with the specification. In addition, notes are made in the "General Notes" section of the plan set to identify minor changes to the NYS Specification in order to comply with Nassau County standards.

2) Scope of Work

a. At all times during the life of this contract, the Contractor shall maintain safe vehicular traffic and access to adjacent private properties located throughout the entire length of the contract.

b. The Contractor will provide a place for concrete test cylinders in proximity to the work so that the cylinders share the same curing conditions as the newly placed concrete. The Contractor will protect these cylinders for the three days they will be left on the job site.

3) Right-of-Way (ROW)

No work outside the Nassau County ROW will be permitted under any circumstances unless property and/or easement rights are obtained and approved by the New York State Department of Transportation (NYSDOT). Minor driveway restoration will only be permitted after a signed release from the property owner has been obtained.

4) Coordination of Work at Intersections of New York State

All coordination requirements necessary due to the following notes are paid for under Item 619.01 "Basic Work Zone Traffic Control" of this contract.

a. The contractor shall be responsible for and shall replace all signal interconnect cable, detector cable, conduit and all underground accessory equipment damaged during construction.

b. Prior to starting any work at this location, the Contractor shall notify the NYSDOT and Nassau County Department of Public Works Traffic Signal Section that a tone- out of signal equipment is needed.

c. All traffic signals shall be maintained in a traffic responsive operation and all interconnect, where existing, shall be maintained. The Contractor shall pay a liquidated damaged charge of $2000.00 per calendar day if actuation and coordination is not maintained.

d. All vehicle detection and signal coordination must be maintained at all times. Splicing of inductance loop wire, shielded lead-in cable, and interconnect cable shall be allowed for temporary repairs during construction only. Temporary loop detectors, if necessary, shall be six feet by six feet, (6'×6') be centered in their respective lane and paid for under Item 619.01. Other types of temporary detection may be used upon approval of the Regional Traffic Signal Section.

e. All detectors shall be centered in their respective lanes and spaced ten feet (10') apart unless otherwise indicated in the plan.

5) The contract drawings provide information with respect to "Work Zone Traffic Control Plans" as required for federal funding. Refer to this site for additional WZTC requirements or information https://www.nysdot.gov/main/business-center/engineering/cadd- info/drawings/standardsheets-us/619

6) It is also intended to replace traffic loops that are destroyed by the Asphalt Removal under Item 680.54 "Inductance Loop Installation" and Item 680.72 "Inductance Loop Wire." The Contractor must coordinate all work with the NYSDOT Traffic Section where appropriate and Nassau County's Engineering Unit's Signal Management Section at (516) 572-0465.

7) The Contractor shall submit for approval for HES Concrete Mix Design that the concrete will achieve 2500 psi in 4 hours.

8) The Contractor will be required to hand out notices to the local homeowners and businesses affected by the asphalt milling and asphalt paving operations 24 hours prior to work startup.

9) The Contractor must set up portable variable message sign three (3) days prior to the start of asphalt milling operations and asphalt paving, giving the dates when work is going to start and work hours before start and end of the job site limits. Payment will be made under Item 619.110511 "Portable Variable Message Sign."

10) On all roads that the asphalt pavement is completely milled off, temporary traffic lines must be placed and paid for under Item No. 619.0901.

On all roads that new asphalt pavement has been placed, temporary reflectorized tape pavement marking 2'×4" white and/or yellow strips shall be placed fifty feet (50'±) on center to denote travel lanes. These temporary tape markings are to be removed at the time the permanent epoxy painted pavement marking are applied. The cost of placing and removing these temporary pavement markings shall be paid under Item No. 619.01

11) Work Hours

The standard working hours for this project are 9:00AM to 4:00PM unless otherwise specified or directed by the engineer. If the contractor does not adhere to the specified time limits, and excessive traffic delays are the result of working beyond the time restrictions, a $5,000 penalty per day for each infraction will be deducted from the traffic related items.

Nightime operations are a possibility depending on how significant the impacts are on the surrounding community during the time of construction. This will be determined by Nassau County and the engineer in charge leading up to construction. Item 619.24 will be included in the contract as a contingency item for this situation.

All costs associated with nighttime operations shall be included in the price bid for Item 619.24.

12) The Contractor shall have a full-time supervisor on the project at all times.

13) On all project roadways epoxy reflectorized pavement markings must be placed within 72 hours of final paving. A $1,000 penalty will be deducted from the various asphalt items per day until the pavement markings are placed. On all other roadways in this Contract, epoxy reflectorized pavement markings must be placed within one week of final paving. A $1,000 penalty will be deducted from the various asphalt items per day after one week until the pavement markings are placed.

NOTE: The county at their option may utilize epoxy reflectorized material in lieu of the materials and items stated on the plans for symbols, characters, stop bars and cross-walks or as ordered by the engineer (A.O.B.E.)

14) The Contractor must submit to the engineer a schedule of operations for when work will be starting and completed for each roadway to be resurfaced within the Contract one week after the Notice to Proceed is issued. The schedule shall be updated monthly until the project is completed. The monthly schedule update shall be submitted and approved as part of the monthly claim requisition.

All work shall be done during a normal eight (8) hour day and/or the hours specified for each roadway.

15) Any existing traffic signal post, pole, mast arm shaft, or strain pole affected by the installation of handicap ramps or changes in grade must be height adjusted to bring the base plate to match new grades, including removing the pole/post and adjusting the anchor nuts, and reinstallation of the pole and equipment. Existing raincap is to be removed and new one installed as per the Nassau County traffic signal foundation item specifications. All signal head heights must be checked before any pole height is adjusted so that they continue to meet signal head height requirements.

All traffic signal pushbuttons need to be adjusted in height to be ADA compliant, if affected by the ramp installation which includes changes in grade from existing and meet the Nassau County traffic signal specifications.

The Contractor must notify Mike Kurpicz of the Nassau County Traffic Signal Management Section before any work begins at 516-572-0465, ext. 20958. A Nassau County inspector must be present during this work.

16) Conformance to the following Special notes with respect to the American with Disabilities Act Curb Ramps is required:

- All curb ramps installed shall be in compliance with the ADA, PROWAG, and NCDPW standards. Where NCDPW Standards are in conflict with the NYSDOT ADA Curb Ramp Standards NYSDOT Standards shall apply.
- Contractor shall verify the placement of all new ramp configurations prior to installation. Contractor must give 48 hours (2 business days) notification for NCDPW approval.
- A NCDPW inspector must be present during the installation of any curb ramp. • It is recommended that a smart level tool (or equivalent) is used to check the slopes on all form work prior to the placement of concrete.
- NCDPW Civil Engineering Design Unit must be notified in writing of all work done to curb ramps to update the transition plan inventory.

NOTE: The contractor will be required to maintain safe pathways for pedestrians during the entire time the contract is in effect, including all periods of work shutdown. This may involve mowing of grass, removal of snow and ice, and any other interruptions interfering with their safe travel through the construction zone. Failure of the contractor to insure safe pedestrian passage as determined by county staff, or from pedestrian complaints in the work zone will result in a fine of $500.00 a day. This fine will be deducted from any funds owed the contractor.

17) Work is not permitted on any holidays unless prior County Approval is obtained.

This includes New Year's Eve, New Year's Day, Martin Luther King, Jr. Day, Lincoln's Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Election Day, Veterans Day, from 12:00 PM on the Wednesday before Thanksgiving Day through the following Sunday, Christmas Eve, Christmas Day, and various Jewish Holidays including Rosh Hashana, Sukkot, Shmini Atzeret, Simchat Torah, Yom Kippur, Chanukah.

18) Schedule: The Contractor shall provide a schedule of operations for when work will be started and completed for each roadway to be resurfaced within the Contract one week after the Notice to Proceed is issued. Typical information to be provided includes, but is not limited to:

- Removal and Replacement of Deteriorated Pavement and Joint;
- Asphalt Removal;
- Asphalt Placement;
- Modifying pedestrian ramps for compliance with ADA requirements:
- Miscellaneous Items, Curb, Sidewalk, Traffic Loops; cleaning catch basins and drainage pipes;
- Traffic Pavement Markings; and
- Punch List
-

No claims will be processed until the County has this updated information on a monthly basis until the completion of the project.

19) Utilities

a. The Contractor is directed to notify all utilities well in advance of his beginning work to allow them time to mark out their facilities.

b. The Contractor is directed to notify all privately owned utilities well in advance of his beginning work to allow them time to adjust their manholes and other castings.

c. The Contractor will see to it that utility valve boxes and manholes are readily accessible at all times. He will not store materials over them and should it become necessary to cover the boxes and manholes with spoil, he will devise a method for finding them quickly and assist the utility company to uncover them. Further, the boxes will be uncovered during non-working hours.

d. Mechanical excavation will not be used within two (2) feet on either side of any utility or house service so marked by the utility company. Hand digging will be required to expose the utility pipe.

e. Prior to backfilling, a gas utility representative will inspect all gas facilities. Damaged pipe will be repaired by the utility company, before backfilling. The County will not be responsible for any of the costs

associated with the repair of damaged utilities. The Contractor's attention is called to existing Long Island Power Authority overhead circuits. The Contractor is warned to keep all equipment and personnel a minimum of ten (10) feet from primary conductors. The Contractor shall fully cooperate with the Long Island Power Authority (LIPA) and comply with its requirements for safe operation.

f. The Contractor's attention is called to the fact that there are utilities, both publicly and privately owned, that are now in place within the contract area. The owners of privately owned utilities may be relocating parts of their existing plants to conform with the new lines and grades of this project. The Contractor shall cooperate with the various agencies carrying out this work, which must be coordinated with the work of this contract.

g. Existing structures, utilities and facilities, either shown or not shown on the plans, above or below the ground, which new items of work shall encounter may not have been located accurately. The Contractor shall determine the locations and elevations or pertinent structures, utilities and facilities, before new installations are started, so that there will be no interference with the progression of the work. Any conflict between existing structures, utilities and facilities and the new items of work shall be ascertained by the Contractor prior to commencing any work under the respective items and called to the attention of the Engineer.

h. Grades and locations of new installations may be changed by the Engineer, if necessary to prevent conflict with existing installations. Therefore, the Contractor shall determine the locations of all existing installations accurately, both as to line and grade, before new items of work are started.

i. If the Contractor does not follow the above procedure and new work has to be removed and replaced, or there is a delay, all cost will be borne by the Contractor, and the County will only pay for the amount of the items in place complete at the completion of the contract. The Contractor shall conduct his operations so that all utility services are maintained at all times.

j. The Contractor shall exercise extreme care in the performance of any operation, in the vicinity of the existing or relocated cable pipelines. No such operations shall take place without the PSEG representatives on hand. All excavation in the immediate vicinity of these lines shall be done by hand, with such application as to ensure that the pipe shall not be punctured or the coating disrupted. In the event that any length of cable pipeline is exposed, it shall be supported and protected to the satisfaction of PSEG inspection personnel. No blind sheeting shall be driven in the

proximity of the existing electric cable pipes before first exposing these cable pipes by hand.

k. The Contractor should inspect the plans of the utility companies plan to ascertain the location of the underground work and locations of crossings of sewer and drainage work. The Contractor shall coordinate his work with the work being done by the utility companies. It is anticipated that job meetings will be held at various times to aid coordination of the work.

20) Clean up

a. The Contractor will be required to backfill and regrade all areas that are disturbed by him during the life of this contract. In all cases disturbed areas shall be cleaned up and restored to the condition existing prior to the commencement of the work.

b. Where the disturbed area was originally earth, it shall be properly graded to meet and match the surrounding terrain and left with a smooth surface. Clean-up shall be as defined herein above, but if in the opinion of the Engineer, the Contractor has exercised carelessness or disregard to private property in the conduct of his work, then restorative measures required thereto shall be included in this procedure.

c. No separate payment will be made for any of this clean up and restoration work, but the cost thereof shall be included in the unit prices bid for the various items.

21) Job Site Safety

The Contractor shall exercise precaution at all times for the protection of all personnel. The safety provisions of applicable laws shall be observed, but job site safety is the sole responsibility of the Contractor and his subcontractors and cannot be assumed by the County or its agents.

22) Rubbish and Debris

The Contractor shall legally dispose of all unsuitable material, rubbish, and debris at some separate location, not in the vicinity of the site.

23) Protection of Facilities

The Contractor shall protect all work done under this contract from possible damage for the duration of the contract. He shall be responsible for the repair or replacement, to the satisfaction of the Engineer, of any material, structure, or property on or adjacent to the site and damaged by him or his employees through the construction openings up to the time of acceptance by the County.

24) Construction Site

The Contractor shall obtain permission from the owner of a property before entering that property for any reason whatsoever. The construction site shall include areas beyond the right of way and working easement lines to allow for grade revisions to driveways and walks on private property.

25) Concrete Breaking

The Contractor is cautioned that the use of a ball operated from a crane or other equipment will not be permitted under any circumstances for the breaking up of any concrete. Any machine or method used must meet the approval of the Engineer.

26) Drainage Installation

The Contractor shall plan his work and progress so that, at all times, either the new or the existing drainage facilities will function to carry off stormwater runoff so that no damage or inconvenience will result.

27) Sales Tax Exemptions

Nassau County is exempt from the payment of New York State Sales Tax and Compensating Use Taxes under Section 1116 of Article 28 of the Tax Law of the State of New York, and is exempt from the payment of Nassau County Sales and Uses Taxes under Section 7, Ordinance 404-C-1968, enacted pursuant to Section 1210 of Article 29 of the Tax Law of the State of New York. However, it is not to be construed by bidders as relieving them from any obligation to pay sales tax on applicable items pursuant to the terms of the present sales tax laws.

28) Cold Patch

No separate payment of cold patch material used in this contract will be made. The cost thereof shall be included in the unit prices bid for the various contract items.

29) Requirements of Other Municipal Departments

The Contractor shall give all necessary notices, obtain all permits, and pay all fees in connection with the work under this contract. He shall comply with all laws, ordinances, rules, and regulations of Nassau County and Municipal Departments having jurisdiction over work of this character. These shall take precedence over any requirements of these specifications where and if a conflict occurs. This however, shall not be interpreted as permitting the use of materials and equipment inferior to these specified.

30) Private Facilities in Public Rights-of-Way

a. The Contractor shall be aware that sprinkler heads, private lamp and sign posts, electric signs, electric lines, water service, oil inlets, oil lines, horticultural planting, landscaping, etc. are owned privately, but exist in the public rights-of-way. The Contractor may be required to remove these appurtenances as ordered by the Engineer.

b. No separate payment for this work will be made. The cost thereof shall be included in the unit prices bid for the various contract items.

31) Special O.S.H.A. Notes

a. The Safety Provisions in the Specification are primarily to protect County property and the public against unsafe acts of the Contractor. The Occupational Safety and Health Act (OSHA) of 1970 requires that "Each Employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees; (2) shall comply with the occupational safety and health standards promulgated under this act". All workers on the project site must have successfully passed the OSHA 10 Hour Training Safety Class, and the certificates should be part of the project records subject to review by the FHWA and NYSDOT.

The regulations in the act may be more stringent than are required by the Plans and/or Specifications. The Contractor however must conform to the O.S.H.A. Regulations and such conformance shall not be reason to demand additional payment or claim extra work.

b. Sheeting, if included in the project, shall conform strictly to the Requirements of the O.S.H.A. Regulations for Construction-Subpart P, Excavation, Trenching, and Shoring:

1926.650 – General protection requirements;
1926.651 – Specific excavation requirements;
1926.652 – Specific trenching requirements; and
1926.653 – Definitions applicable to this subpart.

32) The Contractor shall notify the Nassau County Police Department, local fire departments, and local transportation authorities in writing as to the conditions prevailing on the construction site and detours in use. Duplicate copies of such notices shall be filed with the Engineer.

PIN 0762.06 - BANNISTER CREEK BRIDGE REHABILITATION - SPECIAL SPECIFICATIONS LIST			
No.	Item#	Description	Unit
1	203.02000001	UNCLASSIFIED EXCAVATION AND DISPOSAL, OTHER LOCATIONS	CY
2	209.11010024	TEMPORARY CATCH BASIN INSERT (CBI)	EA
3	304.1011992	SUBBASE COURSE, TYPE 1011-2	CY
4	520.0500001	SAW CUTTING PORTLAND CEMENT CONCRETE AND COMPOSITE PAVEMENTS	LF
5	520.0900001	SAW CUTTING ASPHALT CONCRETE	LF
6	555.80020001	CRACK REPAIR BY EPOXY INJECTION (RESTORATION)	LF
7	567.64000116	REPLACING COMPRESSION SEAL FOR EXISTING BRIDGE JOINTS	LF
8	595.50000018	SHEET-APPLIED WATERPROOFING MEMBRANE	SF
9	604.07260011	CONNECTION TO EXISTING DRAINAGE FACILITIES	EA
10	607.30020010	STEEL CHAIN LINK FENCE WITH TOP RAIL, 6FT HIGH	LF
11	607.96000008	REMOVE AND DISPOSE EXISTING FENCE	LF
12	607.99870011	REMOVE EXISTING CHAIN-LINK FENCE	LF
13	608.01030008	REMOVAL AND REPLACEMENT OF CONCRETE SIDEWALK AND SUBBASE COURSE	SY
14	619.67020010	TEMPORARY LIGHTING SYSTEMS	LS
15	639.2X00NC	CPM (CRITICAL PATH METHOD) SCHEDULE WITH MONTHLY UPDATE	LS
16	655.07030010	CAST FRAME F3, WITHOUT CURB BOX AND WITH RETICULINE GRATE G3	EA
17	655.16000011	REMOVE AND DISPOSE OF FRAMES AND GRATES	EA
18	655.25010005	FURNISH AND/OR INSTALL INLET ASSEMBLY, AS SPECIFIED	EA
19	680.83200010	LOCATE AND MARKOUT INFORM AND STATE LIGHTING FACILITIES	LS
20	685.072XXX10	EPOXY REFLECTORIZED PAVEMENT MARKINGS 20 MILS THICK (WET NIGHT VIS SPHERES)	LF

ITEM 203.02000001 - UNCLASSIFIED EXCAVATION AND DISPOSAL, OTHER LOCATIONS

All the provisions of Section 203 with respect to Unclassified Excavation and Disposal shall apply. The excavation locations shall be as shown in the contract documents.

ITEM 209.11XXNN24 – TEMPORARY CATCH BASIN INSERT (CBI)

DESCRIPTION:
The work shall consist of furnishing, installing, maintaining (removing, disposal of debris and resetting), replacing (if needed), and disposing (at end of contract) a temporary catch basin insert at the locations indicated in and according to the contract documents, and as directed by the Engineer.

The work shall also consist of removing and storing an existing temporary catch basin insert prior to a catastrophic storm event (e.g., flooding), and reinstalling it after the event at the locations indicated in and according to the contract documents, and as directed by the Engineer.

Acronyms
CBI – Temporary Catch Basin Insert

Temporary removal, storage and reinstallation of temporary catch basin inserts does not include the cost of a new temporary catch basin insert.

MATERIALS:
The following sections of the standard specification shall apply:

Temporary Catch Basin Insert	713-21

CONSTRUCTION DETAILS
The following section of the standard specifications shall apply:

Soil Erosion and Sediment Control	209-3.01

with the following exceptions:
- Torn or punctured geotextile must be replaced (see Maintenance below)
- Sediment deposition removed from the CBI shall be disposed of in accordance with §107-10 E.

Installation: Install the CBI according to manufacturer's instructions.

Inspection: Using the most restrictive inspection criteria listed below, the Contractor shall inspect each CBI:
- daily,
- after a rainfall event of 0.5" or more per twenty-four (24) hour period,
- as per manufacturer's instructions, and
- as per the conditions of the Stormwater Pollution Prevention Plan (SWPPP) (if the contract includes one).

Maintenance: Maintenance shall include the following:
- Removal of all accumulated sediment and debris from the vicinity of the CBI after each rainfall event of 0.5" or more per twenty-four (24) hour period and prior to removal of the insert for maintenance.
- Removal of CBI according to manufacturer's instructions.

ITEM 209.11XXNN24 – TEMPORARY CATCH BASIN INSERT (CBI)

- Emptying the CBI when the CBI's containment area is more than one third (1/3) full or before the sediment/trash/debris reaches the overflow openings. The Contractor shall ensure that the CBI is not so full that removing it causes the geotextile to rip, tear or become non-functioning. CBIs damaged during sediment removal shall be replaced at the Contractor's expense. The Engineer will determine if a damaged CBI warrants replacement. Sediment and/or debris that has been released into the drainage structure shall be removed by the Contractor and disposed of as below.
  - Refer to the manufacturer's instructions for emptying and re-installing the CBI. Removal of trash, sediment and debris from the CBI shall be done in a manner that ensures no trash, sediment or debris will enter an unprotected drainage structure.
- Disposal of the removed sediment shall occur at an upland location away from all stormwater conveyances.
  - Trash shall be disposed of according to §107-10 E. of the standard specifications.
- If a CBI's fabric or strap is torn,
  - dispose of the sediment and debris contained within the unit according to this specification, and
  - replace the entire CBI. A CBI shall be replaced at no additional cost to the state.
- When CBI servicing results in a non-functioning or poorly functioning CBI, the CBI shall be replaced at no additional cost to the state. The Engineer will determine if a CBI is non-functioning or poorly functioning.
- CBIs shall be removed prior to winter shut down. Re-installation of the CBIs shall occur prior to ground disturbance or first thaw in the following spring, whichever occurs first, and according to manufacturer's instructions.

Emergency Removal, Storage and Reinstallation: Emergency removal, storage and reinstallation shall be performed in association with catastrophic events (e.g. storms and flooding) as follows:

- As directed in consideration of forecasted events (e.g. moderate or major flood warnings) in impacted urban or residential locations where flooding is likely to result in hazardous public conditions.
- Removal, storage, and reinstallation as specified and applicable under Maintenance above. This includes replacing any damaged, poorly functioning, or non-functioning CBI.
- CBIs removed for emergency flooding events shall be reinstalled prior to resuming construction.

CBIs shall be removed according to §209-3.01 and disposed of according to §107-01 E. after all soil disturbance areas have been fully stabilized with an established, permanent, and approved vegetative cover at a uniform density of eighty percent (80%).

METHOD OF MEASUREMENT

Temporary Catch Basin Insert. The work will be measured as the number of each CBI furnished, installed, maintained, replaced, and disposed.

Temporary Catch Basin Insert Emergency Removal and Reinstallation. The work will be measured as the number of each CBI removed, stored, and reinstalled.

ITEM 209.11XXNN24 – TEMPORARY CATCH BASIN INSERT (CBI)

BASIS OF PAYMENT

Temporary Catch Basin Insert. The unit price bid for each CBI furnished, installed, maintained, replaced, and disposed shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work.

Temporary Catch Basin Insert Emergency Removal and Reinstallation. The unit price bid for each CBI removed, stored, and reinstalled shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work.

Progress payments will be made at fifty percent (50%) of the unit price bid upon installation of each CBI. The remaining fifty percent (50%) will be paid after soil disturbance areas have been fully stabilized with an established, permanent, and approved vegetative cover at a uniform density of eighty percent (80%) and the CBI has been removed. No progress payments are offered for the emergency removal and reinstallation of CBI.

Payment will be made under:

Item Number	Description	Unit
209.11010024	Temporary Catch Basin Insert – Trash, Sediment, and Debris Removal	EA
209.11020024	Temporary Catch Basin Insert –Trash, Sediment and Debris Removal, plus Oil and Hydrocarbon Removal	EA
209.11030024	Oil and Hydrocarbon Absorbent Pouches for Temporary Catch Basin Insert	EA
209.11040024	Temporary Removal, Storage and Reinstallation of a Temporary Catch Basin Insert	EA

ITEM 304.10119917 - SUBBASE COURSE, TYPE 1011-2

All of the requirements of Section 304 *Subbase Course* shall apply except as herein modified:

MATERIALS

Material shall conform to the requirements of §733-04 *Subbase Course* with the addition of the following requirement:

Natural Material. Natural material obtained from sources located in Richmond, Kings, Queens, Nassau and Suffolk Counties shall conform to the following gradation:

Sieve Size Designation	Percentage Passing by Weight
2 in.	100
1 in.	80-100
¼ in.	50-85
No. 10	30-70
No. 40	15-40
No. 200	6-12

Natural material obtained from sources other than those listed above shall conform to the gradation requirements of Table 733-04A *Subbase Gradation* in §733-04B. *Gradation.*

BASIS OF PAYMENT

Payment will be made under:

Item No.	Item	Pay Unit
304.10119917	Subbase Course, Type 1011-2	Cubic Yard

ITEM 520.05000010 - SAW CUTTING PORTLAND CEMENT CONCRETE AND COMPOSITE PAVEMENTS

DESCRIPTION. This work shall consist of saw cutting existing reinforced or unreinforced portland cement concrete, including portland cement concrete pavement and sidewalk, and composite pavement (asphalt concrete on reinforced or unreinforced portland cement concrete), at the locations indicated on the plans or where directed by the Engineer.

MATERIALS. All equipment proposed for this work shall be subject to approval by the Engineer prior to actual use. Rotary rock saws shall not be used for cuts under this item.

CONSTRUCTION DETAILS. Saw cutting shall be along a neat line as indicated on the plans or where directed by the Engineer. The cuts shall be neat and true with no shatter. Saw cuts shall be made to the depth (s) indicated on the plans and as stated below.

When removing composite pavement the Contractor shall saw cut the existing pavement for the full depth of the concrete pavement. The total saw cut depth will be more, depending on the thickness of the asphalt. At the Contractor's option, the asphalt concrete may first be saw cut and removed before making a second cut through the portland cement concrete.

Any damage to material not indicated for removal, caused by the Contractor's operations, shall be repaired by the Contractor. All repair shall be done in a manner satisfactory to the Engineer.

METHOD OF MEASUREMENT. This work will be measured by the number of linear feet of saw cutting done. No allowance will be made for saw cuts of different depths.

Saw cutting which is done for the Contractor's convenience will not be measured for payment under this item.

BASIS OF PAYMENT. The unit price bid per linear foot of saw cutting shall include the cost of all labor, materials, and equipment necessary to complete the work.

Only one payment will be made for saw cutting when removing composite pavement regardless of the method chosen. The cost of saw cutting the asphalt concrete in the composite pavement is included in this item. No payment will be made for this saw cutting under the item for saw cutting asphalt concrete.

Any repairs made necessary by the Contractor's operations shall be done to the satisfaction of the Engineer at no additional cost to the State

ITEM 520.09000010 - SAW CUTTING ASPHALT CONCRETE

DESCRIPTION. This work shall consist of saw cutting existing asphalt concrete pavement or sidewalk at the locations indicated on the plans or where directed by the Engineer.

MATERIALS. All equipment proposed for this work shall be approved by the Engineer prior to actual use.

CONSTRUCTION DETAILS. Saw cutting shall be along a neat line as indicated on the plans or where directed by the Engineer. Saw cuts shall be made to the depth(s) indicated on the plans.

Any damage to material not indicated for removal, caused by the Contractor's operations shall be repaired by the Contractor. All repair shall be done in a manner satisfactory to the Engineer.

METHOD OF MEASUREMENT. This work will be measured by the number of linear feet of saw cutting done. No allowances will be made for saw cuts of different depths.

No saw cutting will be measured for payment under this item which the Contractor may choose to do for his own convenience.

BASIS OF PAYMENT. The unit price bid per linear foot of saw cutting shall include the cost of all labor, materials, and equipment necessary to complete the work.

Any repairs made necessary by the Contractor's operations shall be done to the satisfaction of the Engineer at no additional cost to the State.

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ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

DESCRIPTION: Install injection ports, seal the crack opening, inject the crack with epoxy (full depth for restoration work, or as deep as conditions allow for prevention work), and restore the sealed surface to a flush condition in areas visible to the public. Perform the work at locations indicated on the contract plans or where directed by the Engineer.

PREVENTION - use in contaminated, cracked concrete areas to prevent movement and protect reinforcing.

RESTORATION - use in uncontaminated cracked concrete areas to restore structural integrity. Take verification cores for payment. Have an experienced epoxy manufacturer representative present until the work is acceptable to the Engineer.

MATERIAL REQUIREMENTS:

1. Crack Sealant - epoxy paste that completely cures in 4 hours or less and retains the injected epoxy. Any other type of crack sealant is subject to a project demonstration and approval by the Engineer.

2. Low Viscosity Injection Epoxy - Manufacturer certified to meet ASTM C881, Type I or IV, Grade 1, Class B or C (as temperature conditions require.)

3. Vertical & Overhead Patching Material (Approved List) - (for ITEM 555.80020001) §701-08

INJECTION EQUIPMENT: Use equipment in good working order, as approved by the Engineer, with the following features:

- Separate feed lines to the mixing chamber
- Automatic mixing and metering pump
- Ability to thoroughly mix the epoxy components in the mixing chamber
- Operator control of the epoxy flow from the mixing chamber
- Clean, legible, accurate pressure gauges easily viewable by the operator
- Ability to provide an uninterrupted pressure head to continually force epoxy into the cracks
- Injection pressure from 0 to at least 200 PSI
- Capable of metering each epoxy component to within 3.0% of the epoxy manufacturer's mix ratio

Un-reacted epoxy components may be stored overnight in separate reservoirs and feed lines.

Before starting the work, demonstrate to the Engineer the ability of the equipment to meter and mix epoxy components to the required mix ratio. Ratio accuracy may be determined by simultaneously metering each component into separate, clean, accurately graduated, volumetric containers, or another procedure approved by the Engineer. Also, activate the automatic mixing and metering pump, mix a small amount of injection epoxy, and waste it into a disposable container. The Engineer will observe this trial operation and be satisfied the equipment is working properly, and the epoxy is mixed with no streaks.

CONSTRUCTION DETAILS:

ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

1. Crack and Surface Preparation. Remove all debris or contaminants accessible within the cracks by using hand tools, water blasting or oil-free high pressure air blasting, vacuuming, or other methods suitable to the Engineer. Epoxy resin will not penetrate: compacted, water or oil soaked debris. Allow free moisture within the crack to be absorbed before injecting epoxy. Remove all materials, including moisture, from the surface adjacent to the crack which might interfere with bonding of the crack sealant.

2. Injection Port Installation. Attach injection ports to the prepared surface by placing them onto (surface adapters) or into the cracks (socket ports) and affixing with crack sealant. Larger cracks may be ported by inserting an anchored tube into the crack.

   Use positive connection port designs to connect injection equipment to the ports. Other injection port designs and attachment methods, where worker fatigue would not be a problem, require approval by the Engineer.

   Use the following general guidelines for spacing injection ports when cracks are uniform in width through the structure. For cracks that get tighter with depth, double this spacing. Intermediate ports may be placed for observation. To permit maximum flow into the void, position ports on the wider crack sections and at intersections, rather than at an exact spacing.

   If these guidelines cannot be followed, use port locations approved by the Engineer. Port spacing may be modified by the Engineer as experience is gained, or when cores are taken to determine penetration.

   FOR CRACKS COMPLETELY THROUGH A MEMBER
   A. Cracks accessible from one side - space the ports not less than the thickness of the member.

   B. Cracks accessible from both sides - space the ports not less than twice the thickness of the member and stagger them relative to the ports on the opposite side. Make the stagger between ports (on opposite sides of the member) at least the thickness of the member.

   Place the endmost ports at the ends of the crack so as to insure complete filling of the crack.

   FOR MULTIPLE CRACKS ALL OVER A MEMBER.
   Space the ports as far apart as practical, but not less than 8” from one another. An 8” spacing presumes a 4” penetration in each direction, if the adjacent ports are not plugged when epoxy reaches them. For fine cracks that taper to an end, place the endmost ports about 4” from the end.

3. Crack Seal. After port installation, seal the crack opening with crack sealant, being careful not to plug the injection ports. Allow the crack sealant to cure completely before injecting epoxy.

   Apply crack sealant only when surface and ambient temperatures are above 50º F.

4. Port Flushing. Prior to any epoxy injection, flush critical ports with oil-free compressed air to verify that air exits from all the installed ports, dry the cracks, and check for leaks.

5. Epoxy Injection. Perform epoxy injection only when the surface and ambient temperatures are above 45º F and are not expected to fall below 45º F during the next 24 hours.

   UNIFORM WIDTH CRACKS - start toward the middle of a horizontal crack and work outward, or the lowest point of a sloping or vertical crack and work upward.

   VARIABLE WIDTH CRACKS - start at the widest points of all types of cracks and work outward. Secure the feed line to the first port. Initiate and continue flow until epoxy exits from the adjacent port. (Plug observation ports and continue through the same port to achieve maximum penetration.) Temporarily stop the injection process, remove the feed line, and seal the port. Attach the feed line to the adjacent port and repeat this procedure along the crack until the last port is sealed.

   Generally, use higher pressures when injecting narrow deep cracks, medium to low for wider cracks, and lowest pressures when injecting a delaminated area or an area susceptible to lifting. Low pressure applied for a longer duration is often more effective than high pressure applied for a shorter duration.

   Replenish the epoxy supply in the mixing equipment before it is exhausted. Thoroughly stir each epoxy component both before and after adding it to its respective component in the mixing equipment. Exercise care to assure a continuous injection operation.

   Allow the epoxy to fully cure prior to performing subsequent work in the repaired area.

   In the event of leakage from a crack, stop the injection process until the leak is sealed. When any work stoppage exceeds 15 minutes, clean the mixing chamber and flush the line that carries mixed epoxy. Flush with a suitable solvent, followed by air.

6. For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), take cores ranging in diameter from 1 to 4", as approved by the Engineer, to verify full penetration by epoxy and its cure. Take a representative core from each structural element, or one from every 100 feet of crack repaired, whichever is greater, at locations approved by the Engineer. The Engineer will retain the cores and determine if they are acceptable for payment. Patch the holes with Vertical & Overhead Patching Material.

   More than one core may be necessary to obtain an acceptable sample from cracks that diverge below the surface. (To avoid cutting reinforcing, the core drill may be angled to intercept a crack behind the reinforcing.)

7. Clean Up. In all areas visible to the public, as determined by the Engineer, remove spillage, the ports and crack sealant until flush with the adjacent surface. Remove stains and repair any damage to the satisfaction of the Engineer at no additional cost.

ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

METHOD OF MEASUREMENT: The Engineer will measure the work as the number of linear feet of crack sealed or repaired, as specified.

BASIS OF PAYMENT: Include the cost of all labor, materials, and equipment necessary to complete the work in the unit price bid per linear foot. For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), also include the cost of coring and repairing the core holes.

For ITEM 555.80010001 CRACK SEALING BY EPOXY INJECTION (PREVENTION), the Engineer will authorize payment after the measured length of crack has been sealed and the surface cleaned.

For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), the Engineer will authorize payment after the measured length of crack has been repaired as verified by cores, the core holes patched and the surface cleaned.

ITEM 567.64nnnn16 - REPLACING COMPRESSION SEAL FOR EXISTING BRIDGE JOINTS

DESCRIPTION:

The Contractor shall furnish and install compression seals of the size and at the locations indicated on the plans or ordered by the engineer.

MATERIAL:

The requirements of Section 567-2.02 A, 1 and A, 6 shall apply.

CONSTRUCTION DETAILS:

a. Contractor shall remove the existing sealer. Armored surfaces which are to be coated with adhesive shall be cleaned in accordance with SSPC-SP6 and the cleaned surfaces will be defined by SSPC-Vis 1, Pictorial references ASP-6, BSP-6, CSP-6 or DSP-6.

b. Sealant Application:

Two copies of the sealant manufacturer's printed instructions shall be delivered to the Engineer at least two weeks prior to the start of work.

1. Prior to the application of sealant, all surfaces which will come in contract with sealant shall be completely dried and cleaned. Sealant shall be applied in accordance with the manufacturer's printed instructions.

2. The Contractor shall use extreme care in applying the sealant so as not to smear the adjacent concrete surfaces, and he shall immediately clean concrete surface of sealant in the event some of it is dropped or smeared on them.

c. Installation of the joint sealer to be done in accordance with the manufacturer's written instructions.

d. Watertight Integrity Test:

After the compression seal is permanently installed, a watertight integrity test shall be performed. The test shall be done in accordance with the requirements of subsection 567-3.01H.

METHOD OF MEASUREMENT:

Measurement will be made as the number of feet of compression seal completely installed, measured horizontally and vertically along the centerline of joint system between the outer limits as indicated on the contract plans.

The word "completely installed" shall be interpreted to mean the compression seal in its proper position

and the watertight integrity tests completed.

BASIS OF PAYMENT:

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

Note: "nnnn" denotes a serialized pay item. See § 101-02 Definitions of Terms under "Specifications" and the Standard Drawings.

ITEM 595.50000018 – SHEET-APPLIED WATERPROOFING MEMBRANE

DESCRIPTION

Furnish and install a manually or machine-applied sheet waterproofing membrane in accordance with the contract documents. Include all surface preparation.

MATERIALS

Use a sheet-applied waterproofing membrane meeting the requirements of §717-02.

CONSTRUCTION DETAILS

General - On new structural concrete, the provisions of §557-3.11, Curing, shall be met prior to membrane system placement. Work will not be done during wet-weather conditions. No work will be done when the concrete structural slab surface temperature is below 50°F, or ambient temperatures are below 50°F. The concrete structural slab shall be surface dry at the time of application of the membrane. The Engineer will verify that atmospheric conditions are favorable for placement of the system based on the manufacturer's recommendations.

Arrange for the membrane manufacturer to have a competent technical representative at the job site during all phases of preparation and installation.

Supply Material Safety Data Sheets (MSDS) and approved Material Detail Sheets prepared by the membrane manufacturer to the Engineer a minimum of two (2) weeks prior to the scheduled commencement of work. The Material Detail Sheets will contain all material requirements and installation information for each specific waterproofing membrane. The Material Detail Sheets will be accessible at the Department's Approved List website for reference.

(Bridge Decks) – Begin work no less than (7) calendar days after placement of Portland cement concrete, Portland cement mortar, or epoxy mortar for structural concrete repair. The Engineer may waive the seven-day requirement if the areas of repair can sustain loads without damage or deformation. Subject to the concurrence of the Engineer, if an alternate concrete repair material is used, follow the manufacturer's instructions for allowable loading.

(Culverts) - Fill the joints between precast culvert sections flush to the culvert slab and sidewall surfaces with a grout conforming to §701-08 Vertical and Overhead Patching Material. In areas where the joints do not line up evenly, taper the grout with a maximum slope of 2:1, from the high side of the joint to the low side, to provide a smooth transition from one unit to the next.

Place the waterproofing membrane over the joints of precast or cast-in-place units following the guidelines of Chapter 19 of the Highway Design Manual, or as indicated on the contract plans and Material Detail Sheets.

1. On vertical surfaces, the waterproofing membrane will be covered with material conforming to §705-07 Premoulded Resilient Joint Filler.

2. On horizontal surfaces.

ITEM 595.50000018 – SHEET-APPLIED WATERPROOFING MEMBRANE

Membrane Protection (Culverts) – To protect the waterproofing membrane from punctures, the following procedures will be used:

a. If select granular fill is specified over the culvert, a 6 inch thick protective layer of concrete sand, meeting the requirements of §703-07 Concrete Sand, will be placed on the membrane.

Or

b. If asphalt pavement using aggregate larger than 3/8 inch is specified directly above the membrane, or if clearances don't allow for 6 inches of concrete sand, a 1 inch thick (minimum) course of HMA with a maximum nominal aggregate size of 3/8 inch will be placed on top of the membrane. The hot mix asphalt will be thoroughly compacted with mechanical tampers.

METHOD OF MEASUREMENT

This work will be measured as the number of square feet of sheet-applied, waterproofing membrane satisfactorily installed (measured to the nearest 1 sq ft.). No separate measurement of the vertical faces of curbs, joints, concrete barriers, headers, scuppers, or for the inside surfaces of subdrainage outlets, shall be made. No deductions will be made for holes less than 1 square foot in area.

BASIS OF PAYMENT

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

No additional payments will be made for any re-priming done in conformance with the requirements of the manufacturer's detail sheets.

ITEM 604.07260011 – CONNECTION TO EXISTING DRAINAGE FACILITIES

Description:

Under this item, the Contractor shall remove portions of existing drainage facilities and connect new drainage facilities thereto at the locations shown on the plans as ordered by the Engineer.

Materials:

Concrete	Class A Section 501
Concrete Grouting Material	Section 701-05
Bar Reinforcement	Grade 60 Section 709-01

Construction Details:

The work under this item provides for connecting new pipe lines to existing pipe lines or structures. The Contractor shall maintain the existing pipe lines and structures in continuous service as required and/or directed by the Engineer.

The Contractor shall perform all excavation and backfill and dispose of all excess materials as required to complete the work. Backfilling shall be compacted in conformance with Section 203 of the Standard Specifications.

When connecting to the existing pipe line or structures, the existing facility shall be broken into and reinforcement cut back only as needed to accommodate the new pipe as indicated on the plans. The new pipe shall be set to required grade and the existing pipe wall shall be repaired and patched as required to provide a secure and waterproof connection. Ends of the new pipe projecting into the existing drainage facility shall be neatly cut off and trimmed flush with the inside face of the structure.

Method of Measurement:

The quantity to be paid for shall be the actual number of connections made in conformance with the plans and specifications and the orders of the Engineer.

Basis of Payment:

Payment will be made at the unit price bid for each connection which shall include the cost of all materials, labor and equipment necessary to complete the work except excavation and backfill which will be paid under Trench and Culvert Excavation Item 206.02 and the new pipe which shall be paid under the appropriate pipe item.

ITEM 607.30010010 - STEEL CHAIN LINK FENCE WITH TOP RAIL, 4 ft HIGH
ITEM 607.30020010 - STEEL CHAIN LINK FENCE WITH TOP RAIL, 6 ft HIGH
ITEM 607.30030010 - STEEL CHAIN LINK FENCE WITH TOP RAIL, 8 ft HIGH
ITEM 607.30040010 - STEEL CHAIN LINK FENCE WITH TOP RAIL, 10 ft HIGH
ITEM 607.30050010 - STEEL CHAIN LINK FENCE WITH TOP RAIL, 12 ft HIGH

All the provisions of Section 607 pertaining to Optional Chain Link Fence, Type I, with Top Rail shall apply except for the following:

The fence fabric and frame options shall be listed below:

	Fabric	Frame
1.	Galvanized Steel	Galvanized Steel
2.	Aluminum Coated Steel	Aluminum Coated Steel or Combined Coating on Steel

End, corner, pull and line posts, top rail and braces shall be either Class A, Schedule 40 Pipe or Class B, Steel Tubing, at the Contractor's option. The alternative Roll-formed and H Section posts, top rail and braces shall not be used. The size of the posts, top rail and braces shall be as indicated on the Standard Sheets.

Fittings shall conform to the requirements of Subsection 710-10 except that aluminum alloy fittings shall not be used.

Gate posts shall be steel of the type and size indicated on Standard Sheets except that the optional Roll-formed posts shall not be used.

The fence fabric shall be attached to the line posts with matching tie wires; either galvanized steel or aluminum coated steel. The tie wires shall be 9 gage (5/32 inch Nominal Coated Wire Diameter) and shall be spaced at a maximum of 14 inches. The tie wires shall be installed in accordance with the special note "Fence Fabric Tie Wires" which is included elsewhere in the proposal. Minor damage to the coating on the tie wires, caused by cutting and twisting operations, will be acceptable as determined by the Engineer.

The fabric shall be secured to all end, corner, pull and gate posts with stretcher bars fastened to the posts with stretcher bands spaced at a maximum of 14 inches. When the installation of the fencing is completed, the threads of the bolts in the stretcher bands shall be damaged, as directed by the Engineer, to prevent removal of bolts.

ITEM 607.96000008 - REMOVE AND DISPOSE OF EXISTING FENCE

DESCRIPTION:

The contractor shall remove existing fence in accordance with the plans, specifications and directions of the Engineer. All references to "fencing" shall include existing gates, if any to be removed.

MATERIALS:

Materials needed for modifying end sections shall conform to the requirements of Section 710 of the Standard Specifications or shall conform to the material requirements of the existing fence, as directed by the Engineer.

Concrete for footings shall conform to Section 607-2.01 of the Standard Specifications.

CONSTRUCTION DETAILS:

The contractor shall remove and dispose of the existing fence to a point shown on the plans or where directed by the Engineer. If a portion of the existing fence is to remain, the remaining end section shall be modified to adequately secure the fencing. This modified section shall include all hardware necessary to secure the fencing in a manner similar to the existing end section or as directed by the Engineer. Parts salvaged from the removed portion, acceptable to the Engineer, may be reused in the end section.

All work shall be done in a workmanlike manner with care taken not to disturb the surrounding area or existing fence to remain. Any damage to the area or existing fence to remain caused by the contractor's operations shall be repaired to the original condition at no expense to the state. Any concrete post footings shall be either broken up and removed or removed in one piece as determined by the contractor and approved by the Engineer. All post holes shall be filled to meet existing grade. All excavation and backfill shall conform to Section 203 "Excavation and Embankment".

METHOD OF MEASUREMENT:

This work will be measured as the number of feet of fence removed in accordance with the plans or as directed by the Engineer. An additional 10 foot allowance will be paid for each end section modified to secure the remaining fence.

BASIS OF PAYMENT:

The unit price bid shall include the cost of all labor, equipment and materials necessary to complete the work, including the cost of any fill required to fill the post holes.

ITEM 607.99870011 - REMOVE EXISTING CHAIN-LINK FENCING

DESCRIPTION
This work shall consist of removing and disposing the existing chain-link fencing (including gates, if present) from the locations indicated on the contract plans or where directed by the Engineer.

MATERIALS
None Specified.

CONSTRUCTION DETAILS
The Contractor shall remove and dispose away from the site the existing chain-link fencing (and gates, if present), including the fence posts and footings as directed by the Engineer. All excavated areas shall be properly filled to match the surrounding area to the satisfaction of the Engineer.

METHOD OF MEASUREMENT
This work will be measured as the number of feet of chain-link fencing removed. Measurement will be along the horizontal projection of the center of the fencing, center-to-center of terminal fence posts.

BASIS OF PAYMENT
The unit price bid per linear foot shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work, including excavation, fill and all necessary incidentals.

ITEM 619.67020010- TEMPORARY HIGHWAY LIGHTING SYSTEM

DESCRIPTION:
This work shall consist of removing and disposing of existing concrete sidewalk and subbase, and replacing them with new, approved subbase material and concrete sidewalk at locations indicated in the contract documents and as directed by the Engineer.

MATERIALS:
The following sections of the standard specifications shall apply:

Subbase Course	304-2
Sidewalks, Driveways, Bicycle Paths and Vegetation Control Strips	608-2

Subbase Course shall meet the requirements of §304-1.02, Type 1 under Option B, ***except*** 98 % to 100 % of the material by weight, shall pass a 2" sieve

Concrete Sidewalks shall meet the requirements of §608-2.

Wire fabric for concrete reinforcement shall meet the requirements of §709-02.

Include the cost of adding water in the price bid unless the items for furnishing and applying water are included in the contract.

CONSTRUCTION DETAILS:
The following sections of the standards specifications shall apply:

Excavation and Embankment	203-3.02 B.
Sidewalks, Driveways, Bicycle Paths and Vegetation Control Strips	608-3

Construction of the subbase shall conform with the requirements of Section 304-3 of the Standard Specifications. Construction of the sidewalks shall conform with the requirements of Section 608-3 of the Standard Specifications.

This work shall consist of the following:

A. Removing and disposing of existing concrete sidewalk and subbase material to a depth indicated in the contract documents and as directed by the Engineer. Care shall be taken not to damage adjacent sidewalk and other appurtenances that are to remain. Sawcutting the existing sidewalk at the limits of removal shall be as directed by the Engineer.

Any damage caused by the Contractor's operations, during the sidewalk removal and disposal operations, to the sidewalk or appurtenances that are to remain shall be repaired and/or replaced by the Contractor at no expense to the State. These repairs and/or replacements shall be approved by

ITEM 619.67020010- TEMPORARY HIGHWAY LIGHTING SYSTEM

Engineer.

B. Prior to the placement of the new subbase course, the existing surface shall be graded and compacted as directed by and approved by the Engineer.

C. The subbase course shall then be placed and compacted in accordance with §304-3.01 thru §304-3.05 and as detailed in the contract documents.

D. Concrete for new sidewalks shall be placed in accordance with §608-3.01 and to the thickness shown in the contract documents. Standard Sheet 608-01 shall be used as a guide in the construction of the sidewalk curb ramps. Prior to the placement of concrete, all curbs shall be reset or replaced as approved by the Engineer.

E. Upon removal of forms, the area shall be cleaned of all debris to the satisfaction of the Engineer. All areas disturbed by this operation shall be graded and seeded as approved by the Engineer.

F. Equipment and construction procedures shall be appropriate for the work as set forth in this operation. The Engineer shall review and approve use of all equipment to do this work prior to the beginning of work at each location.

G. Material removed under this item shall be disposed of in conformance with the provisions of §203-3.02 B. *Disposal of Surplus Excavated Materials*.

METHOD OF MEASUREMENT:
This work will be measured as the number of square yards of concrete sidewalk placed.

BASIS OF PAYMENT:
The unit price bid per square yard of concrete sidewalk placed shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

The cost of saw cutting shall be included in the cost of this item. No direct payment will be made for losses of material resulting from compaction, foundation settlement, erosion, or any other cause.

No deductions will be made for the volumes occupied by manholes, catch basins and other such objects. No additional payment will be made for the protective layer, as stated in §304-3.04 *Traffic and Contamination*.

ITEM 619.67020010- TEMPORARY HIGHWAY LIGHTING SYSTEM

DESCRIPTION

Under this item the Contractor shall design, furnish, install, maintain, relocate and/or remove temporary lighting assemblies, wire, poles, connections to permanent lighting systems and power sources.

This item is to provide temporary lighting during construction to supplement the permanent roadway lighting system in achieving an uninterrupted lighted roadway surface, according to the criteria specified in the Plans.

MATERIALS

The luminaries shall be fully weather proof.

The luminaries shall be equipped with a built-in ballast for the proper wattage and operating voltage.

The components comprising the assembly of the upper half of the luminaries shall include a reflector, a porcelain enclosed mogul socket, and a twist-lock three prong receptacle for a photoelectric control (where required).

Multiple lighting wire and ground wire shall conform to subsection 723-70 and 723-75 respectively.

CONSTRUCTION DETAILS:

The Contractor shall submit proposed equipment shop drawings and associated photometrics certified by the manufacturer, proposed layout drawings, and lighting calculations of the proposed temporary roadway lighting system for review and approval by the Engineer. The drawings shall include the calculated point-by-point lighting levels, as well as the calculated veiling luminance ratio, average-to-minimum, and maximum-to-minimum ratio values. These values shall meet or exceed the criteria given in the plans. The layout drawings of the proposed temporary lighting system shall also include the proposed temporary power and control scheme, and include provisions for any required workarounds and/or temporary systems required to maintain power to and control of existing roadway and sign lighting outside the area of work. The drawings and calculations shall be prepared by or under the direct supervision of a Registered Professional Engineer in the State of New York, and bear that Engineer's stamp and signature.

ITEM 619.67020010- TEMPORARY HIGHWAY LIGHTING SYSTEM

Temporary lighting assemblies, poles and wires shall be designed, furnished, installed, maintained, repaired, replaced as necessary and energized as required.

In no case shall the existing lighting system be discontinued until the temporary lighting is in service and approved. Temporary lighting of lower intensity than indicated on the plans will not be permitted.

Temporary Highway Lighting System shall be connected to and operated by the permanent lighting system and shall contain luminaires with photoelectric cells. Nonconforming items and/or installation shall require special approval by the Engineer prior to placement.

Contractor shall make connections to existing permanent lighting systems or other temporary power sources. Coordination with local utility is the responsibility of the Contractor.

Work and testing shall conform to subsections 670-3.14, 670-3.15 and 670-3.16.

In the event that the Contractor fails to restore complete operation of any portion of the temporary roadway lighting system within 24 hours of any failure, the State may direct its own maintenance contractor to make repairs. The Contractor shall reimburse the State for all costs it incurred in restoring the lighting system.

Once the permanent highway lighting is installed and in operation, the temporary lighting assemblies, wires and poles shall be dismantled and removed from the site.

METHOD OF MEASUREMENT:

Payment for Temporary Highway Lighting System will be made on a lump sum basis.

BASIS OF PAYMENT:

The lump sum price bid for this item shall include the cost of all equipment, materials, temporary power connections and labor necessary to adequately and safely maintain the minimum light level indicated on the plans. Relocation and/or removal of temporary lighting system shall be included in the lump sum price bid.

All maintenance costs related to the temporary lighting system shall be included in this item.

The lump sum cost shall include the design of the temporary lighting system.

ITEM 619.67020010- TEMPORARY HIGHWAY LIGHTING SYSTEM

Energy costs for the temporary lighting system will be borne by the party mentioned in the contract documents.

In the event the contract completion date is extended, no additional payment will be made for temporary lighting system.

Monthly progress payments will be made for this item in proportion to the amount of contract work completed less any deductions for disbursements incurred restoring the temporary lighting.

ITEM 639.2X00NC – CPM (CRITICAL PATH METHOD) SCHEDULE with Monthly Update

DESCRIPTION

This work shall consist of preparing, maintaining and submitting a Progress Schedule using the Critical Path Method on Oracle-Primavera P6 software which demonstrates complete fulfillment of all work shown in the contract documents. All work to prepare and maintain the CPM Progress Schedule shall be performed using the scheduling software application. The Contractor shall regularly revise and update the Progress Schedule, and use it in planning, coordinating and performing all work. Schedule activities shall accurately depict the entire scope of work to be performed to complete the project including, but not limited to, all work to be performed by the Contractor, subcontractors, fabricators, suppliers, consultants, the Department, and others, contributing to the project. In preparing and maintaining the Progress Schedule, the Contractor shall take into account submittal requirements and proper submittal review times, coordination of submittals by subcontractors for fabricating and delivering materials and equipment, availability and abilities of workers, availability of construction equipment, weather conditions and site specific restrictions in operations.

DEFINITIONS

Activity - A discrete, identifiable task or event that usually has an expected duration, has a definable Start Date and/or Finish Date, and can be used to plan, schedule, and monitor a project.

Activity, Controlling - The first incomplete activity on the critical path.

Activity, Critical - An activity on the critical path.

Actual Start date- At the activity level, the Actual Start date represents the point in time that meaningful work actually started on an activity.

Actual Finish date - At the activity level, the Actual Finish date represents the point in time that work actually ended on an activity (Note: in some applications areas, the activity is considered "finished" when work is "substantially complete.")

Backward Pass – Calculation of the late start and late finish dates for each activity, based on the start or finish dates of successor activities as well as the duration of the activity itself. It is also known as the second pass.

Baseline Progress Schedule - The Progress Schedule submitted by the Contractor and accepted by the Department that shows the plan to complete the construction contract work. The Baseline Progress Schedule represents the Contractor's plan at the time of Contract Award or Notice to Proceed for completing the project.

Bid Date – The date the contract is let and there is an announcement by the Department of an apparent low bidder.

Completion Date, Contract - The date specified in the Notice To Proceed (NTP) letter for completion of the project or a revised date resulting from properly executed time extensions.

Anticipated Completion Date - The date forecasted by the Progress Schedule for the completion of the contract work.

Constraint - A schedule restriction imposed on the Start or Finish date(s) of an activity that modifies or overrides an activity's relationships.

Contemporaneous Period Analysis Method – A technique for evaluating schedule delays or time savings. The analysis period for the purpose of these provisions shall be the period covered in each regular progress update to the schedule, as they coincide with contract payments to the Contractor.

Contractor's First Day of Work - The day of the Contractor's first day of work which is Notice To Proceed (NTP)

Contractor's Last Day of Work - The Contractor's last day of work which is Contract Completion date.

Contractor Work Day - A calendar day scheduled for active prosecution of the work.

County Work days – Monday through Friday, with the exception of Holidays listed below. Days scheduled for the active prosecution of work activities by NC staff or NC's representatives.

Critical Path – In the Progress Schedule the critical activities shall be those activities being on the longest path. In a project network diagram, it is the series of activities which determines the earliest completion of the project.

Critical Delay - An event, action, or other factor that delays the critical path of the Progress Schedule and extends the time needed for completion of the construction project.

Critical Path Method (CPM) – A network analysis technique used to predict project duration by analyzing which sequence of activities (which path) has the least amount of scheduling flexibility (the least amount of float). A scheduling technique utilizing activities, durations, and interrelationships/dependencies (logic), such that all activities are interrelated with logic ties from the beginning of the project to the completion of the project. Early dates are calculated by means of a forward pass using a specified start date. Late dates are calculated by means of a backward pass starting from a specified completion date (usually the forward pass's calculated project early finish date).

Data Date – The date entered in the Project Details, in the Dates tab, which is used as the starting point to calculate the schedule. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."

Deliverable – Any measurable, tangible, verifiable outcome, result, or item that must be produced to complete a project or part of a project. Often used more narrowly in reference to an external deliverable, which is a deliverable that is subject to approval by the Department.

Draft Baseline Progress Schedule – An optional schedule submission that reflects an outline of the schedule format and content proposed by the Contractor's Project Scheduler to comply with the schedule provisions in the contract to solicit early comments by the Engineer, prior to the submittal of complete Baseline Progress Schedule.

Duration, Original - The original estimated number of working days (not including holidays or other nonworking periods) in which the work task associated with the activity is expected to be performed. (The

number of calendar days may be different based on the calendar assigned to the activity.) For certain activities such as concrete curing, or others approved by the Engineer, the calendar shall reflect no non-working days.

Duration, Remaining - The estimated time, expressed in working days (not including holidays or other nonworking periods), needed to complete an activity that has started but has not finished.

Early Completion Schedule - A progress schedule will be considered an early completion schedule when the schedule submitted by the Contractor indicates a completion date that is earlier than the specified contract completion date, or the Finish date of any interim Milestone work activity is earlier than the date specified in the contract. This includes, but is not limited to, B-Clock activities, activities subject to Incentive/Disincentive provisions, and/or specific Liquidated Damages provisions, and Lane Rental activities.

Final Baseline Progress Schedule - The original plan against which the Contractor's progress is measured. The Final Baseline Progress Schedule represents the original plan at the award of the contract, of what is expected to happen. Once the Final Baseline Progress Schedule is accepted by the Engineer it is saved and used as a basis to compare against Progress Schedules Updates.

Float Suppression - Utilization of zero free float constraints which allows an activity to start as late as possible by using all of its' available free float. This technique allows activities to appear more critical than if the activity's total float was based on early dates. Assigning zero free float prevents true sharing of total float between Department and the Contractor. Utilization of overly generous activity durations and overly restrictive calendar non-working periods are also considered to cause float suppression.

Float, Free - The amount an activity can slip without delaying the immediate successor activities. Free Float is the property of an activity and not the network path.

Float, Total - The amount of time an activity (or chain of activities) can be delayed from its early start without delaying the contract completion date. Float is a mathematical calculation and can change as the project progresses and changes are made to the project plan. Total Float is calculated and reported for each activity in a network, however, Total Float is an attribute of a network path and not associated with any one specific activity along that path.

Fragnet – A subdivision of a project network diagram usually representing some portion of the project.

Global data – Data classified by Oracle-Primavera software as Global, including Project Codes, Global Activity Codes, Global Calendars, Resource Calendars, Global Filters, Resources, Global Reports, User Defined Fields and Unit of Measure.

Key Plans - Key Plans are graphic representations made by the Contractor's Project Scheduler on paper copies of the appropriate contract plan sheets that reflect the Contractor's planned breakdown of the project for scheduling purposes to efficiently communicate the Contractor's activity coding scheme to County scheduling staff. The key plans prepared by the Contractor shall clearly define the boundaries of the work for each designated Area, the operations contained in various Stages of work, and work in the Work Zone Traffic Control (WZTC) Phases. The alphanumeric codes on the key plans shall match the code values for the activity code "Area", "Stage", and "WZTC Phase" in the Progress Schedule.

Longest Path - The sequence of activities through the Progress Schedule network that establishes the Scheduled Completion Date

Look-Ahead Schedule – A three week time segment generated from the accepted Progress Schedule that shows the actual work progressed during the previous one week and forecasts the work planned for next two week

period following the Data Date, and includes any major materials to be delivered and any lane closings or anticipated shifts in WZTC.

Milestone – An activity with zero duration that typically represents a significant event, usually the beginning and end of the project, milestones set forth in the contract proposal, construction stages, a major work package, or the contract interim time-related clauses.

Monthly Status Report – The report generated monthly from the updated Progress Schedule in an electronic Adobe Acrobat PDF format that reflects a Data Date for that Progress Schedule Update period. The report shall be formatted to fit ANSI Size D paper (610 mm x 914 mm) (24 inch x 36 inch), listing all work activities from the data date to contract completion, using the NYSDOT Status Report Layout or as ordered by the Engineer, sorted by Early Start Date, Total Float in increasing order, showing the Activity ID, Activity Description, Original Duration, Remaining Duration, Total Float, Early Start date, Early Finish date, Start date, Finish date and Calendar ID.

Narrative Report - A descriptive report submitted with each Progress Schedule. The required contents of this report are set forth in this specification.

Open End - The condition that exists when an activity has either no predecessor or no successor, or when an activity's only predecessor relationship is a finish-to-finish relationship or only successor relationship is a start-to-start relationship.

Predecessor - An activity that is defined by Schedule logic to precede another activity. A predecessor may control the Start Date or Finish Date of its successor.

Progress Schedule – A general Oracle-Primavera P6 Schedule as defined by this Specification.

Progress Schedule Update – Changes to the Progress Schedule that reflect the status of activities that have commenced or have been completed, including the following items: (a) Actual Start date and or Actual Finish date as appropriate; (b) Remaining Duration for activities commenced and not complete; and (c) Suspend or Resume dates for activities commenced and not complete.

Progress Schedule Revision – Revisions to the Progress Schedule ensure it accurately reflects the current means and methods of how the project is anticipated to progress, including modifications made to any of the following items: (a) changes in logic connections between activities; (b) changes in constraints; (c) changes to activity descriptions; (d) activity additions or deletions; (e) changes in activity code assignments; (f) changes in activity Productivity Rates; and (g) changes in calendar assignments.

Project Scheduler – The person that is responsible for developing and maintaining the Progress Schedule.

Projects Planned Start Date – The date entered in the Project Details, in the Dates tab, that reflects the Contractor's planned start of work (based on contract requirements, and reasonable expectation for a Notice to Proceed) at the time the bid was submitted to the Department.

Projects Must Finish By Date – A date constraint entered in the Project Details, in the Dates tab, that reflects the Contract Completion Date set in the Contract Documents or through a formal contract extension of time.

Recovery Schedule – A schedule depicting the plan for recovery of significant time lost on the project. This separate CPM schedule submission shall provide the resolution and include appropriate changes in network logic, calendar adjustments, or resource assignments.

Relationships - The interdependence among activities. Relationships link an activity to its predecessors and successors. Relationships are defined as:

Finish to Start - The successor activity can start only when the current activity finishes.

Finish to Finish – The finish of the successor activity depends on the finish of the current activity.
Start to Start – The start of the successor activity depends on the start of the current activity.

Start to Finish – The successor activity cannot finish until the current activity starts.

Resources, Contract Pay Item – Contract Pay Item resources shall be identified as a Material resource type. When required, Contract Pay Item resources are developed for each Pay Item in the contract, with the Resource ID matching the contract Pay Item and the Resource Name matching the description of the contract Pay Item.

Resources, Equipment – Equipment resources shall be identified as a Nonlabor resource type. A unique identifier shall be used in the Resource Name or Resource Notes to distinguish this piece of equipment from a similar make and model of equipment used on the project.

Resources, Labor – Labor resources shall be identified as a Labor resource type. Labor Resources shall identify resources that encompass direct labor at the Crew level.

Scheduling/Leveling Report – The report generated by the software application when a user "Schedules" the project. It documents the settings used when scheduling the project, along with project statistics, errors/warnings, scheduling/leveling results, exceptions, etc.

Substantial Completion - the day, determined by the Engineer, when all of the following have occurred:

1. The public (including vehicles and pedestrians) has full and unrestricted use and benefit of the facilities both from the operational and safety standpoint, and
2. All safety features are installed and fully functional, including, but not limited to, illumination, signing, striping, barrier, guard rail, impact attenuators, delineators, and all other safety appurtenances, and
3. Only minor incidental work, replacement of temporary substitute facilities or correction or repair remains for the Physical Completion of the Contract, and
4. The Contractor and Engineer mutually agree that all work remaining will be performed with short term lane closures to minimize delays, disruption, or impediment to the traveling public. No overnight lanes closures will be allowed.

Successor - An activity that is defined by Schedule logic to succeed another activity. The Start Date or Finish Date of a successor may be controlled by its predecessor.

Time Impact Analysis - A technique to demonstrate the comparison of a time impact of a Progress Schedule revision prior to a change in the Contract work, against the current accepted Progress Schedule. It is also known as a "What-If" analysis.

Work Breakdown Structure (WBS) - A deliverable-oriented grouping of project elements, which organizes and defines the total scope of the project. Each descending level represents an increasingly detailed definition of project components or work packages.

Work Days – A calendar day (Monday through Friday) on which NC offices are open to the public for business NC recognized public holidays are not workdays**.** Days scheduled for the active prosecution of work activities by NC staff or the NC's representatives. (NC Workday calendar)

Nassau County Holidays	
New Year's Day	**January 1**
Martin Luther King Day	**3rd Monday in January**
Lincoln's Birthday	**February 12th**
President's Day	**3rd Monday in February**
Memorial Day	**Last Monday in May**

Independence Day	**July 4th**
Labor Day	**1st Monday in September**
Columbus Day	**2nd Monday in October**
Election Day	**1st Tuesday in November**
Veteran's Day	**November 11th**
Thanksgiving Day	**4th Thursday in November & Following Friday**
Christmas Day	**December 25th**

If the holiday occurs on a Saturday, it may be observed the Friday before. If the holiday occurs on a Sunday, it may be observed the Monday after.

Work Package - A deliverable at the lowest level of the work breakdown structure. A work package contains activities.

MATERIALS

Oracle-Primavera P6 software (as accepted by the Engineer)

CONSTRUCTION DETAILS

A. General. In addition to the attributes of the Progress Schedule provisions as set forth in NYSDOT Specification §108-01, the Contractor shall prepare, furnish, and maintain a computer-generated Progress Schedule using the Critical Path Method (CPM) utilizing Oracle-Primavera scheduling software. The CPM Progress Schedule shall be prepared based on the principles defined by the latest issue of the Construction Planning & Scheduling Manual published by the Associated General Contractors of America, except where superseded by the contract documents such as the CPM Special Notes and this specification.

The Contractor and the Department shall use the Progress Schedule to manage the work, including but not limited to the activities of subcontractors, fabricators, the Department, other involved agencies and authorities, other entities such as utilities and municipalities, and all other relevant parties involved with the project.

No work other than installation of the Engineer's Field Office, mobilization, procurement and administrative activities, installation of construction signs, installation of erosion and pollution protection, clearing and grubbing, field measurements, and survey and stakeout will be permitted to start until the Baseline Progress Schedule has been submitted to the Engineer, and the Engineer determines there are no deficiencies consistent with those identified in paragraph I.1 *Immediate Rejection of Progress Schedule Submissions.* .

The purpose of the Progress Schedule, and scheduling provisions in the contract, shall be to:

a) Ensure that the Contractor and the Department have a detailed plan and resources to complete the project in accordance with contract time requirements;
b) Provide a means of monitoring the progress of work;
c) Aid in communication and coordination of activities among all affected parties;
d) Analyze the effect of changed conditions on any milestone dates or on the contract completion date;
e) Analyze the effect of change orders for extra work or deductions, and unanticipated delays, on the contract completion date;
f) Establish a standard methodology for time adjustment analysis based on the principles of the Critical Path Method of scheduling, to analyze delays and resolve construction disputes concerning time;
g) Determine appropriate extensions or reductions of Contract Time.

In scheduling and executing the work, the Contractor shall:

a) Sequence the work commensurate with the Contractor's abilities, resources and the contract documents. The scheduling of activities is the responsibility of the Contractor.

b) Ensure that Progress Schedules prepared by the Project Scheduler for submission to the Department are in compliance with the Contract. The intent should be that Schedule submissions and accompanying Narratives are timely, complete, accurate, and in compliance with the Contract.

c) Communicate all Contract changes, and decisions or actions taken by the Contractor and all subcontractors, fabricators, etc., that effect the Progress Schedule to the Project Scheduler in a timely manner to allow appropriate development, maintenance, and update of the Progress Schedule.

d) Include all work contained in the Contract and all work directed in writing by the Engineer. Work activities directed by the Engineer to be added to the Contract shall be included in the next Monthly Progress Schedule submission.

e) Assure that Progress Schedule Updates reflect the actual dates that work activities started and completed in the field.

f) Break a schedule activity into multiple activities to reflect a discontinuity in the work if a work activity is suspended in the field and restarted at a later date, and the break between when the work was suspended to when it was resumed is significant compared to the original activity duration.

g) Ensure the Progress Schedule contains all work constraints and Milestones defined in the Contract.

h) Schedule the work using such procedures and staging or phasing as required by the Contract. Work designated as part of separate stages may be performed concurrently with other stages where allowed by the Contract or where approved by the Department.

Failure by the Contractor to include any element of work required by the Contract in the accepted progress schedule does not relieve the Contractor from its responsibility to perform such work.

Should the Contractor choose to show activities in the schedule that reflects their plan of work prior to the contract award, the Department does not incur any liability and such work being performed between the letting date and the contract award date shall be considered at risk work.

Errors or omissions on schedules shall not relieve the Contractor from finishing all work within the time limit specified for completion of the contract.

B. Project Scheduler. The Contractor shall designate an individual, entitled the Project Scheduler, who will develop and maintain the construction progress schedule. The Project Scheduler shall be present at the Preconstruction Schedule Meeting, prepared to discuss, in detail, the proposed sequence of work and methods of operation, and how that information will be communicated through the Progress Schedule. The Project Scheduler shall attend all meetings, keep notes which may affect the CPM schedule, including but not limited to those between the Contractor and their Subcontractors and between the Contractor and the Department. The Project Scheduler shall be knowledgeable of the status of all aspects of the work throughout the length of the Contract, including but not limited to original contract work, additional work, new work, and changed conditions of work.

C. Scheduling Software. Oracle-Primavera P6 software and computer system shall be used by the Contractor. The Contractor shall develop, update, and revise the Progress Schedules using Oracle-Primavera P6 software application.

In general, schedules are developed from the Contractor's knowledge of the project, and the means and methods represented in those schedules are based on the Contractor's understanding of the contract documents, and the Contractor's past experience, which are unique to the Contractor. Schedule activity data are therefore the intellectual property of the Contractor and will not be made available to other Contractors. However, all project schedule data are the sole property of the Department.

D. Meetings.

D.1. Preconstruction Schedule Meeting. The Contractor shall contact the Construction Engineer after notification they are the apparent low bidder, but no later than two (2) Work Days following Notification to Proceed (NTP) to schedule a Preconstruction Schedule Meeting. The purpose of this meeting will be to discuss essential matters pertaining to the satisfactory scheduling of project activities, and to resolve any known questions regarding interpretation of the contract requirements for this work.

The Project Scheduler shall be prepared to discuss the following:

a) The proposed hierarchal Work Breakdown Structure (WBS) for the Progress Schedules. The Project Scheduler shall provide a paper copy at the meeting.
b) The proposed project calendars.
c) The proposed project activity codes and various code values for each activity code. The Project Scheduler shall provide a paper copy at the meeting.
d) The specifics of any contract Time-Related Clauses (A+B Bidding, Incentive/Disincentive, Liquidated Damages, Lane Rental, etc.);
e) The Contractor's schedule methodology to be employed, proposed work sequence and any proposed deviations from the contract plans with respect to Staging or Work Zone Traffic Control phasing.
f) The Key Plans shall be provided at the meeting.
g) The factors that the Contractor determines to control the completion of the project and any milestone activity completion dates contained therein.
h) The Project Scheduler shall provide an outline for the content of the Narrative report for future Progress Schedule submissions.
i) Schedule submission protocol for Progress Schedule submissions.

The Contractor shall submit to the Resident Engineer (RE) for review, a minimum of five (5) Work Days prior to the Preconstruction Schedule Meeting, the following: a copy of the Key Plans, a print out of the proposed Work Breakdown Structure, a print out of each of the proposed project Calendars showing the Work Days versus non-work days and hours per day, and a list of the Code Values for each Project Activity Code proposed to be used in the schedules.

The Resident Engineer (RE) will be available to answer questions regarding scheduling, including: the availability of Department supplied electronic file(s) containing sample project schedule information, sample progress schedule narratives, Special Notes for CPM Scheduling, and required standard format for CPM Progress Schedules for contract work.

The Contractor shall schedule meetings as necessary with the Engineer to discuss schedule development and resolve schedule issues, until the Final Baseline Progress Schedule is accepted by the Engineer.

D.2. Progress Meetings. One topic of the regular progress meetings held by the Engineer and attended by the Contractor shall be a review of the monthly Status Report generated from the Progress Schedule. The Contractor shall be represented by the Field Superintendent and Project Scheduler. The Project Scheduler shall bring a copy of the printed plot of the current Status Report to the progress meeting, the report shall show the current anticipated schedule for all remaining work with the critical path activities highlighted.

a) The review of the Status Report serves as the forum to discuss project progress and delays, suggested remedies, necessary Progress Schedule revisions, coordination requirements, change orders, potential Contractor time extension requests, and other relevant issues. If contract work is falling behind the Progress Schedule, the responsible party (i.e. Contractor) shall be ready to discuss what measures it will take in the next thirty (30) days to put the work back on schedule so as to meet the contract Completion Date specified in the contract.
b) Items of discussion will include, but are not limited to: project progress; schedule progress; near term and long-term schedule issues, including RFIs, Shop Drawing submittals, permit

work, utility relocations, mitigation work; project issues and risks; proposed solutions; and any relevant technical issues that are schedule related.

c) At the meeting the Project Scheduler shall compile an action item list that describes who is responsible for existing or pending issues and the date by which the issue needs to be resolved to avoid delays. The Contractor shall forward a copy of the action item list to the Engineer within 2 business days following the meeting.

E. Progress Schedule Submissions:

E.1. Draft Baseline Schedule. The Contractor is encouraged, but not required, to submit a Draft Baseline Progress Schedule that demonstrates a sample of how the Project Scheduler's proposed alphanumeric coding structure and the activity identification system for labeling work activities in the CPM progress schedule will conform to the detailed requirements of this specification.

This submittal may be made anytime following notice to the Contractor that they are the apparent low bidder on the contract.

Critical items for this review should include but are not limited to: the proposed WBS for subsequent progress schedules; the proposed project Calendars; project Planned Start date; project Must Finish By date; major milestone activities (e.g. - Award, Notice to Proceed, Contractor's First Day of Work, Contractor's Last day of Work, Anticipated Completion Date); and between fifty to one hundred summary activities for the major work deliverables of the contract (e.g. - pave EB from STA x to STA y, construct roundabout 1, construct bridge xyz, etc.) that have assigned Activity Ids, Activity Descriptions, Activity Durations, Predecessors, Successors, and Activity Relationships. These summary activities will be broken down into, or supplemented with, individual work activities for the baseline submission.

If any Crew resources are included, the composition of the staffing (the number and titles of the various staff) shall be listed in the Notes tab of the Crew resource, and the composition of the crews shall be included in the narrative. To the extent practicable, the Draft Baseline Progress Schedule should include administrative and procurement activities to be accomplished during the contract; planned submittal, review, and approval dates for shop drawings, working drawings, fabrication drawings, and contractor supplied plans, procedures, and specifications.

Any submission of a Draft Baseline Progress Schedule should be accompanied by a written Narrative that provides details of the Calendar assignments of Working Days versus non-work days, outlines the sequence of planned operations to complete the project work, and provides the proposed Activity Codes and Code values to be assigned to activities in future submissions of project progress schedules.

The review and comment by the Engineer of the sample schedule should assist the Project Scheduler in assuring the first submittal of the Baseline Progress Schedule will be in general conformance with the requirements of the specification and other contract requirements, and that major rework of the Baseline Progress Schedule will not be required. The Engineer will review the logic diagram, coding structure, activity identification system, and Narrative; and provide comments for required changes by the Project Scheduler for implementation in the submission of the Baseline Progress Schedule. The Engineer will provide written comments on major deficiencies within five (5) Workdays of receipt. The Department reviews Draft Baseline Progress Schedules solely for format and will not consider any submission of a Draft Baseline Progress Schedule for approval as an Early Completion Schedule.

E.2. Baseline Progress Schedule– Within ten (10) Work Days of receipt of the contract NTP, the Contractor shall prepare and submit a Baseline Progress Schedule that meets the following requirements:

a) The schedule shall accurately reflect the proposed approach to accomplish the work outlined in the Contract documents and conforms to all requirements of this specification.

b) The schedule shall define a complete logical plan that can realistically be accomplished, to execute the work defined in the Contract.

c) The schedule shall comply with the work constraints and milestones defined in the Contract as well as all other contractual terms and conditions. The schedule shall be consistent in all respects with the

specific interim Time-Related Contract Provisions, and any order of work requirements of the contract documents. The schedule shall meet all interim milestone dates and the contractor's Anticipated Completion Date shall not extend beyond the contract completion date. This submission shall reflect the Contractor's plan at the time of contract award, and prior to the start of any work.

d) **Float.** No negative float is allowed in the Baseline Progress Schedule submission.

e) **Data Date.** The contract Award Date shall be entered as the Data Date. If the Contractor submits a Baseline Progress Schedule @ Bid submission, the Data date shall be the date of the schedule submission to the Engineer and not prior to the bid date. Time shall be the end of the work day.

f) **Activity Codes.** The Progress Schedule shall have assigned, to the maximum extent practicable, the Global Activity Codes Including, but not limited to Responsible Party, Stage and Type of Work. The Contractor shall also use a Project Level activity code named "Subcontractor" with code values identifying each of the approved subcontractors working on relevant activities.

g) **Project Level Layouts & Filters.** Any "Layouts", "Filters" and "Report" formats that the Contractor develops for the various Progress Schedules submissions to the Engineer shall be saved and made available to all other users of the project schedule with a name that includes the contract D#.
The Contractor shall assign appropriate Activity Codes and provide custom Layouts, Filters, and/or report formats necessary to allow the Engineer to generate a report from the each Progress Schedule submission of all submittals required under the contract (i.e., shop drawings, required permits, erection/demolition plans, etc.). The list shall show scheduled submission date, review date, and acceptance date for each submittal and identify the earliest activity affected by each of these submittals. This list shall be generated from each Progress Schedule submission until all such activities are completed.

h) **Schedule Submission**

i) Within the timeframe indicated in Table 1 column 1, the Contractor shall send an email to the Engineer and Construction Supervisor, notifying them the schedule is ready for review. **In the following table, the Construction supervisor may change the time.**

TABLE 1 (in Work Days)		
Timeframe from receipt of Notice to Proceed to Submission of complete Baseline Schedule. (Column 1)	**Timeframe for Engineer's Review (Column 2)**	**Timeframe from Notice to Proceed to acceptance by the Engineer not to exceed (Column 3)**
10	10	40

ii) The Engineer will review the schedule and return it, accept it with comments, or reject it within the timeframes indicated in Table 1 column 2, following the date of receipt of the Contractor's submission.

iii) If the schedule is returned with comments, the Contractor shall address all comments and revise the schedule as necessary. The Contractor shall complete the Final Baseline Progress Schedule and obtain the acceptance of the Engineer within the timeframe required in Table 1 column 3.

iv) If the schedule is accepted without any comments by the Engineer, the Contractor shall copy the schedule and rename it for submission as the Final Baseline Progress Schedule

v) **In no way does the Baseline Progress Schedule modify the contract documents**.

E.3. Final Baseline Progress Schedule

a) If the Baseline Progress Schedule is returned to the Contractor with comments, the Contractor shall make a copy of the schedule and rename it as the Final Baseline Progress Schedule with comments addressed and revisions made as necessary. The Contractor shall complete the Final Baseline Progress Schedule and obtain acceptance of the Engineer within the timeframe required in column 3 of Table1,

or within one week of the Contractor's receipt of the final comments by the Engineer, whichever is sooner.

b) The Engineer shall review the schedule and return it, accepted or with comments, within 5 Work Days following the date of receipt of the Contractor's submission.

c) The Final Baseline Progress Schedule must be "accepted" or "accepted as noted" by the Engineer prior to the Department evaluating any Contractor disputes associated with time impacts. This does not preclude the Contractor from submitting a dispute while the schedule is being reviewed for acceptance.

E.4. Progress Schedule Updates and Monthly Status Reports:

a) The Contractor shall perform a Progress Schedule Update, on a minimum, at the end of each month.

b) The Contractor shall generate a Monthly Status Report at the end each month after performing the Progress Schedule Update and Scheduling the project with a Data Date of day the schedule was updated and submit it to the Engineer by the beginning of business each Monday. The Status Report shall be generated using the activity Layout named Monthly Status Report, with activities grouped by the WBS, sorted by Finish Date. The Gantt Chart shall clearly indicate the project critical (longest) path. Graphical representations shall be shown at a suitable scale to be legible and readable.

c) **During any time periods within the contract that special time-related contract provisions are in effect, including Incentive/Disincentive Periods, the Engineer may require more frequent Progress Schedule Updates and/or Progress Schedule Status Reports.**

E.5. Monthly Progress Schedule Submissions.

a) **First Progress Schedule Submission** – Within three Work Days following acceptance of the Final Baseline Progress Schedule the Contractor shall perform a Progress Schedule Update to reflect the status of all activities where work was performed in the time period between the start of work and acceptance of the Final Baseline Progress Schedule. This shall include actual dates entered in the Actual Start and Actual Finish columns, and percentage of work complete for uncompleted activities, in addition the Contractor shall incorporate any Progress Schedule Revisions that reflect any changes in how future work activities are to be completed.

b) **Subsequent Progress Schedule Submissions** – The Contractor shall prepare and submit subsequent Progress Schedule submissions on a regular basis based on the **Monthly Progress** Schedules.

Schedule Updates and Revisions

The Contractor shall submit a copy of the current Progress Schedule that includes all Progress Schedule Revisions and Progress Schedule Updates to reflect the actual and planned prosecution and progress of the contract work. Progress Schedule Updates shall reflect the status of activities that have commenced or have been completed, including the following items: (a) actual dates in activity Actual Start and Actual Finish columns as appropriate; (b) actual Remaining Duration for activities commenced and not complete; and (c) actual activity Suspend or Resume dates for activities commenced and not complete. Progress Schedule Revisions reflect modifications made to activities in the current project baseline schedule in any of the following items: (a) activity Original Duration; (b) changes in logic connections between activities; (c) changes in Constraints; (d) changes to Activity Descriptions; (e) activity additions or deletions; (f) changes in Activity Code assignments; (g) changes in Calendar assignments, and Work Days; (h) Productivity Rates; (i) a list of Notebook Topic additions and changes . All "Out of Sequence" activities noted in the scheduling log shall be corrected to reflect the current construction operations.

c) As ordered by the Engineer, for any contract time extension requests the Contractor shall include: a Time Impact Analysis (TIA) for any changes to the schedule for future work for such issues as Added Work, VECP, or Changed Conditions; and a Delay Analysis that documents all delays from the Contract Award to the current date that is based on critical path delays that occurred when comparing

subsequent Monthly Progress Schedule submissions and the supporting delay documentation in the Progress Schedule Narratives.

E.6. As-Built Progress Schedule. As ordered by the Engineer, the Contractor shall submit the As-Built Progress Schedule with Actual Start and Actual Finish dates for all activities, within ten (10) Work Days following final acceptance of work by the Commissioner.

E.7. Look-Ahead Schedule. Except during winter shutdown periods the Contractor shall prepare a Look-ahead Schedule as either a plotted report from the current progress schedule, or as a narrative report, and provide it to the EIC on a weekly basis, or if approved by the Engineer on a mutually agreed upon interval The Look-ahead schedule shall include all work activities planned for the next two week period, and include all work activities progressed in the previous one week period, and should also show: anticipated lane closures, road closures and detours, environmental issues, and utility issues. The Engineer will provide the Project Scheduler with guidelines for determining the begin dates and end dates for the one or two week reporting periods, along with the how the plotted schedule report or narrative report shall be formatted.

The Department generally uses this Look-ahead schedule to facilitate communication with other Federal or State agencies, local municipalities, utility companies, railroads, emergency service providers, public news media and other affected parties.

F. Detailed Progress Schedule Requirements.

F.1. Baseline Progress Schedule. As a minimum, the Contractor shall address the following:

a) Defining Project details and defaults – Within the Dates tab, the "Planned Start" shall be the Letting Date, the "Data Date" shall be the date of Contract Award, the "Must Finish By" date shall be the contract Completion Date. Within the Settings tab, define the Critical Activities as the "Longest Path".

b) Sufficient activities shall be included to assure that there is adequate planning for the entire project. The appropriate number of activities will be largely dependent upon the nature, size, and complexity of the project. In addition to all site construction activities, network activities shall include: activities necessary to depict the procurement/submittal process including shop drawings and sample submittals; the fabrication and delivery of key and long-lead procurement elements; testing of materials, plants, and equipment; settlement or surcharge periods activities; sampling and testing period activities; cure periods; activities related to temporary structures or systems; activities assigned to subcontractors, fabricators, or suppliers; erection and removal of falsework and shoring; major traffic stage switches; activities assigned to the Department and other involved State agencies and authorities, including final inspection; activities to perform punch list work; and activities assigned to other entities such as utilities, municipalities, County government/agencies, and other adjacent contractors. The schedule shall indicate intended submittal dates and depict the review and approval periods as defined in the Contract Documents for Department review.

c) The following Activity ID's and Activity Descriptions as shown in Table 2, **subject to changes as approved by the Engineer**, shall be incorporated into all Progress Schedules:

TABLE 2

Activity ID	Activity Description	Duration (Min)	Predecessor	Logic Tie	Responsible Party
C00005	Preconstruction Schedule Meeting	1 Work Day	M00001	SS	NC
C00011	Prepare & Submit DMWBE Goals	Minimum 1 Contractor Work Day	M00001	SS	Contractor

C00015	DMWBE Utilization Approved	15 Work Days	C000011	FS	NYSDOT/NC
C00030	Submit Proof of Insurance	1 Contractor Work Day	M00001	SS	Contractor
M00025	Contract Award Date	0 - Finish Milestone	00020, C00015	FF	NYSDOT/NC
C00010	Preconstruction Meeting	1 Work Day	M00001	SS	NYSDOT/NC
C00035	Notification to Proceed	5 Work Days	M00025, C00030	FS	NYSDOT/NC
C00040	Prepare/Submit Safety & Health Plan	Minimum 1 Work Day	M00001	SS	Contractor
C00045	Approve Safety & Health Plan	20 Work Days	C00040	FS	NYSDOT/NC
M00050	Contractor's First Day of Work	0 - Start Milestone	C00035, C00045	FS	Contractor
C00055	Set Up Engineer's Field Office	20 Contractor Work Days	C00035	FS	Contractor
C00060	Prepare & Submit Baseline Progress Schedule	10 Work Days from NTP	C00005	FS	Contractor
C00065	Review Baseline Progress Schedule	10 Work Days	C00060, M00025	FS	NYSDOT/NC
C00070	Accept Baseline Progress Schedule	1 County Business Days	C00065	FS	NYSDOT/NC
C00075	Mobilization	20 Contractor Work Days	M00050	SS	Contractor

TABLE 2

Activity ID	**Activity Description**	**Duration (Min)**	**Predecessor**	**Logic Tie**	**Responsible Party**
M00100	Field Work Begins	0 - Start Milestone	M00050, C00055, C00060		Contractor
M00900	Substantial Completion	0 - Finish Milestone	See definition	FF	Contractor
C09010	Other Agency Inspection	20 Work Days	M00900	FS	Others
C09020	NYSDOT Final Inspection	20 Work Days	M00900	FS	NYSDOT/NC
C09030	Punchlist Work	20 Contractor Work Days	C09020	FS	Contractor
M00950	Contractor's Last Day of Work	0 - Finish Milestone	C09030	FF	Contractor
M00999	Anticipated Completion Date	0 - Finish Milestone	M00950	FF	Contractor
C09040	Demobilization	10 Contractor Work Days	C09020	FS	Contractor

M00925	Recommendation for Final Acceptance	0 - Finish Milestone	C09040	FF	NYSDOT/NC
M09999	Final Acceptance	0 - Finish Milestone	M00925	FF	NYSDOT/NC

The Logic Tie shown shall be used as a relationship to the predecessor activities contained in the column named Follows.

d) **Work Breakdown Structure (WBS)** - A multilevel hierarchal WBS shall be incorporated that provides a deliverable-oriented grouping of activities and defines the total scope of the project. The Contractor shall develop a detailed project specific WBS for the Engineer's review and approval. The Engineer shall make the final determination on the number of levels of the WBS, and how the activities shall be grouped to represent the deliverables of the project.

For all projects the first two levels (nodes) of the WBS shall be labeled as follows:

Level 1 - is the project level; and shall have the project name.

Level 2 - shall have three nodes; "PRECONSTRUCTION", "CONSTRUCTION", and "POST CONSTRUCTION";

Level 3- under "PRE-CONSTRUCTION", shall include at least three nodes "GENERAL SUBMITTALS", "SHOP DRAWINGS"; and "PROCUREMENT/FABRICATION/DELIVERY".

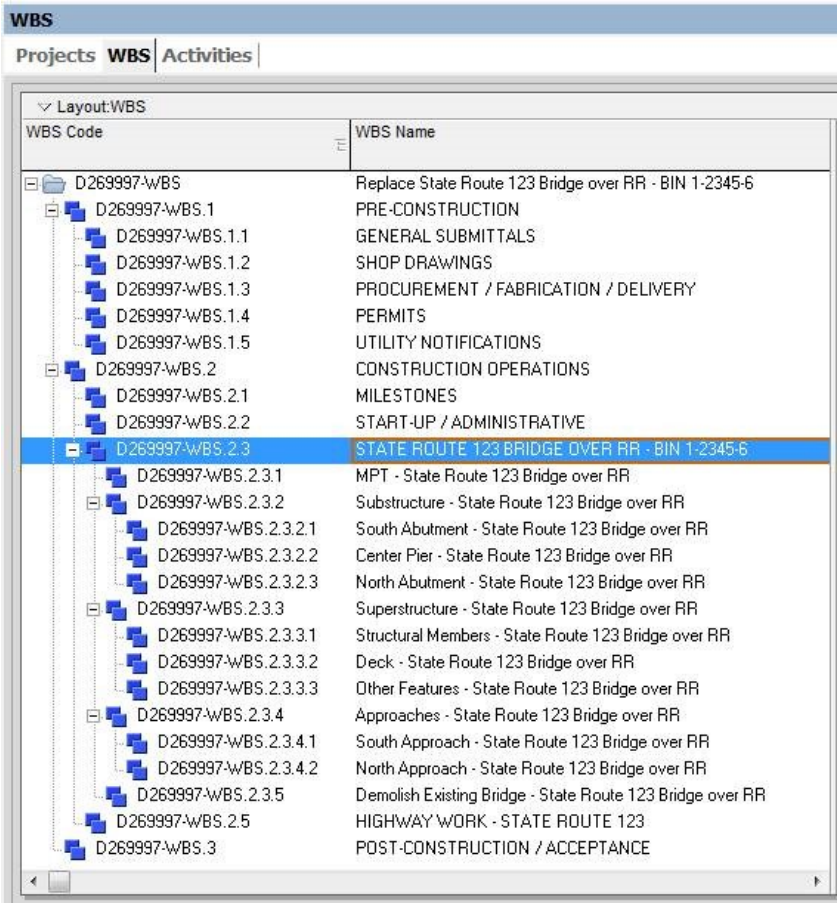
Level 3- under "CONSTRUCTION"; shall have three nodes "PRE-CONSTRUCTION", "CONSTRUCTION OPERATIONS", and "POST CONSTRUCTION/CLOSEOUT";

Under the "CONSTRUCTION OPERATIONS" node, the grouping of activities may vary depending on the scope and nature of the project work. The Contractor shall coordinate with the Engineer to determine the best way to represent (group activities) the project deliverables (i.e. Bridge, Roundabout, Highway segment, Interchange, Intersection, etc.) and the various Stages or Phases of work. The Engineer may require sub nodes for AREA (geographic area within the project limits), STAGE, or for a bridge project SUBSTRUCTURE, SUPERSTRUCTURE, and DECK .

Generally Level 4 would be by geographic area within the project limits, Level 5 would be by highway feature (bridge, highway segment, intersection), Level 6 the highway features should be broken into their components (a bridge into components such as Piles, Substructure, Superstructure), and a highway segment into components such as pavement, drainage, earthwork, lighting, traffic signals, etc.

An example Work Breakdown Structure is shown below in Figure 1

FIGURE 1



e) **Activity ID** - Include a unique identification number for each activity. Activity ID numbers shall not be changed, or reassigned for the duration of the contract. Task type Activity IDs shall be prefixed by a "C". Milestone type activities shall be prefixed by an "M". .

f) **Activity Name** - Clearly and uniquely define each activity name with a description of the work that is readily identifiable to inspection staff and the progress of each activity can be measured. Each Activity shall have a narrative description consisting at a minimum of a verb or work function (i.e. form, pour, excavate, etc.), an object (i.e. slab, footing, wall, etc.), and a location (i.e. STA, bridge or retaining wall number, street, etc.). The work related to each Activity shall be limited to one Area of the contract, one Stage of the contract, one WZTC Phase of the contract, and one Responsible Party of the contract. The Activity Name shall not be changed for the duration of the contract without approval of the Engineer.

g) **Milestone Activities** - Include activities for all contract milestones that define significant contractual events such as Contract Award, Notice to Proceed, Contractor Start Work, Substantial Completion, Physical Completion, Contract Completion, and coordination points with outside entities such as utilities, State agencies, Authorities, municipalities, Time-Related Contract Provisions, etc.

- The Contract Completion milestone shall have a primary constraint of "Finish on or before" and the contract Completion Date.
- The Contractor Start Work" Start milestone activity, that will eventually reflect the actual date the Contractor started work authorized under the contract.

h) **Activity Durations** – Define the Original Duration of each activity in units of whole work days, except for activities of less than one day duration which should be shown in units of tenths of a day. Except submittal/procurement activities, durations shall not exceed 15 work days unless approved by the Engineer. Durations for Department submittal reviews shall meet the requirements set forth in the contract documents. If requested by the Engineer, the Contractor shall justify the reasonableness of planned activity time durations. Task Dependent activities shall not have a zero duration.

i) **Activity Relationships** - Clearly assign predecessors and successors relationships to each activity, and assign appropriate logic ties between activities (Finish to Start, Start to Start, Finish to Finish, etc.). Do not have any open ended activities, with the exception of the first activity and last activity in the schedule. An activity may only appear once as a predecessor or successor to another specific activity, but may be assigned as a predecessor or successor to many different activities. Do not include inappropriate logic ties with Milestone activities (For a finish milestone activity: a predecessor shall only be assigned a Finish to Finish logic tie, a successor shall only be assigned a Finish to Start or Finish to Finish logic tie. For a start milestone: a predecessor shall only be assigned a Finish to Start or Start to Start logic tie, a successor shall only be assigned with a Start to Start logic tie). Lag time may not exceed 10 days. The Contractor shall not use negative Lag times.

j) The Contractor shall assign the 'Submittal' activity as a predecessor to all Review and Approval type activities to be performed by Department staff.

k) **Activity Constraint Dates** – The Contractor shall not have any constrained activities, with the exception of contractual dates, unless the Engineer accepts such constraints in writing. Milestone activities shall be included for the Contract Award which shall have a primary constraint of "Finish On" and the date of contract signature by the State Comptroller, and for the Anticipated Contract Completion which shall have a primary constraint of "Finish on or before" and the contract completion date indicated in the contract documents. Only contractual/owner-designated constraints are allowed unless specifically authorized by this specification or the Engineer. . If used, only Constraints of type, "Finish on or Before", 'Start on or After", or when deemed appropriate by the Engineer "As-Late-As-Possible" are acceptable

l) **Activity Dates** – With the exception of contract Milestone dates, "Actual Start" and "Actual Finish" dates and "Planned Start" and "Planned Finish" dates, activity dates shall be calculated by the project scheduler tool within the Oracle-Primavera software. No Actual Start or Actual Finish dates shall be entered in the Baseline Progress Schedule, with the exception of activities that were completed prior to the Contract Award.

m) **Calendars** - Use clearly defined calendars that account for expected seasonal weather conditions (including winter shutdown periods) and environmental permit requirements, for the planning and scheduling of activities. Do not incorporate an activity with a description of "Winter Shutdown" that requires constraints. Provide the working days per week, non-working holidays. Also provide the number of shifts per day, and the number of hours per shift by using the Calendar feature, called "Time Periods" in the P6 software. Incorporate any seasonal restrictions to the work within calendars assigned to activities.

- Global calendars used in the progress schedule shall be those established by the Department. There are only two Global Calendars developed and maintained by the Department for use by Contractor's, they are the following:
    - NYSDOT/NC Milestone/Curing 365 Day / 8 hour
    - NC Work Days, 5 Day Work Week w/ Holidays (see table on page 5)

  All milestone activities in the schedule shall be assigned the standard Global calendar named 'NYSDOT/NC Milestone/Curing 365 Day / 8 hour", this calendar should also be assigned to any activities for concrete curing. Activities for shop drawing reviews and other approvals by

Department personnel shall be assigned the Department's standard Global – "NC Work Day, 5 Day Work Week w/Holidays, Field" Calendar that reflects all holidays as listed above.

- Changes desired for these calendars shall require prior approval of the Engineer. Calendars related to specific resources (i.e., Crane, Bidwell, Asphalt Paver) shall be established as Project level Calendars (not Resource calendars), with the Calendar name clearly identifying the resource.
- All other calendars developed by a Contractor shall be established as Project Calendars, with the calendar name including the contract ~~D~~# and describing the function All work activities of the Contractor shall be assigned to Project Calendars.
- **The Baseline Progress Schedule cannot include a calendar that reflects any workers working more than 8 hours in any one calendar day or more than 5 days in any one week**. (§102-10 LABOR AND EMPLOYMENT) Following the contract award the Contractor can add additional calendars in their next Monthly Progress Schedule submission based on an approved overtime dispensation.

n) Clearly define significant interaction points between the Contractor, the Department, and other entities including but not limited to: Federal, State and local agencies/authorities; and utilities. All activities of the Department, utility companies, adjacent contracts, and other entities that affect progress and influence any contract required dates including durations shall be shown in the schedule. This includes dates related to all Permits or Agreements. The schedule shall give special consideration to sensitive areas such as road closures and parklands and shall indicate any time frames when work is restricted in these sensitive areas as outlined in the permits issued by the regulatory agencies, and provided in the contract documents.

o) **Activity Resources** – It shall be the Contractor's responsibility to assure the activity logic in the schedule properly reflects their resource limitations. An activity shall not involve multiple crews comprised of the Contractor and a subcontractor, or multiple subcontractors. The level of resource loading of the schedule shall be dependent on the schedule.

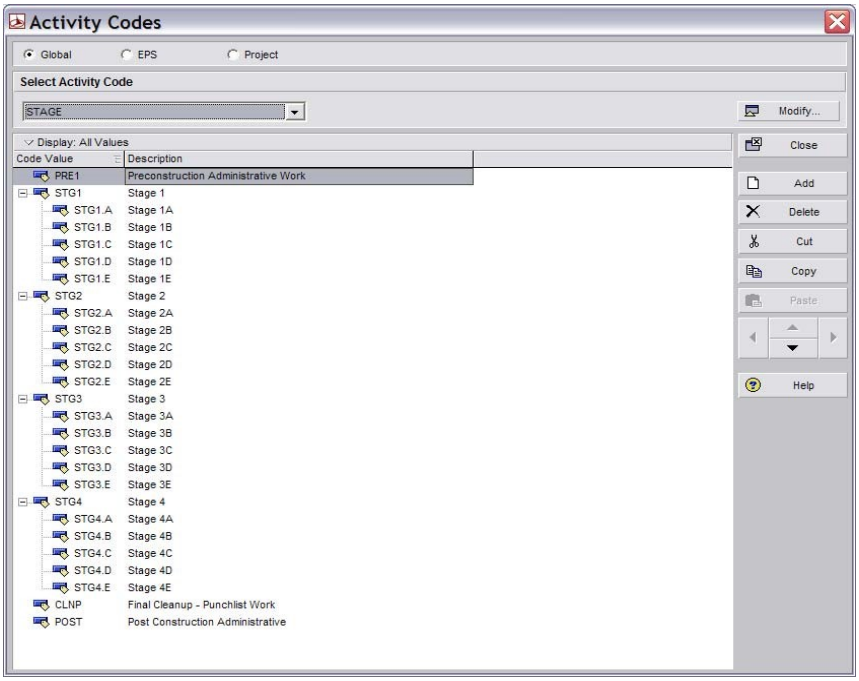
p) **Production Rates** – The Contractor shall enter the quantity of the major item of work for each non administrative activity in the schedule into the field labeled "PR Quantity", the Unit of Measure for that major item in the field labeled "PR Unit", the anticipated production rate of the equipment and labor resources for that activity of work in the field labeled "Production Rate / Day", and the associated duration for that work in the field labeled "PR Duration". These are all Activity level UDF fields, and can be found in the activity Layout named Contractor Production Rates.

q) **Activity Codes** – The Contractor shall include a well-defined activity coding structure that allows project activities to be sorted and filtered. Activity Codes shall include, but not be limited to: Responsible Party; Stage; Area of Work; Type of Work; Subcontractor; and additionally as required by the Engineer to meet the needs of the specific contract work to facilitate the use and analysis of the schedule.

1) Additional Activity Codes developed for specific projects shall be established as Project Activity Codes. As a minimum this shall include the SUBCONTRACTORS.

r) **Activity Code Values** – Each Activity Code shall be broken down into various Activity Code Values that are then assigned to activities, as shown below in the example of Figure 2

FIGURE 2



s) Activity Code Assignments - For each activity, within the activity details the Contractor shall assign Activity Code values to identify the "Responsible Party" (i.e. – Contractor, NYSDOT, Utility Co, Municipality) for the work to be performed (one and only one responsible party shall be assigned to each activity), the "Stage" of the contract for the work that will be performed, the "Area" where the work is to be performed, the "WZTC Phase", and the Type of Work (i.e. - Procurement, Paving, Embankment, Excavation, Electrical, Signing, etc.). For activities included in work governed by time related contract provisions, the appropriate "Time Related" activity code shall be utilized. For activities included in work added and/or changed within an Order-On-Contract, the appropriate "Added/Changed Work" code shall be utilized. For all work activities performed by the Contractor or subcontractors/fabricators/suppliers, "Contactor" shall be designated as the Responsible Party

t) Interim Milestone Dates with Liquidated Damages and Special Time-Related Contract Provisions (i.e. – A+B Bidding, Incentive/Disincentive provisions, Lane Rental) – Each time-related contract provision in the contract shall be represented in the progress schedule by having a start and finish milestone, with appropriate predecessors and successors assigned to all schedule activities considered part of that time-related contract provision work including the start and finish milestone activities. In addition, the Start milestone for the time-related contract work shall have predecessors and/or date constraints assigned that include those defined in the contract documents, and the Finish milestone for the time-related contract work shall have successors and/or date constraints assigned that include those defined in the contract documents. All schedule activities associated with each specific time-related contract provision shall be assigned to a separate node within the project WBS and the WBS node description shall be labeled accordingly, in addition these activities shall be assigned the appropriate Time-Related Clauses activity code value. A Level Of Effort activity shall be used for each time related contract provision (i.e. - "Incentive 1 Duration" or "B Clock 1 Duration"), this activity shall have the Start Milestone as a predecessor with a SS relationship and the Finish Milestone as a successor with a FF relationship and the duration of this activity shall be calculated when the project is scheduled.

u) List of Submittals – The Contractor shall submit with the Progress Schedule a list of all Submittals (i.e. - Shop Drawings, required permits, Erection/Demolition plans, Health and Safety Plan, etc.) generated from the Baseline Progress Schedule for review and approval by the Engineer. The Contractor shall use a Filter to limit the schedule activities shown in the report to only the prepare/submit, and review/approve activities related to submittals. The report shall be in Adobe PDF format and transmitted to the Engineer by email.

F.2. Monthly Progress Schedules. In addition to the detailed schedule requirements for the submission of the Baseline Progress Schedule, the Contractor shall complete the following additional requirements for these regular Progress Schedule submissions: a) Activity Status -

i) Durations – the Original Duration shall not be changed without prior written justification by the Contractor, and written approval by the EIC. The Contractor shall edit the Remaining Duration to reflect progress made on work activities and shall not use Duration percentage. If a proposed change to Original Duration is due to additional or changed work to the contract the Contractor shall instead add an activity to reflect this additional work and assign the appropriate Activity Code. The Contractor shall not use zero durations for Task Dependent activities.

ii) Started and Finished dates – for each activity where work was begun during the Weekly/Biweekly or Monthly reporting period, the Contractor shall check the box adjacent to Started and enter the date the work began. For each activity where work was completed during the Weekly/Bi-weekly or Monthly reporting period, the Contractor shall check the box adjacent to Finished and enter the date the work was completed.

iii) Suspended work – The first time that work has been suspended on a schedule activity, the Contractor shall enter the Suspend and Resume fields within the Project Details under the Status tab. For any subsequent suspensions of work to that activity the Contractor shall break that activity into two or more activities to accurately reflect the suspension and resumption of work dates in the field, and to more accurately reflect the relationship to other work activities.

b) Calendars – To change a project calendar for activities scheduled in the future, the Contractor shall copy the calendar and use a revised name that includes a reference to which Update the change was incorporated (i.e. - D260000 - Concrete Calendar should be revised to D260000 – 2 - Concrete Calendar to reflect the 2nd Monthly Update when the change was made to the calendar). The reason for the change in the calendar shall be documented in the Narrative.

c) Resources –

For each month of the contract the Contractor's Progress Schedule submission shall include labor, equipment and pay item resources for an additional year of anticipated contract work until all activities in the schedule have resources defined. Until such time that all activities are resource loaded, for any activity that resource limitations are affecting the prosecution of work, as determined by the Engineer, labor and equipment resources shall be entered in the schedule by the Contractor. When the resource assignments are complete for all schedule activities, the Engineer will compare pay item quantities in the schedule with pay item quantities in the Engineer's estimate to determine if all contract work is represented in the Contractor's schedule.

d) Notebook Tab –

i) Delays - For any activities on the critical path that are delayed during this monthly reporting period, the Contractor in agreement with the Engineer shall enter the dates the activity was delayed and the reason for such delay in the Notebook tab of that activity. The reviewing scheduler will perform the delay analysis and will inform the Contractor accordingly.

ii) Activity Changes – For any changes to activity logic, calendar assignments, suspended work, added or revised lag periods or constraints the Contractor shall document the change and reason in a

Notebook Topic for that activity by assigning the appropriate "Progress Submission # Revision" and describing the changes.

e) Production Rates – For all non-administrative that have shifted onto the critical path, or now have less than 20 days of Total Float, the Contractor shall enter the Production Rate information required in paragraph F.1.p. For any activities where the work to be performed is similar in nature to work already performed on the same project and that the Production Rate for the work to be performed is different than the actual Production Rate for work already performed the Engineer may require the Contractor to adjust the Duration for the work to be performed to reflect the more appropriate Production Rate.

f) Deleted work – If work has been deleted the corresponding work activities in the schedule shall be deleted. The Contractor shall not just zero the activity duration since the calendar assigned to the zero duration activity shall still affect the logic of future work activities.

g) The Project Scheduler can modify the project's Data Date through the Schedule tool.

h) The Contractor shall complete the following additional requirements:

i) Data Date - the "Data Date" shall be the date the Project Scheduler last edits the schedule prior to submission to the Engineer (generally the last working day of the month).

ii) Submission frequency. The Contractor shall submit the schedule file and Narrative Report to the Engineer **monthly**. The schedule submission to the Engineer shall be made within three (3) Work Days of the last day of the month, whether or not the Engineer has accepted the previous Progress Schedule submission.

G. Detailed Narrative Requirements:

G.1. For the Baseline Progress Schedule. The Contractor shall include a narrative in Microsoft Word and/or Adobe Acrobat format that includes the following topics and attachments:

a) **Contract Identification.** Include the contract D number, project name, project location, and name of Prime Contractor.

b) **Key milestone dates.** Include the actual contract Award Date, original and adjusted contract Completion Date, Substantial Completion Date, and anticipated completion of all project work. Also include any contract Interim Milestone dates (I/D, B-Clock, LD, etc.), and scheduled Start and Finish dates for those Milestone activities.

c) **General approach.** Describe the Contractor's general approach to construct the Work outlined in the baseline schedule. Address the reasons for the sequencing of work and describe any resource limitations, potential conflicts, and other salient items that may affect the schedule and how they may be resolved.

d) **Key Plan**s. If not provided in the contract plans, or if modified by the Contractor, provide copies of the appropriate contract plan sheets marked up to correlate values on the contract plans (for Area of Work, Stage of Work, and WZTC Phase) to the Contractor's planned breakdown of the project (i.e.- Activity Codes, Activity Descriptions) for scheduling purposes.

e) **Logic Justifications.** The justification(s) for each activity with a duration exceeding 15 working days. The justification(s) for Contractor imposed activity constraints proposed in the schedule. The reason for any lags assigned to any activities.

f) **Calendars.** Include a list of calendars which have been incorporated in the schedule, and for each calendar the general reason for it's use in the schedule.

g) **Critical Path issues.** A brief discussion of the critical path shown in Appendix 2, highlighting any potential challenges that are foreseen associated with the critical path work.

h) **Coordination issues.** Outline any anticipated coordination issues related to work activities by other entities that require additional information from, or action by, the Engineer.

i) **APPENDIX 1 – Scheduling/Leveling Report.** This appendix in Adobe Acrobat PDF file format, formatted to fit standard ANSI Size A (Letter) size paper (8.5 inch x 12 inch) (215 mm x 279 mm) paper, printed with portrait orientation, shall be included with the narrative as a separate file.

A complete Scheduling/Leveling Report file generated by Contractor's Oracle-Primavera scheduling software application) which includes the Schedule Settings, Statistics, Errors, Warnings, Scheduling/Leveling Results, Exceptions, Activities with unsatisfied constraints, Activities with unsatisfied relationships, and Activities with external dates. The statistics shall include, # of Activities, # of Activities Not Started, # of Activities In Progress, # of Activities Completed, # of Activity Relationships, and # of Activities with Constraints. Total number of activities on the critical path, percent complete, activities without predecessors, activities without successors, and activities out of sequence.

j) **APPENDIX 2 – Progress Schedule plot.** This appendix in Adobe Acrobat PDF file format, formatted to fit ANSI Size B (Ledger) paper (11 inch x 17 inch) (279 mm x 431 mm) paper, printed with Landscape orientation, shall be included with the narrative as a separate file.

Appendix 2 to the narrative shall be an electronic schedule plot (Adobe Acrobat format), with activities sorted by Start Date in ascending order, Grouping of activities by WBS, and only the "Longest Path" filter applied. This plot shall provide a clear critical path from the Data Date to the last activity in the schedule.

Graphical representations shall be shown at a suitable scale to be legible and readable.

G.2. Monthly Update Progress Schedule. For each Progress Schedule submission, the Contractor shall submit a revised narrative in Microsoft Word or Adobe Acrobat format that includes (but is not limited to) the information from paragraph G.1, and the following **additional** topics:

k) **Project Progress.** Discuss the progress that was made during the current reporting period, and document any Total Float gained or recovered during the period. For major work items describe the differences between the actual work performed and the work planned for the period as represented in the preceding Progress Schedule submission, including explanations for the deviations.

l) **Suspended Work.** For all suspended work activities that could otherwise logically be progressed, identify the responsible party prohibiting the progression of the work, as well as the detailed reasons why.

m) **Project Delays.** Discuss any delays experienced during the current reporting period. Quantify any relative change in Total Float for the project since the last Progress Schedule submission. For each activity on the critical path (include Activity ID's and Activity Descriptions) where work was delayed during the reporting period, provide the following detailed information including:

- the extent in days (negative float) of the delay, and events that caused the delay.
- the party(s) responsible for the delay event(s).
- the other activities in the construction schedule affected by the events.

- the reasonable steps needed to minimize the impact of the delay, and which party needs to take the action(s).

The Contractor is reminded of the requirements of Notice & Recordkeeping as found in NYSDOT §104-06 of the contract specifications and as they relate to Disputed Work. The Contractor shall include a copy of any notice provided to the Engineer for any time-related delay dispute as part of their narrative.

n) **Project Issues**. List any other problems experienced during this Progress Schedule submission period, the party responsible for the problems, and the Contractor's intentions to resolve the issue(s).

o) **Schedule changes.**

i) List of all added or deleted activities included in this Progress Schedule submission, and the reason(s) for and the impact(s) of such changes.

ii) List all changes in activity Original Durations, the justification for such change(s), and the impact(s) of such changes.

iii) List all changes in relationships between activities included in this Progress Schedule submission, and the reason(s) for and the impact(s) of such changes.

iv) List any addition or deletion of activity or project constraints, and the reason(s) for and the impact(s) of such changes.

v) List all changes to the project calendars, and the reason(s) for and the impact(s) of such changes.

p) List all activities for procurement of long lead time materials that are behind schedule and the reason(s) why.

q) Description of any changes to the critical path since the last Progress Schedule submission and the impacts of such changes.

r) The major work elements, as defined in the WBS, to be accomplished during the next monthly work period.

s) Any potential problems that are anticipated for the next monthly work period and the proposed solutions to such problems. Identify potential problems or risks that either the Department or Contractor may be potentially responsible for. Explain what action the responsible party (i.e. - Department or Contractor) needs to take and the date by which time the action needs to taken to avoid the problem.

t) Any planned acceleration of activities that the Contractor anticipates to undertake within the next monthly work period that either the Department directed, or that the Contractor believes is necessary.

u) The following appendix in Adobe Acrobat PDF file format, formatted to fit ANSI Size E paper (34 inch x 44 inch) (863 mm x 1117 mm) paper, printed with Landscape orientation, shall be included with the narrative as a separate file.

- APPENDIX 3 – A listing of all work activities as of the data date, using the Appendix 1 activity layout, sorted by Finish date, Total Float in increasing order, showing the Activity ID, Activity Name, Original Duration, Remaining Duration, Actual Duration, Total Float, Early Start date, Start date, Finish date, Late Finish date, and Calendar ID. The grouping of activities shall be by WBS. The Gantt Chart shall clearly indicate all activities in the schedule. Graphical representations shall be shown at a suitable scale to be legible and readable.
- APPENDIX 4 – A listing of work activities filtered by Notebook Topics assigned as of the data date, sorted by Finish date and Total Float in increasing order, showing the Activity ID, Activity Name, and Notebook Topic. The grouping of activities shall be by WBS.

H. Schedule Submission Methodology. Progress Schedule submissions will only be considered complete when all documents and data have been provided to the Engineer.

H.1. File Naming Convention. The schedule filename shall conform to the requirements of the Department and as defined by the Engineer.

I. Progress Schedule Review and Analysis:

I.1. Immediate Rejection of Progress Schedule Submissions. The following deficiencies in a

Contractor's progress schedule submission shall be grounds for the immediate rejection by the EIC, without further review, analysis and/or comments.

a) Failure of the Project Scheduler to submit "schedule" of the project, as of the data date.
b) Failure to attach a copy of the complete Scheduling/Leveling Report
c) Any activities without predecessors, or activities without successors, appearing in the Scheduling/Leveling Report with the exception of the first and last activity in the schedule.
d) Any activity constraints appearing in the Scheduling/Leveling Report that have not been approved in writing by the EIC, or that are not specifically allowed by this specification.
e) Any Activities with Actual Dates > Data Date appearing in the Scheduling/Leveling Report.
f) Any Milestone Activities with invalid relationships appearing in the Scheduling/Leveling Report.
g) Failure to have a clearly defined Critical Path from the Data Date to the last activity in the schedule, using the Longest Path method. This would reflect logic errors in the project schedule.
h) Failure to attach the schedule Narrative and required appendices.
i) Repeated failure to correct "Out-Of-Sequence" activities.

If any of these deficiencies are found, the Contractor's submission shall be considered deficient, and Engineer will notify the Contractor immediately by return E-mail of the rejection of the schedule submittal.

I.2. Schedule Analysis Method.

Events, actions, and progress that cause delays or gains to the Progress Schedule will be analyzed solely by the "Contemporaneous Period Analysis" method.

I.3. Department Review and Acceptance of Progress Schedules.

The Engineer will review the Monthly Progress Schedule submissions and will prepare a written response (Progress Schedule Review Report) to the Contractor's submission within five (5) Work Days following receipt of the Contractor's complete schedule submission. The Engineer will either "accept" the schedule, "accept as noted", or "reject" the schedule for re-submittal by the Contractor.

If the Progress Schedule submission is not in compliance with contract requirements, the Engineer may reject the submittal and shall forward any comments and requests for schedule revisions to the Project Scheduler by email, with a copy to the Contractor The Project Scheduler shall address all comments in writing and/or make the requested revisions, and resubmit the revised schedule within three (3) State Business days of the Engineer's reply. If the Engineer determines the revised submission still does not meet the contract requirements, any further revisions required thereafter shall also be submitted for acceptance within (3) Work Days of the request for revisions by the Engineer.

For schedules that are "accepted as noted" the Engineer shall forward any comments, or requests for revisions, to the Contractor by email,. The Project Scheduler shall address all comments in writing and/or make the requested revisions as part of the next scheduled Progress Schedule submission.

The Project Scheduler shall make adjustments to the Progress Schedule in accordance with the Engineer's comments and resubmit copies for review consistent with the requirements of this section.

The Engineer, by accepting the progress Schedule, does not agree that the Progress Schedule is reasonable or that by following the Progress Schedule the Contractor can complete the work in a timely manner. If, after a Progress Schedule has been accepted by the Engineer, either the Contractor or the

Engineer discover that any aspect of the Schedule is on error, or something significant has been omitted, the Contractor shall correct the Progress Schedule in the next Progress Schedule submission and describe this revision in the Narrative report.

Acceptance of progress schedules by the Engineer shall not be construed to imply approval of any particular construction methods or sequence of construction or to relieve the Contractor from its responsibility to provide sufficient materials, equipment and labor to guarantee the completion of the contract in accordance with the contract documents.

Acceptance of the progress schedule by the Engineer does not attest to the validity of assumptions, activities, relationships, sequences, resource allocations, or any other aspect of the progress schedule. Within the contractual constraints, the Contractor is solely responsible for the planning and execution of the work.

Acceptance of the progress schedule by the Engineer shall not be construed to modify or amend the contract agreement or the date of completion therein. Completion dates can only be modified or amended by standard contractual means, Request For Extension of Completion Date.

If any resources are included in the Progress Schedule, it is not intended that the Engineer, by accepting the schedule should use the Contractor's resource data for anything other than determining the reasonableness of achieving the Contractor's production rates. Resources included with the accepted CPM schedule shall not be misconstrued as a cost benchmark for the performance of planned or actual work.

Once the progress schedule has been accepted, the Contractor shall not deviate from it without first notifying the Engineer in writing.

Upon receipt from the Contractor of the corrected schedule, a new review period by the Engineer of five (5) Work Days will begin.

J. Changes to Progress Schedule due to Added/Deleted/Changed Work:

J.1. Changes to the contract. In the event a notice of a change to the contract is received, the appropriate changes to the progress schedule shall be made, as necessary, to incorporate the anticipated added/deleted/changed work and the Contractor shall notify the Engineer in writing within 10 (ten) calendar days if there is any effect of such change to the schedule. Change to the contract includes, but is not limited to, Extra Work, Change Orders, Suspensions of Work Directed by the Engineer, Changed Condition, and Value Engineering Change Proposals. Added, deleted and/or extra work associated with Change Orders shall be reflected in the next Monthly Progress Schedule Submission in anticipation of and prior to the date in which the work physically takes place without regard to the dates when the actual Change Order was approved. The effect of the change to the contract on the projects Critical Path shall be stated. Extra work or additional work that does not affect the controlling operation on the critical path will not be considered as the basis for a time extension. All schedule activities effected by added, deleted or changed work that is included in a signed Order-On-Contract, Field Change Order, or Authorization of Extra Work (with the exception of minor quantity changes that do not impact contract milestones), or work activities performed by the Contractor at risk in anticipation of such Department approval, shall be assigned the appropriate Activity Code (Added/Changed Work) and Code Value (sequentially numbered) to denote which "Changed Contract Work" order number correlates to those activities of work.

J.2. Time Impact Analysis.

For each request of an adjustment of contract time due to an anticipated change to future work in the Progress Schedule, when the Contractor or Engineer consider that an anticipated or approved change to the contract may impact the critical path and contract progress by more than a calendar month, the Contractor shall submit a Time Impact Analysis (TIA). The TIA shall be submitted as part of any Order on Contract (Change Order) and/or VECP if the critical path changes by more than a calendar month. The TIA shall be based on a revised Progress Schedule and shall be submitted as an electronic file (using Microsoft Word for the narrative) containing:

a) The TIA shall illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate.
b) The analysis shall use the accepted Monthly Progress Schedule that has a data date closest to and prior to the event as the "Current Baseline", this shall then be compared against the "What-if Project Plan Baseline" for the purpose of the TIA.
c) If the Engineer determines that the accepted schedule used does not appropriately represent the conditions prior to the event, the accepted schedule shall be updated to the day before the event being analyzed.
d) The TIA shall include an impacted schedule ("What-if Project Plan Baseline") developed from incorporating the actual or anticipated event into the accepted schedule by adding or deleting activities, or by changing durations or logic of existing activities.
e) If the impact schedule shows that incorporating the event negatively modifies the critical path and scheduled completion date of the accepted schedule, and the Engineer accepts the impacted schedule, the difference between scheduled completion dates of the two schedules shall be equal to the proposed adjustment of contract time.
f) The Engineer may construct and utilize an appropriate project schedule or use another recognized method to determine adjustments in contract time until the Contractor provides the TIA.
g) The Contractor shall submit a TIA within fifteen (15) ~~State~~ Business Days of receiving a written request for a TIA from the Engineer.
h) The Contractor shall allow the Engineer ten (10) Work Days after receipt to accept or reject the submitted TIA. All accepted TIA schedule changes shall be included in the next Monthly Progress Schedule submission.
i) If a TIA submitted by the Contractor is rejected by the Engineer, the Contractor shall meet with the Engineer to discuss and resolve issues related to the TIA. If agreement is not reached, the Contractor will give notice in conformance with §104-06 Notice & Recordkeeping, and submit in accordance within the provisions in §105-14.E "Required Content of *Dispute Submissions*".
j) The Contractor shall only show actual as-built work, not unapproved changes related to the TIA, in subsequent Monthly Progress Schedules submissions. If agreement is reached at a later date, approved TIA schedule changes shall be included in the next Monthly Progress Schedule submission.
k) Request for a contract time extension will not be processed until the receipt and approval of a Time Impact Analysis. **However, all extension of time will only be considered at the end of the project completion date.**

K. Failure to Submit Progress Schedules and/or Recovery Schedules:

K.1. No progress payment for this item of work shall be made until the progress schedule is "accepted" or "accepted as noted" by the Engineer.

K.2. If the Contractor's Progress Schedule submission is rejected due to any deficiency noted in paragraph I.1(a) through (i), it shall be considered an incomplete submission and therefore substantially deficient.

K.3. If the Contractor's revised Progress Schedule submission does not address the written comments provided by the Engineer and does not include a written explanation with a reasonable rational for not addressing those comments, the submission shall be considered deficient.

K.4. If the Contractor fails to submit a CPM Progress Schedule conforming to the provisions required under this specification, to the degree that such failure is deemed by the Construction Supervisor to adversely affect the management of the project and/or the administration of the construction contract, liquidated damages will be assessed as determined under Basis of Payment.

L. Recovery Schedule

L.1 If the latest completion time for any work on the current Progress Schedule results in an activity being delayed ten percent or more of the time beyond the required Contract duration or any specified Milestone duration, as adjusted if appropriate, the Engineer may require the Contractor to submit a Recovery

Schedule and written description of the plan to recover all lost time and maintain the required Completion Date or specified Interim Milestone Date(s).

L.2. With the Recovery Schedule the Contractor shall submit a narrative that identifies where additional labor and/or equipment resources will be allocated. Alternately, the Contractor may elect to provide the makeup of their Crew resources in the narrative and assign those Crew resources to the appropriate activities in the Progress Schedule. The makeup of the Crew shall include the various Labor classes and equipment that comprise the Crew along with the quantity of each labor class and type of equipment. Equipment resources shall be shown for major or specialty equipment such as tower cranes, piledrivers, barges, asphalt pavers, concrete pavers, dozers, front end loaders, backhoes, rollers, excavators, graders, long line striping truck or other equipment that cannot be rented easily.

The Contractor shall provide a reasonable plan for accomplishing the work of the contract within the current completion date, or to the requested contract extension date. The Engineer will use the Recovery Schedule to evaluate time extensions, with or without charges.

M. Submission of progress schedules with projected Early Completion date(s):

The Contractor may indicate a projected early completion date on any progress schedule submission without compensation

N. Float

During the course of contract execution, Total Float generated due to the efficiencies of either party (Owner or Contractor) will be considered project Float that is not for the sole use of the party generating the float; rather it is a shared commodity to be reasonably used by either party. Any party assigned activity responsibility within the schedule has the full use of the project Float until it is depleted.

METHOD OF MEASUREMENT:

The quantity shall be measured for payment on a Lump Sum basis.

The minimum lump sum bid for this item shall be the unit price shown in the itemized proposal.

Failure of the Contractor to bid at least the minimum amount will result in the Department adjusting the Contractor's bid to include the minimum bid amount for this item.

BASIS OF PAYMENT:

The lump sum price bid for CPM Progress Schedules shall include all labor, material, and equipment necessary to satisfactorily complete the work.

Progress payments will be made at 25 percent of the lump sum price bid upon acceptance of the Final Baseline Progress Schedule and the List of Submittals. 70 percent will be paid in subsequent contract payments, in proportion to the number of months remaining in the original contract duration, less any non-payment for substantial deficiencies. The remaining 5 percent will be paid upon acceptance of the As-built Progress Schedule.

A. Non-Payment. No payment will be made for any Progress Schedule submitted more than twenty-one calendar days late. For each calendar day during which there are substantial deficiencies with the Progress Schedule no payment will be made. The amount of such non-payment will be 1/30th of the Monthly Payment Amount multiplied by the number of days there are substantial deficiencies.

B. Liquidated Damages. Liquidated damages will be assessed for each subsequent calendar day or part thereof that a cited deficiency resulting in non-payment is not corrected or is permitted to recur. **Liquidated damages will be assessed at the rate equal to 1/10th of the Monthly Payment Amount.**

If an extension of time with the assessment of engineering charges and/or liquidated damages is approved, no additional payment **will** be made for CPM Progress Schedules.

ITEM 639.2X00NC – CPM (CRITICAL PATH METHOD) SCHEDULE with Monthly Update

C. Payment will be made under

Item No.	Item	Pay Unit
639.210053	Critical Path Method (CPM) Progress Schedule with Monthly Update	LS

To make the item compatible with the existing Computerized Engineers Estimate System the letters will be replaced as per below.

X=1 (monthly)

N=5 (Nassau) C=3 (County)

Disclaimer: Adopted from NYSDOT Specification 639.21010011

ITEM 655.07010010 - CAST FRAME F1, WITHOUT CURB BOX AND WITH RETICULINE GRATE G1
ITEM 655.07020010 - CAST FRAME F2, WITHOUT CURB BOX AND WITH RETICULINE GRATE G2
ITEM 655.07030010 - CAST FRAME F3, WITHOUT CURB BOX AND WITH RETICULINE GRATE G3

All conditions and requirements of Items 655.0701, 655.0702, and 655.0703 of the Standard Specifications shall apply except for the following modifications:

These shall be cast frame without curb box and with reticuline grate as detailed on the plans.

ITEM 655.16000011 - REMOVE AND DISPOSE OF FRAMES AND GRATES

DESCRIPTION:

Under this item the Contractor shall remove and dispose of the frames and grates indicated on the plans or as ordered by the Engineer.

MATERIALS:

None specified.

CONSTRUCTION DETAILS:

The Contractor shall remove and dispose of the frames and grates as indicated on the plans or ordered by the Engineer.

METHOD OF MEASUREMENT:

Measurement will be taken as the number of frames and grates removed, and disposed. A frame and grate combination shall be measured as one unit.

BASIS OF PAYMENT:

Payment will be made at the unit price bid which shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work.

Rev. 10/22/02
Rev. 8/11/10

ITEM 655.25nn0005 – FURNISH AND/OR INSTALL INLET ASSEMBLY, AS SPECIFIED

DESCRIPTION:

Under this item, the Contractor shall furnish and/or install inlet assemblies as described in the contract documents. The provisions of Standard Specifications Section 655 shall apply, as modified herein.

MATERIALS:

Castings: The provisions of Section 655-2.01 shall apply.

Fabricated articles: The provisions of Section 655-2.02 shall apply.

Other: When other types of inlet assemblies are specified, the materials furnished and/or installed shall meet the requirements in the contract documents.

CONSTRUCTION DETAILS:

The provisions of Section 655-3 shall apply.

METHOD OF MEASUREMENT:

The quantity to be measured for payment will be the number of each type of inlet assembly satisfactorily furnished and/or installed as serialized in the contract documents.

BASIS OF PAYMENT:

The provisions of Section 655-5 shall apply for each type of inlet assembly as serialized in the contract documents.

nn = denotes as described in contract documents

ITEM 680.83200010 - LOCATE AND MARKOUT INFORM AND STATE LIGHTING FACILITIES

DESCRIPTION:
Under this item, the Contractor shall locate, identify and markout all underground Information for Motorists (INFORM) System facilities and State lighting facilities at each work location within the contract limits, in accordance with the contract documents and as directed by the Engineer.

MATERIALS:
All instruments, equipment, stakes, paint and any other material necessary to perform the work satisfactorily shall be provided by the Contractor.

Equipment utilized to locate underground or buried cables and conduit shall be specifically designed for that purpose. This equipment shall be capable of locating energized, non-energized, loaded and unloaded cables. It shall also be designed to generate a discriminating signal on conduits or cables at any accessible point so that they can be individually selected and traced.

CONSTRUCTION DETAILS:
It is the Contractor's responsibility to determine the exact locations of all INFORM underground facilities and State lighting facilities, and to avoid any interference and conflict of any type.

The Contractor is cautioned that abandoned cables may exist within the contract limits which may tend to complicate or mislead tone out operations.

The Contractor shall immediately notify the Engineer if any interferences are encountered. The Contractor shall be responsible for the cost of all damage to INFORM and State lighting underground and above ground facilities caused by his operations. All repairs required for INFORM facilities will be made by others under the direction of the State. All damaged State lighting facilities shall be replaced in kind or repaired A.O.B.E. The Contractor shall be responsible for all costs to make such repairs.

Surface Markout of the underground facilities shall be intelligible painted markings or stakes. The Contractor shall be responsible for maintaining the markings until they are no longer needed. If the markout becomes worn or obliterated in any fashion before completing excavation operations, then the appropriate facilities shall be re-identified and marked out.

Ground rods, power supplies, batteries, connecting cables and any other incidentals, as required and recommended by the specific cable locating equipment manufacturer chosen, shall be furnished and installed by the Contractor.

Approval for access to INFORM equipment cabinets and pullboxes shall be obtained from the Engineer prior to attempting entry to such locations.

ITEM 680.83200010 - LOCATE AND MARKOUT INFORM AND STATE LIGHTING FACILITIES

METHOD OF MEASUREMENT:
The work for this item will be measured for payment on a lump sum basis for the work completed, in accordance with the contract documents, and as directed by the Engineer.

BASIS OF PAYMENT:
The lump sum price bid shall include the cost of furnishing all labor, materials, tools, equipment and incidentals necessary to complete and maintain the work of this item. Monthly progress payment will be made under this item in proportion to the amount of work done, as determined by the Engineer.

ITEM 685.0715XX10 - EPOXY REFLECTORIZED PAVEMENT MARKINGS 15 MILS THICK (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 APPLICATING EQUIPMENT

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

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

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

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

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

2. Individual tanks for the storage of Standard (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

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

3. Standard (Type 2) and Wet/Night Visibilty (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 Visibilty 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:

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

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.

PAY ITEM NO.	***DESCRIPTION***	***PAY UNIT***
685.07150110	White Epoxy Reflectorized Pavement Stripes – 15 mils	Foot

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