

SPECIAL PROVISIONS
Pulaski Contract 2
From J.F.K. Boulevard to Palisades Avenue

Jersey City
Hudson County

Contract No. 000970191

AUTHORIZATION OF CONTRACT

The Contract is authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements thereto, and Title 23 of the United States Code - Highways.

SPECIFICATIONS TO BE USED

The 2007 Standard Specifications for Road and Bridge Construction, of the New Jersey Department of Transportation as amended herein will govern the construction of this Project and the execution of the Contract.

These Special Provisions consist of the following:

Pages 1 to 150 inclusive.

State wage rates may be obtained from the New Jersey Department of Labor & Workforce Development (Telephone: 609-292-2259) or by accessing the Department of Labor & Workforce Development's web site at http://lwd.dol.state.nj.us/labor/wagehour/wagehour_index.html The State wage rates in effect at the time of award are part of this Contract, pursuant to Chapter 150, Laws of 1963 (NJSA 34:11-56.25, et seq.).

If an employee of the Contractor or subcontractor has been paid a rate of wages less than the prevailing wage, the Department may suspend the Work, and declare the Contractor in default.

The following Wholly State funded project Attachments that are located at the end of these Special Provisions:"

1. State of New Jersey Equal Employment Opportunity Special Provisions for Construction Contracts Funded by Wholly or partially State Funds.
2. Payroll Requirements for 100 Percent State Projects.
3. Americans with Disabilities Act for 100 Percent State Funded Contracts.
4. Small Business Enterprise Utilization Attachment for 100% State Funded Contracts.

DIVISION 100 – GENERAL PROVISIONS

SECTION 101 – GENERAL INFORMATION

101.01 INTRODUCTION

THE FOLLOWING IS ADDED:

Pursuant to NJSA 27:1B-21.6 and USC (United States Code) Section 115, the Department intends to enter into a contract for the advancement of the Project. However, sufficient funds for the Project may not have been appropriated, and only amounts appropriated by law may be expended. Payment under the Contract is restricted to the amounts appropriated for a fiscal year (FY).

Governing bodies have no legal obligation to make such an appropriation. There is no guarantee that additional funds will be appropriated. Failure by governing bodies to appropriate additional funds will not constitute a default under, or a breach of, the Contract. However, if the Department terminates the Contract or suspends work because funds have not been appropriated, the parties to the Contract will retain their rights for suspension and termination as provided in 108.13, 108.14 and 108.15; except as indicated below.

Do not expend or cause to be expended any sum in excess of the amount allocated in the current fiscal year's Capital Program (as specified below). The Department will notify the Contractor when additional funding has been appropriated. Any expenditure by the Contractor which exceeds the amount appropriated is at the Contractor's risk and the Contractor waives its right to recover costs in excess of that appropriated amount.

The approved 2013 Capital Program has an item with \$ 5 million for the construction of the Project.

The Department anticipates that the balance of the funds necessary to complete the Project will be provided during State FY 2014.

The State FY begins July 1 of the previous calendar each year.

101.02 ABBREVIATIONS

THE FOLLOWING ABBREVIATION IS ADDED:

CFR Code of Federal Regulations

101.03 TERMS

THE FOLLOWING TERMS ARE CHANGED.

pavement structure. The combination of pavement, base courses, and when specified, a subbase course, placed on a subgrade to support the traffic load and distribute it to the roadbed (see Figure 101-1). These various courses are defined as follows:

1. **pavement.** One or more layers of specified material of designed thickness at the top of the pavement structure.
2. **base course.** One or more layers of specified material of designed thickness placed on the subgrade or subbase.
3. **subbase.** One or more layers of specified material of designed thickness placed on the subgrade.

101.04 INQUIRIES REGARDING THE PROJECT

1. Before Award of Contract.

THE FIRST PARAGRAPH IS CHANGED TO:

Submit inquiries and/or view other questions/answers by following the format prescribed on the project's electronic bidding web page.

THE SECOND PARAGRAPH IS CHANGED TO:

The deadline for submitting inquiries is 12:00 noon, 7 days before the opening of bids.

2. After Award of Contract.

North Region
Ms. Chrissa Roessner, Regional Construction Engineer
200 Stierli Court
Mt. Arlington, NJ 07856-1322
Telephone: 973-601-6670

SECTION 102 – BIDDING REQUIREMENTS AND CONDITIONS

102.02 BIDDER REGISTRATION AND DOWNLOADING OF THE PROPOSAL DOCUMENTS

THE LAST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

The Bidder shall not alter or in any way change the software.

102.03 REVISIONS BEFORE SUBMITTING A BID

THE SECOND PARAGRAPH IS CHANGED TO:

The Bidder shall acknowledge all addenda posted through the Department's website. The addenda acknowledgement folder is included in the Department's electronic bidding file. The Department has the right to reject the bid if the Bidder has not acknowledged all addenda posted.

102.04 EXAMINATION OF CONTRACT AND PROJECT LIMITS

THE FOLLOWING IS ADDED AFTER THE SECOND PARAGRAPH:

The structures and the location(s) of lead paint, if any, are listed in the Special Provisions.

The following is a list of structures and the location(s) of lead paint:

Structure #/Location	Lead Paint Location(s)
Structure No. 0904-152	throughout
Structure No. 0904-151	

**NEW JERSEY DEPARTMENT OF TRANSPORTATION
PAVEMENT CORE RECORD**

PROJECT/ROUTE & SECTION: Route 139_____

DRILLER: SWK Pavement Engineering_____

INSPECTOR: N/A_____

COUNTY/TOWNSHIP: Hudson/Jersey City_____

DATE STARTED: N/A_____ **DATE COMPLETED:** November 1999_____

CORE NUMBER	1	2	3	4	5
ROUTE	139	139	139	139	139
DIRECTION (N, E, S, W)	Lower Level Eastbound	Lower Level Eastbound	Lower Level Eastbound	Lower Level Eastbound	Lower Level Eastbound
MILE POST (MP or Station)	4+550	4+405	4+244	4+083	3+821
LANE NO. (Left to Right)	Right	Right	Right	Right	Right
SHOULDER (Inside or Outside)	-	-	-	-	-
CORE DIAMETER (Inches)					
TOTAL CORE DEPTH (Inches)					
CORE DRILLED TO					
SURFACE TYPE (AC/PC)	Composite AC/PC	Composite AC/PC	Composite AC/PC	Composite AC/PC	Composite AC/PC
AC THICKNESS (Inches)	6.5	5	3.75	6	5.75
PC THICKNESS (Inches)	8	6.5	10	11	13

CORE NUMBER	6	7	8	9	10
ROUTE	139	139	139	139	139
DIRECTION (N, E, S, W)	Lower Level Westbound	Lower Level Westbound	Lower Level Westbound	Lower Level Westbound	Lower Level Westbound
MILE POST (MP or Station)	3+928	4+250	4+418	4+536	3+955
LANE NO. (Left to Right)	Left	Left	Left	Left	Left
SHOULDER (Inside or Outside)	-	-	-	-	-
CORE DIAMETER (Inches)					
TOTAL CORE DEPTH (Inches)					
CORE DRILLED TO					
SURFACE TYPE (AC/PC)	Composite AC/PC	Composite AC/PC	Composite AC/PC	Composite AC/PC	Composite AC/PC
AC THICKNESS (Inches)	4.25	5	5	6	6.75
PC THICKNESS (Inches)	13.5	11	7.75	10	11.5

CORE NUMBER	11	12	13	14	15	16
ROUTE	139	139	139	139	139	139
DIRECTION (N, E, S, W)	Lower Level Eastbound	Upper Level Westbound	Upper Level Westbound	Lower Level Westbound	Upper Level Westbound	Upper Level Westbound
MILE POST (MP or Station)	4+550	4+049	4+393	4+418	3+889	4+049
LANE NO. (Left to Right)	Left	Right	Right	Right	Left	Left
SHOULDER (Inside or Outside)	-	-	-	-	-	-
CORE DIAMETER (Inches)						
TOTAL CORE DEPTH (Inches)						
CORE DRILLED TO						
SURFACE TYPE (AC/PC)	Composite AC/PC	Composite AC/PC	Composite AC/PC	Composite AC/PC	Composite AC/PC	Composite AC/PC
AC THICKNESS (Inches)	5.5	3.5	8	5.5	5	5
PC THICKNESS (Inches)	10	8.5	8	9.5	10	10

* Lane 1 is the left lane in the direction of travel.

The pavement information shown herein was used by the Department for design and estimate purposes.

3. Existing Plans and As-Built.

Existing Plans and As-builts used are as follows:

- a. Plans of Route 139 (1) Contract No. 000970189 (Contract 1), 1999, Rehabilitation of:
12th Street Viaduct Structure No. 0904-153
14th Street Viaduct Structure No. 0904-154
Conrail Viaduct Structure No. 0904-151
- b. Plans of Route 139 Contract No. 001970190 (Contract 2), 2004, Rehabilitation of:
12th Street Viaduct Structure No. 0904-153
14th Street Viaduct Structure No. 0904-154
- c. Conrail Viaduct Structure No. 0904-151:
Route No. 1 Extension, Section No. 3, Contract No. 5, 1926
- d. Hoboken Viaduct Structure No. 0904-152:
Route No. 1 Extension, Contract No. 2, 1925 (Palisades Ave to Oakland Ave)
Route No. 1 Extension, Section No. 3, Contract No. 5, 1926 (Oakland Ave to Conrail Viaduct)
- e. Conrail Viaduct Structure No. 0904-151 Shop Drawings:
The Phoenix Bridge Company for Route No. 1 Extension, Section No. 3, Contract No. 5, Span over Erie Cut (Easterly End), 1927
- f. Hoboken Viaduct Structure No. 0904-152 As-built Rehabilitations:
Route U.S. 1 Business, Section 1J, Safety Improvements, 1979
Route U.S. 1 Business, Section 1F, Rehabilitation of the Hoboken Avenue Underpass, 1975
Route U.S. 1 Business, Section 1A, Reconstruction at Oakland Avenue, 1959
Route U.S. 1 Business, Section 4, Reconstruction of Balustrades, Bevan Street to Palisades Avenue, 1958
- g. Hoboken Viaduct Structure No. 0904-152 Shop Drawings:
The Cumberland Bridge Company for Route U.S. 1 Business, Section 1J, 1980
The Bethlehem Steel Company, Route No. 1 Extension, Contract No. 2, 1925

102.10 SUBMISSION OF BIDS

THE FOLLOWING IS ADDED TO THE LIST INCLUDED IN THE SECOND PARAGRAPH:

8. On the Disclosure of Investment Activities in Iran (Form DC-16) provided by the Department, certify pursuant to N.J.S.A. 52:32-58, that neither the bidder, nor one of its parents, subsidiaries, and/or affiliates (as defined in N.J.S.A. 52:32-56(e)(3)), is listed on the Department of the Treasury's List of Persons or Entities Engaging in Prohibited Investment Activities in Iran and that neither is involved in any of the investment activities set forth in N.J.S.A. 52:32-56(f). If the bidder is unable to so certify, the bidder shall provide a detailed and precise description of such activities to the Department.

102.13 CONSIDERATION OF BIDS

THE FOLLOWING IS ADDED:

Submit proof of SSPC QP 1 and QP 2 certification of the firm or company performing lead paint abatement within 30 days after the bids are received for Department consideration of bid.

102.15 DISQUALIFICATIONS OF BIDDERS

THE FOLLOWING IS ADDED TO THE LIST IN THE FIRST PARAGRAPH:

11. Failure to submit proof of SSPC QP 1 and QP 2 certification of the firm or company performing lead paint abatement within 30 days after the bids are received.

SECTION 104 – SCOPE OF WORK

104.03.03 Types of Changes

3. Changes in the Character of Work.

a. Differing Site Condition.

THE SECOND PARAGRAPH IS CHANGED TO:

The Department will make payment for increased costs resulting from a Type 1 or Type 2 Differing Site Condition as a change in the character of work; however, the Department will not consider making payment for a differing site condition unless the resulting change in cost exceeds \$7,500. Except, if the Contractor incurs cost as the result of multiple differing site conditions, with the cost of each separate differing site condition having a value of at least \$1,500 but not more than \$7,500, the Department will consider making payment for such costs if the aggregate cost of the multiple differing site conditions exceeds \$7,500. If the change in cost exceeds these amounts, the Department will base the modification on the total cost of the change, and the Department will not deduct the threshold amount of \$7,500 from the cost of the change.

104.03.04 Contractual Notice

THE SECOND PARAGRAPH IS CHANGED TO:

Immediately provide written notice to the RE of a circumstance that is believed to be a change to the Contract. If notice is not provided on Contractual Notice (Form DC-161), include the following in the initial written notice:

1. A statement that this is a notice of a change.
2. The date when the circumstances believed to be a change were discovered.
3. A detailed and specific statement describing the nature and circumstances of the change.
4. If the change will or could affect costs to the Department.
5. If the change will or could affect Contract Time as specified in 108.11.01.C.

In addition to the hard copy of the notice, email the notice to the RE. It is not necessary to attach listed documents to the email.

104.03.08 Force Account

7. Equipment.

a. Contractor-Owned Equipment.

PART 1 IS CHANGED TO:

- 1 The Department will calculate the “rental” hourly rates by dividing the monthly rate by 176. The Department will not use weekly, daily, or hourly rates. The Department will apply rental hourly rates for every hour the equipment is in active use, except that for any 30-day period, the Department will limit the total amount paid for each piece of equipment to a maximum of the monthly rate.

THE FOLLOWING PART IS ADDED:

6. The Department will make payment for costs for transporting equipment to and from the work site, if said costs are solely required as a direct result of the Force Account activity.

THE SECOND PARAGRAPH IS CHANGED TO:

The payment established is full payment for all equipment costs, including the cost of fuel, repairs, maintenance, depreciation, storage and incidentals.

10. Subcontractors.

THE SECOND PARAGRAPH IS CHANGED TO:

The Department will make payment for markup on subcontracted work at the rate of 5 percent applied on the total amount of all costs for subcontracted force account work up to \$500,000 and 2% applied on the total amount of all costs for subcontracted force account work over \$500,000.

104.03.09 Delay Damages

1. Non-Productive Activity.

e. Equipment.

THE FIRST SENTENCE IS CHANGED TO:

If as the result of the delay, equipment cannot be used for any active work, and is directed by the RE to remain on the work site during the delay, the Department will make payment as specified in 104.03.08.7.a.5.

SECTION 105 – CONTROL OF WORK

105.05 WORKING DRAWINGS

THE SECOND PARAGRAPH IS CHANGED TO:

Ensure that working drawing submissions also conform to the Department design manuals and other Department standards for the proposed work. Ensure that working drawings are signed and sealed by a Professional Engineer. After Award, the Department will provide additional formatting information, the number of copies required, and the address of the receiving designated design unit.

THE FOLLOWING ITEMS ARE ADDED INTO TABLE 105.05-1, UNDER THE “CERTIFIED” COLUMN:

DMS Sign Support Structure
DMS Standard Ground Mounted
Prefabricated Superstructure Units
Steel Repair
Scupper
Precast Concrete Culvert Channel
Adhesive Anchor Systems
Header Armoring (incidental to Concrete Abutment Wall, Concrete Wingwall and Header Reconstruction)

THE FOLLOWING ITEMS ARE ADDED INTO TABLE 105.05-1, UNDER THE “APPROVED” COLUMN:

15”x54” Concrete Barrier Curb
Steel Grid Flooring (Ventilator)
Steel Grid Flooring (Sidewalk)
Drill and Grout Reinforcement Steel
Rock Dowel
Permanent Ground Anchor
Temporary Jacking System
Temporary Decking
Temporary Utility Supports

1. Certified Working Drawings.

THE LAST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

The Department will require 30 days for review and certification or rejection and return of certified working drawings.

2. Approved Working Drawings.

THE LAST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

The Department will require 45 days for review and approval or rejection and return of working drawings.

105.06 COOPERATION WITH OTHERS

THE FOLLOWING IS ADDED:

The Contractor is advised that the following contracts within the vicinity of this project may be under construction during the time of this contract:

Pulaski Contract #3
MP 51.0 to 54.5
Contract No. 051123250

Pulaski Contract #4
MP 51.0 to 54.5
Contract No. 051123260

Route 1&9T (25)
M.P. 3.39 to 4.35
Contract No. 003970114

Route 7, Hackensack River Wittpenn BR Contract 2
M.P. 0.0 to 2.0
Contract No. 000068088

Route 7, Hackensack River Wittpenn BR Contract 3
M.P. 0.0 to 2.0
Contract No. 000068089

Route 7, Hackensack River Wittpenn BR Contract 4
M.P. 0.0 to 2.0
Contract No. 000068090

NJTA Bridge Deck Reconstruction and Miscellaneous Improvements
Newark Bay Hudson County Extension
M.P. N6.00 to N8.20
Contract N0.T100.125

The Contractor's attention is directed to the need for close coordination and cooperation with the contractors on the above listed projects and any additional future projects that may impact the project that may occur during the work of this project. The Contractor shall be aware of the potential for schedule changes on the projects noted above. The Contractor shall contact the contractors of the above listed projects to coordinate maintenance and protection of traffic required within their respective jurisdictions for road and bridge work at least four weeks before commencement of work, for changes of Traffic Patterns and start of lane closures in the areas of project overlap.

105.07.01 Working in the Vicinity of Utilities

A. Initial Notice.

ELECTRIC
Public Service Electric & Gas (Electric)
Mr. James E. Lizer
Senior Engineering Plant Supervisor
Public Service Electric & Gas (Electric)
325 County Avenue
Secaucus, NJ 07094
T: 201-330-6582

ROUTE 139
PULASKI CONTRACT 2

F: 201-392-1321
C: 201-463-2489
James.Lizer@pseg.com

TELEPHONE

Verizon Communications
Mrs. Sandra Cruger
Engineer
Verizon Communication
114 Paterson Street, Floor 3
Paterson, NJ 07501
T: 973-925-1480
sandra.l.cruger@verizon.com

Mr. Gary S. Stevenson
Lead Specialist Engineer - Conduit Engineering
Centralized Engineering Services
Verizon New Jersey, Inc.
6000 Hadley Road
South Plainfield, NJ 07080
T: 908-412-6161
F: 877-245-3753 or 908-753-5369
Gary.S.Stevenson@Verizon.com

COMMUNICATIONS

MCI

Mr. Gary Pasqua
Verizon Business (MCI)
Construction Manager
1 North Broadway, Suite 710
White Plains, NY 10601
T: 914-461-2102
gary.pasqua@verizon.com

AT&T

Mr. Tim Fitzpatrick
JoeMax Telecom.com
Project Manager
175 West Main Street
Freehold, NJ 07728
T: 908-670-6925
tfitzpatrick@joemaxtelecom.com

Level 3

Mr. Jeffrey Penney
Senior Technician
Level 3 Communications
4260 US Route 1
Monmouth Junction, NJ 08852
T: 201-401-4046
F: 732-355-2050
jeffrey.penney@level3.com

Sidera Networks
Mr. Keith Karyczak
Senior OSP Engineer Manager
55 Broad St, 2nd Floor
New York, NY 10004
T: 212-631-8968
C: 347-386-9003
Keith.Karyczak@sidera.net

Jersey City Economic Development Corp
Roberta Farber
601 Pavonia Ave. Jersey City, NJ 07305
T: 201-463-2489
F: 201-333-9323
rfarber@jcedc.org

CABLE

Comcast of Jersey City
Mr. Kevin Davis
2121 Kennedy Blvd.
Jersey City, NJ 07305
T: 201-526-9978
C: 201-522-4437
kevin_davis@cable.comcast.com

Cablevision
Mr. Dennis Haney
Senior OSP Utility Coordinator
159 Windermere Ave
Greenwood Lake, NJ 10925
T: 845-395-0244
F: 845-395-0252
dhaney@cablevision.com

GAS
Public Service Electric & Gas (Gas)
Mr. Jorge Silva
Public Service Electric & Gas (Gas)
4000 Hadley Rd
South Plainfield NJ 07080
T: 908-412-7047
F: 973-642-7284
Jorge.Silva@pseg.com

WATER
Jersey City Municipal Authority
Mr. Rajiv Prakash
Chief Water Engineer
Bureau of Water Eng.
555 Route 440 South

Jersey City, NJ 07305
T: 201-432-3755
F: 201-432-3795
r.prakesh@jcmua.com

B. Locating Existing Facilities.

2.

Bureau of Traffic Operations, North Region (TOCN)
670 River Drive
Elmwood Park, NJ 07407-1347
Telephone: 201-797-3575

3.

Bureau of Electrical Maintenance, North Region
200 Stierli Court
Mt. Arlington, NJ 07856-1322
Telephone: 973-770-5065

C. Protection of Utilities.

THE SECOND PARAGRAPH IS CHANGED TO:

Protect and support existing Department electrical and ITS facilities and ensure that there is no interruption of service. Use hand tools only while working within two feet of the fiber optic network. At least 30 days before beginning the work, submit a plan to the RE for approval showing the method of support and protection.

THE FOURTH PARAGRAPH IS CHANGED TO:

Access within railroad right-of-way is restricted. Before beginning work within the railroad ROW or on railroad facilities, obtain the railroad's written approval for access, the method of construction, and the schedule of the work. Provide a copy of the submittal and approval to the RE. Comply with the railroad's requirements for working within the railroad right-of-way. Attend training required and provided by the railroad. The Conrail entry access permit instructions are available at <http://www.conrail.com/entry%20permit%20application%20instructions.pdf>.

THE FOLLOWING IS ADDED TO THE SIXTH PARAGRAPH

Ensure that the work is performed following the railroad's access and safety restrictions.

105.07.02 Work Performed by Utilities

Stage Pre Phase I & Phase I			
Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
PSE&G (Electric)	Backfeed and relocate existing aerial service and poles affected between Palisades Avenue and Baldwin Ave. to allow construction of the temporary detour road. Electric service to the billboards will be temporarily discontinued. Reference checklist/UAP items 1,2,3, 5 & 17.	6 weeks +/-	6 months advance notice
PSE&G (Electric)	Install temporary aerial service between Baldwin Ave. and Oakland	6 weeks +/-	6 months advance notice

	Ave. Reference checklist/UAP items 18 & 19.		
Comcast	Relocate aerial service along Palisades Ave. upon PSE&G pole sets. Reference checklist/UAP items 1 & 2.	1 week +/-	2 months advance notice
PSE&G (Gas)	Verify that 4" gas line between Oakland Ave. and Baldwin Ave. within detour road limits is abandoned, prior to State's contractor activities. Reference checklist/UAP item 12.	1 week +/-	2 weeks advance notice
Verizon	Remove existing guy wire between poles 66740 & 66741 along Palisades Ave. Set new anchors upon PSE&G pole sets. Remove aerial service along Baldwin Ave. in coordination with PSE&G pole sets. Reference checklist/UAP items 1, 2 & 5.	1 week +/-	1 month advance notice
Stage Total		15 weeks +/-	

Stage Phase IIA

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
PSE&G (Electric)	Install permanent aerial service along Palisades Ave. and remove abandoned service. Reference checklist/UAP items 1-3, 17.	1 week +/-	6 months advance notice
Stage Total		1 week +/-	

Stage Phase IIB

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
PSE&G (Electric)	Install permanent aerial service along Baldwin Ave. and remove abandoned service. Temporary service to remain. Reference checklist/UAP items 1, 4, 5 & 17.	1 week +/-	6 months advance notice
Verizon	Install permanent aerial cables along Baldwin Ave., riser connections and underground cables through the bridge. Reference checklist/UAP item 5.	1 week +/-	1 month advance notice - work to start upon completion of State Contractor's conduit installation.
Comcast	Install permanent aerial and underground cables along Baldwin Ave. and through the bridge. Reference checklist/UAP item 3.	1 week +/-	2 months advance notice - work to start upon completion of State's Contractor conduit installation.
Stage Total		3 weeks +/-	

Stage Phase IIIA

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
Sidera	Remove aerial cables and install new underground cables between manholes along Oakland Ave.	1 week +/-	2 months advance notice - work to start upon completion of State's Contractor conduit

	Reference checklist/UAP items 1-2.		installation.
Level 3	Remove aerial cables and install new underground cables between manholes along Oakland Ave. Reference checklist/UAP items 1-2.	1 week +/-	2 months advance notice - work to start upon completion of State's Contractor conduit installation.
	Stage Total	2 weeks +/-	

Stage Pre Phase IIIB

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
PSE&G (Electric)	Backfeed and relocate existing aerial poles and service along Central Ave. Reference checklist/UAP items 1, 7 & 17.	6 weeks +/-	6 months advance notice - work to start upon completion of State's Contractor conduit installation.
	Stage Total	6 weeks +/-	

Stage Phase IIIB

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
PSE&G (Electric)	Install permanent aerial and underground cables along Central Ave. and remove abandoned service. Reference checklist/UAP items 1, 6, 7 & 17.	8 weeks +/-	6 months advance notice - work to start upon completion of State's Contractor conduit installation.
MCI	Install permanent underground cables along Central Ave. and remove abandoned service. Reference checklist/UAP items 1 & 2.	1 week +/-	1 month advance notice - work to start upon completion of State's Contractor conduit installation, and PSE&G Electric efforts.
AT&T	Install permanent underground cables along Central Ave. and remove abandoned service. Reference checklist/UAP items 1 & 2.	1 week +/-	2 months advance notice - work to start upon completion of State's Contractor conduit installation, and PSE&G Electric efforts.
Verizon	Remove and replace existing drop wire between poles 67166, 67167 & PS16391JC as necessary to facilitate construction along Central Ave. Reference checklist/UAP items 9 & 10.	1 week +/-	One (1) month advance notice
	Stage Total	11 weeks +/-	

Stage Pre Phase IVA

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
PSE&G (Electric)	Backfeed, relocate existing aerial poles and install temporary service between St. Pauls Ave. and Summit Ave. Reference checklist/UAP items 1, 11, 13, 14 & 17.	6 weeks +/-	6 months advance notice
Comcast	Install temporary service between St. Pauls Ave. and Summit Ave. Remove existing aerial facilities upon completion of temporary service. Reference checklist/UAP	2 weeks +/-	2 months advance notice - work to start upon PSE&G Electric pole sets.

items 5 & 9.

Stage Total	8 weeks +/-
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Stage Phase IVA

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
Cablevision	Remove aerial cables and install permanent underground cables and riser connections from pole 60185, new handole and to pole 69954 between St. Pauls Ave. and Bevan Street intersection. Reference checklist/UAP items 1 & 3.	1 week +/-	1 month advance notice - work to start upon completion of State's Contractor conduit and handhole installation.
PSE&G (Electric)	Install permanent underground cables along St. Pauls Ave. from manhole 659 to manhole 652 and remove abandoned service. Reference checklist/UAP items 15 & 16.	8 weeks +/-	6 months advance notice - work to start upon completion of State's Contractor conduit and Electric manhole installations. Work is to be performed prior to State's contractor St. Pauls Ave. bridge demolition.
PSE&G (Electric)	Install permanent poles and aerial service along Summit Ave. and St. Pauls Ave. Remove abandoned service. Reference checklist/UAP items 1, 12, 14 & 17.	2 weeks +/-	6 months advance notice - work to start upon completion of State's Contractor bridge reconstruction.
MCI	Install permanent underground innerduct conduit and cables along St. Pauls Ave. from manhole 659 to manhole 662. Install aerial service from new riser pole 60182 to 68015 along Summit Ave. Remove abandoned service. Reference checklist/UAP items 3 & 4.	1 week +/-	One month advance notice - work to start upon completion of State's Contractor conduit and manhole installations, and PSE&G Electric efforts. Underground cable work is to be performed prior to State contractor's St. Pauls Ave. bridge demolition.
Verizon	Install new aerial facilities along St. Pauls Ave. from pole 60181 to new riser pole 60182 and remove abandoned service. Reference checklist/UAP items 11,12 & 17.	1 week +/-	1 month advance notice - work to start upon PSE&G pole sets.
Comcast	Install underground cables and riser connections between St. Pauls Ave. , Bevan Street and Summit Ave. Remove abandoned service. Install aerial service along Summit Ave. and St. Pauls Ave. Reference checklist/UAP items 6, 7 & 9.	1 week +/-	1 month advance notice - work to start upon completion of State's Contractor conduit/handhole installations and PSE&G pole sets.
Stage Total		14 weeks +/-	

Stage Phase V & VI

Utility Company Name	Work Description	Work Duration (Day/s)	Restrictions
PSE&G (Electric)	Remove temporary aerial facilities between Baldwin Ave. and Oakland Ave., and re-establish permanent aerial service between Baldwin Ave. and Palisades Ave. upon removal of	2 weeks +/-	6 months advance notice - work to start after temporary detour road is removed by State's Contractor.

the temporary detour road by State's
Contractor. Reference
checklist/UAP items 1 & 4.

Stage Total

2 weeks +/-

SECTION 106 – CONTROL OF MATERIAL

106.03 FOREIGN MATERIALS

THE FOLLOWING IS ADDED AFTER THE FIRST PARAGRAPH:

For steel and iron products incorporated into the Project, provide a certification from the manufacturer stating the country where the steel or iron product was melted and manufactured including application of coatings which protect or enhance the value of the material. Ensure that 4 copies of the manufacturer's certification are provided with each delivery of steel and iron products. Retain 1 copy and submit 3 copies to the RE. Ensure that the certification includes, materials description, quantity of material represented by the certification, country of manufacture, and notarized signature of a person having legal authority to bind the supplier. If a Certification of Compliance as specified in 106.07 contains a statement regarding the country of manufacture, a separate certification is not necessary.

106.04 MATERIALS QUESTIONNAIRE

THE LAST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

For ITS systems as specified in Section 704, obtain approval of system working drawings including individual components and Electrical material instead of submitting a materials questionnaire.

SECTION 107 – LEGAL RELATIONS

107.04 NEW JERSEY CONTRACTUAL LIABILITY ACT

THE FOURTH PARAGRAPH IS CHANGED TO:

For purposes of determining the date of "completion of the contract" pursuant to N.J.S.A. 59:13-5, "completion of the contract" occurs on the date that the Contractor provides written notice to the Department of Acceptance or conditional Acceptance of the Proposed Final Certificate or the 30th day after the Department issues the Proposed Final Certificate, whichever event occurs first.

107.09 INDEPENDENT CONTRACTOR

THE ENTIRE SUBSECTION IS CHANGED TO:

The relationship of the Contractor to the State is that of an independent contractor. Conduct business consistent with such status. Do not hold out or claim to be an officer or employee of the Department by reason hereof. Do not make a claim, demand, or application to or for the rights or privileges applicable to an officer or employee of the Department, including, but not limited to, Workers Compensation Insurance, unemployment insurance benefits, social security coverage, or retirement membership or credit.

107.12.01 Satisfying the Notice Requirements

THE FOLLOWING IS ADDED TO THE SECOND PARAGRAPH:

Upon request, provide the RE with 3 copies of all documentation submitted in support of the claim.

107.12.02 Steps

3. Step III, Claims Committee.

THE SECOND PARAGRAPH IS CHANGED TO:

The Claims Committee will not review a claim or combination of claims valued less than \$250,000 until after the receipt of conditional release as specified in 109.11. If the Contract is 75 percent complete or greater as

measured by Contract Time or Total Adjusted Contract Price, the Claims Committee will not review a claim or combination of claims valued more than \$250,000 until after receipt of conditional release as specified in 109.11. If the Claims Committee does not review a claim or combination of claims before Completion, the Claims Committee will review the claim or combination of claims at a single session of the Claims Committee after the receipt of the conditional release as specified in 109.11 and all claims have been reviewed at Steps I and II of the Claims Resolution Process. When reviewing a combination of claims, the Claims Committee will not review any individual claim valued less than \$20,000.

THE FOLLOWING SUBSECTION IS ADDED

107.17 COMMUNICATION WITH THE NEWS MEDIA

Do not communicate with the news media or issue a news release without obtaining a prior written approval from the Department.

SECTION 108 – PROSECUTION AND COMPLETION

108.01 SUBCONTRACTING

1. Values and Quantities.

THE FOLLOWING IS ADDED TO FIRST PARAGRAPH

1.

Specialty Items are as listed below:

Transformer removal.

Above ground highway lighting items.

Above ground sign lighting items.

Above and below bridge deck lighting items.

Electrical wire items.

ITS items, except for foundations, standards, and junction boxes.

THE THIRD PARAGRAPH IS CHANGED TO:

If a partial quantity of work for a unit price Item is subcontracted, the Department will determine the value of the work subcontracted by multiplying the price of the Item by the quantity of units to be performed by the subcontractor.

THE FOURTH PARAGRAPH IS CHANGED TO:

If only a portion of work of an Item is subcontracted, the Department will determine the value of work subcontracted based on the value of the work subcontracted as indicated in the subcontract agreement and as shown in a breakdown of cost submitted by the Contractor.

108.02 COMMENCEMENT OF WORK

THE SUBPART 4 IN THE FIRST PARAGRAPH IS CHANGED TO:

4. Progress schedule as specified in 153.03

108.06 NIGHT OPERATIONS

2. Visibility Requirements for Workers and Equipment.

THE FIRST PARAGRAPH IS CHANGED TO:

Ensure that workers wear a 360° high-visibility retroreflective safety garment meeting ANSI/ISEA Class 3, Level 2 standards.

108.08 LANE OCCUPANCY CHARGES

THE SECOND PARAGRAPH IS CHANGED TO:

The RE will keep record of each occurrence as well as the cumulative amount of time that a lane is kept closed beyond the lane closure schedule and provide the record to the Contractor. The Department will calculate the lane occupancy charge by multiplying the length of time of the delayed opening, in minutes, by the rate of \$10 per minute per lane, unless otherwise specified in the Special Provisions. The total amount per day for the lane occupancy charge that the Department will collect will not exceed \$10,000.00.

THE FOLLOWING IS ADDED:

The rate to calculate the Lane Occupancy Charge is as follows:

Description	Rate
Route 139 Eastbound Lower Roadway – Overrun of “One Lane Maintained” time limits	\$30/minute
Route 139 Westbound Lower Roadway– Overrun of “One Lane Maintained” time limits	\$10/minute
Route 139 Eastbound & Westbound Upper Roadways– Overrun of “One Lane Maintained” time limits	\$10/minute

108.09 MAINTENANCE WITHIN THE PROJECT LIMITS

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

6. Access to ITS devices and their respective controllers and meter cabinets is maintained throughout the duration of the project.

108.10 CONTRACT TIME

THE FOLLOWING IS ADDED:

No more than 1 intersection on the upper Route 139 roadway may be closed at a time in a construction phase with the exception of Phases II and III, when no more than 2 nonadjacent intersections may be closed.

- A. Complete all work required for completion of the Palisade Avenue intersection (Phase II) in less than 161 days. This work will be considered started when the intersection is closed to traffic crossing Route 139. This work will be considered complete when the intersection is opened to traffic crossing Route 139.
- B. Complete all work required for completion of the Baldwin Avenue intersection (Phase II) in less than 124 days. This work will be considered started when the intersection is closed to traffic crossing Route 139. This work will be considered complete when the intersection is opened to traffic crossing Route 139.
- C. Complete all work required for completion of the Oakland Avenue intersection (Phase III) in less than 239 days. This work will be considered started when the intersection is closed to traffic crossing Route 139. This work will be considered complete when the intersection is opened to traffic crossing Route 139.
- D. Complete all work required for completion of the Central Avenue intersection (Phase III) in less than 174 days. This work will be considered started when the intersection is closed to traffic crossing Route 139. This work will be considered complete when the intersection is opened to traffic crossing Route 139.
- E. Complete all work required for completion of the Summit Avenue and St. Paul Avenue intersections (Phase IV) in less than 148 days. This work will be considered started when the intersection is closed to traffic crossing Route 139. This work will be considered complete when the intersection is opened to traffic crossing Route 139.
- F. Complete all work required for Substantial Completion on or before April 10, 2017.
- G. Achieve Completion on or before June 6, 2017.

108.11.01 Extensions to Contract Time

B. Types of Delays.

1. Non-Excusable Delays.

THE FOLLOWING IS ADDED:

For work performed by Utilities, delays up to 30 percent of the estimated duration specified in 105.07.02 are considered non-excusable. The duration includes both the advance notice and the completion of the work by the Utility.

For delays caused by Railroads, delays up to 30 percent of the estimated availability specified in 105.07 are considered non-excusable.

2. Excusable, Non-Compensable Delays.

b. Utilities.

THE FOLLOWING IS ADDED:

For delays caused by Railroads, when the availability to access is reduced by more than 30 percent greater than the estimated availability specified in 105.07.

108.14 DEFAULT AND TERMINATION OF CONTRACTOR'S RIGHT TO PROCEED

THE FOLLOWING IS ADDED AFTER THE 2ND PARAGRAPH:

If the Department directs the Surety to complete the Contract, and the Surety elects to use a completion-contractor to perform the Work, the Surety must promptly submit to the Department a request for approval of the proposed completion-contractor as a subcontractor as per Section 108.01. The Department has the right to reject a request by the Surety to use the Contractor as the completion-contractor, either directly or under the direction of a consultant to the Surety. In addition, the Department has the right to reject a request by the Surety to contract with employees of the Contractor, directly or under the direction of a consultant to the Surety, to complete the Contract. The Department's right to reject contained in this paragraph is based on the sole discretion of the Department.

108.19 COMPLETION AND ACCEPTANCE

THE FOLLOWING IS ADDED:

No Incentive Payment for Early Completion is specified for this project.

108.20 LIQUIDATED DAMAGES

Liquidated damages are as follows:

- A. For each day that the Contractor fails to complete the work as specified in Subpart A of Subsection 108.10 of these Special Provisions, for Interim Completion, the Department will assess liquidated damages in the amount of \$10,000.
- B. For each day that the Contractor fails to complete the work as specified in Subpart B of Subsection 108.10 of these Special Provisions, for Interim Completion, the Department will assess liquidated damages in the amount of \$10,000.
- C. For each day that the Contractor fails to complete the work as specified in Subpart C of Subsection 108.10 of these Special Provisions, for Interim Completion, the Department will assess liquidated damages in the amount of \$10,000.
- D. For each day that the Contractor fails to complete the work as specified in Subpart D of Subsection 108.10 of these Special Provisions, for Interim Completion, the Department will assess liquidated damages in the amount of \$10,000.
- E. For each day that the Contractor fails to complete the work as specified in Subpart E of Subsection 108.10 of these Special Provisions, for Interim Completion, the Department will assess liquidated damages in the amount of \$10,000.
- F. For each day that the Contractor fails to complete the work as specified in Subpart F of Subsection 108.10 of these Special Provisions, for Substantial Completion, the Department will assess liquidated damages in the amount of \$19,800.

- G. For each day that the Contractor fails to achieve Completion as specified in Subpart G of Subsection 108.10 of these Special Provisions, the Department will assess liquidated damages in the amount of \$4,900.

THE FOLLOWING IS ADDED:

When the Contractor may be subjected to more than one rate of liquidated damages established in this Section, the Department will assess liquidated damages at the higher rate.

SECTION 109 – MEASUREMENT AND PAYMENT

109.01 MEASUREMENT OF QUANTITIES

THE SECOND PARAGRAPH IS CHANGED TO:

The Department will designate Items as Measured Items or as Proposal Items by having a suffix of M or P in the Item number respectively. The Department will measure quantities of Measured Items for payment.

109.02 SCOPE OF PAYMENT

THE THIRD SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

The Department will not make additional or separate payment for work or portion of work unless specifically provided for in the “Measurement and Payment” Subsection.

109.05 ESTIMATES

THE SECOND PARAGRAPH IS CHANGED TO:

The RE will provide a summary of the Estimate to the Contractor. Before the issuance of each payment, certify, on forms provided by the Department, that:

1. Each subcontractor or supplier has been paid the amount due from the previous progress payment and shall be paid the amount due from the current progress payment and that full payment for any retainage withheld from a subcontractor has been or will be made within 30 days after the subcontractor's work has been satisfactorily completed; or
2. There exists a valid basis under the terms of the subcontractor's or supplier's contract to withhold payment from the subcontractor or supplier, and therefore payment is withheld.

THE TENTH PARAGRAPH IS CHANGED TO:

The RE has the right to not process an Estimate when, in the judgment of the RE, the Work is not performed or proceeding as specified in the Contract or following the Department giving the Contractor and Surety notice of default as specified in 108.14.

109.07 BONDS POSTED IN LIEU OF RETAINAGES

THE FIRST PARAGRAPH IS CHANGED TO:

The Contractor may deposit negotiable bonds of the State or any of its political subdivisions, which have been approved by the Department, in an escrow account to secure release of all or a portion of the retainage withheld as specified in [109.05](#). Establish the account under the provisions of an escrow agreement to be entered into between the Contractor, the Department, and a bank located in the State that is an authorized depository with a trust department. Pay the charges of the bank for services rendered according to the terms and conditions of the escrow agreement.

109.09 AUDITS

THE FOLLOWING IS ADDED:

Pursuant to N.J.S.A. 52:15C-14(d), relevant records of private vendors or other persons entering into contracts with the Department are subject to audit or review by the New Jersey Office of the State Comptroller. Therefore, the Contractor shall maintain all documentation related to products, transactions or services under the Contract for a period of five years

from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.

DIVISION 150 – CONTRACT REQUIREMENTS

SECTION 151 – PERFORMANCE BOND AND PAYMENT BOND

151.03.01 Performance Bond and Payment Bond

THE LAST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

Submit the broker's fees, the certified rate schedule, paid invoices and the report of execution for the bond to the RE.

151.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM'S PAY UNIT IS REVISED TO:

<i>Item</i>	<i>Pay Unit</i>
PERFORMANCE BOND AND PAYMENT BOND	DOLLAR

SECTION 152 – INSURANCE

152.03.01 Owner's and Contractor's Protective Liability Insurance

A. Policy Requirements.

THE FOURTH SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

Ensure that policies are underwritten by companies with a current A.M. Best rating of A- with a Financial Size Category of VII or better.

B. Types

3. Owner's and Contractor's Protective Liability Insurance.

THE ENTIRE TEXT IS CHANGED TO:

Procure a separate Owner's and Contractor's Protective Liability Insurance Policy with a minimum limit of liability in the amount of \$4,000,000 per occurrence as a combined single limit for bodily injury and property damage. Ensure the policy is endorsed to include Severability of Interest/Separation of Insureds clause. Ensure the policy names the State, its officers, employees, and agents as additional insured. Provide documentation from the insurance company that indicates the cost of the Owner's and Contractor's Protective Liability Insurance Policy.

Ensure the policy is endorsed to include per project aggregate.

152.03.02 Railroad Protective Liability Insurance

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

Ensure the policy is endorsed to include per project aggregate.

Procure and maintain insurance coverage for the following railroad(s):

Consolidated Rail Corporation (CONRAIL)

Contact:
Conrail
Maria Bourassa
Engineering Contracts
Telephone: 856-231-2454
Maria.Bourassa@Conrail.com

It is estimated that 5 percent of the Project cost is located within or adjacent to the railroad right-of-way.

152.03.03 Pollution Liability Insurance

SUBPART 9 IS ADDED TO THE THIRD PARAGRAPH:

9. Per project aggregate.

152.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS' PAY UNITS ARE REVISED TO:

<i>Item</i>	<i>Pay Unit</i>
OWNER'S AND CONTRACTOR'S PROTECTIVE LIABILITY INSURANCE	DOLLAR
RAILROAD PROTECTIVE LIABILITY INSURANCE	DOLLAR
POLLUTION LIABILITY INSURANCE	DOLLAR

THE LAST PARAGRAPH IS CHANGED TO:

The Department will make initial payment for OWNER'S AND CONTRACTOR'S PROTECTIVE LIABILITY INSURANCE, RAILROAD PROTECTIVE LIABILITY INSURANCE, and POLLUTION LIABILITY INSURANCE at the lesser of the bid amount, or actual costs as documented from paid invoices. If the Bid amount is greater than the amount indicated on the documented paid invoices, the Department will make payment for any remainder, up to the Bid amount, with the final monthly Estimate.

SECTION 153 – PROGRESS SCHEDULE

153.03.01 CPM PROGRESS SCHEDULE

THE THIRD PARAGRAPH IS CHANGED TO:

The Contractor may propose alternate staging. Ensure that proposed alternate staging does not interfere with work done by Others without written concurrence from the affected Others. The Department may reject the proposed alternate staging if it causes an increase to the cost of work done by Others. The Contractor is responsible for the cost of changes or additional work required as a result of completing the work according to the proposed alternate staging.

1. Preliminary Schedule Submission.

THE SECOND PARAGRAPH IS CHANGED TO:

The RE may require 3 color paper copies of the preliminary schedule, Gantt Chart, as specified in 153.03.02.2.e, and a network diagram (PERT) printed on 36 × 22-inch plans detailing the activity relationships.

2. Baseline Schedule Submission.

THE LAST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

The RE may require the Contractor to submit 3 color paper copies of the baseline schedule.

THE SECOND PARAGRAPH PART 3 IS CHANGED TO:

3. The RE may require 3 color paper copies of the tabular reports, as specified in 153.03.02.2, and a printed network diagram (PERT) on 36 × 22-inch sheets detailing the activity relationships.

153.03.02 CPM Progress Schedule Updates

THE LAST PARAGRAPH IS CHANGED TO:

If the project falls behind schedule for nonexcusable delays, so that the schedule indicates that the Work will not be completed by the Completion date, as specified in 108.10, take the necessary steps to improve progress. Under such circumstances, the RE may direct the Contractor to increase the number of shifts, begin overtime operations, work extra days including weekends and holidays, and supplement its construction plant. Furthermore, the RE may require the Contractor to submit for approval a recovery schedule showing how the Contractor proposes to meet the directed acceleration.

2. Tabular Reports.

THE FIRST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

The RE may require 3 color paper copies of the longest path sort, total float sort, responsibility sort, area sort, and Gantt chart.

153.04 MEASUREMENT AND PAYMENT

THE THIRD PARAGRAPH IS CHANGED TO:

If the Contractor's CPM Progress Schedule update is not approved by the date of the progress meeting for the following update, the Department will assess liquidated damages to recover the Department's increased administrative costs. The Department will assess damages for each delinquent update as follows:

SECTION 155 – CONSTRUCTION FIELD OFFICE

155.03.01 Field Office

4. Communication Equipment.

- a. Telephones.** Provide 4 cordless phones with auto-switching.
- c. Cell Phones.** Provide 11 cellular phones. Ensure the cellular phone plan provides for unlimited mobile to mobile in-network usage, unlimited push-to-talk/ walkie-talkie usage and an anticipated monthly usage of 900 any-time minutes for each phone. Ensure the phones are on the same plan. Ensure the cellular phone plan has a home rate with no roaming charges within the state. Ensure each cellular phone has the following features:
 - 1. Push to Talk / Walkie-Talkie capable
 - 2. Camera with 1 megapixel picture capability
 - 3. Battery life capable of 180 minutes of continuous use and 72 hours of standby use
 - 4. Equipped with a hands-free headset
 - 5. Base charger and car charger
- d. Computer System.** Provide a computer system meeting the following requirements:
 - 5 computer configurations each meeting the following:
 - 1. Processor having a clock speed of 3.5 GHz or faster, 8 GB RAM, 512 MB Video RAM, 250 Gigabyte hard drive designated as drive C, one DVD (+/-) Writer Drive, one CD-R Recordable Drive. Ensure the system is USB 2.0 compatible and has at least two front USB ports. Include Keyboard, optical mouse and 2 piece desktop speakers.
 - 2. Wired Router with appropriate number of ports and cables and a print server. Ensure there is at least one wired Ethernet switch.
 - 3. High-speed broad band connection and service with a minimum speed of 3 Megabits per second (mbps) with dynamic IP address for the duration of the project.
 - 4. 19 inch or larger Flat Screen LCD monitor with tilt/swivel capabilities.
 - 5. 250 Gigabyte or larger external drive with backup software for MS-Windows, and fifteen corresponding formatted data cartridges corresponding to the tape drive size.
 - 6. 2 Flatbed USB version 2.0 or greater Color Scanner with automatic document feed.
 - 7. Uninterruptible power supply (UPS).
 - 8. Surge protector for the entire computer configuration to be used in conjunction with the UPS.
 - 9. Computer workstation, chair, printer stand, and/or table having both appropriate surface and chair height.
 - 10. One can of compressed air and screen cleaning solution every other month of the duration of the contract.

If more than one computer configuration is specified, provide one network interface card for the base computer configuration and hardwire connections between computer configurations as directed by the RE.

Also provide:

8 USB 32 GB Flash/Jump memory drives

150 CD-R 700 MB (or larger) recordable CDs compatible with the CD drive and 150 recordable DVDs.

6 CD/DVD Holder (each holds 50)

1 color laser printers and supplies as follows:

1. Minimum of 192 Megabytes of expanded memory, printer cable, and legal size paper tray.
2. One set of printer ink cartridges every other month for the duration of the construction project for each printer.

Software as follows:

1. Microsoft Windows, latest version with future upgrades for the duration of the entire project.
2. Microsoft Office Professional, latest version.
3. Norton's System Works for Windows, latest version, or compatible software package with future upgrades and latest virus patches.
4. Anti-Virus software, latest version with monthly updates for the duration of the contract.
5. Visio Professional Graphics Software for Windows, latest version
6. Primavera Project Management, latest version
7. Adobe Acrobat Professional, latest version, or compatible software for Scanner

THE THIRD PARAGRAPH IS CHANGED TO:

When the computer system is no longer required by the RE, the Department will remove and destroy the hard drive, and return the computer system to the Contractor. The Department will retain other data storage media.

6. Office Equipment.

2. 3 digital camera(s). Ensure each digital camera has auto-focus, with rechargeable batteries and charger, 256 MB memory card, USB Memory Card Reader compatible with camera and field office computer, 1.5 inch LCD monitor, 5 mega pixel resolution, 10X optical zoom lens, built in flash, image stabilization, computer connections, and a carrying case
3. 1 video camcorder(s). Ensure each video camcorder is a mini DVD camcorder with 10X optical zoom, 2" LCD monitor, USB 2.0 compatible and includes USB 2.0 connections.
4. 24 Mini DVD 2.8 GB (or larger) recordable DVDs compatible with the camcorder

7. Inspection Equipment.

1. 5 Calculators with trigonometric capability
2. 2 Date/ Received stamp and ink pad
3. 2 Electronic Smart level, 4 foot
4. 2 Electronic Smart level, 2 foot
5. 10 Carpenter rulers
6. 2 Steel tape, 100 feet
7. 2 Cloth tape, 100 feet
8. 2 Illuminated measuring wheel
9. 1 Plumb bob and cord
10. 1 Line level and cord
11. 2 Surface thermometer
12. 2 Concrete thermometer
13. 2 Digital infrared asphalt thermometer
14. 1 Direct Tension Indicator (DTI) Feeler Gage, 0.005 inch
15. 1 Sledge hammer, 8lb
16. 2 Self leveling laser level with range of 100 feet and an accuracy of 1/4 inch per 100 feet
17. 12 Hard hats - orange, reflectorized hard hats according to ANSI Z89.1.

18. 12 Safety garments – orange, reflectorized, 360° high visibility safety garments according to ANSI/ISEA Class 3, Level 2 standards. To be replaced yearly for the duration of the contract.
19. 12 Sets of orange rain gear with reflective sheeting
20. 12 Sets of hearing protection with a NRR rating of 22 dB
21. 12 Sets of eye protection according to ANSI Z87.1
22. 5 Sets of fall arrest equipment according to ANSI Z359.1 standards consisting of a full body harness, lanyard and anchor.
23. 1 Light meter - capable of measuring the level of luminance in foot-candles
24. 5 Lantern flashlight, 6V with monthly battery replacements
25. 1 Testing equipment and apparatus conforming to AASHTO T23, T119, T152
26. 12 Hard Bound Daily Diaries, 5-½" X 8" minimum with one day per page. To be provided yearly for the duration of the contract.
27. 600 Legal size hanging folders
28. 600 Legal size manila file folders – three tab
29. 1500 White File Folder Labels

155.03.03 Telephone Service

THE CONTENT OF THIS SUBSECTION IS DELETED

155.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM IS DELETED:

<i>Item</i>	<i>Pay Unit</i>
TELEPHONE SERVICE	LUMP SUM

THE THIRD PARAGRAPH IS DELETED.

SECTION 156 – MATERIALS FIELD LABORATORY AND CURING FACILITY

156.03 PROCEDURE

156.03.01 Materials Field Laboratory

4. Communication Equipment.

- c. **Cell Phones.** Provide 6 cellular phones. Ensure the cellular phone plan provides for unlimited mobile to mobile in-network usage, unlimited push-to-talk/ walkie-talkie usage and an anticipated monthly usage of 900 any-time minutes for each phone. Ensure the phones are on the same plan. Ensure the cellular phone plan has a home rate with no roaming charges within the state. Ensure each cellular phone has the following features:

1. Push to Talk / Walkie-Talkie capable
2. Camera with 1 megapixel picture capability
3. Battery life capable of 180 minutes of continuous use and 72 hours of standby use
4. Equipped with a hands-free headset
5. Base charger and car charger

- d. **Computer System.** Provide a computer system meeting the following requirements:

2 computer configurations each meeting the following:

1. Processor having a clock speed of 3.5 GHz or faster, 2 GB RAM, 512 MB Video RAM, 200 Gigabyte hard drive designated as drive C, one DVD (+/-) Writer Drive, one CD-R Recordable Drive. Ensure the system is USB 2.0 compatible and has at least two front USB ports.
2. Wireless Ethernet Hub Switch with appropriate number of ports and cables and a print server.

3. High-speed broad band connection and service with a minimum speed of 3 Megabytes per second (mbps) with dynamic IP address for the duration of the project.
4. 19 inch or larger Flat Screen LCD monitor with tilt/swivel capabilities.
5. 250 Gigabyte or larger external drive with backup software for MS-Windows, and fifteen corresponding formatted data cartridges corresponding to the tape drive size.
6. 1 Flatbed USB version 2.0 Color Scanner with automatic document feed.
7. Uninterruptible power supply (UPS).
8. Surge protector for the entire computer configuration to be used in conjunction with the UPS.
9. 1 computer workstations, chair, printer stand, and/or table having both appropriate surface and chair height.
10. One can of compressed air and screen cleaning solution every other month of the duration of the contract.

If more than one computer configuration is specified, provide one wireless network card for the base computer configuration and hardwire connections between computer configurations as directed by the RE.

Also provide:

10 USB 2 GB Flash/Jump memory drives

100 CD-R 700 MB (or larger) recordable CD's compatible with the CD drive and 100 recordable DVD's.

4 CD/DVD Holder (each holds 50)

1 color laser printers and supplies as follows:

1. Minimum of 192 Megabytes of expanded memory, printer cable, and legal size paper tray.
2. One set of printer ink cartridges every other month for the duration of the construction project for each printer.

THE THIRD PARAGRAPH IS CHANGED TO:

When the computer system is no longer required by the ME, the Department will remove and destroy the hard drive, and return the computer system to the Contractor. The Department will retain other data storage media.

156.03.05 Nuclear Density Gauge

THE LAST PARAGRAPH IS CHANGED TO:

Provide a nuclear density gauge for the exclusive use of the ME using one of the following methods:

1. Purchase a nuclear density gauge under the Contractor's New Jersey Department of Environmental Protection (NJDEP) License or the Contractors United States Nuclear Regulatory Commission (USNRC) license.
2. Lease a nuclear density gauge from a New Jersey Department of Environmental Protection (NJDEP) or United States Nuclear Regulatory Commission (USNRC) licensed third party on the Department's New Jersey Department of Environmental Protection (NJDEP) License.

The Contractor is barred from purchasing gauges on the Department's New Jersey Department of Environmental Protection (NJDEP) license. Perform calibration and servicing of the gauge, other than routine wipe tests, every 24 months. The ME may direct additional calibrations, when necessary. Supply a replacement gauge for the Department's use during the calibration and servicing period.

SECTION 157 – CONSTRUCTION LAYOUT AND MONUMENTS

157.03.01 Construction Layout

THE SEVENTH PARAGRAPH IS CHANGED TO:

Provide the Utilities with the layout needed to install relocated utility facilities and coordinate the Work. Ensure that relocated facilities do not conflict with proposed construction, including High Voltage Proximity Act conflicts.

THE FOLLOWING IS ADDED AFTER THE NINTH PARAGRAPH:

For each bridge and sign structure within the Project Limits, provide the RE as-built measurements of the vertical under clearance at each lane line, shoulder line, curb line and edge of pavement line under a structure to the nearest inch. For each bridge structure, provide vertical under clearance measurements at each fascia beam.

157.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM'S PAY UNIT IS REVISED TO:

<i>Item</i>	<i>Pay Unit</i>
CONSTRUCTION LAYOUT	DOLLAR

THE SECOND PARAGRAPH IS CHANGED TO:

The Department will adjust payment for CONSTRUCTION LAYOUT based on the final contract amount and will calculate as follows:

$$CL = \frac{CL_B \times (C_F - E_F)}{C_O - E_O}$$

Where:

CL = Adjusted payment for CONSTRUCTION LAYOUT.

CL_B = Bid price for CONSTRUCTION LAYOUT.

C_O = Original Contract Price.

C_F = Final Contract Price.

E_F = Total of CL_B and the final cost for PERFORMANCE BOND AND PAYMENT BOND, Incentive/Disincentives for completion/interim completion, and claim settlements.

E_O = Total of CL_B

E_O = Total of CL_B, and PERFORMANCE AND PAYMENT BOND.

SECTION 158 – SOIL EROSION AND SEDIMENT CONTROL AND WATER QUALITY CONTROL

158.03.02 SESC Measures

8. Inlet Filters. Provide Type 1 and Type 2 inlet filters as follows:

a. Type 1.

THE ENTIRE TEXT IS CHANGED TO:

For a new inlet structure without a casting, mold welded steel wire fabric around the inlet walls. Extend the welded steel wire a minimum of 6 inches down each side of the structure. Secure geotextile to the welded wire fabric. Place No. 2 coarse aggregate against the inlet structure to hold the inlet filter in place.

For an inlet structure with a casting and exposed exterior walls, place geotextile under the casting and extend it a minimum of 6 inches below the top of the exposed walls. Place No. 2 coarse aggregate around the drain hole opening.

For an existing inlet structure without exposed exterior walls, place geotextile under the grate and extend the geotextile for a minimum of 6 inches beyond the grate.

For an inlet with a curb piece and without exposed exterior walls, ensure that the opening in the curb piece has a height of 2 inches. If the opening is greater than 2 inches, achieve the 2 inch opening size by wrapping the geotextile around an appropriately sized piece of lumber. Place the lumber against the vertical opening.

19. Oil-Only Emergency Spill Kit.
THE SECOND SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:
Include Oil-only Emergency Spill Kit, Type 1 consisting of the following:

SECTION 159 – TRAFFIC CONTROL

159.02.01 Materials

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS:

Concrete 903.03

THE FOLLOWING IS ADDED:

Provide temporary QuadGuard crash cushions, QuadGuard CZ, as designed and manufactured by Energy Absorption Systems, Inc., Chicago, Illinois, or approved equal. Provide manufacturer certification that the system has been crash tested according to NCHRP 350 and has passed the Test Level 3. Provide systems with a nose cover that is a highway yellow color.

159.03.02 Traffic Control Devices

2. Construction Barrier Curb.

THE LAST PARAGRAPH IS CHANGED TO:

Provide top and side mounted flexible delineators on the construction barrier curb. For delineators located on the right side when facing in the direction of traffic, ensure that the retroreflective sheeting is white. For delineators located on the left side when facing in the direction of traffic, ensure that the retroreflective sheeting is yellow. Attach flexible delineators according to the manufacturer's recommendations.

Starting at the beginning of the construction barrier curb section mount top delineators at 100-foot intervals on tangent sections, curves of radii greater than 1,910 feet, and at 50-foot intervals on curves of radii of 1,910 feet or less.

Mount side delineators at the lead end of each barrier segment with the top of the delineator 3 inches from the top of the barrier.

6. Traffic Control Truck with Mounted Crash Cushions.

THE LAST SENTENCE IS CHANGED TO:

Submit drawings to the RE detailing the manner of securing the ballast, signed and sealed by a Professional Engineer, certifying that it is capable of withstanding the impact forces for which the impact attenuator is rated.

THE FOLLOWING IS ADDED TO THE SECOND PARAGRAPH:

- 8. Movable Barrier System.** Use the Reactive Tension System Quickchange Movable Barrier (RTS-QMB) System manufactured by Barrier Systems, Inc. (<http://www.barriersystemsinc.com>), or approved equal. A local contact for the RTS-QMB system is:

Mr. Art Korfin
44 Cooper Run Drive
Cherry Hill, New Jersey 08003
Telephone: 856-424-8186
Fax: 509-692-5646
Email: art.korfin@barriersystemsinc.com

Install the system according to the manufacturer's recommendations. Laterally transfer the system as necessary utilizing the Barrier Transfer Machine (BTM) manufactured by Barrier Systems, Inc. Provide the

necessary safety crew. Provide an on-site operator 24 hours a day, 7 days a week to operate the BTM during traffic emergencies.

159.03.08 Traffic Direction

A. Flagger.

THE LAST SENTENCE IS CHANGED TO:

Ensure that the flagger is equipped with a STOP/SLOW paddle and follows MUTCD flagging procedures.

159.03.09 Emergency Towing Service

the following is added to the first paragraph: Indicate in the plan the nearest locations where the towed vehicles (for each direction of traffic on Route 139) can be legally parked. Indicate in the plan the manner of coordinating with emergency service responders, the Department and the Port Authority of New York and New Jersey.

THE FOLLOWING IS ADDED TO THE SECOND PARAGRAPH:

Provide equipment capable of removing all types of disabled or abandoned vehicles. Provide a dedicated standby towing vehicle 24 hours, 7 days a week for eastbound traffic. For westbound traffic, provide a separate dedicated standby towing vehicle during off-peak closure hours. For westbound traffic during other times, provide on-call towing services. For on-call towing service, ensure that the towing vehicle arrives at the scene of the disabled or abandoned vehicle within 15 minutes of receiving notification. The staging requirements may necessitate that the towing vehicle proceed in reverse to reach the disabled vehicle.

159.04 MEASUREMENT AND PAYMENT

TEMPORARY CRASH CUSHION, QUADGUARD, ___ BAYS, ___" WIDE
CONSTRUCTION BARRIER CURB, MOVABLE SYSTEM

UNIT
LINEAR FOOT

THE SECOND PARAGRAPH IS CHANGED TO:

For traffic control devices measured by the linear foot or unit basis that are specified in 159.03.02, the Department will make payment for the maximum quantity in service at one time as required by the Contract. For CONSTRUCTION SIGNS, the Department will make payment for the maximum quantity of specific sign types in service at one time as required by the Contract. If a particular sign type has more than one unique text, each sign with a unique text will be considered to be a specific sign type. The Department will make payment for 50 percent of the Contract bid price for traffic control devices specified in 159.03.02 that are measured on a linear foot, square foot or unit basis upon approved placement. The Department will prorate the balance of payment over the duration of the Contract.

SECTION 160 – PRICE ADJUSTMENTS

160.03.01 Fuel Price Adjustment

THROUGHOUT THIS SUBPART, TABLE 161.03.01-1 IS CHANGED TO TABLE 160.03.01-1

THE THIRD PARAGRAPH IS CHANGED TO:

If the as-built quantity of an Item listed in Table 160.03.01-1 differs from the sum of the quantities in the monthly Estimates, and the as-built quantity cannot be readily distributed among the months that the Item listed in Table 160.03.01-1 was constructed, then the Department will determine fuel price adjustment by distributing the difference in the same proportion as the Item's monthly Estimate quantity is to the total of the Item's monthly estimates.

THE 13 TH AND 15 TH LINE IN THE TABLE 160.03.01-1 IS CHANGED TO:

SOIL AGGREGATE BASE COURSE, ___ " THICK

1 Gallon per Cubic Yard

DENSE-GRADED AGGREGATE BASE COURSE, ____ " THICK	1 Gallon per Cubic Yard
--	-------------------------

THE 25 TH LINE IN THE TABLE 160.03.01-1 IS CHANGED TO:

HOT MIX ASPHALT ____ ____ BASE COURSE	2.50 Gallons per Ton
---------------------------------------	----------------------

THE FOLLOWING ARE ADDED TO TABLE 160.03.01-1

Items	Fuel Usage Factor
NON-VEGETATIVE SURFACE, HOT MIX ASPHALT	2.50 Gallons per Ton
COLOR-COATED NON-VEGETATIVE SURFACE, HOT MIX ASPHALT	2.50 Gallons per Ton

160.03.02 Asphalt Price Adjustment

NOTE 1 OF THE THIRD PARAGRAPH IS CHANGED TO:

1. The Department will determine the weight of asphalt binder for price adjustment by multiplying the percentage of new asphalt binder in the approved job mix formula by the weight of the item containing asphalt binder. If a Hot Mix Asphalt item has a payment unit other than ton, the Department will apply an appropriate conversion factor to determine the number of tons used.

THE FOURTH PARAGRAPH IS CHANGED TO:

$$A = B \times [(MA - BA)/BA] \times C \times M \times G$$

Where:

A = Asphalt Price Adjustment

B = Bid Price for Tack Coat/Prime Coat

MA = Monthly Asphalt Price Index

BA = Basic Asphalt Price Index

C = Petroleum Content of the Tack Coat and Prime Coat in Percent by Volume:

Use 100% for cutbacks and Tack Coat 64-22

60% for Polymer Modified Tack Coat

60% for RS or similar type emulsions

M = Percentage of Bid Price Applicable to Materials Only: Use 82%

G = Gallons of Tack Coat and Prime Coat Furnished and Applied

160.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS' PAY UNITS ARE REVISED TO:

Item	Pay Unit
FUEL PRICE ADJUSTMENT	DOLLAR
ASPHALT PRICE ADJUSTMENT	DOLLAR

THE FOLLOWING SECTION IS ADDED:

SECTION 162 – VIBRATION MONITORING

162.01 DESCRIPTION

This Section describes the requirements for performing pre-construction surveys, vibration monitoring, displacement monitoring, and post-construction inspections. Perform pre-construction surveys to document the condition of existing structures and utilities within 100 feet of Affected Construction Operations. Affected Construction Operations include demolition, excavation, rock anchor installation, sheet pile installation, or any other construction or demolition activity that has the potential to have impact on existing or newly constructed structures. Perform vibration monitoring to measure the vibration levels and displacement monitoring to measure movements on the existing structures. Perform monitoring during Affected Construction Operations.

Structures to be included in the condition surveys and monitoring program include the existing and proposed abutments, retaining walls, and columns of the Hoboken Viaduct, and also all buildings within 100 feet from the construction area. Include the following:

1. Before, during and after construction, inspect the structures and buildings, and document the condition of the structures and buildings in written reports.
2. Develop and implement a program to monitor ambient and construction vibrations at the structures. Measure settlement before, during, and after Affected Construction Operations.
3. Develop and implement a program to limit construction vibrations to prevent damage to any existing structures and buildings.

162.02 CONSTRUCTION

162.02.01 Vibration and Settlement Monitoring and Control

Perform preconstruction and post-construction inspections of the existing buildings, bridge components or utilities as directed by the RE.

Develop a program to monitor the ambient and construction vibrations, and displacements.

A. Quality Assurance. Perform all work under the direct supervision of a Professional Engineer. The Engineer must have at least 10 years responsible experience in similar work and have available professional level capability in related geotechnical and structural evaluations and engineering. Submit for approval the following information at least 30 calendar days prior to commencement of the work:

1. Name of firm engaged to perform all vibration monitoring, inspections, and report work.
2. Qualifications of firm including list of at least 3 similar project experience for previous 10 years.
3. Qualifications/Resumes for all key personnel performing work. Vibration specialists must be capable and experienced in installing, operating, reading and interpreting seismographs on existing structures for the purpose of monitoring vibrations.
4. Inspection Schedule for all structures and buildings with anticipated submission dates for the preconstruction inspection report, vibration monitoring and construction control report, and post construction inspection report.
5. Equipment List. Provide a list of vibration monitoring equipment to be used.
6. The firm performing the vibration monitoring work shall be responsible for instrument calibration, maintenance, reading and recording, and providing report data during construction activities to the RE. Submit equipment calibration certification to the RE. All work shall be performed under the direct supervision of the Vibration Specialist and the RE.

B. Preconstruction Inspections.

Prior to performing any Affected Construction Operations, the Contractor shall engage the services of a qualified, independent Professional Engineer, acceptable to the RE to conduct a preconstruction Condition Survey of structures and buildings in the vicinity of the site. Survey shall extend to such structures or conditions as may be affected by the Contractor's operations as determined by the Contractor. At a minimum, all buildings and structures within 100 feet of the active construction area shall be surveyed. The scope and detail of the survey shall be sufficient to serve as a reference for comparison should evidence of damage be observed during construction.

At least 30 days prior to the performance of the preconstruction Condition Survey of structures and buildings, the Contractor shall submit to the RE the proposed survey program prepared by the Professional Engineer. The program description shall include detailed specifications of the field procedures and survey methods to be utilized. Provide qualifications of the individuals performing the surveys and those reviewing and supervising the work.

Coordinate activities, issue notices, obtain clearances and provide whatever photographic and secretarial assistance is necessary to accomplish the survey. Give notice in writing to the Owner of each property or facility concerned, and tenants of the property. Advise in notice the dates on which surveys are to be made so that they may have representatives present during the survey. Provide copies of all notices to the Department.

The survey shall consist of a description of the interior and exterior conditions of the structures and buildings examined. All structures and buildings, including residences, sheds, garages, decks, support structures, utility buildings, etc., shall be included in the survey.

The survey reports shall document with color photographs and video all interior and exterior walls, ceilings, and floors. Descriptions shall locate any cracks, damage, or other existing defects and shall include such information to make it possible to determine the effect, if any, of the Affected Construction Operations on the defects. Photographs shall be taken and made part of the record for all existing conditions whether or not defects exist.

Contractor's record of the preconstruction Condition Survey shall consist of written documentation and photographs of the conditions identified and a high quality video survey with appropriate audio description of conditions and defects. Prior to start of work, one copy of the Contractor's record of preconstruction Condition Survey shall be submitted to the Department for review and retention.

If any vibration-related damage claims are received in writing, the Contractor shall give notice to all interested parties so that they may be present during the examination and make an examination similar to the preconstruction Condition Survey. Arrangements to make the inspections and records of this examination shall be handled in the same manner as the original preconstruction Condition Survey.

Perform a detailed preconstruction Condition Survey and submit the associated report of the structures and buildings to the RE a minimum of 20 working days before beginning any construction operations. The preconstruction inspection report shall be 8-1/2 × 11-inch format including an index, names and responsibilities of the inspection party, notes, four by six inch color prints of photographs with date and location captions documenting the existing condition of the structures, and a DVD containing the video survey. The preconstruction inspection report shall also include a comprehensive plan for the vibration control and monitoring of the existing structures and buildings. The plan shall include, but not be limited to, all of the provisions described in these Specifications. Among others, the plan shall include materials, installation procedures, schedule of installation, and drawings indicating the location of the monitoring points.

Contractor shall conduct his own evaluations to predict vibrations from Affected Construction Operations and may, at no additional cost to the Department, conduct additional preconstruction surveys of structures in the area that he deems warranted. Contractor shall include establishing survey targets along the side of the structures and buildings nearest the work location. The locations of the Contractor's proposed survey targets shall be provided on working drawings submitted to the RE for approval.

Monitor these survey targets vertically and horizontally on a daily basis for a period of 5 days prior to performing any Affected Construction Operations to establish ambient baseline data. The Vibration Specialist shall interpret the readings and submit a vibration report to the NJDOT prior to performing any Affected Construction Operations. The report shall show the seismograph locations and results of the ambient vibration readings at the structures and buildings. A distinction shall be made in the report between vibrations caused with and without vehicular traffic.

Do not proceed with Affected Construction Operations until final approval of the submitted survey, report, documentation, baseline data, and all else required as part of the plan is obtained. Upon final acceptance submit 7 copies of the survey for final approval signatures and distribution.

C. Vibration and Displacement Monitoring and Control Program.

Contractor shall control ground vibrations caused by excavation, bridge demolition, installing sheeting or any other construction activities that have the potential to have significant impact on existing structures and buildings so that they are not impacted adversely.

Monitor bridge components using monitoring points located at a maximum 25 feet apart. Install crack gauges across visible cracks on any structure.

Monitor buildings using at least 1 monitoring point per building but no less than one monitoring point located at a maximum of 25 feet apart. Install crack gauges across visible cracks on any building elements.

Prior to performing any Affected Construction Operations visually inspect the portion of the existing structures and buildings immediately adjacent to the work area with the RE in order to document baseline conditions. Attach seismographs to the existing structure closest to the ongoing construction operations and record vibration measurements continuously during work hours. A full-time on-site vibration specialist shall evaluate these

measurements continuously during the first day of operations, and the records shall be reviewed once daily thereafter. In addition, the pre-established survey targets shall be surveyed vertically and horizontally on a daily basis. A copy of all data and evaluations shall be provided daily (within 24 hours) to the RE. Any vibrations close to or exceeding the specified limits shall be immediately reported to the RE.

- 1. Vibration Limit Criteria.** Contractor shall conduct all activities in such a manner that the maximum peak particle velocity (PPV) in the vicinity does not exceed 2 inches per second for bridge components, 1 inch per second for buildings, 0.5 inch per second for historic buildings, and 0.5 inch per second for the existing utilities to remain located in the bay between floorbeams 53 and 54. For cast-in-place concrete structures, no vibrations above ambient site levels shall be allowed for a period of 48 hours after concrete placement. For green concrete, vibrations shall be less than 1.0 inch per second until the concrete has attained its design strength. For the bridge structures the Contractor may propose higher PPV limits based on additional study and monitoring, which at a minimum must include dynamic strain monitoring of the structure. Any such proposal is subject to approval of the RE.
- 2. Displacement Limit Criteria.**
 - a. Existing Structures.** Cumulative survey target or crack movement shall be less than 1/8" vertically or 1/8" horizontally for bridge components.
 - b. Existing Utility Structures and Bridges.** Cumulative survey target movement shall be less than 1/4" vertically or 1/4" horizontally.

Initiate Affected Construction Operations at the point closest to the existing structures and buildings. Cease operations and inform the RE if the vibration levels monitored by the seismographs during any Affected Construction Operations exceed a peak particle velocity as noted above or if displacement limits exceed those noted above. The RE will then perform an initial inspection of the portion of the structure or buildings adjacent to the Contractor's operations. If no indication of significant damage is found, i.e. noticeable deformation, that may cause damage to the structure or buildings, or observed damage to the structure or buildings, the Contractor may resume operations at the direction of the RE.

If it is determined within 48 hours of monitoring Affected Construction Operations that there is imminent or actual observed damage to the structures or buildings, cease construction operations. The Contractor shall propose and evaluate modifications to his operations and/or the existing structures or buildings to mitigate damage to the adjacent structures and buildings and submit the proposed changes to the RE for review and acceptance before resuming operations.

Vibration and movement monitoring shall be performed daily for the full duration of the Affected Construction Operations or as otherwise directed by the RE. The results of the monitoring shall be reported to the RE daily or as otherwise directed by the RE.

In the event that the Contractor does not follow the vibration monitoring and control provisions described above, then he shall be responsible for the cost of any necessary repairs to the existing structures.

D. Post-Construction Inspection.

After the project has reached Substantial Completion, perform a detailed post-construction inspection of the existing structures and buildings and report the findings to the RE. Obtain permission to enter the building(s) as needed for the purposes of taking photographs and measurements, performing a visual inspection and assessing the post-construction condition of the building. Perform a detailed post-construction inspection of the inside and outside of those building(s) in the same areas of the pre-construction inspection. The post-construction inspection report shall be 8-1/2 × 11-inch format including an index, names and responsibilities of the inspection party, notes and 4 × 6-inch color prints of photographs with date and location captions. The report shall include:

1. Any change or damage or the absence of change or damage to the structures and buildings,
2. Photographs of any change or damage or the absence of any change or damage,
3. In the case of change or damage, note the cause and the remedial action to be undertaken, and
4. All other results of the monitoring program.

Seven color copies of the report shall be submitted to the RE a maximum of 10 days after affected construction operations. The Contractor shall be responsible for any damage caused by his activities.

162.03 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item

VIBRATION MONITORING

Pay Unit

LUMP SUM

DIVISION 200 – EARTHWORK

SECTION 201 – CLEARING SITE

201.03.01 Clearing Site

THE FOLLOWING IS ADDED:

Dispose of material and debris as specified in 201.03.09.

201.03.02 Clearing Site, Bridge and Clearing Site, Structure

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH.

For Structure No. 0904-152, remove the existing superstructure with the exception of two utility support girders at the Summit Ave. intersection. Remove portions of the existing substructure elements as shown on the Plans. Temporarily brace all elements to assure lateral stability as attached elements are removed. This includes but is not limited to columns, floorbeams, stringers, major truss and cross-girder elements.

For Structure No. 0904-152, where removals are related to the existing rock line, obtain the elevations of the line from the existing subsurface exploration data.

Only the following equipment is permitted for the work:

1. **Pneumatic or Electric Equivalent Hand Operated Hammers.**
 - a. When demolishing concrete not closer than 6 inches to structural members: hammers weighing no more than 90 lbs (exclusive of bit), equipped only with chisel point bits.
 - b. When demolishing concrete within 6 inches of structural members: hammers weighing no more than 30 lbs (exclusive of bit).
2. **Saw Cutters.**
 - a. When cutting concrete within 6 inches of structural members: concrete cutters and concrete saws. While using water in the cutting operation, provide shielding beneath the cutting operation to prevent water leakage. Continuously collect slurry and dispose of as specified in 201.03.09. Ensure that the slurry does not enter the structure or highway drainage system.
3. **Hydraulic Breakers.** Ram-hoe type breakers, hydraulic breakers, and demolition shears may be used with the following restrictions:
 - a. Submit required data to the RE for Department's analysis of stresses induced to the girders.
 - b. Delineate the centerline and limits of the top flange of girders before the equipment operation.
 - c. Do not use equipment within 6 inches of the delineated flanges.
 - d. Do not pull or twist the reinforcement steel.
4. **Hydraulic Splitters.** Hydraulic splitters.
5. **Other Equipment.** Obtain RE approval before use.

THE FOLLOWING IS ADDED AFTER THE FOURTH PARAGRAPH:

For Structure No. 0904-151 (Conrail Viaduct), monitor the portions of the existing substructure scheduled to remain for damage during removal activities. Before beginning removal activities at Structure No. 0904-151 (Conrail Viaduct), submit photos to the RE of each pier and wall showing the full length of every crack. Submit close-up photos of each concrete pedestal. Label each photo with location. Maintain one set of photos for reference. Monitor the substructure twice daily during demolition activities. Immediately report all changes in condition to the RE.

For Structure No. 0904-152 (Hoboken Viaduct), perform vibration monitoring as specified in Section 162.

THE FOLLOWING IS ADDED:

The procedure is described below:

- 1. Prestressed Concrete Stringers and Concrete Diaphragms.** Repair damage to prestressed concrete stringers and concrete diaphragms using nonshrink grout conforming to Subsection 903.08 before deck placement.
- 2. Steel Stringers, Floorbeams, Cross Frames, and Diaphragms.**
 - a. Repair procedures to tensile components in conformance with ASTM A 6/A 6M and the following:
 - 1 Repair gouges up to 1/8 inch by grinding flush in the direction of principal stress.
 - 2 Repair gouges deeper than 1/8 inch by first grinding; then, depositing weld metal and grinding flush with the surface of the metal in the direction of principal stress. Weld using low hydrogen electrodes conforming to current AWS Specifications A5.1 and A5.5.
 - 3 Repair kinks and deformations by flame straightening or a combination of flame straightening and jacking. Ensure flame straightening is performed by personnel having a minimum of three years of documented experience. Submit the names of the personnel to the RE for review and approval prior to performing the work.
 - b. Repair procedures to compression components for kinks and deformations as outlined in 2.a (3) above. Where more than five percent of the cross-sectional area of the member is damaged, submit a repair procedure to the RE for review and approval.

Clean and paint exposed existing top flanges of beams with prime coat as specified in Subsection 554.03.

Design temporary decking to withstand HS-20 loading and according to *AASHTO Standard Specifications for Highway Bridges*. Ensure temporary decking has a nonskid surface. Submit working drawings for approval. Indicate materials specifications for the decking and coatings on the working drawings. Design and install temporary decking to ensure it does not move when open to traffic or as a result of snow removal.

201.03.04 Removing Underground Storage Tanks

THE THIRD PARAGRAPH, SUBPART 2, LAST PARAGRAPH IS CHANGED TO:

Before backfilling, remove and dispose of contaminated water not associated with ground water. If directed, immediately backfill the excavated hole as required per N.J.A.C. 7:26E and obtain documentation for the quality of the fill. In addition, provide certification stating that it is virgin material from a commercial or noncommercial source or decontaminated recycled soil. Backfill the excavation as specified in 201.03.07.5 but use certified clean fill as noted above.

201.04 MEASUREMENT AND PAYMENT

THE FOLLOWING IS ADDED:

The Department will not make payment for the Item CLEARING SITE in excess of \$500,000 until Completion.

The Department will not make payment for the Item CLEARING SITE, BRIDGE (Structure No. 0904-152) in excess of \$19,100,000 until Substantial Completion.

The Department will make payment of thirty-five percent of the price bid (or \$6,685,000, whichever is less) for the Item CLEARING SITE, BRIDGE (Structure No. 0904-152) upon acceptance of Phase 2 demolition.

The Department will make payment of thirty-five percent of the price bid (or \$6,685,000, whichever is less) for the Item CLEARING SITE, BRIDGE (Structure No. 0904-152) upon acceptance of Phase 3 demolition.

The Department will make payment of thirty percent of the price bid (or \$5,730,000, whichever is less) for the Item CLEARING SITE, BRIDGE (Structure No. 0904-152) upon acceptance of Phase 4 demolition.

The Department will not make payment for the Item CLEARING SITE, BRIDGE (Structure No. 0904-151) in excess of \$600,000 until Substantial Completion.

The Department will make payment of thirty-five percent of the price bid (or \$210,000, whichever is less) for the Item CLEARING SITE, BRIDGE (Structure No. 0904-151) upon acceptance of Phase 1 demolition.

The Department will make payment of sixty-five percent of the price bid (or \$390,000, whichever is less) for the Item CLEARING SITE, BRIDGE (Structure No. 0904-151) upon acceptance of Phase 2 demolition.

SECTION 202 – EXCAVATION

202.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This section also describes the requirements for furnishing, installing, and testing rock dowels at the locations indicated on the Plans and as directed by the RE.

202.02 MATERIALS

THE FIRST IN THE LIST IS CHANGED TO:

Coarse Aggregate (No. 57, or 67)..... 901.03

THE FOLLOWING IS ADDED TO LIST OF MATERIALS:

Non-Shrink Grout..... 903.08.02.A

Reinforcement Steel..... 905.01

THE FOLLOWING IS ADDED:

Provide rock dowels consisting of Grade 60 galvanized reinforcement steel.

Handle and store rock dowel steel in such a manner as to avoid damage or corrosion. Damage to the rock dowel steel as a result of abrasion, cuts, nicks, weld, or weld splatter will be cause for rejection by the RE.

Protect rock dowel steel from dirt, rust, and deleterious substances. Galvanize all exposed parts of the rock dowel. Pint cut dowel ends with a cold galvanizing compound.

202.03.03 Excavating Unclassified Material

A. Excavating.

THE FIRST PARAGRAPH IS CHANGED TO:

The Department, as the generator, is solely responsible for the designation of excavated material. Unclassified excavation consists of excavation and management of material of whatever nature encountered, except for regulated material, pavement removal and acid producing soil.

2. Foundation and Bridge Areas.

THE FOLLOWING IS ADDED:

Blasting is not allowed.

- a. Excavation Work Plan.** Excavation means and methods shall be selected by Contractor. Submit a work plan at least 30 days before commencing the excavation. Include the following information in the Excavation Work Plan:

1. Site plan with the limits of the work area and the locations of nearest residential, commercial or other structures within 150 feet from the limits of the excavation area for abutment reconstruction, column construction, and precast concrete culvert channel construction.
2. Details of means and methods for excavating soil and rock, including mechanical excavation, drilling and splitting, percussion tools, boulder breaking, etc.
3. Qualifications of the personnel performing rock excavation per the methods proposed by the Contractor. Qualifications include documentation with project descriptions of successful experience performing excavation with the proposed method on at least 3 similar projects in the last 6 years.
4. Plans and sections of excavation showing sequencing, staging, and means of excavation. Survey as-built excavation limits during course of work and submit to RE for review.
5. List of equipment and materials to be used, including manufacturer data sheets.

6. Work sequencing information and schedule.
7. Means of protecting existing remaining structures, adjacent property (if applicable), and finished work.
8. Safety plan for personnel and public.

3. Rock Areas.

THE THIRD PARAGRAPH AND SUBSEQUENT BLASTING OPERATION PROVISIONS ARE REPLACED WITH THE FOLLOWING:

If it is determined that in-place stabilization is required, use rock bolting or other stabilization techniques as directed. Before excavating, remove existing overburden to the top of rock. Take necessary precautions in excavating operations to preserve the rock remaining in the specified finished slope in a natural undamaged condition. Blasting is not allowed. Include methods for excavating rock in the Excavation Work Plan described in 202.03.03.A.2.

- a. **Vibration Monitoring.** Perform vibration monitoring as specified in Section 162.
- b. **Test Sections.** Before commencing full-scale rock excavation operations, demonstrate the adequacy of the proposed method by excavating short test sections, up to 30 feet in length. The RE may direct additional test sections when field conditions warrant. Do not excavate ahead of the test area until the test section has been excavated and the results evaluated. If the results of the test excavations are unsatisfactory, revise methods to achieve the required results. Unsatisfactory excavation results include an excessive amount of fragmentation beyond the lines and grade shown, excessive flyrock, or violation of other requirements.

If, at any time during the progress of the work, the methods of excavation do not produce the desired result of a uniform slope and shear face, excavate in short sections, not exceeding 30 feet long, until a technique is arrived at that produces the desired results.

- c. **Code, Permits, and Regulations.** The Contractor shall comply with all applicable laws, rules, ordinances and regulations of the Federal Government, the State of New Jersey, and the City of Jersey City. All labor, materials, equipment and services necessary to make the excavation operations comply with such requirements shall be provided without additional cost to the State. The Contractor shall obtain and pay for all permits and licenses required to complete the work of this Section.

202.03.04 Excavating Regulated Material

3. Temporarily Storing.

THE FIRST PARAGRAPH IS CHANGED TO:

Temporarily store regulated or hazardous material in stockpiles within the Project Limits and as shown on the Plans. Construct stockpiles on polyethylene sheeting. Contain stockpiles with haybales or silt fence placed continuously at the perimeter of the stockpiles. For hazardous material, if a stockpile area is not available within the Project Limits, sample and analyze materials in-situ for disposal. Excavate and place the hazardous regulated material directly into trucks, and haul it directly to the approved disposal facility.

THE FOLLOWING IS ADDED:

202.03.10 Rock Dowels

- A. **General.** This work consists of furnishing, installing, and testing rock dowels at the locations indicated on the Plans and as directed by the RE. Ensure rock dowels are galvanized continuous reinforcement steel bars (minimum Grade 60 bar) inserted in boreholes drilled into rock. Fill boreholes with cement grout using a tremie pipe prior to insertion of the bars. When installed as rock dowels, the bars are not tensioned. Install rock dowels in accordance with the Plans and as directed by the RE.
- B. **Reference.** Review the subsurface survey (boring logs). The subsurface information presented in the subsurface survey is for information only and shall not be interpreted as a warranty of subsurface or environmental conditions.
- C. **Applicable Standards and Specifications.** The most recent versions of the cited standards and specifications shall be used to govern the quality of work and materials:

ASTM A 36	Standard Specification for Structural Steel
ASTM A 123	Zinc (Hot-Dip Galvanized) Coatings for Iron and Steel Products
ASTM A153	Zinc (Hot-Dip Galvanized) Coatings for Iron and Steel Hardware
ASTM C 109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
ASTM C 150	Standard Specifications for Portland Cement
ASTM C 452	Standard Test Method for Potential Expansion of Portland Cement Mortars Exposed to Sulfate
ASTM E 329	Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction

D. Submittals.

1. **Qualification and Experience.** All work shall be performed by a contractor experienced in the installation of rock dowels. The Contractor shall have the following qualifications, and shall submit evidence of these qualifications to the Department at least 30 days before beginning the work.
 1. At least 3 years experience within the last 5 years with permanent rock dowel installations of similar type and complexity.
 2. Completed not less than 3 successful permanent rock dowel projects of similar type and complexity within the last 3 years.
 3. The Contractor will not be allowed to perform this work until the qualifications and experience statements are submitted.
2. **Work Plan.** Not less than two weeks prior to beginning rock doweling, submit a detailed work plan for the rock doweling. The plan shall include:
 1. The proposed construction sequence and schedule.
 2. The proposed drilling method and equipment.
 3. The proposed drill hole diameter and basis for selecting the diameter.
 4. The proposed steel for the rock dowel.
 5. The proposed corrosion protection for the rock dowel system.
 6. The proposed non-shrink grout from the QPL.

Work shall not begin until the appropriate submittals have been approved in writing by the RE.

3. **Field Reports.** Submit a field report on a daily basis to the RE for approval. The field report shall include the location and description of dowels installed, the length of dowel, installation angle and direction.

E. Construction Requirements.

1. **General.** Submit Work Plan and Schedule for approval prior to the beginning of work. Proceed according to the approved Work Plan and schedule submitted by the Contractor prior to the beginning of work.
2. **Drilling.** The orientation of the drill hole shall be as shown on the Plans. The dowels shall be installed within 5 degrees of the specified angle. Flush the drill hole of all drill cuttings and debris with compressed air prior to the installation of the rock dowel.

Holes drilled for rock doweling in which dowel installation is considered by the RE to be unacceptable or impractical shall be re-drilled at the Contractor's expense.

3. **Grout Mixing.** Mix and place non-shrink grout according to the manufacturer's recommendations. Grout may be pumped or fed by gravity into the tremie pipe or grout tube. Grout containing lumps or that has been in the grout mixer for more than 30 minutes shall not be used. Flush the drill hole of all drill cuttings and debris with compressed air prior to grout installation.
4. **Dowel Installation.** Tremie neat cement grout into hole with tremie pipe at the toe of the hole. Fill hole with grout while withdrawing tremie pipe at a rate such that the bottom of the tremie pipe remains at or below the rising grout surface.

For all dowel bar installations, the annular space between the dowel and the drill hole perimeter in the completed installation shall be completely filled with cement grout over the full depth of the hole. Sufficient grout shall be used such that, at a minimum, a small amount of grout extrudes from the collar of the hole when

the dowel is inserted to ensure that no voids are left around the bar. The quantity of grout that is required to fill each dowel hole will vary, and is highly dependent on geological conditions.

5. **Rock Dowel Testing.** Perform proof loading on 10 percent of the installed rock dowels to verify the Contractor's installation methods and design assumptions. Provide calibration certificates for the test equipment before testing. Perform all testing in the presence of the RE. Tension test the rock dowels according to ASTM E488 to 90 percent of the yield strength of the dowel bars. If the location of the dowel bars precludes the proof loading of rock dowels according to ASTM E 488, propose an alternate testing method to the RE for approval. Repair all spalls or cracks caused by the testing. All test data shall be recorded by the Contractor and submitted to the RE.

202.02 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM IS ADDED:

<i>Item</i>	<i>Pay Unit</i>
ROCK DOWEL	UNIT

THE FOLLOWING IS ADDED:

Based on satisfactory performance in proof loading, the RE will approve the rock dowels. The RE will reject the rock dowel installation for failure to conform to the proof loading requirements. A test dowel shall be considered acceptable when a pull-out failure does not occur during testing. The pull-out failure will be defined as the continued pull-out movement of the dowel during the application of the test load. With the approval of the RE, replace the rock dowel installation by using larger size dowel or increasing the embedment depth.

SECTION 203 – EMBANKMENT

203.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This Section also describes the requirements for furnishing and installing flowable fill.

203.02.01 Materials

THIS SUBPART IS CHANGED TO:

Provide materials as specified:

Soil Aggregate (I-7, I-9, I-10, I-11, I-13, and I-14)..... 901.11

THE FOLLOWING IS ADDED:

Provide flowable concrete fill that conforms to the requirements of Section 903 and the following table:

Requirements for Flowable Concrete Fill	
Property/Component	Type C
Cement (lb/cy)	150 to 200
Fly Ash (lb/cy)	300
Fine Aggregate (lb/cy)	2600
Slump (inches)	3 to 7
Density (pcf)	125
Compressive Strength @ 3-days (psi)	300
Compressive Strength @ 28-days (psi)	2400

203.02.02 Equipment

THE FOLLOWING IS ADDED TO THE LIST OF EQUIPMENT:

ROUTE 139
PULASKI CONTRACT 2

Concrete Batching Plant.....	1010.01
Concrete Trucks.....	1010.02

203.03.01 Constructing Embankment

THE FOLLOWING IS ADDED AFTER THE EIGHTH PARAGRAPH:

Construct forms as necessary to contain the flowable fill. Design and provide temporary supports, shoring and bracing necessary to protect existing structures to remain during placement of the flowable fill. Submit working drawings of temporary protection for approval. Place flowable fill according to the limitations specified in 504.03.02.C. Place flowable fill to minimize handling. Drill 6-inch diameter cores through the entire thickness of the concrete pavement to place the flowable fill. Use a water-cooled, diamond-tipped, masonry-type drill bit capable of drilling through the entire pavement thickness. Protect flowable fill as specified in 504.03.02.I. After flowable fill operations, use a quick-setting patch to fill the hole flush with the adjacent pavement surface.

For Structure No. 0904-152, place flowable concrete fill behind retaining structure modifications, reconstructed abutments, and reconstructed headblocks, and at the Oakland Avenue utility room, in 2-foot maximum lifts as indicated on the Plans. Allow a minimum 24 hours between pouring of lifts

203.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
FLOWABLE CONCRETE FILL	CUBIC YARD

DIVISION 400 – PAVEMENTS

SECTION 401 – HOT MIX ASPHALT (HMA) COURSES

401.02.01 Materials

EMULSIFIED ASPHALT UNDER TACK COAT IS REVISED TO:

Emulsified Asphalt, Grade RS-1, CRS-1, SS-1, SS-1h, Grade CSS-1 or CSS-1h902.01.03

401.02.02 Equipment

THE LAST PARAGRAPH IS CHANGED TO:

When an MTV is used, install a paver hopper insert with a minimum capacity of 14 tons in the hopper of the HMA paver.

401.03.01 Preparing Existing Pavement

A. Milling of HMA.

Stage	Max. time interval allowed
All stages	Milled areas are not permitted to be open to traffic.

THE FOLLOWING IS ADDED AFTER THE FOURTH PARAGRAPH:

Sawcut at the limit of paving in driveways and at other limits requiring a neat edge between new and existing HMA.

D. Repairing HMA Pavement.

THE ENTIRE TEXT IS CHANGED TO:

If potholes are discovered, notify the RE immediately. The RE may immediately direct repairs of small areas. The RE may require further evaluation of a large area to determine the need for additional milling and paving.

Sawcut existing HMA pavement to a maximum depth of 10 inches, or to the full depth of bound layers, whichever is less. Sawcut lines parallel and perpendicular to the roadway baseline and 3 inches away, at the closest point, from the damaged area to be repaired.

Remove damaged and loose material to a depth of at least 3 and no more than 10 inches below the level of milling within the boundary of the sawcuts to form rectangular openings with vertical sides. Shape and compact the underlying surface to produce a firm, level base. Ensure that the remaining pavement is not damaged.

Apply polymerized joint adhesive or tack coat to the vertical surfaces of the openings. Spread and grade HMA in the opening as directed by the RE. Ensure that the temperature of the HMA when placed is at least 250 °F, and compact as specified in 401.03.03.F. Compact areas not accessible to rollers with a flat face compactor. Compact until the top of the patch is flush with the adjacent pavement surface.

Reuse removed material as specified in 202.03.07.A.

401.03.02 Tack Coat and Prime Coat

TABLE 401.03.02-1 IS CHANGED TO:

Table 401.03.02-1 Tack Coat Application			
Material	Spraying Temp, °F	Gallons per Square Yard	Season
Cut-Back Asphalt:			
RC-70	120 to 190	0.05 to 0.15	Oct 15 to Apr 15
Emulsified Asphalt:			
RS-1	70 to 140	0.05 to 0.15	All year
CRS-1	125 to 185	0.05 to 0.15	All year

SS-1, SS-1h	70 to 140	0.05 to 0.15	All year
CSS-1, CSS-1h	70 to 140	0.05 to 0.15	All year

TABLE 401.03.02-2 IS CHANGED TO:

Table 401.03.02-2 Prime Coat Application			
Cut-Back Asphalt	Spraying Temp, °F	Gallons per Square Yard	Season
MC-30	85 to 150	0.1 to 0.5	Oct 15 to Apr 15
MC-70	120 to 190	0.1 to 0.5	Oct 15 to Apr 15
Emulsified Asphalt:			
CSS-1	70 to 140	0.1 to 0.50	All year

401.03.03 HMA Courses

D. Transportation and Delivery of HMA.

THE FIRST PARAGRAPH IS CHANGED TO:

Deliver HMA using HMA trucks in sufficient quantities and at such intervals to allow continuous placement of the material. Do not allow trucks to leave the plant within 1 hour of sunset unless nighttime lighting is provided as specified in 108.06. The RE will reject HMA if the HMA trucks do not meet the requirements specified in 1009.02. The RE will suspend construction operations if the Contractor fails to maintain a continuous paving operation. Before the truck leaves the plant, obtain a weigh ticket from a fully automatic scale. Before unloading, submit for each truckload a legible weigh ticket that includes the following:

1. Name and location of the HMA plant.
2. Project title.
3. Load time and date.
4. Truck number.
5. Mix designation.
6. Plant lot number.
7. Tare, gross, and net weight.

E. Spreading and Grading.

THE THIRD PARAGRAPH IS CHANGED TO:

The use of an MTV is optional for the construction of intermediate and surface course in the traveled way. If an MTV is used, ensure that the MTV independently delivers HMA from the HMA trucks to the HMA paver. Operate the MTV to ensure that the axle loading does not damage structures, roadway, or other infrastructure.

H. Air Void Requirements.

THE FOLLOWING IS ADDED AFTER THE THIRD PARAGRAPH:

If areas of existing shoulders are found to be insufficient to support the proposed HMA pavement and the required compaction cannot be achieved, notify the RE immediately. The RE may either direct additional milling and paving to provide a suitable base to pave the proposed HMA or waive coring and air void requirements in such shoulder areas.

J. Ride Quality Requirements.

THIS ENTIRE SUBPART IS CHANGED TO:

The Department will not test the longitudinal profiles of the final riding surface for pay adjustment.

401.03.05 Core Samples

THE LAST SENTENCE OF THE 2ND PARAGRAPH IS CHANGED TO THE FOLLOWING:

Apply an even coating of tack coat to sides of the hole. Place HMA in maximum lifts of 4 inches in the hole and compact each lift. Ensure that the final surface is 1/4 inch above the surrounding pavement surface.

401.04 MEASUREMENT AND PAYMENT

THE FOLLOWING IS ADDED:

The Department will make a payment adjustment for HMA air void quality by the following formula:

$$\text{Pay Adjustment} = Q \times \text{BP} \times \text{PPA}$$

Where:

BP = Bid Price

Q= Air Void Lot Quantity

PPA= air void PPA as specified in 401.03.03H.

The Department will make a payment adjustment for HMA thickness quality by the following formula:

$$\text{Pay Adjustment} = Q \times \text{BP} \times \text{PPA}$$

Where:

BP = Bid Price

Q= Thickness Lot Quantity

PPA= thickness PPA as specified in 401.03.03I

The Department will make a payment adjustment for HMA ride quality, as specified in 401.03.03J.

SECTION 404 – STONE MATRIX ASPHALT (SMA)

404.03.01 SMA

H. Air Void Requirements.

THIS PART IS CHANGED TO:

Drill cores as specified in 401.03.05.

Mainline lots are defined as the area covered by a day's paving production of the same job mixed formula between 1000 and 4000 tons for the traveled way and auxiliary lanes. The RE will combine daily production areas less than 1000 tons with previous or subsequent production areas to meet the minimum lot requirements. When the maximum lot requirement is exceeded in a day's production, the RE will divide the area of HMA placed into 2 lots with approximately equal areas.

Ramp pavement lots are defined as approximately 10,000 square yards of pavement in ramps. The RE may combine ramps with less than the minimum area into a single lot. If 2 or more ramps are included in a single lot, the RE will require additional cores to ensure that at least 1 core is taken from each ramp.

Other pavement lots are defined as approximately 10,000 square yards of pavement in shoulders and other undefined areas.

The ME will calculate the percent defective (PD) as the percentage of the lot outside the acceptable range of 2 percent air voids to 7 percent air voids. The acceptable quality limit is 10 percent defective. For lots in which PD < 10, the Department will award a positive pay adjustment. For lots in which PD > 10, the Department will assess a negative pay adjustment.

The ME will determine air voids from 5 cores taken from each lot in random locations. The ME will determine air voids of cores from the values for the maximum specific gravity of the mix and the bulk specific gravity of the core. The ME will determine the maximum specific gravity of the mix according to NJDOT B-3 and AASHTO T 209, except that minimum sample size may be waived in order to use a 6-inch diameter core sample. The ME will determine the bulk specific gravity of the compacted mixture by testing each core according to AASHTO T 331.

The ME will calculate pay adjustments based on the following:

1. Sample Mean (\bar{X}) and Standard Deviation (S) of the N Test Results (X_1, X_2, \dots, X_N).

$$\bar{X} = \frac{(X_1 + X_2 + \dots + X_N)}{N}$$

$$S = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_N - \bar{X})^2}{N - 1}}$$

2. **Quality Index (Q).**

$$Q_L = \frac{(\bar{X} - 2.0)}{S}$$

$$Q_U = \frac{(7.0 - \bar{X})}{S}$$

3. **Percent Defective (PD).** Using NJDOT ST for the appropriate sample size, the Department will determine PD_L and PD_U associated with Q_L and Q_U , respectively. $PD = PD_L + PD_U$
4. **Percent Pay Adjustment (PPA).** Calculate the PPA for traveled way and ramp lots as specified in Table 401.03.03-3.

Table 404.03.01-1 PPA for Mainline Lots and Ramp Lots		
	Quality	PPA
Surface	$PD < 10$	$PPA = 4 - (0.4 PD)$
	$10 \leq PD < 30$	$PPA = 1 - (0.1 PD)$
	$PD \geq 30$	$PPA = 40 - (1.4 PD)$
Intermediate and Base	$PD < 30$	$PPA = 1 - (0.1 PD)$
	$PD \geq 30$	$PPA = 40 - (1.4 PD)$

Calculate the PPA for other pavement lots as specified in Table 401.03.03-4.

Table 404.03.01-2 PPA for Other Pavement Lots		
	Quality	PPA
All Courses	$PD < 50$	$PPA = 1 - (0.1 PD)$
	$PD \geq 50$	$PPA = 92 - (1.92 PD)$

5. **Outlier Detection.** The ME will screen all acceptance cores for outliers using a statistically valid procedure. If an outlier is detected, replace that core by taking an additional core at the same offset and within 5 feet of the original station. The following procedure applies only for a sample size of 5.
- The ME will arrange the 5 core results in ascending order, in which X_1 represents the smallest value and X_5 represents the largest value.
 - If X_5 is suspected of being an outlier, the ME will calculate:

$$R = \frac{X_5 - X_4}{X_5 - X_1}$$

- If X_1 is suspected of being an outlier, the ME will calculate:

$$R = \frac{X_2 - X_1}{X_5 - X_1}$$

- If $R > 0.642$, the value is judged to be statistically significant and the core is excluded.
6. **Retest.** If the initial series of 5 cores produces a percent defective value of $PD \geq 30$ for mainline or ramp lots, or $PD \geq 50$ for other pavement lots, the Contractor may elect to take an additional set of 5 cores at random

locations chosen by the ME. Take the additional cores within 15 days of receipt of the initial core results. If the additional cores are not taken within the 15 days, the ME will use the initial core results to determine the PPA. If the additional cores are taken, the ME will recalculate the PPA using the combined results from the 10 cores.

7. **Removal and Replacement.** If the final lot PD ≥ 75 (based on the combined set of 10 cores or 5 cores if the Contractor does not take additional cores), remove and replace the lot and all overlying work. The replacement work is subject to the same requirements as the initial work.

404.04 MEASUREMENT AND PAYMENT

THE FOLLOWING IS ADDED:

The Department will make a payment adjustment for HMA air void quality by the following formula:

$$\text{Pay Adjustment} = Q \times BP \times PPA$$

Where:

BP = Bid Price

Q= Air Void Lot Quantity

PPA= air void PPA as specified in 401.03.03H.

The Department will make a payment adjustment for HMA thickness quality by the following formula:

$$\text{Pay Adjustment} = Q \times BP \times PPA$$

Where:

BP = Bid Price

Q= Thickness Lot Quantity

PPA= thickness PPA as specified in 401.03.03I

The Department will make a payment adjustment for HMA ride quality, as specified in 401.03.03J

THE FOLLOWING SECTION IS ADDED TO DIVISION 400:

SECTION 406 – HIGH PERFORMANCE THIN OVERLAY (HPTO)

406.01 DESCRIPTION

This Section describes the requirements for constructing high performance thin overlay (HPTO).

406.02 MATERIALS

406.02.01 Materials

Provide materials as specified:

Tack Coat:

Emulsified Asphalt, Grade RS-1, SS-1, SS-1h, Grade CSS-1 or CSS-1h902.01.03

HPTO 902.08

406.02.02 Equipment

Provide equipment as specified:

Materials Transfer Vehicle (MTV)1003.01

HMA Paver.....1003.03

Ultra-Thin Paver1003.04

HMA Compactor1003.05

HMA Plant1009.01

HMA Trucks.....1009.02

406.03 CONSTRUCTION

406.03.01 High Performance Thin Overlay (HPTO)

- A. **Paving Plan.** At least 20 days before the start of placing the HPTO, submit a detailed plan of operation to the RE for approval as specified in 401.03.03.A.
- B. **Weather Limitations.** If within the 3 hours before paving the National Weather Service locally forecasts a 50 percent chance or greater of precipitation during the scheduled placement, postpone the placement of HPTO. Do not place HPTO if it is precipitating and do not allow trucks to leave the plant when precipitation is imminent. The Contractor may resume paving operations when the chance of precipitation is less than 50 percent and the surface is dry.

Do not pave if the surface temperature of the underlying pavement is below 50 °F.

- C. **Test Strip.** At least 14 days prior to production of the HPTO, construct a test strip as specified in 401.03.03.C except for the allowance to continue paving. Submit test strip results to the RE. The RE will analyze the test strip results in conjunction with the ME's results from the HMA plant to approve the test strip. Do not proceed with production paving until receiving written permission from the RE.

If paving HPTO only on a bridge deck, then the test strip is not required.

- D. **Transportation and Delivery of HMA.** Transport and deliver HMA as specified in 401.03.03.D.
- E. **Spreading and Grading.** Do not start paving of the HPTO until the RE has approved the underlying surface. Apply tack coat as specified in 401.03.02. Place HPTO at the laydown temperature recommended by the supplier of the asphalt binder or the supplier of the asphalt modifier without exceeding 330 °F maximum discharge temperature. Spread and grade HPTO as specified in 401.03.03.E. Do not exceed the maximum lift thickness of 1 ¼".
- F. **Compacting.** Compact as specified in 401.03.03.F. If vibratory compaction causes aggregate breakdown, forces liquid asphalt to the surface or creates a surface with undesirable ride quality, then operate rollers in static mode only. If compacting HPTO on a bridge deck, then operate rollers in static mode only.
- G. **Opening to Traffic.** Remove loose material from the traveled way before opening to traffic. Do not allow construction equipment or traffic on the HPTO until the mat cools to a temperature of less than 140 °F.
- H. **Air Void Requirements on Roadway.** Mainline lots are defined as the area covered by a day's paving production of the same job mixed formula between 500 and 2000 tons for the traveled way and auxiliary lanes. The RE will combine daily production areas less than 500 tons with previous or subsequent production areas to meet the minimum lot requirements. When the maximum lot requirement is exceeded in a day's production, the RE may divide the area of HMA placed into 2 lots with approximately equal areas.

Ramp pavement lots are defined as approximately 10,000 square yards of pavement in ramps. The RE may combine ramps with less than the minimum area into a single lot. If 2 or more ramps are included in a single lot, the RE will require additional cores to ensure that at least 1 core is taken from each ramp.

Other pavement lots are defined as approximately 10,000 square yards of pavement in shoulders and other undefined areas.

The ME will calculate the percent defective (PD) as the percentage of the lot outside the acceptable range of 2 percent air voids to 7 percent air voids. The acceptable quality limit is 10 percent defective. For lots in which PD < 10, the Department will award a positive pay adjustment. For lots in which PD > 10, the Department will assess a negative pay adjustment.

The ME will determine air voids from 5 cores taken from each lot in random locations. The ME will determine air voids of cores from the values for the maximum specific gravity of the mix and the bulk specific gravity of the core. The ME will determine the maximum specific gravity of the mix according to NJDOT B-3 and AASHTO T 209, except that minimum sample size may be waived in order to use a 6-inch diameter core sample. The ME will determine the bulk specific gravity of the compacted mixture by testing each core according to AASHTO T 166.

The ME will calculate pay adjustments based on the following:

1. **Sample Mean (\bar{X}) and Standard Deviation (S) of the N Test Results (X1, X2,..., XN).**

$$\bar{X} = \frac{(X_1 + X_2 + \dots + X_N)}{N}$$

$$S = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_N - \bar{X})^2}{N - 1}}$$

2. **Quality Index (Q).**

$$Q_L = \frac{(\bar{X} - 2.0)}{S}$$

$$Q_U = \frac{(7.0 - \bar{X})}{S}$$

3. **Percent Defective (PD).** Using NJDOT ST for the appropriate sample size, the Department will determine PD_L and PD_U associated with Q_L and Q_U , respectively. $PD = PD_L + PD_U$
4. **Percent Pay Adjustment (PPA).** Calculate the PPA for traveled way and ramp lots as specified in Table 401.03.03-3.

DIVISION 500 – BRIDGES AND STRUCTURES

SECTION 501 SHEETING AND COFFERDAMS

501.02 MATERIALS

THE FOLLOWING IS ADDED:

Use materials conforming to 505.02.01 for precast concrete lagging for permanent sheeting.

Use materials conforming to 515.02 for permanent sheeting.

501.03 CONSTRUCTION

THE FOLLOWING IS ADDED:

Perform vibration monitoring in conformance with Section 162.

501.03.02 Permanent Sheeting

THE FIRST PARAGRAPH IS REPLACED WITH THE FOLLOWING:

Construct permanent sheeting in accordance with 515.03 and as shown on the Plans.

SECTION 504 – STRUCTURAL CONCRETE

504.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This section also describes the requirements for drilling of holes for dowels and the grouting of the dowels in place.

504.02.01 Materials

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS:

Non-Shrink Grout	903.08.02.A
Self Consolidating Concrete (SCC)	903.06.01
Adhesive Anchor System	906.04
Soil Aggregate (I-9)	901.11
Plastic Drainage Pipe	909.02.03
Timber	915.04

504.03.01 Reinforcement Steel

THE FOLLOWING IS ADDED:

- I. Drilling and Grouting.** Drill holes for dowels and anchor bolts at the locations and to the diameter and depth as indicated or as recommended by the adhesive anchor system manufacturer. Grout the dowels in place, using an adhesive anchor system to form a complete bond between the dowels and the concrete. Submit the proposed adhesive anchor system for approval at least 30 days before commencing the work. Include in the submittal the maximum tensile and shear capacity of the system after any applicable reductions for dowel spacing and concrete edge distance as determined by the anchoring system manufacturer. Also include the recommended embedment depth. Repair structure damage caused by dowel operations..

504.03.02 Constructing Concrete

THE FOLLOWING IS ADDED:

- K. Header Armoring.** Fabricate the structural steel components of the armoring as specified in 906.04 and as shown on the Plans and the approved working drawings. Use steel plates and concrete anchors consisting of studs welded to the steel shapes. Ensure that the fabricator is AISC certified. The ME will inspect armoring either at the fabrication shop or at the work site. Ensure that the steel shapes used in the armoring conform to AASHTO M 270,

Grade 36 or Grade 50. Ensure that shear studs conform to Section 7 of the ANSI/AWS D1.5 Bridge Welding Code. Weld structural steel as specified in 906.04.02 and as shown on the Plans and the approved working drawings. After fabrication, hot-dip galvanize the entire joint system according to ASTM A 123.

- L. Abutment Reconstruction.** Construct abutment seat and gravity wall as shown on the Plans. Pour the gravity wall in 2-foot maximum lifts. Allow at least 24 hours between lift pours. Install Soil Aggregate (I-9) behind the gravity wall as indicated on the temporary sheeting working drawings, use plywood to remain in place to facilitate installation. Install PVC sleeves in drill hole for rock dowel and extend it through the coarse aggregate layer into the gravity wall as shown on the Plans. Clean existing abutment under drain pipes in accordance with 601.03.06.
- M. Oakland Avenue Utility Room.** Fill the Oakland Avenue utility room and stairs with SCC conforming to 903.06.01. Place the SCC in 2-foot maximum lifts. Allow a minimum of 24 hours between lift pours. Submit a working drawing of the pour plan for approval in conformance with 105.05.

504.03.03 Epoxy Waterproofing

THE FOLLOWING IS ADDED:

Also apply epoxy waterproofing to abutment, column and pocket seat surfaces to the limits shown on the Plans.

504.04 MEASUREMENT AND PAYMENT

THE FOLLOWING PAY ITEM IS ADDED:

<i>Item</i>	<i>Pay Unit</i>
DRILL AND GROUT REINFORCEMENT STEEL	LINEAR FEET

THE FOLLOWING IS ADDED:

Where shown on the Plans, welded wire reinforcement shall be galvanized and will be considered incidental to the concrete Items that include the welded wire material.

The Department will measure DRILL AND GROUT REINFORCEMENT STEEL by the linear foot of hole drilled into the concrete structure or rock.

The Department will include payment for header armoring, Soil Aggregate (I-9) placed behind the north abutment gravity walls, PVC sleeves, cleaning existing abutment drain pipes, and plywood under CONCRETE ABUTMENT WALL, and CONCRETE WING WALL.

The Department will make payment for SCC at the Oakland Avenue Utility Room and Stairs under CONCRETE ABUTMENT WALL.

SECTION 505 – PRECAST AND PRESTRESSED STRUCTURAL CONCRETE

505.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This section also describes the requirements for manufacturing, furnishing, and erecting prefabricated superstructure units as shown on the Plans. Alternative prefabricated or cast in place superstructure systems may be submitted for review and approval.

505.02.01 Materials

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS:

Prefabricated Superstructure Units..... 904.05

THE FOLLOWING IS ADDED:

Use only galvanized reinforcement steel in the fabrication of the prefabricated superstructure units.

THE FOLLOWING IS ADDED:

505.03.04 Prefabricated Superstructure Units

A. Submittals. Submit the following at least 20 days before start of fabrication:

- 1. Quality Control Plan.** Submit for review and approval to the ME. In the plan, clearly define the quality control procedures, personnel, frequency of activities, and the required remedial actions.
- 2. Working Drawings.** Submit as specified in 105.05 for approval with the following information as a minimum:
 1. Plan layout, including length, width, skew angle and orientation.
 2. Concrete mix design including admixtures.
 3. Concrete surface finishes.
 4. Concrete compressive strength (stripping, lifting and rotating).
 5. Lifting details including crane placement location.
 6. Deck cross-sections showing structural depths and reinforcement.
 7. Tolerances.
 8. Reinforcement size, positioning and schedule.
 9. Camber table.
 10. Structural steel type and grade specifications.
 11. Structural steel girders and diaphragms including detail connections.
 12. Welding procedures.
 13. Cambering procedures.
 14. Calculations and drawings for closure pour forms.
- 3. Erection Plan.** Provide to the RE, 60 working days in advance of any erection, a detailed erection plan. The RE will approve the erection plan and time estimate prior to the start of any erection work. The erection plan shall include at a minimum, the following:
 1. Number and type of manpower and equipment.
 2. Shipping procedures.
 3. Lifting procedures.
 4. Erecting sequence.
 5. Temporary bracing.
 6. Manufacturer's recommendations.
 7. Procedures for employee safety.
 8. Anchorage details and design calculations, signed and sealed by a Professional Engineer.
 9. Grout placement procedures and equipment.
 10. Route used by delivery trucks.
 11. Location of storage.
 12. Estimated time for erection.

B. Rejection of Units. RE will reject individual precast units for any of the following reasons:

1. Fractures or cracks passing through the deck.
2. Camber that does not meet the requirements in the approved working drawings.
3. Honeycombed open texture.
4. Dimensions not conforming within the allowable tolerances as specified.
5. Separation of the concrete deck from the steel girders.
6. Defects that indicate proportioning, mixing and molding not in compliance with the specification as specified or indicated.
7. Damaged ends where such damage would prevent making a satisfactory joint.
8. Units with cracks within any part of the concrete that is greater than 0.03 inches in width.
9. Significant damage to the units during transportation, erection or construction.

C. Shipping and Storing. Notify the RE at least 10 days before shipping. Ship and store units according to the manufacturers' recommendations.

D. Installation. Notify the RE to schedule a pre-installation meeting at least 20 calendar days prior to the start of installation. Install units according to the approved erection plan. Ensure that a representative from the

manufacturer is present at the project site, full time, during the erection of prefabricated superstructure units to provide technical assistance to the Contractor in the event unusual problems or special circumstances arise.

1. **Erection of Units.** Do not proceed with the erection of units until all units for the structure have been delivered to the site. Install units to the correct line and grade as shown on the approved working drawings and as indicated in the approved erection plan. After all the units are erected, inspect them to ensure the correctness of their location.
 2. **Structural Steel.** Install all diaphragms and other structural steel work as shown on the Plans and approved working drawings. Transport the precast units to the construction site with the diaphragms installed.
 3. **Installation Tolerances.** Ensure adjacent units match elevation within 1/4 inch vertically along longitudinal edges and 1/4 inch vertically at the end of units. Ensure that joint widths between units are $\pm 1/2$ inch from the dimension indicated on the Plans. If the tolerances are not met, adjust the units as indicated in the procedures shown on the approved working drawings.
 4. **Filling and Sealing Longitudinal Joints.** Ensure that the surface of the joint is free of any material such as oil, grease or dirt, which may prevent bonding of the sealing materials. Prior to placement of the concrete closure pour HPC material, form the bottom of the joint flush with the bottom of the slab. Mix according to the manufacturer's directions. Place and cure in accordance with the manufacturer's recommendations. Ensure that installers are trained in the proper handling and installation of the materials as recommended by the manufacturer.
 5. **Sealing of Lifting Holes.** After the units are in their final locations, fill the lifting holes with non-shrink grout. Use a removable form at the bottom surface of the deck to retain the grout.
- E. **Loading.** Units may have construction loads applied upon erection and before the joints are sealed in accordance with the approved erection procedure. Once the joints are sealed, do not apply any load to the units until joint material has a minimum strength of 4600 psi as approved by the RE.F. **Final Repairs.** After the installation work is complete, repair remaining concrete defects, holes for inserts and lifting holes as indicated and approved by the RE.

505.04 MEASUREMENT AND PAYMENT

THE FOLLOWING IS ADDED:

<i>Item</i>	<i>Pay Unit</i>
PREFABRICATED SUPERSTRUCTURE UNITS	SQUARE FOOT

SECTION 506 – STRUCTURAL STEEL

506.02 MATERIALS

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS:

Concrete 903.03

506.03.01 Structural Steel

B. Erection Plan.

THE ENTIRE TEXT IS CHANGED TO:

At least 30 days before the pre-erection meeting, submit working drawings for certification regarding the plan of operations to the RE. Include, at a minimum, the following in the plan:

1. Number and type of manpower and equipment.
2. Shipping procedures.
3. Lifting procedures.
4. Beam erecting sequence, including method of setting bearings and diaphragms.
5. Temporary bracing.
6. Manufacturer's recommendations.

7. Procedures for employee safety.
8. Traffic control and protection.

E. Installing High-Strength Steel Bolts.

THE ENTIRE TEXT IS CHANGED TO:

Check galvanized bolts and nuts to verify that a visible lubricant is on the threads. Check black bolts and nuts to verify that they are oily to the touch.

Before beginning bolt installation, provide on the project site a Skidmore-Wilhelm calibrator or an acceptable equivalent tension measuring device. Ensure that the manufacturer's representative is present during the first full day of tensioning work to provide technical assistance.

Test assemblies as follows:

1. For bolt assemblies that do not require Direct Tension Indicators (DTI's), perform the rotational capacity test in accordance with 908.02.02.C, on 2 assemblies from each rotational-capacity lot.
2. For bolt assemblies requiring DTI's, install in accordance with the following, and perform the rotational-capacity test as specified in NJDOT S-3 on 3 assemblies from each rotational-capacity lot.

Ensure that the bolt, nut, and washer are from the same rotational-capacity lot. If the DTI is used under the nut, place an additional washer between the nut and the protrusions on the DTI. If recommended by the bolt manufacturer, the Contractor may use wax lubricant, beeswax, or a water wax emulsion to aid in installation. Hold the bolt head stationary while tightening the nut.

Install bolts in all of the holes of the connection and tighten to a snug-tight condition to compact the joint. Ensure that the number of spaces on DTIs in which a 0.005-inch feeler gauge is refused after snugging does not exceed the maximum snug-tight refusals as specified in Table 506.03.01-1. If the number of refusals exceeds the maximum, remove the assembly, insert a new DTI, and resnug.

Tighten the assemblies successively from the most rigid part of the connection to the free edges by turning the nuts while holding the bolts stationary. Tension the assemblies until the number of spaces in which the 0.005-inch thickness gauge is refused meets or exceeds the minimum final tension refusals specified in Table 506.03.01-1.

Table 506.03.01-1 Criteria for DTI Spaces for A 325 Bolts

Bolt Diameter, Inches	1/2	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2
Number of Spaces on DTIs	4	4	5	5	6	6	7	7	8
Maximum Snug Tight Refusals¹	1	1	2	2	2	2	3	3	3
Minimum Final Tension Refusals²	2	2	3	3	3	3	5	6	7

1. If the DTI is coated and under the nut, the maximum snug tight refusals is the number of spaces on the DTI minus one.
2. If the DTI is coated and under the nut, the minimum final tension refusals is the number of spaces on the DTI.

If an assembly is tightened so that there are no visible gaps remaining in any of the spaces on the DTI, the assembly has been over-tightened. Remove and replace over-tightened assemblies.

If assemblies do not meet the above rotational capacity requirements when tested at the work site, the Contractor may clean and relubricate the bolt assemblies in the rotational-capacity lot. After cleaning and relubricating, retest the assemblies for compliance to the above rotational capacity requirements.

For painted steel, apply 3 coats of an organic paint system, supplied by the same manufacturer as the originally applied inorganic zinc system, to the field bolted connections.

506.03.02 Bearings

A. Working Drawings. Submit for approval working drawings that include the following:

THE FOLLOWING IS ADDED TO THE LIST OF REQUIREMENTS:

14. Field measurements and dimensions of the existing structural steel, rivet patterns, field drilled holes and newly reamed rivet holes.

C. Installing Bearings. Install bearings as follows:

1. Anchor Bolts.

THE SECOND SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

If using anchor bolt sleeves, ensure that they are circumferentially corrugated and are galvanized steel or plastic.

506.03.03 Shear Connectors

THE FIRST PARAGRAPH IS CHANGED TO:

Ensure that shear connectors conform to Section 7 of the ANSI/AWS D1.5 Bridge Welding Code. When galvanized reinforcement steel is used in a cast-in-place bridge deck, field weld shear connectors to the beam flange and apply a prime coat of organic zinc-rich coating to the shear connectors.

506.03.06 Repair Galvanizing

THE LAST SENTENCE OF THE SECOND PARAGRAPH IS CHANGED TO:

If painting is directed, treat the galvanized surface according to the manufacturer's recommendations, then apply the epoxy intermediate and urethane finish coats only.

THE FOLLOWING IS ADDED:

506.03.07 Steel Grid Flooring

A. Description. The work of this item applies to the design and fabrication of steel grid deck at locations indicated on the Plans. Galvanize the steel grid flooring. Design to conform to Section 9.8 of the AASHTO LRFD Bridge Construction Specifications.

1. Steel Grid Flooring (Ventilator). Design grating between permanent concrete barriers (to carry pedestrian traffic only. Design these gratings for 75 psf. During and after construction, do not run construction equipment on the grating or on the concrete closure elements over the floorbeams. For the pedestrian only areas use grating that complies with the following:

- a. Galvanized and serrated grating
- b. 2.5" depth including serrations
- c. Maximum selfweight of 25 psf
- d. Maximum live load deflection of Span/400

2. Steel Grid Flooring (Sidewalk). Design grating adjacent to sidewalks to support both pedestrian loads stated above and also AASHTO HL-93 or NJDOT Permit Vehicle traffic loads, whichever governs.

- a. Galvanized and serrated grating
- b. 7" depth including serrations
- c. Maximum selfweight of 50 psf

B. Materials. Conform to the following:

1. High-Strength Bolts ASTM A325
2. Nuts ASTM A563, Grade A
3. Structural Steel ASTM A709, Grade 36
4. Washers ASTM F436
5. Steel-Grid – All Components ASTM A709, Grade 36
6. Welded, Headed Anchor Studs shall conform to Section 7 of the ANSI/AASHTO/AWS D1.5 Bridge Welding Code
7. Galvanizing to conform to 506.03.08.

C. Design and Fabrication Requirements.

1. Fabricate the steel grid in an AISC Class I fabrication shop. Galvanize the steel grid deck panels after fabrication.

2. Do not exceed 12 inch overhang of steel grid deck panels from centerline of supporting stringer to edge of panel unless the overhang is supported by another element, such as the north abutment headblock.
3. Alternate grid-to-stringer attachment methods may be submitted by the Contractor for the RE's approval.

D. Submittals. Submit design calculations and working drawings for the steel grid deck panels, signed and sealed by a Professional Engineer.

E. Construction Requirements.

1. Construct steel grid flooring as indicated on the Plans and as shown on the approved working drawings.
2. Before placing the units on the bridge floorbeams or stringers, carefully mark the location of each unit on the floorbeams and stringers as shown on the Erection Diagram.
3. Properly align and bolt the units into position on the stringers. The fabricating shop is allowed a small tolerance of 1/8 inch + with regard to all dimensions of each unit. These tolerances apply to flatness of units, sweep or bow in a horizontal direction and out-of-squareness at ends and top and crossbar alignment. Remove from units before bolting to the stringers any sweep or horizontal bow to ensure proper alignment of crossbars and preserve overall dimensions of completed deck.
4. Install the grid units in accordance with the manufacturer's instructions and as detailed on the Plans and working drawings. Provide cross bar splices between grid units by means of welds or bolts, as shown on the Plans.

506.03.08 Galvanized Steel

Hot-dip galvanize all steel in accordance with 912.02.01 except for the top of the top flange of steel members that will have studs welded in the field. Apply a prime coat of an organic zinc primer to the top flange of steel members in accordance with 906.06. Apply a two-coat paint system (intermediate and finish) to the galvanized surfaces in accordance with 906.06 with a finish color as described on the Plans. Install shear connectors in the field as described in 506.03.03. After installation, clean shear studs according to SSPC-SP1. Ensure that the number of shear connectors cleaned is not greater than the number of shear connectors that can be prime coated in the same day. Apply a prime coat of the same organic zinc primer used for the flange surface to the shear connectors before reinforcement steel is placed.

Galvanize all stringers, diaphragms, utility supports, floorbeams, and beams by single or double dipping. For floorbeams exceeding 60 feet in length and 5.5 feet height, if the galvanizing kettle dimensions or if the galvanizing facility preclude galvanizing the entire length of the floorbeams, metalize the center portion of the beam that remains uncoated after double dipping. Metalize in accordance with 912.02.05. Coordination between the galvanizing supplier and the metalizing supplier is required to ensure full compatibility. All metalizing will be at no additional cost to the Department.

506.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM IS DELETED:

<i>Item</i>	<i>Pay Unit</i>
SHEAR CONNECTOR, GALVANIZED	UNIT

THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
STEEL GRID FLOORING (VENTILATOR)	SQUARE FOOT
STEEL GRID FLOORING (SIDEWALK)	SQUARE FOOT

SECTION 507 – CONCRETE BRIDGE DECK AND APPROACHES

507.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This Section also describes the requirements for constructing high early compressive strength (HES) bridge decks and approaches where shown on the Plans. This Section also describes the requirements for placing a latex modified

concrete (LMC) overlay over the bridge deck of the Hoboken Viaduct or a rapid set latex modified concrete (RSLMC) overlay over the concrete bridge deck of the Conrail Viaduct.

507.02 MATERIALS

507.02.01 Materials

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS;

HPTO	902.08
Rebar Coupling Devices.....	905.04
Latex Emulsion Admixture for LMC	919.16

THE FOLLOWING IS ADDED AFTER THE LIST OF MATERIALS:

Use HPC-1 in closure pours.

A. High Early Strength Concrete.

Ensure that HES concrete conforms to the requirements of Class A concrete with the following exceptions:

36-hour Class Design Strength (field cure)	4200 psi
36-hour Verification Strength (standard cure)	4500 psi
36-hour Retest Limit (field cure)	4000 psi

Follow the supplier's materials recommendations for minimizing cracks in the finished, cured product. The ME will perform additional compressive strength tests during production to verify the design strength is met in 36 hours. The initial sampling rate for 36-hour tests will be the same as the initial sampling rate for 28 day compressive strength acceptance.

Concrete Items constructed with HES concrete will be considered non-pay-adjustment items.

B. Rapid Set Latex Modified Concrete.

For cement for RSLMC, provide rapid set cement manufactured by CTS Cement Manufacturing Company of Cypress, California, or approved equal. Provide rapid set cement manufactured within the past year and free from lumps.

For the latex emulsion admixture for RSLMC, provide Dow Modifier A, a styrene butadiene polymeric emulsion, by Dow Chemical USA, Functional Products and Systems Department, Midland, Michigan, or approved equal.

For RSLMC, use coarse aggregate size No. 8 with a maximum particle size of 1/2 inch but no larger than half the depth of the section to be placed, or as recommended by the rapid set cement manufacturer. Do not use carbonate rock for coarse aggregate. Do not use mineral admixtures. Chemical admixtures may be used as retarders. Provide chemical admixtures according to 903.02 and the rapid set cement manufacturer. Use only admixtures recommended by the rapid set cement manufacturer. Follow the supplier's materials recommendations for minimizing cracks in the finished, cured product.

Ensure that the concrete is uniform in composition and consistency. Ensure that mixing capability is such that placing and finishing can be accomplished in one continuous operation without any delay before the formation of the plastic surface film.

Provide other materials for RSLMC and comply with the requirements of 903.03, the provisions for Class A concrete, with the exceptions listed herein. The verification batching cylinders shall be tested for a minimum 3-hour strength of 2500 pounds per square inch and a 6-hour strength of 4000 pounds per square inch.

Produce RSLMC that conforms to the acceptance testing criteria in Table 507.02.01-1.

Table 507.02.01-1 Acceptance Requirements for RSLMC Overlay

Performance Characteristic	Test Method	Requirement
Percent Air Entrainment	AASHTO T 152	6.0 ± 2
Slump (inches)	AASHTO T 119	6 ± 2

Compressive Strength @ 6-hours (pounds per square inch, minimum)	AASHTO T 22	4000
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For compressive strength testing, the initial rate for RSLMC is 2 per lot. The retest limit is 4000 pounds per square inch. Follow the sampling and testing methods of AASHTO T 23, except air cure cylinders for compression testing.

C. Latex Modified Concrete.

For Latex Modified Concrete Overlay use Coarse Aggregate size No. 8 with a maximum ½-inch size, not to exceed one-half of the section to be placed.

Provide a latex emulsion admixture for LMC in accordance with 919.16.

Ensure that the concrete is uniform in composition and consistency. Ensure that mixing capability is such that placing and finishing can be accomplished in one continuous operation without any delay before the formation of the plastic surface film. Make a minimum of four test cylinders for compression testing for each day's placement for each mixer in accordance with AASHTO T 23. This is with the exception that the demolded cylinders are to be air cured.

Submit a mix design for approval and verification at least 45 calendar days before the planned start of the overlay placement. Verification and approval of the design mix shall include testing properties that are specified for the overlay. The compressive strength testing requirement is 4,000 pounds per square inch at 28 days. Prepare trial batches of the same materials and proportions required by the mix design that has been submitted for approval and verification. Department personnel will be present during verification batching to ensure that the proportions and ingredients batches are according to the proposed mix design. Prepare, cure, and deliver at least three tests (six cylinders) for compression testing according to AASHTO T 23 or AASHTO T 126, except that the demolded cylinders shall be delivered to the Department laboratory for testing for 7 and 28 day compressive strength.

Submit to the ME a certification of compliance as specified in 106.07 that the manufacturer of the latex emulsion admixture has verified the compatibility of the proposed cement to be used in the LMC mix.

Produce LMC that conforms to the acceptance testing criteria in Table 507.02.01-2.

Table 507.02.01-2 Acceptance Requirements for LMC Overlay

Performance Characteristic	Test Method	Requirement
Percent Air Entrainment	AASHTO T 152	6.5 max
Slump (inches)	AASHTO T 119	4.5 ±1.5
Compressive Strength @ 28-days (pounds per square inch, minimum)	AASHTO T 22	4000

Measure the slump four to five minutes after discharge from the mixer. Do not place LMC during this waiting period. For compressive strength testing, the initial rate for LMC is 2 per lot. The retest limit is 4000 pounds per square inch. Follow the sampling and testing methods of AASHTO T 23, except air cure cylinders for compression testing.

507.02.02 Equipment

THE FOLLOWING IS ADDED TO THE LIST OF EQUIPMENT:

Scarification Equipment.....	1006.09
Mobile Mixer.....	1010.03

THE FOLLOWING IS ADDED AFTER THE LIST OF EQUIPMENT:

Provide LMC and RSLMC mixers with separate fluid tanks for water, latex and admixtures. Provide mixers with positive control of the flow of water, latex and admixtures into the mixing chamber. Ensure the admixture discharge pipe is readily accessible.

Ensure LMC and RSLMC mixers prevent foreign matter or objects from entering the cement hopper during the loading process.

Calibrate mixers at intervals of at least every 100 cubic yards of LMC or RSLMC discharged.

Provide LMC and RSLMC self-propelled mixers and bulk materials handling systems of adequate capacity to accurately proportion, mix, place and properly finish at least 6 cubic yards of LMC or RSLMC per hour.

Provide fog misting equipment according to 507.03.02.F.

507.03 CONSTRUCTION

THE FOLLOWING IS ADDED:

The requirements herein also apply to Concrete Closure Pour construction.

507.03.02 Constructing Bridge Decks

A. Forms. Construct forms as follows:

2. Removable Forms.

THIS PART IS CHANGED TO:

Construct removable forms as specified in 504.03.02.B. Do not use shoring to support stringers along the span length where the superstructure, under live load and impact loads, is designed for composite action. Do not weld attachments required for placement of the removable forms to the beam.

B. Deck Placement Plan.

THE FOLLOWING IS ADDED:

In addition, for deck slabs constructed with HES concrete, at least 30 days before the start of placing bridge deck concrete, submit a separate plan of operation that also includes provisions such as temporary decking and supports in case the concrete does not meet the class design strength before the time the deck is scheduled to be reopened to traffic. Submit working drawings for approval for temporary measures. Design temporary measures according to AASHTO Standard Specifications for Highway Bridges to withstand HS-20 loading. Ensure temporary decking has a nonskid surface. Indicate materials specifications for the decking and coatings on the working drawings. Design and install temporary decking to ensure it does not move when open to traffic or as a result of snow removal.

H. Placing Deck Concrete.

THE FOLLOWING IS ADDED:

For deck slabs constructed with HES concrete, follow the supplier's recommendations for minimizing cracks in the finished, cured product.

Construct temporary ramps with HPTO to accommodate differences in elevation. Remove temporary HPTO ramps before placing overlay.

I. Deck Slab Texture Finish.

THE ENTIRE TEXT IS CHANGED TO:

Texture concrete bridge deck slabs using a broom immediately after final strike-off. Texture the concrete deck slab in a transverse direction. Clean the broom as necessary to provide a uniform texture. Provide a smooth finish within 1 foot of curbs and drainage structures. Provide a final finish on sidewalks and top of curbs with a fine-bristle broom.

J. Curing.

THE FOLLOWING IS ADDED:

For deck slabs constructed with HES concrete, within 10 minutes of texturing, apply wet burlap and white polyethylene sheeting as specified in 504.03.02.F, and maintain for at least 36 hours. Ensure that the water used for curing does not leave the bridge deck. Do not allow anything on the freshly placed concrete during the 36-hour curing period except for personnel necessary to maintain curing materials and protective measures. Post warning tape around flatwork during the curing period.

L. Saw Cut Grooved Surfacing.

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

Do not saw cut until after the Department performs Acceptance Testing as specified in Subsection 507.03.02 N.

THE FOLLOWING IS ADDED:

For Structure No. 0904-151 (Conrail Viaduct), do not saw cut the concrete bridge deck. Saw cut the overlay only. The deck slab need not be saw cut grooved finished before opening to traffic.

For Structure No. 0904-152 (Hoboken Viaduct), do not saw cut groove closure pours. Saw cut overlays and cast-in-place bridge decks only.

M. Loading the Deck.

THE FOLLOWING IS ADDED:

For deck slabs constructed with HES concrete, ensure that the deck has cured for a minimum of 36 hours before allowing anything on the freshly placed concrete. The RE may allow the Contractor to place a finishing machine on the deck 36 hours after placing concrete for the previous segment. After 36 hours, the Contractor may load a total of 80,000 pounds on the deck if the deck has attained a strength of at least 4000 pounds per square inch, as determined from 1 set of cylinders field cured according to AASHTO T 23.

N. Concrete Deck Surface Requirements.

1. Acceptance Testing.

THE FIRST PARAGRAPH IS CHANGED TO:

Construct deck slabs so that less than 9 percent of the measured length of the lot exceeds 1/8 inch tolerance in 10 feet. The ME will test the surface of concrete bridge deck slabs with a Class I Walking Profiler prior to the performance of saw cut grooved surfacing. The ME will calculate the percent defective using a rolling straight edge simulator analysis of the profiler data.

THE FOLLOWING IS ADDED:

For deck slabs constructed with HES concrete, visually inspect the overlay for cracking or other damage 7 days after placement. Seal surface cracks not exceeding 3/8-inch in depth with a low viscosity epoxy sealer or a low viscosity methacrylate monomer penetrating sealer approved by the RE. For cracks exceeding 3/8-inch in depth, submit a corrective action plan to the RE for approval, or remove and replace the affected portion. Perform corrective action at no cost to the State.

For deck slabs with two course construction, the ME will perform acceptance testing and the RE will determine acceptance and payment reductions for the overlay course only.

O. Opening to Traffic.

THE FOLLOWING IS ADDED:

For deck slabs constructed with HES concrete, do not allow vehicular traffic of any kind on the freshly poured concrete until authorized by the RE if any one of the initial 36 hour compressive strength tests fail to meet the 36 hour retest limit. If any one of the initial 36 hour compressive strength tests fails to meet the 36 hour retest limit, the RE may allow the deck to be opened to traffic using approved temporary provisions according to 507.03.03.B. The RE may make additional strength tests for the purpose of determining the time at which the deck may be opened to traffic. If any one of the compressive strength tests fails to meet the 36 hour retest limit when tested at 40 hours, open the deck to traffic using approved temporary provisions according to 507.03.03.B and remove and replace the defective work during the next available lane closure at no cost to the State.

For Structure No. 0904-151 (Conrail Viaduct), the deck slab need not be saw cut grooved finished before opening to traffic.

THE FOLLOWING IS ADDED:

P. Construction of Closure Pours. Ensure that the edges of the precast units are free of any material such as oil, grease or dirt, which may prevent bonding of the closure pour concrete. Prior to placement of the closure pour

concrete, form the bottom of the closure pour flush with the top flange of the floorbeam, place reinforcement steel, and place deck joint armoring if the closure pour is at an expansion joint.

507.03.05 Concrete Parapet and BarrierCurb

THE SECOND PARAGRAPH IS CHANGED TO:

Cure using curing compound as specified 504.03.02.F. If drilling is required for subsequent construction, allow the concrete to cure for a minimum of 14 days before drilling.

507.03.07 Concrete Bridge Approach

THE FOLLOWING IS ADDED TO THE FOURTH PARAGRAPH:

For approach slabs constructed with HES concrete, saw cut the surface after it has cured for 36 hours and has achieved a compressive strength of 4000 pounds per square inch. Follow the requirements specified in 507.03.02.O for opening to traffic except the RE may waive the requirement to implement approved temporary provisions.

THE FOLLOWING IS ADDED:

Ensure the concrete conforms to the surface requirements as specified in 507.03.02 N, except each lot will be equal to the number of cubic yards of approach concrete placed in the lane.

THE FOLLOWING IS ADDED TO THIS SECTION:

507.03.08 Rapid Set Latex Modified Concrete Overlay.

A. Overlay Placement Plan. At least 30 days before the start of placing RSLMC overlay, submit to the RE for approval a plan of operation that includes the following:

1. Method of operation.
2. Equipment description.
3. Number of mixing trucks to be used.
4. A plan for discontinuing placement and protecting the RSLMC during unfavorable weather conditions.
5. A contingency plan for interruptions of pours, work schedules, limits of pours and for protecting the overlay in the event stoppages prevent completion of the placement before opening to traffic.
6. List of material suppliers.
7. Qualifications of the personnel intended to perform the work.
8. Maintenance and protection of traffic.

In the plan, address the requirement that the RSLMC be finished, textured and covered within thirty minutes of placement on the deck. Due to the rapid setting nature of overlay, delays in placement will not be permitted.

B. Meeting. Within 14 days before the start of placing RSLMC overlay, conduct a meeting with the RE, the ME, and the rapid set cement manufacturer to discuss the plan of operation and to coordinate the overlay placement. At the meeting, address the requirements for meeting the manufacturer's timeframe recommendations for finishing, texturing and covering the RSLMC in consideration of anticipated weather conditions at the time of the work.

C. Performing the Dry Run. Perform a dry run according to the applicable provisions of 507.03.02.G to ensure the specified minimum thickness of overlay is achieved.

D. Placing Overlay. Before placing the overlay, scarify the deck according to 551.03.02. Ensure the surface is clean and free of laitance that will be detrimental to bonding by wet sandblasting, shrouded dry sandblasting with dust collectors, shot blasting, or high pressure water blasting. Scarify and clean the deck and place the overlay within the same lane closure period. Do not allow traffic on the deck after scarification. Immediately before placing the overlay, wet the clean surface for at least 1 hour. Follow the supplier's recommendations for minimizing cracks in the finished, cured product. Follow the limitations of placing concrete according to 507.03.02.F except that placing RSLMC will be prohibited below 45 °F. Ensure the RSLMC has an initial temperature above 60 °F. Brush RSLMC or slurry into the moist substrate just ahead of the pour. Ensure all vertical and horizontal surfaces are covered with an even coating. Place RSLMC as soon as possible over the brushed surface to prevent its drying out. Place the overlay according to the applicable provisions of 507.03.02.H except the timeframe required for removing and replacing the overlay due to stoppages shall be determined by the rapid set cement manufacturer based on

weather and other field conditions. Finish edges by hand. Place and finish the overlay in one continuous operation, without delay, before the formation of a plastic surface film on the overlay. Subject to the conditions of 507.03.02.F, begin fog misting immediately after placement and continue until the wet burlap is placed. Ensure an ACI certified concrete technician employed by the rapid set cement supplier is on the work site when overlay is being placed.

- E. Surface Texture Finish.** Texture the overlay according to 507.03.02.I.
- F. Curing.** Within ten minutes of striking off, apply wet burlap and white polyethylene sheeting as specified in 504.03.02.F, and maintain for at least 4 hours. Keep the burlap continuously wet for the 4-hour curing duration. Ensure that the water used for curing does not leave the bridge deck. Do not allow anything on the freshly poured concrete during the 4-hour curing period except for personnel necessary to maintain curing materials and protective measures. Post warning tape around flatwork during the curing period.
- G. Saw Cut Grooved Finish.** Saw cut the overlay during the next lane closure allowed to take place under the lane closure schedule after it has cured for 4 hours and has achieved a compressive strength of 4000 pounds per square inch, as determined from 1 set of cylinders field cured according to AASHTO T 23. Do not saw cut until after the Department performs the surface tolerance test as specified in 507.03.08 N.

Provide 2 approved gauges to the RE to verify groove depth before sawcutting. Include the manufacturer's recommendations for use with the gauges.

Cut grooves using multi-bladed sawcutting equipment fitted with diamond-tipped circular saw blades. The RE will allow the use of single blade saw equipment where necessary to complete the work, as required.

Cut grooves perpendicular or radial to the centerline of the traveled way. Radially groove in partial-width passes. Limit each pass to 1 lane width. Ensure that grooves are between 0.10 and 0.15 inches wide and 1/4 and 3/8 inches deep. Space the blades to achieve the distance specified in Table 507.03.02-1 between the centerlines of each groove to form a random pattern. Perform consecutive passes within 2 inches of the previous pass. Do not cut grooves over an area that has been already grooved, or introduce a cutting blade into a groove that has been already established.

- H. Opening to Traffic.** Before allowing anything, including construction equipment, on the overlay, ensure that the overlay has cured for at least 4 hours and has achieved a compressive strength of 2500 pounds per square inch, as determined from 1 set of cylinders field cured according to AASHTO T 23.
- I. Concrete Deck Surface Requirements.** Comply with the requirements of 507.03.02.N. The ME will perform the surface tolerance test as described therein. The Department will assess pay reductions based on the criteria therein. The RE may order the overlay be removed, replaced and retested for acceptance based on the criteria therein. The RE may order remedial measures to restore the deck slab surface to the required grades and surface tolerance as specified therein.

After the 4-hour curing period, visually inspect the overlay for cracking or other damage. The ME will perform a delamination survey to verify bonding between the overlay and substrate. Before the survey is performed, clear the survey area of construction equipment, operations, and debris and clean the area by using compressed air or an equivalent method.

Seal surface cracks not exceeding 3/8-inch in depth with a low viscosity epoxy sealer or a low viscosity methacrylate monomer penetrating sealer approved by the RE. For cracks exceeding 3/8-inch in depth, submit a corrective action plan for approval, or remove and replace the affected portion of the overlay. Delaminated or unbonded portions of the overlay shall be removed and replaced. If the overlay requires repair, perform a petrographic examination conforming to ASTM C 856 before repairs are performed and after repairs have been performed. Submit a certified copy of the test results from an independent testing laboratory to the RE. The RE will be the sole judge in determining where the function and service of the deck may be impaired. Make corrective actions or remove and replace the overlay in the areas prescribed by the RE before the deck will be considered for acceptance. Submit a corrective action plan to the RE for approval before beginning corrective action operations. Perform corrective action at no cost to the State.

Do not place traffic, equipment, or other loading on the patch material until the concrete has attained a minimum strength of 2500 pounds per square inch as determined from 2 test cylinders cast during placement and field cured.

THE FOLLOWING IS ADDED TO THIS SECTION:

507.03.09 Latex Modified Concrete Overlay

A. Overlay Placement Plan. At least 30 days before the proposed start of placement of the overlay, submit a plan for the construction of the overlay for approval by the RE. Include the following in the written plan:

1. Method of operation.
2. Equipment description.
3. Number of mixing trucks to be used.
4. A plan for discontinuing placement and protecting the overlay during unfavorable weather conditions.
5. Contingency plans for interruptions of pours, work schedules and limits of pours.
6. Traffic vibration mitigation.
7. List of material's suppliers.
8. Qualification of personnel intended to perform the work.
9. Maintenance and protection of traffic.

The plan should demonstrate the ability of the Contractor to place, finish, texture, and cover the overlay within thirty minutes of placement on the deck and according to the equipment and manufacturers' recommendations.

B. Meeting. Within 14 days before the start of placing LMC overlay, conduct a meeting with the RE, the ME, and the LMC supplier to discuss the plan of operation and to coordinate the overlay placement.

C. Limitations of Placing LMC Overlay. Do not place the concrete overlay at air temperatures lower than 50 °F. It can be placed at 50 °F and rising, provided that the air temperature is forecast to remain above 50 °F for the first 12 hours of the curing period.

If it is probable that the air temperature could fall below 36 °F at any time during the planned placement or wet cure period, at least 30 calendar days before the scheduled placement, submit a plan of action for cold weather concreting, as defined in 504.03.02 (C) for approval.

Placement of the overlay will not begin unless provisions are made by the Contractor to reduce the atmospheric evaporation rate below 0.15 pounds per square foot per hour. Additionally, discontinue the placement of the concrete overlay when the air temperature begins to exceed 86 °F or when the evaporation rate begins to exceed 0.15 pounds per square foot per hour. The evaporation rate will be as determined with a nomograph. Refer to the publication ACI Committee 305, "Recommended Practice for Hot Weather Concreting" (ACI 305 R-91) for guidance. Provide a nomograph for measurements.

Use fog misting, wind shields, or other methods approved by the RE to keep the evaporation rate below 0.15 pounds per square foot per hour. Do not use fog misting to apply water that is to be worked into the surface of the concrete for finishing purposes. Cease fog misting immediately if any water accumulation occurs on the surface.

Take the measurements for air temperature, relative humidity, and wind speed at the location of the concrete placement. Take concrete temperatures from the sample used for slump and air content tests. Perform these measurements and calculations at least once per hour beginning with the initial concrete placement and whenever, in the opinion of the RE, changes in atmospheric conditions merit. Supply all the instruments necessary to take these measurements, subject to approval by the RE, including two battery operated psychrometers, two concrete thermometers, and two wind gauges. These instruments will become the property of the Contractor after acceptance. Ensure that all instruments are certified by an independent laboratory approved by the RE. Ensure that the instruments are certified to be in good working order and have been calibrated within the two months immediately before use.

Do not begin or discontinue placement in the event of rain. Provide a sufficient number of approved covers and take adequate precautions to protect freshly placed concrete from rain. The RE may order the replacement of any material damaged by rain.

D. Surface Preparation.

- a. Perform a field survey on the finished surface after completion of the overlay, to establish actual finished grades and cross slopes. Take a minimum of three deck elevations at the centerline, along each lane line and

along the gutter line, at the same location of each span. Take additional field measurements necessary to establish existing grades or cross slopes and to develop and document finished grades and cross slopes in transition areas.

- b. Within a 48-hour period before placing the overlay, clean the entire surface that is to receive the overlay by wet sandblasting, shrouded dry sandblasting with dust collectors, shot blasting, or high pressure water blasting to remove any loosened chips of concrete, curing compound, laitence, oil or any other residue that may impede the bonding of the overlay to the concrete substrate. All cleaning equipment shall be approved by the RE. Ensure that air supplies for all cleaning operations are equipped with an oil trap in the air line and supply air free from oil that may contaminate the deck surface. When high pressure waterblast is used, the pressure of the water shall be a minimum of 5,000 pounds per square inch and shall be capable of producing the desired results.
- c. Protect the cleaned deck surface by covering all surfaces to receive the overlay with a 6 mil minimum thickness, polyethylene film, until the overlay placement is to begin. If more than 48 hours elapse from the termination of surface cleaning operations to beginning of the overlay placement, then a second stage surface cleaning will be required regardless of the apparent condition of the receiving surfaces.
- d. If in the RE's opinion, contaminants, which might interfere with bonding, are present on the prepared surface, perform a second stage surface cleaning. This shall be done in areas directed by the RE. A light coating of orange colored rust, that forms on the exposed existing reinforcing steel after first stage surface cleaning, is not considered detrimental to bond. It may remain unless the time limit stated above is exceeded, or if ordered to be removed by the RE.
- e. In scheduling the overlay placement, plan a 12 hour duration for pre-wetting the entire area that is to be overlaid the next day. Upon completion of the 12 hour period, cover the saturated surface with polyethene sheeting.

Ensure that any standing water in depressions, holes, or areas of deteriorated concrete removal is blown out with compressed air that is equipped with an oil trap.

E. Performing the Dry Run. Perform a dry run according to the applicable provisions of 507.03.02.G to ensure the specified minimum thickness of overlay is achieved.

F. Placing Latex Modified Concrete Overlay.

- a. Brush latex modified concrete onto the wetted prepared surface. Ensure that all vertical and horizontal surfaces receive a thorough even coating.
- b. Do not allow the brushed material to become dry before placement of the overlay concrete. Dispose and replace brushed material, as directed by the RE.
- c. Dispose of stones that accumulate as a result of the brushing operation.
- d. Ensure that the overlay placement is continuous. Install a temporary bulkhead or joint and stop placement where delays occur due to sudden inclement weather, equipment failure, insufficient equipment or labor, disruption in material supply, or other conditions. Provide a sufficient amount of approved covers for the protection of the overlay in the event of delays. Complete a 48-hour, wet curing period before resuming the overlay placement in the area of the joint or bulkhead, also clean the entire surface area including the vertical surfaces of the joint. Sawcut a new edge a minimum of 6 inches back from any defect in the surface. Do not sawcut the new edge before the end of the two-day, wet, curing period. Ensure that the sawcutting or removal will not damage the overlay that is to remain. The RE may permit mitigation of unavoidable delays of up to 15 minutes by placing wet burlap over the fresh, unfinished concrete to prevent drying.
- e. As per the conditions stated in Subpart C., begin fog misting immediately after placement and continue after the finishing operation until the placement of wet burlap.
- f. Ensure that the overlay admixture manufacturer supplies guidance concerning finishing and handling of the concrete. Ensure that the manufacturer has ACI certified concrete technicians on the site for the full day of the initial construction. Ensure that the overlay admixture manufacturer provides recommended methods and operational techniques based on prevailing climatic and job conditions.

- g. Place and strike off the concrete to approximately 3/16 inch above final grade. It shall then be consolidated and finished to the final grade by the finishing machine.
 - h. Hand finish with a float may be required along the edge of the placement or on small areas of repair. Edge tooling is required at joints except next to metal expansion dams, curbs, and previously placed lanes.
 - i. Use a portable lightweight or wheeled work bridge behind the finishing operation for touchup work, surface texturing, and curing cover placement.
- G. Curing.** After completion of the overlay placement and finishing, completely cover the entire overlay surface with clean, wet burlap. Lap the burlap a minimum of 12 inches. Ensure that burlap has been presoaked for a minimum of 24 hours before use and drain excess water before its application. Keep the burlap continuously wet and protected from displacement. Take measures to ensure that the burlap lays flat in a manner acceptable to the RE. Lapped edges are not required to be sealed. Failure to apply wet burlap within 15 minutes after concrete overlay placement shall be cause for rejection of overlay work as determined by the RE. Keep the burlap wet for a continuous period of 72 hours by either a continuous wetting system or an intermittent sprinkler as approved by the RE. At the end of the wet curing period remove the burlap late in the day so as to reduce the thermal shock to the overlay. After the wet curing period air cure the overlay for an additional four calendar days. Inform the RE of the intended curing procedure 30 days before the overlay placement.
- H. Sawcut Grooved Surfacing.** After completion of the minimum total curing time specified in subpart G, groove the overlay in accordance with 507.03.02(L), provided that the concrete has attained a strength of at least 4,000 pounds per square inch as determined from cylinders cast during the placement. Construction equipment needed for saw cutting the overlay will be permitted to operate on the overlay. Saw cutting equipment that is to be used shall not overstress the concrete deck or the overlay.
- I. Deck Surface Tolerance Requirements.** Testing for deck surface tolerance requirements during placement of concrete overlay shall be according to 507.03.02(N).
- J. Opening to Traffic.** Do not allow vehicular traffic of any kind on the overlay excepting that as specified above in Subpart H for saw cutting operations. Maintain the vehicular traffic restriction until the minimum curing period has elapsed and then only on the condition that test cylinders made at the time of placement have a minimum compressive strength of 4,000 pounds per square inch. In the event that the 28-day cylinders fail to produce a compressive strength of 4,000 pounds per square inch, the RE may order that the overlay be removed, replaced and tested for acceptance, all at no cost to the Department.
- K. External Heat Provisions.** If the Contractor elects to maintain curing temperatures by this method, furnish sufficient canvas and framework, or other type of housing, to enclose and protect the concrete slab in such a way that the air surrounding the fresh concrete overlay can be kept at a temperature range of between 45 and 85 °F for the specified curing period. Any time in which the curing temperature falls between 32 and 45 °F will not be counted as curing hours. At the end of the curing period, reduce the heat gradually at a rate not to exceed one half degree per hour until the temperature within the enclosure equals the temperature outside the enclosure.

Enclosures used for overlay pours must completely enclose the existing slab on all five sides. Provide sufficient room between the top of the existing slab and the top of the enclosure to allow placement of concrete overlay by any normal means.

Provide external heat by means of stoves, salamanders, or steam equipment supplied and operated by the contractor at its expense. Supply sufficient equipment to continuously maintain the specified temperatures of fresh concrete overlay to compensate for the accumulation of carbon monoxide gas.

Keep all exposed concrete overlay surfaces within the heated area wet during the heating period unless heat is supplied in the form of live steam.

Ensure that materials and equipment necessary to erect the enclosures and provide external heat are present on the job site and approved by the RE 30 days before any concrete overlay placement.

Ensure that heating appliances are not be placed in such a manner as to endanger formwork or expose any area of concrete overlay to drying out or injury due to excessive temperatures.

Maintain temperature limits for 7 calendar days.

Continuous wetting will not be required. However, keep the burlap wet by wetting at regular intervals in a manner satisfactory to the RE.

Ensure that enclosures for heat retention are properly vented to prevent surface disintegration due to carbonation.

- L. Acceptance Testing.** After the total curing period has been completed, the overlay will be visually inspected for cracking or other damage. Perform a delamination survey to verify bonding between the overlay and substrate after the overlay construction. Clear the survey area of all construction equipment, operations, and debris and clean the area by using compressed air or an equivalent method before this survey is performed. The survey will be scheduled during the daylight hours of working days (and not less than five calendar days after the concrete overlay has been placed in any span). The RE will arrange for the performance of this survey by the Department. Seal surface cracks not exceeding 1/2 inch in depth with a low viscosity epoxy sealer or a low viscosity methacrylate monomer penetrating sealer which is to be approved by the RE. Repair cracks exceeding 1/2 inch in depth by methods approved by the RE, or remove and replace the affected portion of the overlay. Remove and replace delaminated or unbonded portions of the wearing surface or portions damaged by rain, other weather effects, or construction activity. All corrective work identified above shall be at the Contractor's expense. Should the concrete overlay require this repair procedure, test the concrete overlay and evaluate by petrographic examination at the Contractor's expense according to the latest ASTM C 856 specifications before performing any repairs and after concrete repairs have been performed. Submit a certified copy of the test results from an independent testing laboratory to the RE. The RE will be the sole judge in determining where the function and service of the deck may be impaired. Removal and replacement of the overlay or corrective actions shall be made in those areas prescribed by the RE before the deck slab will be considered for acceptance and opening to traffic. Submit a plan for corrective action, describing the methods, equipment, and materials to be used, in writing for approval by the RE before beginning corrective action operations.

THE FOLLOWING IS ADDED TO THIS SECTION:

507.03.10 Concrete Bridge Parapet With Moment Slab, HPC

Construct the moment slab as specified in 504.03. Construct the parapet as specified in 507.03.05.

507.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
CONCRETE BRIDGE APPROACH, HES	CUBIC YARD
CONCRETE BRIDGE DECK, HES	CUBIC YARD
CONCRETE BRIDGE PARAPET WITH MOMENT SLAB, HPC	LINEAR FOOT
RAPID SET LATEX MODIFIED CONCRETE OVERLAY	CUBIC YARD
LATEX MODIFIED CONCRETE OVERLAY	CUBIC YARD

THE SECOND PARAGRAPH IS CHANGED TO:

The Department will include payment for galvanized reinforcement steel for the bridge approaches under the various concrete bridge approach Items. The Department will include payment for galvanized reinforcement steel for the closure pours under CONCRETE CLOSURE POUR, HPC. The Department will include payment for plain and galvanized reinforcement steel for the parapet with moment slab under CONCRETE BRIDGE PARAPET WITH MOMENT SLAB, HPC. For other concrete Items, the Department will make payment for reinforcement steel under REINFORCEMENT STEEL, REINFORCEMENT STEEL, EPOXY-COATED, and REINFORCEMENT STEEL, GALVANIZED as specified in 504.04.

THE FOLLOWING IS ADDED:

The Department will make payment for scarification as SCARIFICATION as specified in 551.04.

The Department will include payment for architectural treatments of barriers and parapets under the various parapet and barrier Items.

The Department will make a payment adjustment for concrete surface requirement quality in cast-in-place deck slabs for Structure No. 0904-152 (Hoboken Viaduct), overlays and approaches, by the following formula:

$$\text{Pay Adjustment} = Q \times BP \times PR$$

Where:

BP = Bid Price

Q= Surface Requirement Lot Quantity

PR= percent reduction as specified in Table 507.03.02-2

SECTION 508 – BRIDGE DRAINAGE

508.02 MATERIALS

THE FOLLOWING IS ADDED TO LIST OF MATERIALS:

Fiberglass Pipe.....909.02.09

THE FOLLOWING SUBPART IS ADDED:

508.03.03 Fiberglass Pipe and Fittings

Ensure that pipe supports are located at spacings that do not exceed the pipe manufacturer's recommendations. Avoid supports that have point contact or narrow supporting areas. Standard sling, clamp, and clevis hangers and shoe supports designed for use with steel pipe may be used. Ensure that the minimum strap width of all pipe hangers meets the pipe manufacturer's recommendations. Ensure that straps have a minimum of 120 degrees of contact with the pipe. On pipe supported on surface with less than 120 degrees of contact use a split fiberglass pipe protective sleeve bonded in place with adhesive.

Ensure that all connections of pipes and fittings shown on the plans to facilitate future removal for maintenance cleanout or flushing are made with a threaded, gasketed coupler or a bolted gasketed flange system. Use only female – male threaded plugs for cleanouts.

508.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
____" FIBERGLASS PIPE	LINEAR FOOT
FIBERGLASS DRAIN PIPE (10" DIAMETER)	LINEAR FOOT

SECTION 509 – BRIDGE RAILING AND FENCE

509.03.02 Chain-Link Fence for Bridge

THE ENTIRE SUBPART IS CHANGED TO:

At least 30 days before beginning the work, submit working drawings for certification. Indicate material specifications for adhesive, anchors, washers, and nuts on the working drawings.

Base the design embedment of the adhesive anchor bolts on a concrete compressive strength of 4000 pounds per square inch. Ensure that the embedment depth of the adhesive anchors shown on the working drawings is sufficient to obtain the required pullout strength as required for the proof load testing as specified in 908.01.04.

Do not use expansion type anchor bolts. Place anchors using one of the following:

- 1. Cast-in-Place Type.** Set anchor bolts before placing concrete using a rigid template for each anchor assembly. When placing concrete, ensure that bolts do not move and spacing is maintained between the rigid templates. Ensure that the exposed threaded ends of the anchor bolts remain clean and protected from concrete. Clean the anchor bolts before installing the specified hardware.
- 2. Adhesive Type.** Do not drill for installation until the concrete has cured for at least 14 days. Install adhesive anchors according to the manufacturer's recommendations. When drilling, ensure that spalling does not occur

and existing utilities are not damaged. Repair damage to the existing concrete, utilities, and reinforcement steel as a result of drilling. Clean and dry drill holes before and during installation of the adhesive anchors.

Erect fencing as shown on the Plans.

SECTION 513 – RETAINING WALLS

513.02.01 Materials

THE FOLLOWING IS ADDED:

For MSE Walls, use either Soil Aggregate, I-15 or Coarse Aggregate, No. 57. For Prefabricated Modular Retaining Walls and T-Wall, use either Soil Aggregate, I-9 or Coarse Aggregate, No. 57.

513.03.01 Proprietary Retaining Walls

F. Backfilling.

THE HEADING AND FIRST PARAGRAPH UNDER SUBPART (1) ARE CHANGED TO:

1. **Soil Aggregate.**

G. Compacting.

THE HEADING AND FIRST PARAGRAPH UNDER SUBPART (1) ARE CHANGED TO:

1. **Soil Aggregate.** With the exception of the 5-foot zone directly behind the units, compact soil aggregate with large, smooth drum, vibratory rollers using the density control method as specified in 203.03.02.D.

THE FOLLOWING IS ADDED:

513.03.02 Coarse Aggregate Layer

Coarse aggregate layer consists of Coarse Aggregate (No.57). Construct coarse aggregate layer at the locations indicated on the Plans in accordance with 503.03.01(F)(2) and compact in accordance with 503.03.01(G)(2).

513.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM IS DELETED:

<i>Item</i>	<i>Pay Unit</i>
RETAINING WALL, LOCATION NO. ____	SQUARE FOOT

THE FOLLOWING ITEM IS ADDED:

<i>Item</i>	<i>Pay Unit</i>
COARSE AGGREGATE LAYER	CUBIC FOOT

THE FOLLOWING IS ADDED AFTER THE FIRST PARAGRAPH:

The Department will make payment for reinforcement steel under REINFORCEMENT STEEL, and REINFORCEMENT STEEL, EPOXY-COATED as specified in 504.04 for reinforcement steel in cast-in-place retaining walls.

THE FOLLOWING SECTION IS ADDED:

SECTION 515 - PERMANENT SOLDIER PILE WALLS

515.01 DESCRIPTION

The Contractor shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals necessary to complete the work specified herein and shown on the Contract Drawings. The work shall include but not be limited to mobilization, surveying, installation of steel soldier piles, timber lagging, drainage systems, and cast-in-place concrete facing.

515.02 MATERIALS

- A. Portland Cement Concrete.** Furnish Class B encasement concrete for steel soldier pile sockets as indicated, conforming to the requirements of 504 and 903. Provide mix design for low strength encasement concrete above socket.
- B. Steel Soldier Piles.** Steel soldier piles shall be of the type and weight shown indicated on the Plans. Steel soldier piles shall conform to AASHTO M270 Grade 50 (ASTM A709M, Grade 50). Galvanize in accordance with AASHTO M111 (ASTM A123).
- C. Treated Timber Lagging.** Treated Timber Lagging shall be construction grade rough cut and shall be a minimum of 4" thick. Treated timber shall conform with section 915.
- D. Lean-Mix Concrete Backfill.** Lean-mix concrete shall consist of Type I or Type II Portland cement, fine aggregate, and water. Each cubic yard of lean-mix concrete backfill shall consist of a minimum of one sack (94 pounds) of Portland cement.
- E. Fabricated Structural Steel.** Steel used to fabricate steel studs and other devices shall conform to the requirements of AASHTO M169 (ASTM A108). Galvanize in accordance with AASHTO M232 (ASTM A153).
- F. Reinforcing Steel.** Reinforcing steel shall conform to ASTM A 615M, Grade 60.
- G. Prefabricated Drainage Composite.** When required for the project and as called out on the Plans, the Contractor shall furnish prefabricated drainage composite that is a flexible product consisting of a geotextile bonded to an internal supporting core. The prefabricated drainage composite shall be resistant to deterioration from salts, road oils, fuels and other deleterious substances encountered in the type of application shown. Use AmerDrain 650, TerraDrain 203 or approved equal.
- H. Concrete Facing/Structural Concrete.** Structural concrete shall conform to the requirements of 504 and 903. Structural concrete shall be Class A, unless otherwise noted on the Plans.

515.03 CONSTRUCTION

- A. General.** Wall elements constructed in accordance with this Specification shall be steel soldier piles placed in predrilled holes that are subsequently backfilled with Class B concrete and lean mix concrete.
- B. Drilling Holes for Piles.** Use drilling rigs of the proper type and capacity for the proposed work and maintain in good operating condition to the satisfaction of the RE. It is likely that the drilled holes will be partially embedded in shale bedrock at some locations. When drilling through bedrock, use an auger head fitted with teeth specifically designed for cutting rock efficiently, or core the rock. Do not use shot drilling. Use core drilling, rotary drilling, percussion drilling, auger drilling or driven casing. Locate drill holes within 4 inches of the location shown on the plans at ground surface. Drill holes plumb, or to the inclination shown on the approved plans, and within tolerances specified in Section 503, Drilled Shafts. Unless otherwise specified or indicated, all piles will be drilled piles constructed as follows:
 - 1. Drilling Procedure and Depth.** Observe the drilling rate and resistance as the boring of each hole is advanced, and record the relative drilling rate. If a satisfactory socket length is not obtained when the bottom of pile elevation indicated by design is reached, continue drilling to a greater depth until a minimum satisfactory socket length is obtained. During the drilling of each pile socket, record any soft seams, discontinuities, or decreases in drilling resistance. Evaluate the capability of the pile socket to support the

lateral and vertical design loads. Increase the socket length as required, subject to the acceptance of the RE, to assure that a competent, non-yielding foundation socket is developed.

2. **Casing.** Bored holes may require casings through fill or soil to prevent collapse of overburden, or, when necessary, to shut off seepage water. Keep the casing in place through the cleaning and inspection of the prebored holes, and withdraw either during or after concrete placement. While the casing is being withdrawn, a sufficient head of concrete should be maintained above the bottom of the casing, to prevent "necking" of the shaft due to sloughing soils.
 3. **Cleaning of Predrilled Holes.** After the holes have been drilled to the proper depth, remove all loose rock, earth, and debris and water from the bottom of the hole by approved methods acceptable to the RE. Make a complete check, and verify that all holes have been drilled to a sufficient depth to assure a competent, non-yielding socket foundation.
- C. **Placing Piles.** Set soldier piles and fill holes with concrete, after drilling of each hole is complete. Pour concrete within 12 hours after completion of drilling to avoid swelling of the shale at the bottom of the hole. If any water accumulates in the holes after cleaning and inspection, prior to concrete encasement, remove the water by approved method, or, alternatively, place the concrete at the bottom of the hole below the accumulated water by tremie methods. A tip elevation tolerance of +/- one (1) foot is acceptable. Larger deviations must be approved by the RE. The vertical alignment of the piles shall not vary from the plan alignment by more than 1 inch per foot of depth. Splicing of soldier piles shall not be permitted.
- D. **Excavation.** The Contractor constructing the wall shall be familiar with the sequence of wall excavation described in Plans. Placement of timber lagging shall immediately follow excavation in front of the wall.
- E. **Blasting.** Blasting is not allowed.
- F. **Treated Timber Lagging Installation.** Timber lagging shall be placed from the top-down in sufficiently small lifts immediately after excavation to prevent erosion of materials into the excavation. Prior to lagging placement, the soil face shall be smoothed to create a contact surface for the lagging. A gap shall be maintained between each vertically adjacent lagging board for drainage between adjacent lagging sections. In no case shall lagging be placed in tight contact to adjacent lagging.
- G. **Drainage System Installation.**
1. The Contractor shall handle the prefabricated drainage composite in such a manner as to ensure the composite is not damaged in any way. Care shall be taken during placement of the composite not to entrap dirt or excessive dust in the composite that could cause clogging of the drainage system. Delivery, storage, and handling of the drainage composite shall be based on manufacturer's recommendations.
 2. Drainage composite strips shall be placed and secured tightly against the timber lagging with the fabric facing the lagging. A continuous sheet of drainage composite that spans between adjacent soldier piles shall not be allowed. Seams and overlaps between adjacent composites shall be made according to manufacturer's recommendations and specifications. Repairs shall be made at no additional cost to the Department and shall conform to manufacturer's recommendations.
 3. Perforated collection pipes shall be placed at the bottom of the drainage composite to the flow line elevations and at the locations shown on the Plans. Outlet pipes shall be placed at the low end of each collector pipe placed between each soldier pile as shown on the Plans.

515.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
RETAINING WALL, LOCATION NO. ____	SQUARE FOOT

The Department will measure retaining walls by the square foot. The area measured is the product of the average height determined by extending the final ground lines at the top and bottom of the wall to a vertical plane of the front face of wall and the total length of wall shown.

THE FOLLOWING SECTION IS ADDED:

SECTION 518 – TEMPORARY JACKING SYSTEM

518.01 DESCRIPTION

This Section describes the requirements for designing, providing, installing, monitoring and removing a temporary jacking system, including temporary strengthening of the existing structure, in preparation for pier reconstruction and bearing assembly replacement.

518.02 MATERIALS

518.02.01 Materials

Provide materials as specified:

Concrete	903.03
Curing Materials	903.10
Structural Steel	906.01
Structural Steel Fabrication	906.04
Bolts and Bolting Material	908.01
DTI.....	908.03

518.02.02 Equipment

Provide jacking equipment with a capacity rating at least 1.5 times the maximum total dead load plus live load plus impact reaction for the jack location. Provide equipment with load measuring devices that enable the lifting force to be constantly monitored. If jacks are used, provide jacks with the rated capacity clearly shown on the manufacturer's name plate attached to each jack. If jacks are used, ensure that each jack has a swivel-top bearing plate and a lock nut capable of supporting the entire load independent of the hydraulic system. If using more than one jack per location, operate the jacks from the same jacking source to maintain equal pressure in the jacks.

518.03 CONSTRUCTION

518.03.01 Jacking System

A. Working Drawings and Calculations. At least 30 days before beginning the work, submit the following items, signed and sealed by a Professional Engineer, to the RE for approval:

1. Detailed erection plan including detailed erection instructions, proposed equipment and drawings of all structures and support framing.
2. Detailed jacking system removal plan including detailed removal instructions and proposed equipment.
3. Design calculations and working drawings for the jacking system including temporary support towers, temporary support tower foundations, temporary supports, temporary support bracing and framing, and shims and blocking.
4. Design calculations and working drawings for modifications to existing superstructure framing, temporary strengthening of the existing structure, and temporary lateral supports of the bridge superstructure as required.
5. Substructure analysis where applicable.
6. Loads and jacking forces.
7. Type and grade of all materials.
8. Method of jacking and securing the lift after jacking.
9. Procedure for recording gauge readings and monitoring movements.
10. Details of gauge supports, including locations and methods.
11. Jacking and Structural Bearing Assembly Removal and Replacement Plan.

B. Jacking and Structural Bearing Assembly Removal and Replacement Plan. At least 30 days before beginning the work, submit the following items to the RE for approval:

1. All field measurements used for designing and installing the jacking system, including the temporary strengthening of the existing structure.
2. Field measurements of the existing structural steel and rivet patterns for verification of the required proposed structural bearing assemblies and pedestals. Do not order structural bearing assemblies before receiving approval.
3. Jacking schedule.
4. Detailed sequence of work for the jacking operations, coordinated with related work items and the staging plan.
5. Size, capacity and position of jacking equipment.
6. Schematic hydraulic layout.
7. Jacking plate sizes and thicknesses.

C. Installation.

1. Comply with the applicable requirements of 506.03.01.
2. Perform work to prevent damage to existing structures to remain. If damage occurs as the result of performing the work, submit a repair plan to the RE for approval. Repair damaged portions of existing structures according to the approved repair plan.
3. Jacking will not be allowed except as required related to pier reconstruction and replacing existing bearing assemblies as shown on the approved working drawings.
4. Before jacking, repair kinks and deformations in existing structural steel as specified in 557.03.01.
5. Provide certification that all jacks and gauges are calibrated and tested to ensure proper performance.
6. Before jacking to perform the work, perform test jacking to 75% of the maximum total dead load. Do not proceed with the work until successful test jacking has been performed. Perform inspection and testing according to Section 6 of the ANSI/AWS D1.5 Bridge Welding Code as modified by Section 506. Maintain the test load for 24 hours. Slippage is not allowed during the test jacking. If slippage occurs during test jacking, modify the assembly and retest until the assembly supports the load without slippage for 24 hours. Live loads will be allowed during test jacking.
7. Limit vertical displacement to the extent necessary to replace the bearing assemblies to the bridge seat elevations shown on the Plans. Limit differential displacement between trusses to a maximum of 1/16 inch.
8. Ensure that no live loads are applied during jacking operations until the structure is secured and no longer dependent on the hydraulic system for support. Jack one entire bearing line at a time in order not to cause differential movement. Lifting of the trusses will not be allowed. Perform jacking at a slow and uniform rate approved by the RE. Apply the last 30 percent of the jacking load in 5 percent increments and check for movement prior to incremental load application. Halt jacking operations if jacking to 110 percent of the jacking load does not release the bearings. Perform jacking operations only in the presence of the RE.
9. As early as possible during or after each lift, safely secure the structure so that it is not dependent on the hydraulic system for support.
10. Remove existing rivets as shown on the approved working drawings and as specified in 558.03.
11. Field drill bolt holes in the existing structural steel as shown on the approved working drawings. Ensure drilled holes are cylindrical and perpendicular to the member and are clean-cut without torn or ragged edges. Remove burrs on the outer surfaces. Control operations to ensure that the offset of a field drilled hole reamed 1/4 inch in any ply of material, measured from an outer ply after the hole has been finished for bolting, does not exceed 1/16 inch and that no more than 10 percent of the holes are offset as much as 1/16 inch. Control operations to ensure that the offset in any hole reamed 1/8 inch full size in any ply of material, measured from an outer ply after the hole has been finished for bolting, does not exceed 1/8 inch and that no more than 10 percent of the holes are offset as much as 1/8 inch. As approved, holes may be overreamed to meet these requirements, and larger bolts installed.
12. As approved by the RE, existing rivet holes may be reamed to fit proposed high strength bolts. Do not exceed the minimum edge distance or bolt spacing requirements as specified in AASHTO, Division I, Chapter 10.24.
13. Install high-strength bolts according to 506.03.01.
14. Ensure the temporary jacking system is adequately braced to transmit all stresses imposed by the jacking operation.

15. Do not leave the structure unsupported during jacking operations, pier reconstruction or bearing removal. Design, provide and install temporary support for the bridge, other than the primary jacking system, to provide redundancy in case of jacking system failure.
16. Monitor the jacking system while in service and suspend operations at the sign of distress or movement in the superstructure or jacking system.
17. Remove temporary supports when they are no longer required.

D. Monitoring. Use mechanical displacement gauges (accurate to 0.001 inches) to monitor vertical superstructure movement at locations shown on the Plans. Record gauge readings before, during, and after the jacking operation to transfer load to the jacks. Record gauge readings twice daily, at the beginning and end of each day thereafter. Record gauge readings before, during and after jacking operations to transfer the load to the bearings. Record all gauge readings in the presence of the RE.

518.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
TEMPORARY JACKING SYSTEM	LUMP SUM

The Department will make payment for repairing existing kinks and deformations in existing trusses as part of TRUSS REPAIR, CONRAIL VIADUCT, TYPE TR4 as specified in 557.04.

The Department will include payment for removing bearing assemblies in CLEARING SITE, BRIDGE (STRUCTURE NO. 0904-151) as specified in 201.04.

The Department will include payment for disposal of removed materials in CLEARING SITE, BRIDGE (STRUCTURE NO. 0904-151) as specified in 201.04.

The Department will make payment for reinforced elastomeric bearing assemblies as REINFORCED ELASTOMERIC BEARING ASSEMBLY as specified in 506.04.

The Department will make payment for pier reconstruction as PIER RECONSTRUCTION as specified in 555.04.

THE FOLLOWING SECTION IS ADDED:

SECTION 520 – PERMANENT GROUND ANCHORS

520.01 DESCRIPTION

This Section describes the requirements for constructing column footing rock anchors. This is a performance-based item. The Plans provide basic information and minimum length requirements of the anchors. The Contractor is responsible to perform its own evaluation and select lengths, sizes, and procedures that will achieve the load capacities provided on the Plans and described herein.

A. Definitions.

1. Rock Anchors (Permanent): Grade 150 ksi anchors all-thread-bar (tendon) with double corrosion protection. Elements of the Rock Anchor may include but are not limited to the steel bar, cement grout, epoxy resin, end hardware, lubricant, centering devices, grout tubing, and bond breaking sleeve.
2. End Hardware: Bearing plate, flat washers, and hexagonal nut.
3. Corrosion Protection: Rock anchors, including both the bonded and un-bonded lengths, and end hardware shall be double corrosion protected.

B. References.

1. Review the subsurface survey (boring logs) information. The subsurface information presented in the subsurface survey is for information only and shall not be interpreted as a warranty of subsurface or environmental conditions.
2. Additional test borings and other subsurface investigation operations may be performed at no cost to the Department. Include in the bid the cost of any additional explorations that deems necessary for proper final design and installation of the anchors.
3. Recommendations for Pre-stressed Rock and Soil Anchors", Post-Tensioning Manual, Post-Tensioning Institute, Phoenix, Arizona, fourth edition, 2004.

520.02 MATERIALS

A. Rock Anchors.

1. Rock Anchor: Grade 150 ksi all-thread bar with minimum diameter as shown on the Plans and that conforms to ASTM A-722.
2. Mechanical Couplers: Mechanical couplers will not allow splices in sections of anchor bar. All rock anchors shall be continuous.

B. Corrosion Protection. Provide primary corrosion protection of the rock anchor system by epoxy coating in accordance with ASTM A 775. Secondary corrosion protection will be by a complete grout seal in both the bonded and un-bonded zones.

C. Bearing Plate and Nut.

1. Bearing plates shall be epoxy coated with a circular opening sized to receive the anchor bar. The plate shall be of sufficient strength to withstand the application of the working and test loads on the anchor, or as recommended by the manufacturer. Epoxy shall be as provided for anchor bar.
2. Nuts shall be hexagonal head, heavy duty type, conforming to ASTM A325 or to bar manufacturer's specifications.

D. Centralizers. Fabricate centralizers from a material, except wood, which is non-detrimental to the pre-stressing steel elements. The centralizer shall position the anchor in the drill hole so a minimum of 0.5 inch of grout cover is provided all-around anchor bar. Centralizers shall be spaced at 5-foot maximum intervals in the bonded zone and at 10-foot maximum intervals in the un-bonded zone.

E. Bond Breaking Sleeve. The bond breaking sleeve in the un-bonded zone shall consist of Schedule 40 PVC tubing, or rock anchor manufacturer's recommended equivalent.

F. Grout and Grout Tubes.

1. Use an approved non-shrink grout conforming to 903.08.02.
2. Grout tubes shall have an inside diameter sufficient to enable pumping of grout without blockage to the bottom of the drilled anchor hole, and shall be able to withstand the anticipated grout pressures.

520.03 CONSTRUCTION

A. Submittals. At least 30 days before beginning the work, submit working drawings and materials for approval, including the following:

1. Details of the rock anchor including embedment, bonded and un-bonded length, size, materials, strength, and corrosion protection.
2. Details of the anchor head assembly connecting to the footing concrete, showing associated waterproofing.
3. Details of the proposed installation procedures for the rock anchors, including description of equipment to be used in drilling holes, installing, loading, and locking off the rock anchors.
4. Details and manufacturer's literature describing the proposed grout material and additives, grouting process, and equipment.
5. Prior to testing rock anchors, submit manufacturer's information for the equipment to be used to conduct performance, proof, and lift-off tests on the rock anchors. Submit diagram(s) showing the geometry of test

equipment relative to rock anchor bar, end hardware, method of locking off specified load and calibration data for the system of jack and gauges, including the following:

- a. A calibration, conducted by a certified testing agency, for the complete performance, proof, and lift-off test assemblies, together as a unit. Jacks and gauges shall be individually identified (by serial number) and calibrated against known standards at intervals not exceeding four months. Gauges may be calibrated against a master gauge of known accuracy, provided the jacks are calibrated against the same master gauge. Provide a production and master gauge for use with each jacking assembly. The master gauge shall be used to provide calibration checks of the production gauge. To allow for accuracy of reading the pressure gauge, the range of the gauge shall be such that the pressures recorded at 100% design load shall be mid-range of the gauge. Jacking equipment shall have a common header to allow both the production and master gauges to be connected simultaneously for the daily calibration check of the production gauge. Submit calibration certificates, which include a plot of gauge pressure versus actual jack force, for each jacking assembly used, 30 days prior to the first performance test.
 - b. A diagram of the Contractor's proposed test equipment setup(s) for monitoring the elongation during performance and proof tests on rock anchors. The test equipment setup(s) proposed shall be completely independent of the jack, and shall include a micrometer dial gauge, capable of measuring anchor tendon extension to the nearest 0.001 inch, and be mounted on an adjustable tripod or other device with flexible extension arms or a "goose neck" to permit rapid alignment of the dial gauge axis with the axis of the rock anchor. The support for the dial gauge shall be located such that it is safe from movement due to the testing or other construction activities.
6. Submit the following information for each completed rock anchor to the Department:
- a. Bottom elevation of anchors, or anchor length (to bottom of base plate);
 - b. Drilling logs, indicating drilling rates;
 - c. Bond breaking sleeve length;
 - d. Difficulties in drilling holes (if any);
 - e. Grout take for rock anchor grouting; and
 - f. Gallons of water per bag of cement used for grouting of rock anchor.

B. Quality Assurance.

1. All work shall be performed by a contractor experienced in the installation of permanent rock anchors. The Contractor shall have the following qualifications, and shall submit evidence of these qualifications to the Department at least 30 days before beginning the work.
 - a. At least 3 years experience within the last 5 years with permanent rock anchor installations of similar type and complexity.
 - b. Completed not less than 3 successful permanent rock anchor projects of similar type and complexity within the last 3 years.
2. Fabrication, installation, and testing of the rock anchors shall be done in accordance with "Recommendations for Pre-stressed Rock and Soil Anchors", Post-Tensioning Manual, Post-Tensioning Institute, Phoenix, Arizona, 4th edition.
3. Load test each rock anchor by either a Performance or Proof test as specified, and locked-off at the specified lock-off load. Perform Lift-off tests on all rock anchors.
4. Perform all testing in the presence of the Department.

C. Rock Anchors.

1. Fabricate and install rock anchors in accordance with approved submittals and manufacturer recommendations.
2. Install rock anchors at the locations indicated on the Plans. Drill hole size shall be in accordance with rock anchor manufacturer's recommendation, but shall not be less than 3.0 inches in diameter. Minimum drill hole depth shall be as indicated on the Plans.
3. Insert and center the threaded bar in the drill hole. Use centralizers to ensure that the bar does not contact the wall of the drill hole.
4. Prevent debris from entering rock anchor holes at all time during rock anchor installation.

5. Do not subject threaded bars to unintentional sharp bends.
6. Do not damage the corrosion protective sheathing and/or centralizers.

D. Grouting.

1. Grout the annular space between the rock anchor and the drill hole with cement grout using the tremie method to expel all water and debris from the drill hole. Grout the bar to the dimension shown, ensuring full grout coverage over the entire anchor length. The rock anchor will be considered grouted when there is full return of undiluted grout from the top of the hole. If grout loss from drill hole exceeds 3 times the drill hole volume, grouting shall be discontinued, the rock anchor removed from the hole, and the drill hole fully grouted and re-drilled at least one day later.
2. Inject grouts through grouting tube at the lowest point of the anchor. Limit pressure in anchor hole to 5 psi in excess of static grout head. Grouting shall be continuous once started.
3. Before and during grouting operations, protect rock anchor hole from being filled with debris. All anchor holes shall be flushed clean of debris, with water, prior to the start of grouting.
4. Provide bearing plates with sufficient holes to facilitate grouting, as applicable.
5. Grout equipment shall be capable of continuously mixing the grout for the duration of the grouting operation.

E. Testing.

1. Check calibration of the production gauge daily against the master gauge to verify actual jacking pressures. The master gauge shall be easily spliced into the jacking system in series with the production gauge for use in checking calibration of the production gauge. Keep master gauge in a safe location away from the immediate work area when not being used. Calibrate and recalibrate measuring devices as necessary to permit the force in the tendon to be accurately measured at all times. Recalibration shall be done routinely as determined necessary by the Contractor or when directed by the RE. Calibration checks and recalibration shall be at the Contractor's expense.
2. Load test each rock anchor. The maximum test load shall not exceed 80 percent of the guaranteed ultimate tensile strength (GUTS) of the bar.
3. The Lock-off Load shall be as indicated on the Plans or Specifications.
4. Conduct two (2) Performance tests: one at Column 8-9 and the other at Column 13-14. Proof test all remaining anchors. The first anchor installed shall be performance tested. The remaining performance test shall be conducted on rock anchor selected by the Contractor and approved by the RE.
5. Lift-off test all rock anchors.
6. Conduct all testing in the presence of the RE. Submit testing schedules to the RE at least one week prior to testing.
7. Performance Test. Conduct performance test by incrementally loading and unloading the anchor in accordance with the below-listed schedule. Record at each load increment the movement of the tendon to the nearest 0.001 inch (0.0025 cm) with respect to an independent fixed reference point. Monitor the jack load with a pressure gauge or load cell. Take movement measurements at the alignment load and at each load increment. (P = anchor working load; AL = alignment load)

AL
0.25P
AL
0.25P
0.50P
AL
0.25P
0.50P
0.75P
AL
0.25P
0.50P
0.75P
1.00P
AL

0.25P
 0.50P
 1.00P
 1.20P
 AL
 0.25P
 0.50P
 1.00P
 1.20P
 1.33P (Test Load)
 1.00P

- a. Hold the load at each increment long enough to obtain the movement reading, but no longer than 1 minute. Except for the reading of the residual movement at AL, no movement readings need to be taken during unloading of the anchor.
 - b. Hold the Test Load for 10 minutes. Record total movements with respect to a fixed reference point at 1, 2, 3, 4, 5, 6, and 10 minutes. If the total movement between 1 minute and 10 minutes exceeds 0.04 in. (1 mm), the test load shall be held for an additional 50 minutes, and total movements shall be recorded at 20, 30, 40, 50, and 60 minutes.
 - c. The hold time will begin when the Test Load has been reached.
8. Proof Test. Conduct the proof test by incrementally loading the anchor in accordance with the below-listed schedule. Record at each increment the movement of the tendon to the nearest 0.001 inch (0.0025 cm) with respect to an independent fixed reference point. Monitor the jack load with a pressure gauge or load cell. Take movement measurements at the alignment load and at each load increment. (P = anchor working load; AL = alignment load)

AL
 0.25P
 0.50P
 0.75P
 1.00P
 1.20P
 1.33P (Test Load)
 1.00P.

- a. Hold the load at each increment long enough to obtain the movement reading, but no longer than 1 minute.
 - b. Hold the Test Load for 10 minutes. Record total movements with respect to a fixed reference point at 1, 2, 3, 4, 5, 6, and 10 minutes. If the total movement between 1 minute and 10 minutes exceeds 0.04 in. (1 mm), the test load shall be held for an additional 50 minutes, and total movements shall be recorded at 20, 30, 40, 50, and 60 minutes.
 - c. The hold time will begin when the Test Load has been reached.
 - d. Compare the proof test results to the performance test results. If the results vary significantly, as determined by the RE, a performance test on another anchor may be required.
9. Lift-off Tests
- a. A Lift-off test consists of applying an increasing tension load to the rock anchor using a centerhole jack; the point of load application shall be above the lock-off nut.
 - b. Perform a Lift-off test on each rock anchor between two and seven days of when the load was locked-off in the anchor.
 - c. The load shall be applied as directed by the RE, but sufficiently slow to allow accurate determination of the lift-off load. Lift-off shall be defined as that load required to lift the lock-off nut off of the bearing plate. Load applied to the rock anchor during lift-off tests shall not exceed the actual lift-off load by more than five kips.
 - d. The RE may require the Contractor to re-tension specific rock anchors after a lift-off test.

10. Acceptance Criteria

- a. The RE will evaluate the anchor test results and determine whether the anchor is acceptable. An anchor will be acceptable if:
 - (1) The rock anchor develops the maximum required load.
 - (2) The minimum apparent free length at the test load as determined on the basis of elastic movement shall not be less than 80 percent of the design free length, and not greater than 100 percent of the free length plus 50 percent of the bond length.
 - (3) The creep rate does not exceed 0.080 inch (2.0 mm)/log cycle during the final log cycle of the performance test or proof test regardless of tendon length and load. The maximum load shall be maintained until the rate of movement is less than that specified above.
 - (4) The initial lift-off reading shows an anchor load within 5 percent of the specified Lock-off Load.
- b. Rock anchors shall be rejected if any acceptance criterion is not met. If the first anchor installed fails during the performance test, it will be necessary for the Contractor to modify the design or installation procedures.
- c. Rock anchors not meeting the lift-off load requirement shall be re-tensioned to lock-off load. Re-tensioned rock anchors shall be lift-off tested again not less than one day nor more than 7 days after re-tensioning. Rock anchors with a second test lift-off load less than 95 percent of lock-off shall be rejected.
- d. Replace each rejected rock anchor with one or more rock anchors as directed. Test replacements as specified herein. Conduct replacement installation and testing at no additional cost to the Department.
- e. Do not remove the section of bar projecting above the anchor head assembly until the RE has accepted the results of the anchor testing and has authorized to remove the projections. Bars shall be removed in accordance with manufacturer recommendations.

520.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
PERMANENT GROUND ANCHOR	UNIT
GROUND ANCHOR PERFORMANCE LOAD TEST	UNIT

The Department will make payment for each PERMANENT GROUND ANCHOR completed and accepted. Rock anchors rejected or not in compliance with the provisions of this Section will not be paid for, and shall be replaced and re-tested at no additional cost to the Department. Whenever rejection of a rock anchor necessitates structural redesign of the footing or any other element of the permanent structure, the cost of such redesign shall be deducted from sums otherwise due to the Contractor under the Contract. If the redesigned footing requires greater quantities of concrete and reinforcing steel, as compared with the quantities required for the footing as originally designed, the additional cost for concrete, reinforcing steel and form work shall also be deducted from the payment due the Contractor.

The Department will make payment for each PERFORMANCE TEST completed and accepted. The Department will not make separate payment for proof tests or lift-off tests.

DIVISION 550 – STRUCTURE REHABILITATION

SECTION 551 – BRIDGE DECK REHABILITATION

551.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This Section also describes the requirements for the reconstruction of concrete headers on abutments and walls. This Section also describes the requirements for making interim concrete deck repairs.

551.03 CONSTRUCTION

551.03.01 Repair of Concrete Deck

THE FOLLOWING IS ADDED:

- E. Emergency Repairs.** Make repairs on an emergency basis as directed by the RE. Begin emergency repair within 24 hours of the RE's notice. Complete repair and open repair to traffic within 48 hours of the RE's notice. For emergency repairs, the deck condition survey is waived.
- F. Header Reconstruction.** Saw cut the abutment headers to the limits shown. Remove and dispose of disintegrated concrete, prepare the surface, clean the existing reinforcement steel and apply epoxy-coating according to AASHTO M 317. Furnish and place new galvanized reinforcement steel, drill and grout reinforcement steel according to 504.03.01. Match the color of the proposed concrete with the existing concrete.
- G. Header Armoring.** Fabricate the structural steel components of the armoring as specified in 906.04 and as shown on the Plans and the approved working drawings. Use steel plates and concrete anchors consisting of studs welded to the steel shapes. Ensure that the fabricator is AISC certified. The ME will inspect armoring either at the fabrication shop or at the work site. Ensure that the steel shapes used in the armoring conform to AASHTO M 270, Grade 36 or Grade 50. Ensure that shear studs conform to Section 7 of the ANSI/AWS D1.5 Bridge Welding Code. Weld structural steel as specified in 906.04.02 and as shown on the Plans and the approved working drawings. After fabrication, hot-dip galvanize the entire joint system according to ASTM A 123.

551.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM IS ADDED:

<i>Item</i>	<i>Pay Unit</i>
HEADER RECONSTRUCTION	LINEAR FOOT

THE FOLLOWING IS ADDED:

The Department will include payment for galvanized reinforcement steel, drilling and grouting of reinforcement steel, and header armoring under HEADER RECONSTRUCTION.

SECTION 553 – PNEUMATICALLY APPLIED MORTAR

553.03.01 Pneumatically Applied Mortar

A. Limits of Repair.

THE FIRST SENTENCE IS CHANGED TO:

The RE will examine the structure to verify the repair limits.

B. Preparing and Cleaning.

THE FIRST PARAGRAPH IS CHANGED TO:

Remove deteriorated concrete to a sound surface and at least 1 inch beyond the first mat of reinforcement steel. For superstructure repairs to Structure No. 0904-152 (Hoboken Viaduct), do not use pneumatic hammers to remove the

concrete; use only hand tools to remove the concrete. For repairs elsewhere, do not use pneumatic hammers heavier than nominal 30-pound class (33 pounds maximum) to remove the concrete. For abutment, pier seat, or column repairs, do not extend removal under the bearing seats without approval of the RE. Clean and replace reinforcement steel as specified in 551.03.01.C.

SECTION 554 – PAINTING EXISTING BRIDGES

554.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This section also describes the requirements for removing concrete encasement on existing bridges before painting.

554.02 MATERIALS

554.02.01 Materials

THE FOLLOWING IS ADDED:

Use paint system components, including thinners and solvents, from the same manufacturer.

Provide a technical representative from the paint system manufacturer when painting operations begin and as required during operations.

554.02.02 Equipment

THE FOLLOWING IS ADDED:

Submit technical data sheets for the proposed pneumatic hammers to the RE for approval.

554.03 CONSTRUCTION

554.03.01 Pollution Control System

THE FOURTH PARAGRAPH IS CHANGED TO:

Include the containment plan, the waste disposal plan, the lead health and safety plan, and the equipment storage plan in the pollution control system. Do not remove paint until the pollution control system, including all plans, are approved by the Department. Ensure that the certified industrial hygienist (CIH) certifies monthly, in writing, to the RE that the Contractor is in compliance with the Pollution Control System.

1. Containment Plan.

THE FIRST PARAGRAPH IS CHANGED TO:

Describe, in detail, the method of providing, erecting, maintaining, and removing enclosures as required to contain and collect waste resulting from the removal of coatings in the preparation of steel surfaces for painting. Ensure that the containment system is at minimum a Level-1 Class-A Containment System according to SSPC Guide 6i (con). Ensure that visible emissions meet or exceed Section 5.5.1.1, Level 1 Emissions. Verify compliance with applicable regulations in accordance with Section 5.5.4 Method D, Ambient Air Monitoring for Toxic Metals. Containment may consist of “local” systems, such as small enclosures where power tools are used, or certain enclosed vacuum blasting techniques where suction captures the abrasive and paint residue directly from the surface, removes paint and fine particles, and returns abrasive to the blast nozzle. Where work takes place over travel lanes and adjacent shoulders, use only containment systems that employ either “rapid deployment type containment trailers” or “suspended work platforms.” Simple bridge to grade containment systems will not be permitted at these locations. A “suspended work platform” will be permitted only when all of the following conditions are met:

1. The platform has a minimum live load design of 20 pounds per square foot, excluding all OSHA safety factors. If the containment platform is to be used as a work platform, ensure the floor of the platform is solid/rigid and the platform does not deflect more than 1/60 of the span length under design loads. Do not use unstable objects as supports.

2. The minimum underclearance is greater than 16 feet.
3. All spent blast material is continuously vacuumed during blasting operations and this is noted in the Containment Plan.
4. A qualified independent individual certifies in writing that each “suspended work platform” has been constructed in accordance with the approved Containment Plan. Minor modifications will be allowed to accommodate site conditions provided they do not alter the operation or requirements of the platform. Ensure the certifying individual is not affiliated with the Contractor or the Containment Plan preparer. The RE will determine if the qualifications of the certifying individual are acceptable. Do not perform blasting operations until the written certification is approved by the RE.

Otherwise, use “rapid deployment type containment trailers” over travel lanes and adjacent shoulders.

2. Waste Disposal Plan.

THE FOLLOWING IS ADDED:

The EPA Identification Number (EPA ID#) for this project is listed below:

Structure Number	EPA ID#
0904-151 & 0904-152	NJR000063990

Ensure that waste generated by the removal of the existing paint systems is disposed of at an approved EPA lead reclaiming facility. The Department is aware of two possible lead reclaiming facilities that are believed to be approved by the EPA:

1. Exide Corporation
645 Penn Street
Reading, Pennsylvania 19612
Telephone: 800-437-8495
Contact: Robert F. Jordan
2. Encycle Texas
5500 Upriver Road
Corpus Christi, Texas 78407
Telephone: 512-289-0300
Contact: Rick Gilbert

THE FOLLOWING IS ADDED TO THE LIST OF REQUIREMENTS FOR THE WASTE DISPOSAL PLAN:

6. Certification that the TSD facilities intended to be used, including the two listed herein, are approved by the EPA for lead reclaiming. The Contractor is advised to contact the EPA directly to determine if a particular lead reclaiming facility is approved by the EPA.

3. Lead Health and Safety Plan (LHASP).

g. Medical Surveillance Program.

THE FOLLOWING IS ADDED:

A current list of New Jersey clinical laboratories approved by OSHA with a demonstrated proficiency in blood lead analyses is available at http://www.osha.gov/SLTC/bloodlead/state_list.html#states. Additional information is available at OSHA’s website <http://www.osha.gov> and OSHA publication 3142 *Lead in Construction* is available at <http://www.osha.gov/Publications/osh3142.pdf>. Additional information is available at the State of New Jersey Department of Health’s website <http://www.state.nj.us/health/eoh/survweb/> and at the Centers for Disease Control and Prevention National Institute for Occupational Safety and Health’s website <http://www.cdc.gov/niosh/>.

554.03.02 Cleaning and Painting

A. Protection of Environment, Structure, Person, and Property.

THE THIRD PARAGRAPH IS CHANGED TO:

For contracts that involve lead paint abatement, ensure that the personnel that supervise and perform the lead paint abatement are trained in the applicable programs that concern health and safety compliance and environmental regulations regarding lead abatement. Ensure that the training is certified by the Department of Health and Senior Services in accordance with N.J.S.A. 26:2q.1 *et seq.* and N.J.A.C. 8:62-1.1 *et seq.* Ensure that each individual supervising or performing lead paint abatement has an individual lead permit as issued by the Department of Health and Senior Services. In addition, ensure that the firm or company performing the lead paint abatement is certified by the Department of Community Affairs, Division of Codes and Standards in accordance with N.J.S.A. 52:27d-427 *et seq.* and N.J.A.C. 5:17-1.1 *et seq.* Submit a copy of the Department of Community Affairs certification to the Department's Bureau of Construction Services, Division of Procurement prior to award of the Contract. Maintain the certifications for the duration of the Contract. The State regulating agencies will monitor the work for compliance with the training and certification requirements through random inspections.

Ensure that the firm or company performing the lead paint abatement is SSPC QP 1 and SSPC QP 2 certified. Submit a copy of the current SSPC certifications to the RE each year. Maintain the certifications for the duration of the Contract.

B. Cleaning.

THE FOLLOWING IS ADDED AFTER THE FIRST PARAGRAPH:

Remove all materials and debris that has accumulated on the steel surfaces prior to blast, hand or power tool cleaning.

For areas designated for concrete encasement removal, remove encasement according to 201.03.02 except hydraulic breakers are not allowed, and when demolishing concrete within 6 inches of structural members, use hammers weighing no more than 30 pounds (exclusive of bit). Perform work to prevent damage to existing structures to remain. If damage occurs as the result of performing the work, submit a repair plan to the RE for approval. Repair damaged portions of existing structures according to the approved repair plan. Remove wire mesh, reinforcement steel, and clips or other devices used to secure the reinforcement in the concrete encasement. Clean concrete from holes in steel members.

At Structure No. 0904-151 (Conrail Viaduct), clean the steel exposed by encasement removal using blast cleaning, and paint.

At Structure No. 0904-152 (Hoboken Viaduct), clean the steel exposed by encasement removal using hand or power tool cleaning, and paint.

2. Blast Cleaning.

THE FOLLOWING IS ADDED TO THE SECOND PARAGRAPH:

Do not exceed an anchor profile of 4.0 mils. In the event that the anchor profile exceeds 4.0 mils, ensure that the thickness of the organic zinc coating exceeds the anchor profile by a minimum of 1.0 mils. In order to achieve the required anchor profile, G-50 grit is recommended for blast cleaning.

C. Waste Disposal.

THE FOLLOWING IS ADDED TO THE NINTH PARAGRAPH:

In addition, send the manifests to:

New Jersey Department of Transportation
Bureau of Project Support
951 Parkway Avenue
P.O. Box 600
Trenton, New Jersey 08625

D. Conditions for Painting.

THE THIRD PARAGRAPH IS CHANGED TO:

Apply coatings according to the manufacturer's recommendations for temperature and drying time. However, do not apply coatings when the temperature is below 35 °F. Maintain the temperature for the duration of the drying time of the coating according to the manufacturer's time table. Allow the drying time before applying subsequent

coats according to the manufacturer's time table. Do not apply subsequent coats until the previous coat is fully dried. Prior to applying subsequent coats, test the previous coat dryness by thumb nail and solvent wipes.

E. Paint Application.

5. Coating Thickness.

b. Organic Zinc Coating System.

THE SECOND PARAGRAPH IS CHANGED TO:

Ensure the following dry film thickness of the coatings:

Prime coat	4 mils
Intermediate coat	5 mils
Finish coat	2 mils

THE FOLLOWING IS ADDED:

Apply the zinc prime coat immediately after inspection and acceptance of the surface preparation, SSPC-SP 10, near-white blast cleaning.

Ensure the maximum dry film thickness does not exceed the manufacturer's recommendations. In the event that the dry film thickness of any coat exceed the manufacturer's recommendations, remove the coating and recoat to the required thickness.

Measure the Dry Film Thickness with a Positector 6000 F3. Calibrate the Positector according to National Institute of Standards and Technology (NIST) calibration standards. Take measurements according to SSPC-PA 2.

In the event that the dry film thickness of any coat does not meet the requirements, ensure that recoat times are in accordance with the manufacturer's recommendations. If the manufacturer does not recommend recoat time, re-blast and recoat to the required thickness.

F. Stenciling.

THE FIRST PARAGRAPH IS CHANGED TO:

Stencil the following information on the outside web of both fascia beams, on both ends of the structure, and as specified below:

1. The 7-digit structure number.
2. The phrase "PAINTED ON" plus the month and year of completion.
For example: "PAINTED ON 08-2009."
3. The paint system code number.

554.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE DELETED:

<i>Item</i>	<i>Pay Unit</i>
POLLUTION CONTROL SYSTEM	LUMP SUM
HAND/POWER TOOL CLEANING AND PAINTING	LUMP SUM
NEAR-WHITE BLAST CLEANING AND PAINTING	LUMP SUM

THE FOLLOWING ITEM IS ADDED:

<i>Item</i>	<i>Pay Unit</i>
CONCRETE ENCASEMENT REMOVAL AND PAINTING	CUBIC YARD

THE SECOND PARAGRAPH IS CHANGED TO:

The Department will base payment for TESTING, IF AND WHERE DIRECTED on the actual cost as evidenced by paid receipts from the testing laboratory.

THE FOLLOWING IS ADDED:

ROUTE 139
PULASKI CONTRACT 2

The Department will include payment for cleaning and painting related to structural steel repairs under the various structural steel repair Items as specified in 557.04.

The Department will make payment for CONCRETE ENCASEMENT REMOVAL AND PAINTING as follows:

Work Completed	Payment
Encasement removal	25% of bid price
Cleaning and painting	100% of bid price

THE FOLLOWING SECTION IS ADDED:

SECTION 555 – SUBSTRUCTURE REPAIR

555.01 DESCRIPTION

This Section describes the requirements for repairing existing concrete structures. This section also describes the requirements for repointing and repair of masonry walls.

555.02 MATERIALS

555.02.01 Materials

Provide materials as specified:

Coarse Aggregate.....	901.06.01
Fine Aggregate	907.06.02
Concrete	903.03
Mortar	903.08.01
Curing Materials	903.10
Quick-Setting Patch Materials	903.07
Reinforcement Steel.....	905.01
Rebar Coupling Devices.....	905.04
Epoxy Bonding Compound	919.07

For masonry repair, use Type S masonry cement according to ASTM C 91 and Type S mortar cement according to ASTM C 1329. Submit a certificate of compliance, as specified in 106.07, for the masonry cement and mortar.

555.02.02 Equipment

Provide equipment as specified:

Vibrator	1005.04
Mobile Mixer.....	1010.03
Small-Batch Mixer.....	1010.04

Submit technical data sheets for the proposed pneumatic hammers to the RE for approval.

555.03 CONSTRUCTION

- A. Working Drawings.** Submit working drawings for adhesive materials for certification.
- B. General.** Perform work to prevent damage to existing structures to remain. If damage occurs as the result of performing the work, submit a repair plan to the RE for approval. Repair damaged portions of existing structures according to the approved repair plan.
- C. Condition Survey.** The RE will perform the condition survey before and after the removal of any existing concrete. Submit written notice to the RE at least 15 days before the work site is available for a condition survey. The Department will schedule surveys during daylight hours unless the working time is restricted in the Contract.

The RE will perform surveys only if the ambient temperature has been above 40 °F for at least 72 hours before the beginning of the survey. The RE will use the data obtained to determine the repair limits.

- D. Pier Reconstruction.** Ensure that the reinforcement steel is not damaged during core drilling. Prevent collection and freezing of water in holes according to 506.03.02.C.1.

Use Class A concrete for the repair. Base the design embedment of the adhesive anchor system on a concrete compressive strength of 4000 pounds per square inch. Install the adhesive anchor system according to the manufacturer's recommendations. Provide forms for making the repair in accordance with 504.03.02.B. Immediately before placing concrete, intentionally roughen the surface of the existing concrete and apply epoxy bonding coat according to the manufacturer's recommendations. Place the reinforcement steel and construct the concrete according to 504.03, including the limitations therein. Immediately after removing the forms or when repairs have set, apply a Class 1 finish to the surface of the repaired concrete according to 504.03.02.H.1.

- E. Concrete Repair.** Sawcut repair areas to a 3/4-inch depth to form a rectangular perimeter surrounding the repair area. Remove loose and disintegrated concrete from the areas to be repaired to a sound concrete surface. Ensure that the remaining concrete is not damaged during concrete removal. Ensure that the reinforcement steel is not damaged or debonded during concrete removal. In areas where reinforcement steel is debonded during concrete removal, or where more than half the diameter of the reinforcement steel is exposed, remove concrete to a minimum depth of 1 inch below the reinforcement steel.

The Contractor may remove concrete or prepare and shape repair areas with power chipping or hand tools. Do not use pneumatic hammers heavier than 33 pounds. The Contractor may start such tools in a perpendicular position but must immediately tilt to a 45-degree operational angle. Do not operate pneumatic hammers and chipping tools at an angle exceeding 45 degrees relative to the surface. Do not use pneumatic hammers heavier than 20 pounds for chipping areas directly below the first layer of reinforcement steel. Remove concrete to the depth specified for the following type of repair.

1. **Type D Repair.** For Type D repair, remove delaminated, deteriorated, and designated concrete to a minimum depth of 1 inch and a maximum depth not to exceed the front face of the first layer of existing reinforcement steel. If the repair depth is expected to extend below the existing first layer of reinforcement, notify the RE who may require the Contractor to perform a Type E repair as indicated in 555.03.01.B.2. The RE may require the Contractor to remove sound concrete to achieve the limits of the designated repairs.
2. **Type E Repair.** For Type E repair, remove delaminated, deteriorated, and designated concrete to a depth 1" below the existing front face reinforcement of the existing structure. The RE may require the Contractor to remove sound concrete to achieve the limits of the designated repairs. Collect the concrete and reuse as specified in 202.03.07.A.
3. **Type F Repair.** For Type F repair, fill in the existing void with concrete and wire mesh. Where deteriorated and delaminated concrete is found in the vicinity of the void or at the rear of the void, repair these areas using Type D or E or as required by the RE. Install anchor bolts to secure the wire mesh to the existing concrete. For Type F Repair, provide forms for placing the patch material.
4. **Type G Repair.** For Type G repair, remove deteriorated, delaminated, and designated concrete and corroded conduit embedded in the concrete wall to the depth required to reach sound concrete. The RE may require the Contractor to remove sound concrete to achieve the limits of the designated repairs.

Clean corroded reinforcement steel by sandblasting, waterblasting, or wire brushing. Epoxy coat exposed reinforcement steel according to AASHTO M 317. For reinforcement steel that has lost 25 percent or more of its original cross-sectional area, splice in or couple new reinforcement of the same size. Lap the reinforcement steel at least 15 bar diameters from each end of the damaged area and wire tie together. Where reinforcement steel is broken or missing, lap new bars at least 30 bar diameters from each end of the break. If necessary, perform additional chipping of adjacent concrete to provide the required lap.

Use Class A concrete or Type IA or IB or 2 quick-setting patch material for the repair, whichever is specified. Immediately before placing concrete, apply epoxy bonding coat according to the manufacturer's recommendations.

1. **Repairs made with Class A Concrete.** Perform patching within the limitations specified in 504.03.02.C. Place concrete as specified in 405.03.02.D.1.b; consolidate and strike-off as specified in 405.03.02.D.1.c; and

texture to match the existing surrounding concrete. Cure the repair areas as specified in 504.03.02.F. Do not place loading on the patch material until the concrete has cured 72 hours and has attained a minimum strength of 4000 pounds per square inch as determined from 2 test cylinders cast during placement and field cured.

2. **Repairs made with Quick Setting Patch.** For Type IA, IB, or 2 quick-setting patch material, place according to the manufacturer's recommendations. Wet cure the patched area using wet burlap, as specified in 504.03.02.F.2, immediately after placing and finishing. Keep the patched area covered for 3 hours. Do not open repair to loading until compressive strength as measured by the average of 2 test cylinders is more than 2000 pounds per square inch.

Immediately after removing the forms or when repairs have set, apply a Class 1 finish to the surface of the repaired concrete according to 504.03.02.H.1.

F. Masonry Repair.

1. **Removal of deteriorated mortar.** Remove soft, loose, cracked and deteriorated mortar to at least a depth (measured from the wall face) of twice the average joint width, and remove all deteriorated mortar beyond the minimum depth, as ordered by the RE. Clean all contamination from the prepared joints.
2. **Tuck pointing (repointing) of mortar joints.** Before repointing, rake out loose mortar until sound surface is reached. Flush joints clean with water or compressed air and leave all surfaces to be re-mortared in a dampened, surface dry state. Pack the prepared joints in layers with mortar that closely matches the original color and texture, allowing each layer to become thumb-print hard before the next. Use at least two layers when the joint depth is twice the joint width. Apply a final layer thickness that does not exceed the joint width. When the final is thumb-print hard, finish with a pointing tool that recreates the original joint shape, or as approved by the RE.

Perform pointing when the ambient temperature is 41° F or above, and the masonry is frost free. Avoid recessed joints that hold water.

3. **Cleaning of mortar joints.** After mortar sets, clean all mortar and cement stains from the surfaces. In direct sunlight, keep the newly pointed masonry moist for at least 3 days. In shade, moisten 2 to 3 times a day for at least 3 days.

555.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
PIER RECONSTRUCTION	LUMP SUM
SUBSTRUCTURE CONCRETE REPAIR, TYPE ____	SQUARE FOOT
MASONRY REPOINTING	SQUARE FOOT

The Department will include payment for all reinforcement steel for substructure rehabilitation under the various substructure rehabilitation Items.

The Department will make final payment for each repair area for only one of the repair types as determined by the final depth as measured in the field and as specified in the construction details and described herein regardless of the original designation or preparatory work for another repair type.

THE FOLLOWING SECTION IS ADDED:

SECTION 556 – PRESSURE WASHING AND FINISHING OF SUBSTRUCTURE CONCRETE

556.01 DESCRIPTION

This Section describes the requirements for pressure washing and finishing of substructure concrete.

556.02 MATERIALS

556.02.01 Materials

Provide materials as specified:

Fine Aggregate	901.06.02
Cement	903.01
Water.....	919.08

Chemical cleaning agents and liquid detergents (non-ionic, PH neutral detergent) – Solutions of chemical cleaning agents and additives that will remove the dirt, grime, carbon, surface residues, stains, graffiti, and other foreign material from the concrete surfaces, but will not damage the concrete. Cleaning agents shall be formulated and manufactured specifically for cleaning the concrete. Cleaning agents shall be biodegradable and EPA VOC compliant.

556.02.02 Equipment

Provide equipment as specified:

Straightedge	1008.02
Small-Batch Mixer.....	1010.04

556.04 CONSTRUCTION

A. Submittals. Submit certification of compliance, as specified in 106.07, for cleaning agents and liquid detergents.

B. Quality Assurance:

- 1. Cleaning Contractor's Qualifications:** The firm performing the Work of this Section shall have been regularly engaged in masonry/concrete cleaning work for at least five years, and shall have completed 5 similar projects using the cleaning method specified.
- 2. Cleaners' Qualifications:** The persons cleaning the masonry/concrete and their supervisors shall be personally experienced in the required method of masonry/concrete cleaning, and shall have worked on 5 similar projects within the last 3 years.
- 3. Cleaning Equipment:**
 - a. Low Pressure Spray Equipment
 - b. Brushes: Fiber bristle
- 4. Field Examples:**
 - a. Before the cleaning operations are started, clean a sample panel of approximately 100 square feet required to be cleaned at a location as chosen by the RE. If the sample panel is not satisfactory, as determined by the RE, modify the cleaning procedure and clean another sample panel. Continue cleaning sample panels until satisfactory results are obtained and approved by the RE.
 - b. For cleaning procedures other than specified, but that generally follow the method(s) specified, submit proposed procedure for approval and clean additional sample panels adjacent to the sample panels referred to above for comparison of results.
 - c. Approved panels and procedures will become the cleaning standard for the Work of this Section.

C. Project Conditions:

- 1. Environmental Requirements:**
 - a. Make necessary provisions for the diversion and disposal of cleaning water and solutions, including the furnishing of pumps if required. Take precautions as required to prevent damage and contamination resulting from runoff of cleaning solution.
 - b. Do not wet or wash down masonry/concrete surfaces when the temperature is below 40° F or may drop below 40° F within 24 hours.

2. Existing Conditions:

- a. Take necessary precautions and protective measures to prevent injury to people and damage to property in areas adjacent to the Site, including damage due to wind drift of cleaning materials.

D. Procedures:

1. Protection:

- a. Protect adjacent surfaces not required to be cleaned from damage.
- b. Protect landscaping, paving, and other improvements from damage.

2. Surface Preparation:

- a. Remove vines, bird nests, stalactite deposits, and heavy accumulations of dirt, bird droppings and other foreign material from surfaces required to be cleaned.
- b. Perform this preliminary cleaning by brushing, sweeping, wiping, scraping, vacuuming, and other approved methods as required by existing conditions. Use tools that will not damage the concrete or surrounding materials.

3. Cleaning Concrete

- a. Pre-wet the surfaces with water.
- b. Prepare cleaning solutions and operate pressure spray equipment in accordance with cleaning materials manufacturer's recommendations, unless otherwise indicated.
- c. Clean areas not accessible to spray equipment with bristle brushes.
- d. Clean surface equal in appearance to the approved sample panels.
- e. Clean surface free of dirt, grime, soot, carbon, efflorescence, moss, stains, graffiti, tendrils, and other foreign material. Leave surface uniformly clean and undamaged.
- f. Thoroughly rinse off the surfaces with water.
- g. Clean and restore adjacent damaged areas as a result of the cleaning operations. Remove all protective materials.

4. Finishing Concrete

- a. Once the pressure washing is complete, finish the visible face of the concrete substructure to attain a uniform color and appearance. Finish the surfaces by rubbing the surfaces with burlap and grout composed of equal parts of cement and clean shape sand to produce a smooth uniform color. Tint the grout to match as closely as possible the color of the repair concrete. Submit color samples of the tint to the RE for approval.

556.06 PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
PRESSURE WASHING AND FINISHING OF SUBSTRUCTURE CONCRETE	LUMP SUM

THE FOLLOWING SECTION IS ADDED:

SECTION 557 – STRUCTURAL STEEL REPAIR

557.01 DESCRIPTION

This Section describes the requirements for furnishing and erecting structural steel and miscellaneous metals to repair existing structural steel elements.

557.02 MATERIALS

557.02.01 Materials

Provide materials as specified:

Structural Steel	906.01
Structural Steel Fabrication	906.04
Bolts and Bolting Material	908.01
Direct Tension Indicators (DTI)	908.03
Structural Steel Paint.....	912.01.01

557.02.02 Equipment

Submit technical data sheets for the proposed pneumatic hammers to the RE for approval.

557.03 CONSTRUCTION

557.03.01 Structural Steel Repair

A. Working Drawings. Submit working drawings for approval. Include field measurements and repair details related to each repair location, including dimensions and locations of deteriorated steel. Base working drawings on field measurements of existing structural steel elements.

B. Erection Plan. At least 30 days before the scheduled repairs are to be made, submit a plan of operations to the RE for approval. Include, at a minimum, the following in the plan:

1. Number and type of manpower and equipment.
2. Shipping procedures.
3. Lifting procedures.
4. Erecting and repair sequence.
5. Fabricator's recommendations.
6. Procedures for employee safety.
7. Traffic control and protection.

C. Shipping and Handling. Comply with the requirements of 506.03.01.C.

D. Erecting.

1. **General Requirements.** After removal of concrete encasement, the RE will examine the structure to verify the repair areas. The RE may increase the repair areas based on the examination. Make structural steel repairs according to the applicable requirements of 506.03.01 and the following:
 - a. Perform work at one repair location at a time. Do not proceed to another repair location until completing the preceding repair and obtaining RE approval of the repair.
 - b. Perform work to prevent damage to existing structures to remain. If damage occurs as the result of performing the work, submit a repair plan to the RE for approval. Repair damaged portions of existing structures according to the approved repair plan.
 - c. Remove existing rivets as necessary to make repairs as shown on the approved working drawings and as specified in Section 558.
 - d. Saw cut existing structural steel as necessary to make repairs as shown on the approved working drawings. Flame cutting of existing structural steel will not be allowed.
 - e. Clean the structural steel using blast cleaning according to 554.03. Obtain the RE's approval of the cleaned repair area before field drilling bolt holes or proceeding with the repair.
 - f. Field drill bolt holes in the existing structural steel as necessary to make repairs as shown on the approved working drawings and as specified in 518.03.01.D. Apply the prime coat to the cleaned repair area.

- g. Provide structural steel for repairs with shop drilled bolt holes, and that has been shop primed. Repair defects in the prime coating before the repair is made.
 - h. As approved by the RE, existing rivet holes may be reamed to fit proposed high strength bolts. Do not exceed the minimum edge distance or bolt spacing requirements as specified in AASHTO, Division I, Chapter 10.24.
 - i. If directed by the RE, make structural repairs not shown on the Plans by in kind replacement of structural steel members. Replace rivets with high-strength bolts. Ream or field drill holes as required.
 - j. Install high-strength bolts according to the working drawings and as specified in 506.03.01.
 - k. Apply the intermediate and finish paint coats according to 554.03.02.
- 2. Straightening.** Repair existing kinks and deformations in existing trusses. Perform repairs to tensile components in conformance with ASTM A 6/A 6M and by flame straightening or a combination of flame straightening and jacking. Perform repairs to compression components in the same manner, but where more than five percent of the cross-sectional area of the member is damaged, submit a repair procedure to the RE for review and approval. If flame straightening is used, comply with the following qualifications and requirements:
- a. Ensure flame straightening is performed by personnel having a minimum of three years of documented experience.
 - b. Submit the names of the personnel to the RE for review and approval prior to performing the work.
- 3. Other Structural Steel Repairs.** Before making floorbeam or stringer repairs, remove the portion of the deck that contributes dead load to the floorbeam or stringer. After removing the deck, submit to the RE 2 copies of photo documentation of the condition of the top flange of each floorbeam or stringer. As a minimum, include the following in the documentation:
- 1. For each floorbeam and stringer, include one photo of the entire length of the floorbeam or stringer (or multiple photos with match lines), and individual photos of each area of deterioration.
 - 2. Label photos according to the framing plan numbering system shown on the Plans.
 - 3. Provide cross reference labels for each photo of an area of deterioration and the photo of the overall top flange.
 - 4. Include a scale for reference in each photo.
 - 5. Submit photos in clear plastic sleeves in a 3-ring binder.
 - 6. Submit to the RE 2 copies of a field sketch to approximate scale of each top flange with the areas of deterioration delineated and cross references to the photo numbering system.

For each floorbeam and stringer, the RE will determine whether the repairs are to be made according to the Plans or the structural elements are to be replaced in kind. The RE will direct the Contractor in writing based on the determination for each floorbeam or stringer.

557.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
TRUSS REPAIR, ___ VIADUCT, TYPE ___	UNIT
TRUSS REPAIR, ___ VIADUCT, TYPE ___, IF AND WHERE DIRECTED	POUND
FLOORBEAM REPAIR, ___ VIADUCT, TYPE ___	UNIT
FLOORBEAM REPAIR, ___ VIADUCT, TYPE ___, IF AND WHERE DIRECTED	POUND
BRACING REPLACEMENT, TYPE ___	UNIT
STRUCTURAL STEEL REPAIRS, IF AND WHERE DIRECTED	POUND

The Department will include payment for disposal of removed materials under Clearing Site, Bridge (___) as specified in 201.04.

The Department will make payment for removal of concrete encasement as CONCRETE ENCASUREMENT REMOVAL AND PAINTING as specified in 554.04.

THE FOLLOWING SECTION IS ADDED:

SECTION 558 – RIVET REPLACEMENT

558.01 DESCRIPTION

This section describes the requirements for replacing rivets with high-strength bolts.

558.02 MATERIALS

558.02.01 Materials

Provide materials as specified:

Structural Steel	906.01
Structural Steel Fabrication	906.04
Bolts and Bolting Material	908.01
DTL.....	908.03

558.03 CONSTRUCTION

558.03.01 Installation

1. Perform work at one repair location at a time. Do not proceed to another repair location until completing the preceding repair and obtaining RE approval of the repair.
2. Perform work to prevent damage to existing structures to remain. If damage occurs as the result of performing the work, submit a repair plan to the RE for approval. Repair damaged portions of existing structures according to the approved repair plan.
3. Flame-cut rivet heads 1/16 inch above the base metal using a rivet scarfing tip or other method approved by the RE that will not damage the existing structures to remain. Use a pneumatic punch to drive out the cut rivet shank.
4. If in the opinion of the RE rivet shanks cannot be removed by punching without damaging the base metal, remove the rivet shank by drilling.
5. Install high-strength bolts according to 506.03.01.
6. As approved by the RE, existing rivet holes may be reamed to fit proposed high strength bolts. Do not exceed the minimum edge distance or bolt spacing requirements as specified in AASHTO, Division I, Chapter 10.24.
7. At locations not shown on the Plans, replace rivets meeting the following criteria on an “if and where directed basis”:
 - a. Rivets or bolts are missing.
 - b. 50% or more of a rivet head or bolt is missing.
 - c. Rivets or bolts are loose (as noted in previous construction reports or observed during the work).
 - d. As directed by the RE.

558.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
RIVET REPLACEMENT	UNIT

The Department will include payment for rivet replacement related to structural steel repairs or the temporary jacking system under the various structural steel repair Items as specified in 557.04 or TEMPORARY JACKING SYSTEM as specified in 518.04, as applicable. The Department will make payment for rivet replacement not related to other structural steel repair Items or the temporary jacking system under RIVET REPLACEMENT.

The Department will include payment for disposal of removed materials as part of Clearing Site, Bridge (____) as specified in 201.04.

The Department will make payment for removal of concrete encasement as CONCRETE ENCASEMENT REMOVAL AND PAINTING as specified in 554.04.

THE FOLLOWING SECTION IS ADDED:

SECTION 559 – ABUTMENT POCKET

559.01 DESCRIPTION

This Section describes the requirements for constructing abutment pockets for the bearing seats of the proposed floorbeams.

559.02 MATERIALS

559.02.01 Materials

Use materials in conformance with 504.02.01 for cast in place concrete elements. Use materials in conformance with 505.02.01 for the precast slabs.

Use galvanized welded wire reinforcement as specified in 905.01.03.

559.02.02 Equipment

Use equipment in conformance with 504.02.02 for cast in place concrete elements. Use equipment in conformance with 505.02.02 for the precast slabs.

559.03 CONSTRUCTION

Demolish the areas of the existing abutment shown on the Plans as specified in 201.03.02. Construct cast in place concrete elements as specified in 504.03. Construct the precast concrete slabs as specified in 505.03.

559.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
ABUTMENT POCKET	UNIT

ABUTMENT POCKET includes payment for furnishing all labor, materials, tools, equipment, and incidentals involved for sawcutting, abutment demolition, cast in place concrete, reinforcement steel-galvanized, welded wire reinforcement-galvanized, precast concrete panels, drilling and grouting rebar, welded wire fabric, anchor bolts, grouting under masonry plate, and epoxy water proofing.

DIVISION 600 – MISCELLANEOUS CONSTRUCTION

SECTION 601 – PIPE

601.04 MEASUREMENT AND PAYMENT

THE FOLLOWING IS ADDED:

The Department will make payment for restoring the pavement structure for trenches in the traveled way and shoulder under various Items of the Contract.

SECTION 602 – DRAINAGE STRUCTURES

602.02.01 Materials

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS:

DGA.....	901.10
Self Consolidating Concrete (SCC)	903.06.01
Precast Concrete Culvert Channel	904.03
Structural Steel	906.01
Structural Steel Fabrication	906.04

THE FOLLOWING IS ADDED:

Use materials in conformance with 504.02.01 for cast in place concrete elements.

Use AASHTO gradation No. 8 for SCC.

602.02.02 Equipment

THE FOLLOWING IS ADDED TO THE LIST OF EQUIPMENT:

Use equipment in conformance with 504.02.02 for cast in place concrete elements.

602.03.01 Culverts and Headwalls

THE FIRST SENTENCE IS CHANGED TO:

Excavate as specified in 202.03.03 to accommodate precast concrete culvert channels and drain pipe connections.

1. Precast.

THE ENTIRE TEXT IS CHANGED TO:

Construct precast concrete culvert channels as specified in 505.03. Set precast culverts and headwalls on a 6-inch bed of compacted coarse aggregate. Remove handling devices and fill lifting holes with mortar. Set precast concrete culvert channel on SCC as shown on the Plans.

602.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
SPECIAL DRAINAGE STRUCTURE (___)	UNIT
SET INLET TYPE ___, CASTING	UNIT
PRECAST CONCRETE CULVERT CHANNEL, TYPE ___	LINEAR FOOT

THE FOLLOWING IS ADDED:

The Department will measure culvert channel with sloped or skewed ends along the invert.

SECTION 605 – FENCE

605.02.01 Materials

THE FOLLOWING IS ADDED:

Chain-Link Fence, PVC-Coated Steel, ____ High shall be fabricated from #9 gage having a 1” mesh, top and bottom selva to be knuckled. Fabric shall be continuous across all joints.

Fabricate the fabric for bird fencing from PVC coated galvanized steel wire, minimum #18 gage. Mesh size shall be 1” (25mm). Use fabric that matches the color of PVC-coated chain-link fence to be attached to. Use bolts and bolting materials as specified in 908.01. Submit certifications of compliance, as specified in 106.07, for fence materials. Attach mill certification to the certification of compliance.

605.03.01 Chain-Link Fence

THE FOLLOWING IS ADDED:

Construct bird fencing attachments to Structure No. 0904-152 in accordance with 509.03.01

605.04 MEASUREMENT AND PAYMENT

THE FOLLOWING IS ADDED:

The Department will include the payment for bird fencing under CHAIN-LINK FENCE, PVC-COATED STEEL, ____ HIGH.

SECTION 606 – SIDEWALKS, DRIVEWAYS, AND ISLANDS

606.03.02 Concrete Sidewalks, Driveways, and Islands

H. Protection and Curing.

THE LAST SENTENCE IS CHANGED TO:

Ensure vehicles and other loads are not placed on sidewalks, islands, and driveways until the concrete has attained compressive strength of 3000 pounds per square inch, as determined from 2 concrete cylinders field cured according to AASHTO T 23.

SECTION 607 – CURB

607.03.01 Concrete Barrier Curb

D. Placing Concrete.

THE THIRD SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

To place concrete between November 1 to March 15, submit to RE for approval a plan detailing the method of protecting the concrete from salt for at least 30 days after placing.

607.03.02 Concrete Vertical Curb and Concrete Sloping Curb

D. Placing Concrete.

THE ENTIRE TEXT IS CHANGED TO:

Place concrete for vertical curb and sloping curb as specified in 607.03.01.D, except that consolidation may be achieved by hand spading or internal mechanical vibrators.

607.03.04 Concrete Vertical Curb and Concrete Sloping Curb, Dowelled

D. Placing Concrete.

THE ENTIRE TEXT IS CHANGED TO:

Place concrete for vertical and sloping curb as specified in 607.03.02.D.

SECTION 608 – NON-VEGETATIVE SURFACES

THE ENTIRE SECTION IS CHANGED TO:

608.01 DESCRIPTION

This Section describes the requirements for constructing non-vegetative surfaces of HMA; color-coated HMA; porous HMA; broken stone, and polyester matting.

608.02 MATERIALS

608.02.01 Materials

Provide materials as specified:

Broken Stone, Coarse Aggregate No. 3.....	901.03
HMA (9.5M64).....	902.02
Asphalt-Stabilized Drainage Course.....	902.06
Non-Vegetative Surface Coating.....	912.02.04
Herbicide.....	917.11.03
Polyester Matting.....	919.15

Provide Non-Vegetative Surface, Porous HMA conforming to the requirements of Asphalt-Stabilized Drainage Course.

608.02.02 Equipment

Provide equipment as specified:

HMA Compactor.....	1003.05
Vibratory Drum Compactor.....	1003.06
HMA Plant.....	1009.01
HMA Trucks.....	1009.02

608.03 CONSTRUCTION

608.03.01 Non-Vegetative Surface, HMA

Excavate as specified in 202.03.03. Shape and compact the underlying material to produce a firm, even surface. Obtain RE approval before finishing excavation. If the RE determines that the bottom of the excavation is unstable, undercut, backfill, and compact as directed by the RE.

Construct the non-vegetative surface, HMA before installing guide rail. Obtain RE approval for alternate methods of construction.

Deliver HMA as specified in 401.03.03.D. Construct non-vegetative surfaces 4 inches thick. Place and compact the material to produce a surface free of roller marks and ridges. Spread and grade the HMA as specified in 401.03.03.E. Ensure that the finished surface is smooth, even, and graded to drain away from the guide rail. Compact HMA as specified in 401.03.03.F. Spread, rake, and lute areas not accessible to pavers and rollers with hand tools and compact with dynamic compactors.

Repair non-vegetative surface damaged by guide rail installation with HMA. Use hand tampers around posts and other obstacles where mechanical compactors are not accessible.

608.03.06 Post-Emergent Weed Control of Non-Vegetative Surfaces

Manually remove or spray vegetation growing on the non-vegetative surface with a post-emergent non-selective herbicide treatment for total control of vegetation on the non-vegetative surface area, as directed by the RE. Select post-emergent herbicides for control of targeted vegetation based on the manufacturer's recommendations and product label.

Begin the work associated with vegetation removal as early as the conditions permit. Herbicides must be applied by, or under the direct supervision of, a Certified Commercial Pesticide Applicator, according to the manufacturer's recommendations. Restore areas where herbicide has been applied and not intended to its prior existing condition at no cost to the State. Do not apply herbicide in the rain or when wet weather is expected within 24 hours. Do not apply herbicide after rain until approved by the RE.

The RE will notify the ME after Acceptance for inclusion of the non-vegetative surface in its herbicide spraying program including the date that the herbicide was last applied on the project section.

608.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
NON-VEGETATIVE SURFACE, HOT MIX ASPHALT	SQUARE YARD

When the RE directs undercutting of unstable material in the excavation area, the Department will make payment, as specified in 104.03.03, for the additional excavation. The Department will also make payment, as specified in 104.03.03, for the additional bedding if there is not an excess of excavated material available for use as bedding.

SECTION 609 – BEAM GUIDE RAIL

609.03.01 Beam Guide Rail

THE SEVENTH PARAGRAPH IS CHANGED TO:

Install flexible delineators with white retroreflective sheeting on the right side of the direction of traffic. Install flexible delineators with yellow retroreflective sheeting on the left side of the direction of traffic. Mount flexible delineators on the blockout of beam guide rail using either a "U" channel base on the I-beam blockout or a flat base attached to a wood, polymer, or other solid top blockout. Attach the base to the blockout using an adhesive recommended by the manufacturer of the base and panel.

SECTION 611 – CRASH CUSHIONS

611.02 MATERIALS

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS:

Concrete 903.03

THE SECOND PARAGRAPH IS CHANGED TO:

Ensure that the sand has a dry density of 90 to 100 pounds per cubic foot and a 3 percent maximum allowable moisture content. The RE may require the Contractor to test the moisture content of the sand according to AASHTO T 255 and to submit certified test results.

THE FOLLOWING IS ADDED:

Provide QuadGuard crash cushions as designed and manufactured by Energy Absorption Systems, Inc., Chicago, Illinois. No substitution is permitted. Provide manufacturer certification that the system has been crash tested according to NCHRP 350 and has passed the Test Level 3. Provide systems with a nose cover that is a highway yellow color.

611.03.02 Crash Cushion

Use Quadguard crash cushion(s) on the project. No substitution is permitted. Install QuadGuard crash cushions with steel backup structures on a relatively flat concrete foundation pad according to 504.03.02 and the manufacturer's recommendations.

611.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM IS ADDED:

Item
CRASH CUSHION, QUADGUARD, ___ BAYS, ___" WIDE

Pay Unit
UNIT

SECTION 612 – SIGNS

612.02 MATERIALS

THE FOLLOWING IS DELETED FROM THE MATERIALS LIST.

Non-Breakaway Sign Supports.....911.02.03

THE SECOND PARAGRAPH IS DELETED.

THE FOLLOWING IS ADDED AFTER THE LIST OF MATERIALS:

For specialized signs, provide historic sign panels of cast aluminum, alloy 43 with no junk or remelt, with a baked enamel or approved equal finish on the background in a leatherette texture and a smooth finish on the raised portions. Ensure the casting is free of pits and gas holes. Ensure all letters are sharp, with a clean edge. Provide octagonal posts for commemorative signs of galvanized steel with a baked enamel finish to match the panel background. Provide panels cast by:

Lake Shore Industries, Inc.
1817 Poplar Street
P.O. Box 59
Erie, Pennsylvania 16512-0059
Telephone: 800-458-0463

Flemington Aluminum and Brass, Inc.
24 Junction Road
Flemington, New Jersey 08822
Telephone: 908-782-6317
Contact: Jean Blackman

Greg Lefevre Studios
27 Bleeker Street
New York, New York 10012
Telephone: 212-677-1445

THE FOLLOWING SUBPART IS ADDED:

612.03.04 Specialized Sign

At least 30 days before beginning work, submit working drawings for approval. Include calculations for the post and foundation design, details of the post, sign layout and details, mounting hub details, and installation details. Ensure that the post and foundation are designed according to the Department's design manuals. In addition, submit a full size sign panel with mounting hub to the Bureau of Landscape Architecture and Environmental Solutions for approval. Ensure the dimensions, material, text, layout, color schemes, and finishes are as shown on the Plans.

Excavate as specified in 612.03.02.B.

Provide a single-face sign panel with a center post mounting hub sized to fit the octagonal sign post. Construct a reinforced cast-in-place concrete footing with an imbedded sign post. Install the sign and post according to the manufacturer's recommendations.

612.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEM IS ADDED:

Item
SPECIALIZED SIGN

Pay Unit
UNIT

ROUTE 139
PULASKI CONTRACT 2

THE FOLLOWING ITEM IS DELETED:

<i>Item</i>
GUIDE SIGN, TYPE GA, NON-BREAKAWAY SUPPORTS

<i>Pay Unit</i>
SQUARE FOOT

DIVISION 650 – UTILITIES

SECTION 651 – WATER

651.02 MATERIALS

THE THIRD PARAGRAPH AFTER THE LIST OF MATERIALS IS CHANGED TO:

Provide galvanized supports, rollers, rods, bolts, nuts, washers, inserts, and other hardware required for the permanent installation according to ASTM A 123 or A 153.

THE FOLLOWING IS ADDED:

Provide Jersey City Standard 2-piece hydrants as manufactured by A.P. Smith Company, or approved equal.

651.03.01 Water Pipe

C. Excavating.

THE LAST SENTENCE OF THE SECOND PARAGRAPH IS CHANGED TO:

For trenches not in the traveled way and shoulder, do not leave trenches open overnight unless protected with caution fence and approved by the RE.

E. Installing Water Pipe.

THE FOLLOWING IS ADDED AFTER THE FIRST SENTENCE OF THE FIFTH PARAGRAPH:

Make connections in dissimilar pipe materials using factory-fabricated connection pieces installed in accordance with the manufacturer's recommendations.

THE FOLLOWING IS ADDED:

Make all connections to the existing system using wet taps. Pump all leakage.

Install air release valves at high points of the water mains.

Do not operate valves. Notify the Utility to operate all valves.

I. Thrust Blocks.

THE FIRST SENTENCE IS CHANGED TO:

Install thrust blocks and tie rods at bends greater than 5 degrees, and at tees, plugs, and valves.

651.03.02 Water Pipe, Bridge

Submit working drawings for temporary utility supports for approval. Design temporary supports according to *AASHTO Standard Specifications for Highway Bridges*.

Comply with the requirements of 506.03.01 for structural steel shapes and supports for utility supports. Adjust hangers to provide uniform support of the pipe across the bridge and to align it in the abutment sleeves. Clean and paint the hanger supports as directed by the Utility or the RE. Use a laser system to control the alignment and grade of the pipe. Lay pipe in straight lines. Use only bridge members shown on the Plans as utility supports to support pipe. Install hangers, supports and straps as shown on the Plans and according to the manufacturer's recommendations. Ensure that the interior of the pipe is kept clean and free of intrusion of all foreign material. Ensure that the inside of the pipe is maintained clean. Protect open ends of the pipe at all times and securely seal the openings with plugs approved by the Utility whenever work is stopped. Remove the plug, and inspect and clean the interior of the pipe before resuming pipe installation. Join the pipe according to the manufacturer's recommendations. Cut pipe according to the manufacturer's recommendations. Ensure cuts are clean and square.

Locate spacers inside the casing pipe within 12 inches of each side of all joints in the water main. Provide intermediate spacers at a maximum spacing of 8 feet. In addition, install one spacer within 12 inches of the end of the casing pipe and

another spacer within 6 feet of the end of the casing. Extend casing pipe a minimum of 8 inches behind the abutment backwall. For water pipes without casing, provide sleeves through walls.

Remove temporary utility supports and water mains after the permanent water mains are in service.

651.03.04 Fire Hydrant

THE FOLLOWING IS ADDED:

Deliver hydrants that are removed to the Jersey City Division of Water Distribution. Locate hydrants at least 20 feet from the point of tangency or curvature at intersections. Locate hydrants at least 10 feet from the edge of residential driveways and at least 20 feet from the edge of commercial driveways.

651.04 MEASUREMENT AND PAYMENT

THE LAST PARAGRAPH IS DELETED.

THE FOLLOWING ITEM IS ADDED:

<i>Item</i>	<i>Pay Unit</i>
___" STEEL CASING	LINEAR FOOT

THE FOLLOWING IS ADDED:

The Department will include payment for permanent structural steel shapes used as utility supports as shown on the framing plan drawings on the Plans under STRUCTURAL STEEL as specified in 506.04. The Department will not make payment for structural steel shapes not shown on the framing plan drawings on the Plans or for other utility support members, temporary or permanent. Include the cost in the bid price of the various pipe Items.

SECTION 652 – SANITARY SEWERS

652.03.01 Sewer Pipe

C. Excavating.

THE LAST SENTENCE OF THE SECOND PARAGRAPH IS CHANGED TO:

For trenches not in the traveled way and shoulder, do not leave trenches open overnight unless protected with caution fence and approved by the RE.

F. Thrust Blocks.

THE THIRD SENTENCE IS CHANGED TO:

Ensure that thrust blocks do not come in contact with other utilities or structures without the approval of the RE.

652.04 MEASUREMENT AND PAYMENT

THE LAST PARAGRAPH IS DELETED.

SECTION 653 – GAS

653.02 MATERIALS

THE LAST PARAGRAPH AFTER THE LIST OF MATERIALS IS CHANGED TO:

Provide hot-dip galvanized supports, rollers, rods, bolts, nuts, washers, inserts, and other hardware required for the permanent installation according to ASTM A 123 or A 153.

653.03.01 Gas Main

A. Prequalification.

List of pre-qualified subcontractors is as follows:

J. Fletcher Creamer & Sons
Jorge Pires & Jack Hanley
1701 East Linden Avenue
Linden, New Jersey 07036
Telephone: 908-925-3200
Fax: 908-925-3350

DiClemente Contractors
Andy DiClemente
3100 Dell Avenue
North Bergen, New Jersey 07047
Telephone: 201-319-0900
Fax: 201-319-9312

Elk/Crown Pipeline
Construction Company
Bob Williams
3345 Delsea Drive
P.O. Box 39
Franklinville, New Jersey 08322
Telephone: 856-694-9200
Fax: 856-694-9201

Henkels & McCoy
Ken Carmelia & Pete Janco
Elbow Lane
P.O. Box 218
Burlington, New Jersey 08016
Telephone: 609-387-9000
Fax: 609 387 9682

J.F. Kiely Construction Co.
Jim Pagano
700 McClellan Street
Long Branch, New Jersey 07740
Telephone: 732-222-4400
Fax: 732-229-2353

Kemsco Construction Inc.
Ralph Serpe & Tony Perricho
139 Harper Street
Newark, New Jersey 07114
Telephone: 973-733-2255
Fax: 973-642-2928

Lantier Construction Co.
Bill Phillips
145 Dey Grove Road
Monroe Twp., New Jersey 08831
Telephone: 973-628-9302
Cell: 732-674-7981
Fax: 609-784-8764

Miller Pipeline Corp.
Greg Ritsick & Brad Heck

378 Whitehead Avenue
South River, New Jersey 08882
Telephone: 484-256-4619
Fax: 732-238-2265

Napp Grecco Company
Joseph Napp & Phil Testa
1500 McCarter Highway
Newark, New Jersey 07104
Telephone: 973-482-3500
Cell: 973-445-3084
Fax: 973-268-3639

Roman E&G Corp.
Michael Lamorgese & Joe Belott
14 Ogden Street
Newark, New Jersey 07104
Telephone: 973 482 1113
Fax: 609 882 7338

Joseph M. Sanzari, Inc.
Rich Egan
19 Wallace Street
Elmwood Park, New Jersey 07601
Telephone: 201-538-6615

Skoda Contracting
Barry Stelmack & Frank Evans
147 Gold Mine Road
Flanders, New Jersey 07836
Telephone: 800-507-9601
Fax: (973) 691-2005

Waters & Bugbee, Inc.
Dennis Brophy
75 South Gold Drive
Hamilton, New Jersey 08691
Telephone: 609 584-1100
Fax: 609 584-2200

E. Excavating.

THE LAST SENTENCE OF THE SECOND PARAGRAPH IS CHANGED TO:

For trenches not in the traveled way and shoulder, do not leave trenches open overnight unless protected with caution fence and approved by the RE.

653.03.02 Installing Gas Mains on Bridges

THE ENTIRE SUBPART IS CHANGED TO:

Install expansion joints in the main as instructed by the Utility representative. Comply with the requirements of 506.03.01 for structural shapes and plates for utility supports. Use adjustable roller hangers or approved equal to provide uniform support of the pipe across the bridge and to align it in the abutment sleeves. Use only bridge members shown on the Plans as utility supports to support pipe. Install hangers, supports and straps as shown on the Plans and according to the manufacturer's recommendations. Clean and paint the hanger supports as directed by the Utility or the RE. Comply with the applicable provisions of 653.03.01.

Before removing abandoned pipe designated for removal, purge, cut and cap the pipe. Remove pipe to a minimum of 5 feet behind the abutment backwalls or as necessary to perform the work.

653.04 MEASUREMENT AND PAYMENT

THE LAST PARAGRAPH IS DELETED.

THE FOLLOWING IS ADDED:

The Department will include payment for permanent structural steel shapes used as utility supports as shown on the framing plan drawings on the Plans under STRUCTURAL STEEL as specified in 506.04. The Department will not make payment for structural steel shapes not shown on the framing plan drawings on the Plans or for other utility support members, temporary or permanent. Include the cost in the bid price of the various pipe Items.

The Department will include payment for purging, cutting, capping and removing abandoned pipe designated for removal from the bridge under the Item CLEARING SITE, BRIDGE (Structure No. 0904-152) as specified in 201.04.

THE FOLLOWING SECTION IS ADDED:

SECTION 655 – ELECTRIC FACILITIES

655.01 DESCRIPTION

This Section describes the requirements for installing conduit systems, and manholes for electric utilities.

655.02 MATERIALS

Provide materials as specified:

Coarse Aggregate (No. 57)	901.03
Concrete	903.03
Controlled Low Strength Material (CLSM)	903.09
Structural Steel	906.01
Bolts and Bolting Material	908.01
Class B Bedding	909.01.02
Class C Bedding	909.01.03

Provide steel pipe sleeves according to ASTM A 252, and galvanize according to ASTM A 123.

Provide galvanized supports, rollers, rods, bolts, nuts, washers, inserts, and other hardware required for the permanent installation according to ASTM A 123 or A 153.

The Utility will supply all conduit, protective steel plate and manhole materials at no cost to the Contractor. Provide the Utility written notice 4 to 6 months in advance of when materials will be required. Pick up the materials within two weeks of the notice that the material is available. Materials may be located at more than one storage facility. If delivery is not taken within two weeks of notification, the material may not be available. The Contractor is responsible for compensating the Department for additional handling costs incurred by the Utility resulting from the failure to take delivery within the time required.

Store and protect all materials received from the Utility. Return and deliver all excess materials furnished by the Utility to the Utility's storage facility. Obtain a receipt for all material received, maintain a documented inventory of materials used and obtain a receipt for all material returned.

655.03 CONSTRUCTION

A. Prequalification. Only a pre-qualified contractor approved by the Utility may construct electric facilities.

List of pre-qualified subcontractors is as follows:

J F Creamer & Sons. Inc.

Ted Palowada
101 East Broadway
Hackensack, New Jersey 07601
Telephone: 201-488-9800

Henkles and McCoy, Inc.
Ray Hill
Elbow Lane
P.O. Box 218
Burlington, New Jersey 08016
Telephone: 609-387-9000

KEMSCO Construction Inc.
Ralph Serpe
P.O. Box 10019
139 Harper Street
Newark, New Jersey 07101
Telephone: 973-733-2255

Roman E & G Corp.
Michael Lamorgese & Joe Bellot
14 Ogden Street
Newark, New Jersey 07104
Telephone: 973-482-2501

- B. Scheduling Work.** Schedule work as specified in 651.03.01.A.
- C. Existing Utilities and Structures.** Comply with 651.03.01.B.
- D. Excavation.** When excavation is required in areas having existing pavement and sidewalk, sawcut to the full depth of the existing pavement and sidewalk. Excavate trenches for conduit, manholes and vaults and appurtenances. Provide vertical sides for excavations within the traveled way, shoulder, sidewalk areas, and where existing facilities require protection. Remove unstable material at the bottom of the excavation and backfill with granular material. Grade trenches toward manholes. Do not excavate trenches more than 300 feet in advance of installing conduit unless approved by the RE. Provide and maintain trench crossings where necessary to maintain access.
- Maintain trenches according to 29 CFR 1926. Provide and maintain trench crossings where necessary. For trenches in the traveled way, shoulder and within 30 feet of the outside edge of the shoulder, backfill and restore the pavement structure and match the surrounding condition before opening to traffic. The Contractor may use temporary protection instead of backfilling trenches in the traveled way and shoulder. If using temporary protection, submit working drawings for approval. For trenches not in the traveled way and shoulder, do not leave trenches open overnight unless protected with caution fence and approved by the RE. Remove and dispose of excess or unsuitable material as specified in 202.03.07.
- E. Installation.** Remove water from the trench immediately before laying conduit. If small quantities of water remain in the trench, place coarse aggregate. Install conduit with 3 feet of cover. Do not install conduit with less than 12 inches of cover. If less than 2.5 feet of cover is provided, install protective steel plate as directed by the Utility. Install 3/16-inch polypropylene rope in each conduit. Install a measuring tape in lieu of the rope in single duct installations and in one duct of multi-duct installations. Where change in horizontal direction is necessary, use a minimum radius of 12.5 feet. Properly cement all joints and couplings. Use polypropylene banding to tie plastic conduit in place. Use weights to prevent the conduit from floating while pouring concrete. Concrete a minimum of 3 inches all around conduit, with 1-1/2 inches of concrete between conduits.

At risers, use horizontal sweeps with a minimum radius of 12.5 feet. Install vertical 90° bends with a 4-foot radius at the base of the pole.

Construct manholes as specified in 602.03.02. Provide 6 inches of coarse aggregate under manholes. Install manholes with a minimum of 12 inches between final grade and the top of the manhole roof. Ensure manholes are

set level. When terminating conduits in manhole with knockout windows, remove the entire knockout panel, apply an epoxy bonding compound and fill with concrete.

Rod all completed conduit runs. Clean with a wire brush slightly larger than the conduit and a flexible mandrel at least 12 inches long and 1/4 inch less than the inside diameter of the conduit.

F. Backfill. Backfill with suitable material in lifts not exceeding 6 inches thick, loose measurement as specified in 701.03.05C. If the backfill is predominantly granular material, compact the backfill material with a vibratory plate compactor. For material that is not predominately granular, compact the backfill material with a vibratory rammer compactor. If it is not possible to compact the backfill material, the Contractor may backfill with CLSM with the approval of the PSE&G representative. If using CLSM, install as specified in 601.03.01.F.

G. Installing Electric Conduit on Bridges. Comply with the requirements of 506.03.01 for structural shapes and plates for utility supports. Use adjustable roller hangers or approved equal to provide uniform support of the conduit across the bridge and to align it in the abutment sleeves. Use only bridge members shown on the Plans as utility supports to support conduit. Install hangers, supports and straps as shown on the Plans and according to the manufacturer's recommendations. Clean and paint the hanger supports as directed by the Utility or the RE. Comply with the applicable provisions of 653.03.01.

H. As-Built Plans. Upon completion of the work, submit to the RE and the Utility scaled as-built plans. On the plans, show the following:

1. Location of all manholes with final grade elevations and the length of duct installed between them.
2. Depth of conduit at all changes in direction and at a minimum of 100-foot increments along the line.
3. Locations of steel plating.
4. The location, depth, size and type of other utilities or obstructions encountered during construction of electric facilities.
5. Detail drawings of new manholes with interior dimensions and the location of all conduits (50 scale).

On all plans, show stationing and distance references to the curb line or other permanent structure.

655.04 MEASUREMENT AND PAYMENT

<i>Item</i>	<i>Pay Unit</i>
ELECTRICAL CONDUIT	LINEAR FOOT
ELECTRICAL MANHOLE	LINEAR FOOT

THE FOLLOWING IS ADDED:

The Department will include payment for permanent structural steel shapes used as utility supports as shown on the framing plan drawings on the Plans under STRUCTURAL STEEL as specified in 506.04. The Department will not make payment for structural steel shapes not shown on the framing plan drawings on the Plans or for other utility support members, temporary or permanent. Include the cost in the bid price of the various conduit Items.

THE FOLLOWING SECTION IS ADDED:

SECTION 656– COMMUNICATIONS

656.01 DESCRIPTION

This Section describes the requirements for installing conduit systems, including conduit, handholes and manholes, for communications facilities for Comcast, Cablevision, Sidera Networks, Level 3 Communications, LLC, and Jersey City Economic Development Corporation (JCEDC).

656.02 MATERIALS

Provide materials as specified:

Coarse Aggregate (No. 57).....	901.03
Concrete	903.03

Grout	903.08.02.A
CLSM.....	903.09
Structural Steel	906.01
Bolts and Bolting Material	908.01
Class B Bedding	909.01.02
Class C Bedding	909.01.03
Conduit and Fittings.....	918.01
Resin Splicing Kits	918.05
Electrical Tape.....	918.06

For Comcast and Cablevision facilities on bridges, provide 4-inch fiberglass conduit as according to NEMA TC-14.

Elsewhere, provide 4-inch PVC conduit for Comcast and Cablevision facilities according to the requirements for Rigid Nonmetallic Conduit.

Provide 6-inch fiberglass conduit for JCEDC facilities as according to NEMA TC-14.

For Sidera Networks and Level 3 Communications, LLC facilities on bridges provide fiberglass quad duct conduit.

Elsewhere, provide PVC quad duct conduit for Sidera Networks and Level 3 Communications, LLC facilities.

Provide steel pipe sleeves according to ASTM A 252, and galvanize according to ASTM A 123.

Provide hot-dip galvanized supports, rollers, rods, bolts, nuts, washers, inserts, and other hardware required for the permanent installation according to ASTM A 123 or A 153.

The Utility will provide handholes. Provide 2 months advance written notice to Comcast to provide handholes. Provide 1 month advance written notice to Comcast to provide handholes.

656.03 CONSTRUCTION

656.03.01 Communications Facilities

- A. Scheduling of Work.** Schedule work as specified in 651.03.01.A.
- B. Existing Utilities and Structures.** Comply with 651.03.01.B.
- C. Handling and Storing.** The Utility will provide handholes. Coordinate pickup of the handholes with each Utility. Obtain material receipts from the Utility and provide a copy to the RE.
- D. Excavating.** Before excavating, sawcut the full depth of the existing pavement and sidewalk. Excavate a trench for placing communications conduit and appurtenances. Obtain RE approval before finishing excavation. If the RE determines that the bottom of the trench is unstable, undercut as directed by the RE and backfill with Class B bedding. If the material at the bottom of the trench is rock or other hard material, excavate an additional 6 inches of the material below the bottom of the pipe. Backfill the undercut with Class C bedding. Ensure that trenches are kept free of standing water during the installation. Do not excavate for trenches in embankments until the embankment has been constructed to an elevation of at least 3 feet above the top of the pipe or to the top of the embankment, whichever is lower. Do not excavate trenches more than 300 feet in advance of installing the pipe unless approved by the RE.

Maintain trenches according to 29 CFR 1926. Provide and maintain trench crossings where necessary. For trenches in the traveled way, shoulder and within 30 feet of the outside edge of the shoulder, backfill and restore the pavement structure and match the surrounding condition before opening to traffic. The Contractor may use temporary protection instead of backfilling trenches in the traveled way and shoulder. If using temporary protection, submit working drawings for approval. For trenches not in the traveled way and shoulder, do not leave trenches open overnight unless protected with caution fence and approved by the RE. Remove and dispose of excess or unsuitable material as specified in 202.03.07.

- E. Installation.** Install PVC conduit as specified in 701.03.05.B. Make 11 1/4, 22 1/2, 45, and 90-degree bends to accomplish offsets or turns. Construct bends with a minimum radius of 3 feet. Install fiberglass conduit according to the manufacturer's recommendations. Install conduit with 3 feet of cover. Place handholes on 6 inches of

course aggregate No. 57 in sidewalks or grassed areas. Do not construct handholes in lanes or shoulders of the roadway.

- F. Backfill.** Backfill with suitable material in lifts not exceeding 6 inches thick, loose measurement, as specified in 701.03.05.C. If the backfill is predominantly granular material, compact the backfill material with a vibratory plate compactor. For material that is not predominately granular, compact the backfill material with a vibratory rammer compactor. If it is not possible to compact the backfill material, the Contractor may backfill with CLSM with the approval of the Utility. If using CLSM, install as specified in 601.03.01.F. Restore the original pavement structure to the original condition or as shown on the Plans.
- G. As-Built Plans.** Upon completion of the work, submit to the RE and to each Utility a scaled as-built plan noting the location of the Items of construction related to that utility. On the plan, show stationing and distance references to the curb line. On the plans, show the depth of the conduit at a minimum of 100-foot increments along the line. Prints of Plans, marked to show the final locations, are acceptable.

656.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

<i>Item</i>	<i>Pay Unit</i>
CABLE CONDUIT	LINEAR FOOT
___" QUAD DUCT CONDUIT	LINEAR FOOT
___" QUAD DUCT CONDUIT, BRIDGE	LINEAR FOOT
CABLE HANDHOLE	UNIT

THE FOLLOWING IS ADDED:

The Department will include payment for permanent structural steel shapes used as utility supports as shown on the framing plan drawings on the Plans under STRUCTURAL STEEL as specified in 506.04. The Department will not make payment for structural steel shapes not shown on the framing plan drawings on the Plans or for other utility support members, temporary or permanent. Include the cost in the bid price of the various conduit Items.

DIVISION 700 – ELECTRICAL

SECTION 701 – GENERAL ITEMS

701.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This Section also describes the requirements for modifying an existing load center, including removal of an existing transformer.

701.03.01 Existing Systems

THE FOLLOWING IS ADDED:

Decommission, remove and dispose of the existing transformer from the load center. It is not known if the transformer contains polychlorinated biphenyl (PCB). The transformer was not tested; however, for “use” the transformer is presumed to be PCB-Contaminated Electrical Equipment.

When performing activities related to the existing transformer to be removed, comply with 40 CFR Part 761 *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*. Comply with Federal, State and local laws, rules and regulations; and as specified herein.

Provide power for the roadway lighting system at all times during construction. Ensure the temporary lighting system is operational before beginning removal of the electrical equipment.

Ensure the personnel performing the work have expertise in removing and disposing of mineral oils and electrical equipment in accordance with 40 CFR 761. Submit the qualifications of the personnel performing the work to the RE. The RE will be the sole judge of the qualifications.

Submit a Spill Control Plan and a Spill Prevention Plan and a copy of all plans required by the EPA to the RE 30 days before beginning the work. Include a list of emergency contact telephone numbers in the plans.

While performing the work, limit personnel from the immediate area to those directly involved in the work.

De-energize the transformer and perform the required testing to determine if it is non-PCB, PCB-Contaminated or PCB. If testing determines that it is PCB or PCB-Contaminated, empty the transformer of all free flowing oil for immediate removal and disposal. Dispose of the drained oil and the transformer carcass according to EPA regulations. Do not send the carcass or drained oil to a landfill. If testing determines the unit is non-PCB, it may be removed and disposed of without removing the oil.

Provide the appropriate protective clothing to the RE, including but not limited to overalls, goggles and gloves for the duration of the work.

Provide proof of all requisite licenses, permits, training and insurance for the waste transporters to transport material wastes.

Pay fees associated with removal and disposal. Submit a Certificate of Disposal to the RE. Submit to the RE all documentation required according to EPA rules and state and local laws.

701.03.15 Cable and Wire

A. Installing.

THE FOLLOWING IS ADDED

Test the existing tracer wire in the conduit for continuity. If there is no existing tracer wire in any of the conduits in the same trench, then install a continuous tracer wire between the adjacent junction boxes without any splice when installing the cable and wire as directed by the RE.

C. Connection and Coordination with Utility Services.

THE FOLLOWING IS ADDED TO THE FOURTH PARAGRAPH:

At Substantial Completion provide the RE with a letter requesting transfer of utility services providing the latest copy of the utility bill from each utility company. Such transfers are to be effective beginning the next monthly billing cycle after Substantial Completion or as directed by the RE.

For transfer of utility services involved with ITS system devices, successful ITS system testing is also required to be completed as specified in Section 704.

701.04 MEASUREMENT AND PAYMENT
THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
MODIFY EXISTING LOAD CENTER	LUMP SUM

THE FOLLOWING IS ADDED:

If restoration of disturbed areas includes pavement, curb, sidewalk, driveway or island, the Department will make payment for such work as specified in 104.03.03.

When the RE directs the installation of a new conduit or a repair to the defective conduit, the Department will make payment for this work as specified in 104.03.03.

When the RE directs the Contractor to install a tracer wire in existing conduit, the Department will make payment for this work as specified in 104.03.03.

The Department will make payment for removal and disposal of the transformer from the load center under MODIFY EXISTING LOAD CENTER. The Department will include payment for removal of equipment from the load center other than the transformer under the Item CLEARING SITE as specified in 201.04.

SECTION 702 – TRAFFIC SIGNALS

702.02.01 Materials

THE FOLLOWING IS ADDED:

For Items indicated to be decorative, ensure all metal components are powder coated black after welding.

Push button assemblies Type APS shall include the complete push button and housing, traffic signal cable from terminals of the push button to the base of the standard, and instruction sign. The signs shall be in conformance with the MUTCD. The legend for the sign shall be Push Button for Green Light except if WALK - DON'T WALK indications are used, the legend shall be Push Button for WALK Signal. Push buttons shall operate with the APS Control Unit in the controller cabinet. The Push Button is part of an Accessible Pedestrian System (APS). The item includes all programming of the buttons.

The APS Control Unit shall consist of furnishing and installing a complete APS system at the intersection. The APS Control Unit is composed of the control unit in the controller, all cables and all required programming. The assemblies shall also include an interface panel installed in each of the traffic signal controllers. The item also includes providing two handheld devices for programming the push buttons.

The Accessible Pedestrian System (APS) Push Buttons and Control Unit as a minimum shall comply with the following:

- A. Push Button Assembly Type APS.** Push button assemblies shall be of the direct push button contact type and shall not have any levers, handles or toggle switches externally or internally. The button shall be rated for 100 million plus operations with greater than 2 pound actuation force. The push button shall operate with the APS control unit. The contacts shall be entirely insulated from the housing and operating button. The contacts shall be normally open and shall be closed with a minimum of pressure on the button, restoring immediately to the normally open position when the pressure is released.

The cast aluminum housing shall have a curved back that will readily enable it to be mounted on a traffic signal pole or push button standard. The housing shall have a minimum 1/2 inch access hole in the rear for wiring. The front cover plate shall be secured with stainless steel vandal resistant screws. Any other threaded conduit bosses shall be provided with threaded plugs so that access is only possible from the rear of the

housing. The plugs shall not be removable with ordinary tools. The housing shall be painted highway yellow baked enamel matching to Federal Standard 595A color #13538.

Push button shall provide an 8 ohm, 15 watt, weatherproof speaker, and operate in a temperature range of -40 to 165 °F with 0-100 percent humidity non-condensing. The push button shall contain an LED that lights when the button is pushed and remains lit until the next walk phase. The LED luminous intensity shall be greater than 1200 mcd, sunlight visible, ultra bright red, viewing angle 160°. The face plate shall be aluminum, powder coated, ink marking. The push button shall be ADA compliant, cast aluminum, nickel plated, powder coated. The push button shall be provided with outputs optically isolated 36 volts AC/DC Peak, 0.3A solid state fused contact closure. The fault output normally shall provide a constant pedestrian call to the controller. The power output shall not exceed nominal 22 volts DC, short circuit protected - auto recovering.

The push button shall be programmable to provide a tone or speech WALK indication for pedestrians. Text and name of street for speech WALK indication shall be programmed for the information provided on the Plans. The push button shall provide a built-in WALK/DONT WALK conflict detection system.

The push button shall utilize two wires, the standard pushbutton cable. All push button sounds shall be synchronized on an intersection. The system shall provide independent minimum and maximum volume settings for locate sounds, clearance and walk sounds, and extended button push and volume overrides that provide pushbutton information message and provides a louder WALK indication. The system shall provide global configuration changes (setup one and save changes to all versus setup per individual push button station). The system shall provide an optional clearance sound or audible countdown of remaining seconds during clearance that complements visible countdown displays. The system shall provide a secure configuration that prevents unauthorized tampering and a self-test and fault report to a remote site for real-time monitoring and system maintenance.

The system shall provide user selectable multiple language support option available so that it can be programmed with up to three pedestrian selectable languages. The maximum volume dynamic range shall be 60 decibels. Provide an adjustable extended push time from 1 to 6 seconds in 0.5-second increments that can be set by installer. The push button shall provide valuable information and cues via both a vibrating arrow button and audible sounds making the intersection accessible for all pedestrians. All sounds shall emanate from the back of the unit. The weatherproof speaker shall be protected by a vandal resistant screen. A sunlight visible red LED shall indicate "ON" to confirm the button has been pushed. The arrow of the push button shall be oriented in the direction of the crosswalk and provide a clear indication of the direction of travel to the pedestrian.

The APS system shall provide as a minimum the following messages and sounds:

1. Custom Locate Sound - Plays a sound at a selectable interval to assist a blind pedestrian in locating the push button station.
2. Custom Location Message(s) - States street being crossed and cross street names with option to add direction of travel.
3. Custom Walk Message(s) - Alerts pedestrians that the walk interval has begun and name of street being crossed.
4. Custom Clearance Sounds/Countdown - Plays a sound to notify pedestrians to clear intersection crosswalk. This tone sounds similar to the locate tone but is played at a faster rate or counts down the number of seconds in the clearance phase.
5. Two custom messages shall be available also, both override all other sounds or messages and play once every time the assigned input is activated on the APS control unit.

The push button shall include an integral pedestrian instruction sign conforming to MUTCD, published by FHWA. Pedestrian instruction signs shall be either Type R10-3 or Type R10-4 as specified on the Plans. The text shall be encoded into braille for imprinting on pushbutton or informational sign.

Two hand held remote devices shall be provided to perform the field programming of the push buttons and APS control unit. The device shall utilize an infrared connection to provide the programming function. The device shall provide a 2-line, 16-character display.

- B. APS Control Unit.** The APS control unit shall be installed inside the traffic signal controller cabinet and shall be powered by the AC supply mains (115 volts AC). The APS control unit shall provide the power supply and signaling interface between the existing intersection traffic signal controller and the Push Button Assemblies Type APS located in the field. One APS control unit shall have the ability to control up to 12 push button assemblies. The APS control unit shall control up to 4 pedestrian phases, receiving its timing from the Walk and Don't Walk signals. Additional advanced configurations shall be available by using its general purpose inputs and outputs. All inputs and outputs shall have full optical isolation and include transient voltage protection. The Ped Walk / Don't Walk Inputs shall be optically isolated 80-150 volts AC/DC, 5mA maximum. The general purpose outputs and pedestrian outputs shall be optically isolated 36 volts AC/DC peak with 0.3A solid state fused contact closure.

The fault output normally shall be open and closed relay contacts at 125 volts AC/DC, 1A maximum. A, B, C, D PBS power outputs shall be nominal 22 volts DC, short circuit protected, auto recovering. The general purpose inputs shall be 10 to 36 volts AC/DC peak, 10mA maximum, optically isolated.

The APS control unit shall have an operating temperature range of -30 to 165 °F, 0 to 100 humidity non-condensing. The unit shall include all interface cables and wiring for a completely operational system.

The system shall provide an announcement of direction of travel (example "traveling west") added in the field to a location message. The system shall have an extended push priority (mutes entire intersection except selected crosswalk to minimize confusion caused by other sounds). The system shall have synchronized sounds throughout intersection and reduced noise clutter. All inputs and outputs of the APS control unit shall be optically isolated and eliminate the need for pedestrian button isolators.

The system shall have the capability to provide special messages throughout intersection such as "Emergency vehicle approaching, please clear intersection immediately", or a similar warning message regarding an approaching train or emergency vehicle.

- C. Instructions and Guarantee.** The system shall have a 3 year manufacturer's guarantee from the date of acceptance against all imperfections in workmanship and materials.

The manufacturer shall provide field assistance for the operation and maintenance of the system for one year following the acceptance of the system.

Five schematic wiring diagrams and maintenance manuals, including theory of operation, shall be provided with each intersection at which the APS system is provided.

- D. Training.** A one-day training seminar shall be provided by the vendor and shall provide instruction in the proper installation and programming of the APS push buttons and control unit. The training shall be provided for 10 people at a facility provided by the State.

702.03 CONSTRUCTION

THE FOLLOWING IS ADDED:

After placing a new, temporary or interim traffic signal system into operation, inspect the traffic signal system every 2 months. Fill out a Contractor Maintenance Traffic Signal Inspection Report (Form EL-16C) when the traffic signal system becomes operational, when the traffic signal system is modified, and at every 2-month inspection.

Maintain as-built drawings of each signal modification. Place copies of the as-built drawings for each traffic signal system modification, Forms EL-16C, and Forms EL-11C in a plastic pocket mounted inside the cabinet door of each controller cabinet. Also provide a copy of all forms and as-built drawings to the RE.

If a new, temporary or interim traffic signal system fails or becomes damaged, repair and restore the traffic signal system to normal operation. Begin repair of the traffic signal system within 2 hours of receiving notice of damage or malfunction from the Department, State police, or local authorities. Ensure that workers assigned to such repair work continuously until the traffic signal resumes normal signal operation.

For each response to a system failure or damage, fill out a Contractor Maintenance Emergency Call Record (Form EL-11C) and place it in a plastic pocket mounted inside the cabinet door of each controller cabinet.

If the Contractor fails to respond to a failure or damage notification and begin work within 2 hours of notification, or does not continue to work until the traffic signal system resumes normal operation, the Department, in the interest of safety, will respond with its own forces to restore normal operation. If the Department mobilizes its forces to effect repairs, the Contractor agrees to pay the Department a sum of \$3000 for costs of mobilizing its forces and equipment. In addition, the Contractor must pay the Department the actual cost of material used for the repair and pay the actual costs of police traffic protection.

702.03.11 Temporary and Interim Traffic Signal Systems
 THE FIRST THROUGH FIFTH PARAGRAPHS ARE DELETED.

702.04 MEASUREMENT AND PAYMENT
 THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
PUSH BUTTON ASSEMBLIES, TYPE ____	UNIT
APS CONTROL UNIT	UNIT
TRAFFIC SIGNAL STANDARD, ALUMINUM, DECORATIVE	UNIT
TRAFFIC SIGNAL MAST ARM, ALUMINUM, DECORATIVE	UNIT
TRAFFIC SIGNAL STANDARD, STEEL, DECORATIVE	UNIT
TRAFFIC SIGNAL MAST ARM, STEEL, DECORATIVE	UNIT

THE FOLLOWING IS ADDED:

The Department will include payment for all costs related to programming push buttons, testing, providing hand held programming devices, training and all other materials and labor under APS CONTROL UNIT.

SECTION 703 – HIGHWAY LIGHTING

703.02.01 Materials.

THE FOLLOWING IS ADDED TO THE LIST OF MATERIALS:

Decorative Luminaire.....	918.12
Lighting Standard Concrete.....	918.12

THE FOLLOWING IS ADDED AFTER THE LIST OF MATERIALS:

For Items indicated to be decorative, ensure all metal components are powder coated black after welding.

Provide concrete lighting standards as specified on the Plans and in 918.12.

703.03 CONSTRUCTION

THE FOLLOWING IS ADDED:

Maintain up-to-date as-built drawings of the highway lighting system and temporary highway lighting system. Place copies of the as-built drawings in a plastic pocket mounted inside the meter cabinet, and provide a copy to the RE.

If the highway lighting system or temporary highway lighting system fails or becomes damaged, repair and restore the system to normal operation. Begin repair of the signal system within 2 hours of receiving notice of damage or malfunction from the Department, State police, or local authorities. Ensure workers assigned to such repair work continuously until the lighting system is restored to normal operation.

For each response to a system failure or damage, fill out a Contractor Maintenance Emergency Call Record (Form EL-11C) and place it in a plastic pocket mounted inside the cabinet door of each controller cabinet.

If the Contractor fails to respond to a failure or damage notification and begin work within 2 hours of notification, or does not continue to work until the lighting system is restored to normal operation, the Department, in the interest of safety, will respond with its own forces to restore normal operation. If the Department mobilizes its forces to effect repairs, the Contractor agrees to pay the Department a sum of \$3000 for costs of mobilizing its forces and equipment. In

addition, the Contractor must pay the Department the actual cost of material used for the repair and pay the actual costs of police traffic protection.

703.03.07 Temporary Highway Lighting System

Design the temporary lighting system at the areas shown on the Plans.

Deliver and unload salvaged materials to the Department maintenance yard nearest the Project Limits.

THE SIXTH PARAGRAPH IS DELETED:

THE EIGHTH THROUGH TENTH PARAGRAPHS ARE DELETED:

703.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
LIGHTING STANDARD DECORATIVE	UNIT
LIGHTING MAST ARM DECORATIVE	UNIT
LUMINAIRE DECORATIVE	UNIT
LIGHTING STANDARD CONCRETE	UNIT

SECTION 704 – INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

704.02.01 Materials

FIFTH PARAGRAPH IS CHANGED TO:

Submit catalog cut sheets of the ITS and electrical material specified components along with the system working drawings, in a complete package for approval. The complete package of the system working drawings includes but is not limited to the ITS System Block Diagrams, Fiber Assignment Diagrams, and Rack/Cabinet Equipment Layout Diagrams; Electrical material catalog cut sheets, Certified Structural Details & Calculations. All components must be approved in the system working drawings before use on the Contract. Submit structural components separately for structural review and approval with the required certification and include a copy of all approvals when submitting the system working drawings to meet the complete package requirement.

THE FIRST SENTENCE OF THE LAST PARAGRAPH IS CHANGED TO:

For materials furnished and installed, provide a minimum 2-year warranty from the latter date of Substantial Completion and Successful ITS System Testing against any imperfections in workmanship, components and materials.

704.03.01 General System (GS)

B. Installation.

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

When installing a new system or modifying an existing system, ensure the respective manufacturer certified field representative of ITS components and related equipment is on site to put the equipment into operation.

The Department will allow existing system shutdowns for work at the Statewide Traffic Management Center from 10:00 p.m. to 5:00 a.m.. For each half hour the work extends beyond those time frames, the Department will assess liquidated damages of \$500 per half hour.

1. Junction Box ITS.

THE ENTIRE TEXT IS CHANGED TO:

- a. Installation.** Excavate as specified in 202.03.02. Install junction boxes only in areas where the slope is not less than 22H: 1V. Place junction boxes on 10 inches of coarse aggregate No. 57. With each junction box, provide 6 coiling brackets, inserts and fasteners, and a ground rod and clamp. A ground rod is only required for locations where electrically conductive material is present. Backfill and compact

using the directed method as specified in 203.03.02.D. Restore disturbed areas to the original conditions, the conditions specified in the Contract, or as directed by the RE.

- b. Relocation.** Submit plans showing the proposed method of relocation of junction box including any provisions for maintaining network operation and/or cut-over during the process to the RE for approval. Remove existing ITS junction box by excavating around the junction box, cutting back conduits, pulling the cable slack equally to adjacent junction boxes and notching the portion of junction box below the conduits sufficient to slide the fiber optic cable. After removal of the junction box, re-couple the conduit(s), and terminate them using approved conduit repair kits and backfill with approved material and compact using the directed method as specified in 203.03.02.D. Install the Junction Box after approval by the RE. Ensure that the cut conduit ends are terminated at the entrance of the junction box wall using a manufacturer recommended kit depending upon the type of conduits. Ensure that the fiber optic cable is pulled back from the adjacent junction boxes in equal length to maintain the required slack for any immediate or future splicing.

6. Control Center System.

THE FOLLOWING IS ADDED:

Ensure the ITS System Network working drawing is submitted in a format acceptable to the Department. Sample Working Drawings are available at:

<http://www.state.nj.us/transportation/eng/elec/ITS/pdf/sampledrawings.pdf>

Ensure the working drawing contains the following information:

1. Affected network nodes are shown in nodal format with Latitude/Longitude
2. Each node shows equipment type and the proposed communication links between them.
3. Distances between Ethernet switches and calculated dB loss between them.
4. A Communication Network Assignment Table specifying Equipment Location (Node, Site ID, Lat/Long, Plan sheet reference, Route, Mile Post), Equipment Information (Item No., Description, Function, VLAN No., Subnet Mask, and IP Address)

Supply and install equipment, software, software revisions, firmware, miscellaneous wiring and cabling, at the specified Control Centers to ensure the remote operation and control of all ITS field devices from the Traffic Operation Centers. Comply with building installation requirements, restrictions, access, and security requirements in the performance of work. The material and work required for the integration of the various ITS installations into the various existing operating systems or subsystems used by the Department includes, but is not limited to, the following:

1. At least 6 days in advance of requiring access to the designated Control Center, submit a written notice to the RE requesting access.
2. Ensure complete functionality with field devices. Coordinate with the Department for access, rack space, and LAN connections to Client Workstations, respectively.
3. Ensure CCTV encoders are compatible with approved camera system especially for PTZ and focus control and CCTV Controller Software.
4. Ensure CCTV Controller Software is updated by integrating new cameras installed and ensure video and control is available to all necessary Traffic Operations personnel.
5. Ensure DMS signs are integrated and remotely operable by the DMS Controller Software.
6. Ensure Transmit Devices are integrated and operational in accordance with Contract requirements. Develop the required travel time routes and the appropriate travel time sign messages as directed by the Department.
7. Ensure CTSS components are fully integrated and all the necessary functionality is demonstrated in the designated CTSS Controller Software.
8. Secure and provide all necessary Network configurations and assignments as directed by the Department.
9. Provide and install any other electronic equipment that may become necessary as a result of network protocol translation, electrical signal transmission degradation or communications media translation (fiber optic, coax, DSL interface, network interface, etc.)

10. Provide for software support to integrate new ITS devices into new and existing platforms for all workstations and servers utilized by DOT operators. This includes any required work from each of the software suppliers for workstations located remotely from the Traffic Operation Centers. The Department will provide information regarding the respective system, on particulars for authorized remote users.
11. Provide for the installation of network assignments for all field devices as well as enabling the network and device management protocols as directed by the Department.
12. Ensure that network support requests through the RE to the Department are made at least 60 days prior to the installation of any device to be included in the network.
13. For RWIS, integrate weather station(s) into the appropriate password protected website as directed by the Department.
14. For WIMS, integrate the system for live data retrieval by the designated staff with password protected web site as directed by the Department.

THE FOLLOWING IS ADDED:

7. **ITS Conduits.** Install Flexible Nonmetallic Conduits as specified in 701.03.07 with the following exceptions:
 - a. Do not install mechanical joints on conduit runs between junction boxes.
 - b. Obtain RE approval for fusion joints that may be permitted under special circumstances on conduit runs between junction boxes.
 - c. Provide an as-built list indicating the location of all joints to the RE.
 - d. Install a continuous tracer wire without any splice in the conduits and from junction box to a termination point in the field cabinet.
 - e. Ensure that all conduits and ducts entering a junction box, foundation, cabinet, hub, or building are terminated based on manufacturer's recommendation and are rodent proofed and sealed around cables, or plugged if conduit is built for future use.
 - f. Ensure that the ITS Conduits facilitate the various means of cable and wire installations including but not limited to pulling, jetting, and blowing of Fiber optic cable and electrical wires.
 - g. When lateral ITS conduits are installed under a roadway, install a Schedule 80 rated protective sleeve around the group of conduits.
8. **Fiberoptic Cross-Connect Cabinet.** Submit working drawings for approval that include a block wiring diagram illustrating the interconnection of the system components within the cabinet. Identify each component by manufacturer, model, and CLEI number. Install a Fiberoptic Cross Connect Cabinet on Foundation ITS Type A with concrete pads on front and back of the cabinet. Ensure all fiber optic cables entering this cabinet are terminated into individual patch panels. Provide and install jumpers between multiple patch panels as required to complete the fiber network continuity.

C. Testing.

THE FIRST PARAGRAPH IS CHANGED TO:

Perform wiring and cable testing, as specified in 701.03.15.D, before performing any other testing. Complete the device and system testing as specified on the Department provided forms and instructions.

1. Device Testing.

b. Level B.

THE FIRST SENTENCE IS CHANGED TO:

Demonstrate that each device is fully operational from the designated control center to the work site with the original equipment manufacturer's software.

2. Project Testing.

THE FIRST SENTENCE OF THE SECOND PARAGRAPH IS CHANGED TO:

After the Contractor's verification test, the Department will conduct a 14-day observational and functional test period of all systems on the Project.

E. Final Documentation.

THE FOLLOWING IS ADDED AT THE END OF FIRST PARAGRAPH:

Place one set of all manuals of each device in the respective controller cabinet installed in the field, and provide a set to the RE. Also, send an electronic set to the RE. Provide all documentation listed under this section at or prior to Substantial Completion of the project.

THE FOLLOWING IS ADDED TO THE FOURTH PARAGRAPH:

10. Certification of successful deployment of ITS components from the respective equipment manufacturers with complete details of any repair work performed under warranty.

THE FOLLOWING IS ADDED:

- G. Warranty.** In addition to the provisions set forth in Section 108.21, document all repairs made by the manufacturer or its designated representative to the device under warranty during construction. Include an explanation of the exact repairs made and identification of parts replaced by part number and circuit number. Provide all necessary equipment for safe access to the installed device along with traffic control promptly upon request by the manufacturer to perform the repairs under warranty during this period. Provide the Department with a complete record of the repairs made to each device as part of the Final Documentation. Ensure that a minimum two year warranty certificate by the manufacturer is provided and transferred to the Department with documentation as set forth in Section 704.02.01 for any repairs to be performed by the manufacturer after substantial completion.

704.03.02 Camera Surveillance System (CSS)

B. Installation.

The Department will allow existing camera system shutdowns from 10:00 p.m. to 5:00 a.m. For each half hour the work extends beyond those time frames, the Department will assess liquidated damages of \$500 per half hour.

THE FOLLOWING IS ADDED AFTER THE FIRST PARAGRAPH :

If directed by the RE, provide a bucket truck with safety equipment that can reach the height of the camera. Operate the bucket truck for the Department to use to determine the camera's final location and orientation, and for testing.

1. Foundation CSS.

THE FOLLOWING IS ADDED:

Ensure that the anchor bolts are placed after verifying the orientation of the camera lowering system to minimize the obstruction of desired camera view by the Camera Standard.

2. Camera Standard.

THE FOLLOWING IS ADDED:

At least 30 days before beginning construction, submit working drawings for approval that include structural calculations meeting the specified criteria. Ensure the calculations are signed and sealed by a Professional Engineer.

3. Camera

THE FIRST PARAGRAPH IS CHANGED TO:

Mount the camera housing and camera according to the manufacturer's recommendation. Ensure that the camera's field of view is unobstructed. Perform tree trimming and site clearing to provide an unobstructed field of view as directed by the RE. Set up "On Screen Display" to indicate the quadrant views with directional titles (e.g. NB view, EB view, SB view, WB view) displayed in the bottom right corner of the screen for each camera. Leave the display blank for any quadrant not representing any highway view. For a

camera with multiple highway views, include route and directional title (e.g. Rt 1 NB view). Also, establish a pan and tilt zones system and set up 4 presets for quick pan-tilt-zoom views prior to level B testing. At least 6 days prior to Level C testing, submit a request to the RE for the Department to integrate each camera into the designated control center CSS control software management system in use at the time of construction.

THE FOURTH PARAGRAPH IS CHANGE TO:

Provide a drill, a drill adaptor assembly and a manual crank assembly with handle for each impacted TOC when a CSS Type A or B standard is installed.

F. Equipment Training.

THE FOLLOWING IS ADDED:

G. Warranty. Perform repairs under warranty and provide documentation as specified in 704.03.01.G.

704.03.03 Fiber Optic Cable

B. Installation.

The Department will allow existing system shutdowns on the fiber network from 10:00 p.m. to 5:00 a.m. For each half hour the work extends beyond those time frames, the Department will assess liquidated damages of \$500 per half hour.

THE FOLLOWING IS ADDED TO THE SIXTH PARAGRAPH:

When installing fiber optic cable in existing conduits, install a tracer wire as specified in 701.03.15.A. Perform testing of existing tracer wires for continuity and perform splicing required to ensure access to the tracer wire from cabinet to cabinet.

THE FIRST SENTENCE OF THE LAST PARAGRAPH IS REVISED TO:

Splice a manufacturer recommended fiber optic breakout kit with connectors to each end of the strands for a cable that terminates at a device cabinet.

C. Testing

THE LAST PARAGRAPH IS CHANGED TO:

After completion of Level 1 and 2 tests, perform network communication system testing and demonstrate that the communication system is fully operational to meet the material specifications and project requirements. Complete the testing as specified on the Department provided forms and instructions.

F. Equipment Training.

704.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE ADDED:

<i>Item</i>	<i>Pay Unit</i>
ITS CONDUIT, TYPE _____	LINEAR FOOT
METER CABINET ITS	UNIT
FOUNDATION CSS	UNIT
CAMERA STANDARD	UNIT
TTS DETECTOR	UNIT

THE FOLLOWING ITEMS ARE DELETED:

<i>Item</i>	<i>Pay Unit</i>
DMS STANDARD TYPE _____	UNIT
FOUNDATION CSS TYPE _____	UNIT
FOUNDATION DMS TYPE _____	UNIT

THE FOLLOWING IS ADDED AFTER THE FIRST PARAGRAPH:

ROUTE 139
PULASKI CONTRACT 2

The Department will consider ITS CONDUITS, TYPE ____ as a single conduit comprised of multiple individual conduits as shown in details and will make payment as one unit.

The Department will accept either drilled shaft foundation method or alternate spread footing method for the installation of ground mounted DMS sign structures and will make payment under FOUNDATION DMS GROUND MOUNTED.

THE TABLE UNDER SECOND PARAGRAPH IS REVISED TO:

Work Completed	Payment
Installing the Item	60% of Total Contract Price
Successful completion of Level A testing	10% of Total Contract Price
Successful completion of Level B testing	10% of Total Contract Price
Successful completion of Level C testing	10% of Total Contract Price
Successful completion of Project testing	10% of Total Contract Price

DIVISION 900 – MATERIALS

SECTION 901 – AGGREGATES

901.11 SOIL AGGREGATE

1. Composition of Soil Aggregate.

THE FOLLOWING IS ADDED TO THE LAST PARAGRAPH:

For Designation I-14, the Contractor may use up to 30 percent steel slag by weight of the coarse aggregate portion of the soil aggregate. Obtain steel slag from a source listed on the QPL as specified in 901.01. Use steel slag that was produced as a co-product of the steel making process. Ensure that the steel slag consists of tough, durable pieces that are uniform in density and quality. Stockpile steel slag as specified in 901.02. Ensure steel slag for blending with I-14 Soil Aggregate does not exceed 0.50 percent expansion from hydration when tested according to ASTM D 4792.

SECTION 902 – ASPHALT

902.02.02 Composition of Mixtures

TABLE 902.02.02-2 IS CHANGED TO:

Table 902.02.02-2 Additional Fine Aggregate Requirements for HMA		
Tests	Test Method	Minimum Percent
Uncompacted Void Content of Fine Aggregate	AASHTO T 304, Method A	45
Sand Equivalent	AASHTO T 176	45

902.03.02 Mix Design

THE FOURTH PARAGRAPH IS CHANGED TO:

The ME will test 2 specimens to verify that the final JMF produces a mixture that has a minimum void content as specified in Table 902.03.03-1. The ME will determine percent air voids according to AASHTO T 209, and either NJDOT B-6 or AASHTO T 331.

902.03.03 Sampling and Testing

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

Ensure that the mix meets the requirements as specified in 902.02.04.A, otherwise the RE or ME will reject the material.

THE SECOND PARAGRAPH IS CHANGED TO:

During production, the ME will take one random acceptance sample from each 700 tons of production to verify composition. Conduct air voids and draindown tests as directed by the ME.

THE FOURTH PARAGRAPH IS CHANGED TO:

The ME will perform sampling according to NJDOT B-2 or ASTM D 3665, and will perform testing for composition according to AASHTO T 308 or NJDOT B-5. Perform testing for air voids according to AASHTO T 209 and either NJDOT B-6 or AASHTO T 331. Perform testing for draindown according to NJDOT B-7 or NJDOT B-8.

902.04.03 Sampling and Testing

THE FIRST PARAGRAPH IS CHANGED TO:

Ensure that the mix meets the requirements as specified in 902.02.04.A, otherwise the RE or ME will reject the material. Maintain the temperature of the mix between 300 °F and 330 °F. Perform and meet requirements for quality control testing as specified in 902.02.04.C.

THE SECOND PARAGRAPH IS CHANGED TO:

During production, the ME will take one random acceptance sample from each 700 tons of production to verify composition. Conduct draindown tests as directed by the ME.

902.05.01 Composition of Mixture

THE FIFTH PARAGRAPH IS CHANGED TO:

For fine aggregate, use stone sand conforming to 901.05.02. Ensure that the combined fine aggregate in the mixture conforms to the requirements in Table 902.02.02-2.

902.05.02 Mix Design

THE FIRST PARAGRAPH IS CHANGED TO:

Design the SMA to meet the requirements in Table 902.05.02-1 and Table 902.05.02-2. Prepare the JMF according to AASHTO R 46. Determine the JMF at 4 percent air voids and 75 gyrations of the Superpave gyratory compactor.

TABLE 902.05.02-2 IS CHANGED TO:

Table 902.05.02-2 SMA Mixtures Volumetrics For Design and Plant Production		
Property	Production Control Tolerances	Requirement
Air Voids	±1%	4.0%
Voids in Mineral Aggregate (VMA)	–	17.0% minimum
VCA _{mix}	–	Less than VCA _{dry}
Draindown @ production temperature	–	0.30% maximum
Asphalt Binder Content (NJDOT B-5)	±0.15%	6% minimum
Asphalt Binder Content (AASHTO T 308)	±0.40%	6% minimum
Tensile Strength Ratio (AASHTO T 283)	–	80% minimum

902.05.03 Sampling and Testing

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

Ensure that the mix meets the requirements as specified in 902.02.04.A, otherwise the RE or ME will reject the material.

THE SECOND PARAGRAPH IS CHANGED TO:

During production at the plant, the ME will take a sample from each 700 tons of production to verify composition and air voids. Conduct draindown, VCA_{mix}, VCA_{dry}, and VMA testing as directed by the ME. Perform tests according to AASHTO R 46.

THE FOURTH PARAGRAPH IS CHANGED TO:

The ME will perform sampling according to NJDOT B-2 or ASTM D 3665, and will perform testing for composition according to AASHTO T 308, or NJDOT B-5. The ME will determine bulk specific gravity of the compacted sample according to AASHTO T 166 or AASHTO T 331. The ME will use the most current QC maximum specific gravity test result, obtained according to AASHTO T 209, in calculating the volumetric properties of the SMA. Perform testing for draindown according to AASHTO T 305.

902.06.03 Sampling and Testing

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

Ensure that the mix meets the requirements as specified in 902.02.04.A, except that the temperature of the mix at discharge is required to be between 230 °F and 275 °F, otherwise the RE or ME will reject the material.

THE SECOND PARAGRAPH IS CHANGED TO:

During production, the ME will take one random acceptance sample from each 700 tons of production to verify composition. Conduct draindown tests as directed by the ME.

SECTION 903 – CONCRETE

903.03.05 Control and Acceptance Testing Requirements

E. Acceptance Testing for Strength for Pay-Adjustment Items.

Concrete Items which are subject to pay adjustment and the base prices are as follows:

ITEMS	DESCRIPTION	UNIT	BASE PRICE
507021P	CONCRETE BRIDGE DECK	CY	\$500.00

903.03.06 Tables

Table 903.03.06-2 Requirements for Structural Concrete Items

THE SEVENTH LINE UNDER CAST-IN-PLACE ITEMS IS CHANGED TO:

Table 903.03.06-2 Requirements for Structural Concrete Items				
	Concrete Class	Slump ¹ (inches)	Percent Air Entrainment for Coarse Aggregate ¹	
			No. 57 & No. 67	No. 8
Decks, Sidewalks, Curbs, Parapets, Concrete Patch	A	3 ± 1	6.0 ± 1.5	7.0 ± 1.5

903.05.04 Control and Acceptance Testing Requirements

THE SUPERScript REFERENCE NO. 4 UNDER TABLE 903.05.04-1 IS CHANGED TO:

4. For chloride permeability testing, the ME will mold 4 additional cylinders, taking 2 cylinders each from 2 randomly selected delivery trucks for testing at 56-days.

THE FOURTH PARAGRAPH IS CHANGED TO:

If, upon testing at 56 days, 1 or more individual test results exceed 2000 coulombs, the RE may:

1. Require that the Contractor remove and replace the defective lot, or
2. Allow the Contractor to submit a corrective action plan for approval.

SECTION 904 – PRECAST AND PRESTRESSED CONCRETE

904.01.02 Fabrication

THE LAST SENTENCE OF PART 2 IS CHANGED TO:

If using SCC, minimize or eliminate the use of vibrators to prevent segregation.

904.02.06 Quality Control and Acceptance Requirements

STEP 2 IN THE THIRD PARAGRAPH IS CHANGED TO:

ROUTE 139
PULASKI CONTRACT 2

2. Dimensions not conforming to the tolerances specified in Table 904.02.02-1.

THE FOLLOWING IS ADDED:

904.05 PREFABRICATED SUPERSTRUCTURE UNITS

904.05.01 Component Materials

Provide materials as specified:

Corrosion Inhibitor.....	903.02.05
Concrete	903.03
Mortar	903.08.01
Curing Materials	903.10
Reinforcement Steel.....	905.01
Structural Steel	906.04
Structural Steel Paint.....	912.01.01
Galvanizing	912.02.01
Bolts and Bolting Materials.....	908
Gray Iron Casting Frame.....	909.03
Ductile Iron Casting Grates	909.03

Use Class A Concrete with corrosion inhibitor for the prefabricated superstructure units. Ensure that the concrete meets the requirements for deck in Table 903.03.06-2.

Cast the units right side up with no prestressing.

If inlet frames, grates, and scuppers are fabricated from steel, galvanize as specified in 912.02.01.

904.05.02 Manufacturer Requirements

Ensure that the precast concrete plant meets the requirements of 1011.01. Provide an office for the ME as specified in 1011.03.

904.05.03 Structural Steel Fabrication

Fabricate structural steel as specified in 906.04. For guidelines to safeguard against warping and distortion during hot-dip galvanizing of steel assemblies, follow the procedures outlined in ASTM A 384.

Install shear connectors in the shop using automatically timed stud welding equipment. Ensure that shear connectors conform to Section 7 of the ANSI/AWS D1.5 Bridge Welding Code. Hot-dip galvanize all steel in accordance with 912.02.01 including shear studs and top flange surfaces. Cast concrete deck on stringers at the shop as shown on the Plans. After curing of deck, apply a two-coat paint system (intermediate and finish) to the galvanized surfaces in accordance with 906.06 with a finish color as described on the Plans.

904.05.04 Pre-cast Concrete Fabrication

- A. Placing Reinforcement Steel.** Before placing the concrete, place all reinforcement steel in position as shown on the approved working drawings and as specified in 504.03.01. Firmly tie the reinforcement steel to avoid displacement during placing of the concrete.

For longitudinal distribution reinforcement steel, the fabricator may use welded wire fabric or deformed billet steel bars. Ensure that welded wire fabric is shipped in mats.

If using lifting hooks or lugs, galvanize the devices according to ASTM A 153.

- B. Placing Concrete.** Before placing concrete, install scuppers. Ensure that the bearing surfaces of frames and grates are machined so that the grates have uniform bearing on the frames. Ensure that the bearing surfaces are match marked before being delivered. Ensure that the frames are set as shown on the Plans. Place concrete as specified in 504.03.02.D and 504.03.02.E. Before placing concrete, ensure that reinforcement and any other embedded material

are free of loose rust, frost, dirt, oil, or contaminants that may prevent a bond with the concrete. Consolidate concrete with internal vibrators. The fabricator may use external vibration to supplement internal vibration.

- C. Marking of Units.** Identify each unit with a permanent marking on the underside of the deck in the vicinity of the end diaphragm with the following information:

Trade Name
 Manufacturer
 Date of Manufacture
 Load Rating
 Mark Number

- D. Fabrication Requirements.** Manufacture the precast concrete units in steel forms. Ensure that units comply with Table 904.05.04-1.

Table 904.05.04-1 Fabrication Requirements for Precast Concrete Arch Structures	
Geometry of Concrete Deck	
Length of Each Unit	± 3/4 inch
Width	± 3/8 inch
Deck Thickness	- 1/4 inch
Deviation from Diagonals (horizontal)	± 3/4 inch
Deviation from End Squareness or Skew	± 3/4 inch
Stringer Spacing (within unit)	± 1/2 inch
Horizontal Alignment	± 3/8 inch
Reinforcing	± 2 inch (non-cumulative)
Spacing	± 3/8 inch
Cover (top and bottom mats)	± 1/4 inch
Camber of Steel Beams	± 1/4 inch
Upright Design Camber	± 1/4 inch
Adjacent unit lengths shall not vary by more than 3/4 inch.	
Deviation measured from straight line parallel to the centerline of the unit.	

904.05.05 Shipping and Handling

Handle and ship as specified in 904.01.05.

904.05.06 Quality Control and Acceptance

Provide quality control and acceptance as specified in 904.03.06.

SECTION 905 – REINFORCEMENT METALS

905.01.03 Welded Wire Reinforcement

THE SECOND PARAGRAPH IS CHANGED TO:

When approved as an alternate to galvanized reinforcement bars, use galvanized welded wire reinforcement that meets the requirements of ASTM A 641, Table 1, Class 1.

905.01.05 Dowels

THE ENTIRE SUBPART IS CHANGED TO:

Use plain reinforcement bars according to ASTM A 615, Grade 60. Galvanize according to ASTM A 123.

905.03.03 Dowel Bars

THE FIRST PARAGRAPH IS CHANGED TO:

For dowel bars in transverse joints, use epoxy-coated, Grade 60, plain reinforcement steel according to ASTM A 615. If shown on the Plans, use dowel bars fitted with end caps. Ensure that the end caps are non-metallic and designed to prevent the entrance of grout or mortar into the expansion void.

SECTION 906 – STRUCTURAL STEEL

906.04 STRUCTURAL STEEL FABRICATION

906.04.02 Fabrication

THE FOLLOWING IS ADDED AT THE END OF THE SECOND PARAGRAPH:

3. For Stringers in Superstructure Precast Units, the allowable variation from required camber at shop assembly shall be:

at midspan: -20 millimeters[-3/4 inch], +0 millimeters

at supports: 0

at intermediate points: $[4(a)b(1-a/S)] / S$

Where:

A = distance in meters [feet] from inspection point to nearest support

S = span length in meters [feet]

B = 20 millimeters [3/4 inch]

The sign convention for allowable variation of camber is plus (+) above, and minus (-) below the detailed camber shape on the Plans.

906.04.03 Cleaning and Coating

SUBPART B IS REPLACED WITH THE FOLLOWING:

- B. Non-weathering Steel.** Galvanize as specified in 912.02.01 and also clean and paint as specified in 906.06. Conform to ASTM A 384 to safeguard against warping and distortion during hot-dip galvanizing of steel assemblies.

906.06 CLEANING AND PAINTING OF STRUCTURAL STEEL IN THE SHOP

THE FOLLOWING IS ADDED:

Use a duplex corrosion protecting system (i.e painting over hot-dip galvanized steel) for all structural steel as presented in the Special Provisions. Alternate structural steel coating systems will not be permitted.

906.06.01 Painting Materials

THE FOLLOWING IS ADDED:

Apply a prime coat of an organic zinc primer selected from an organic zinc coating system (OEU) listed on the QPL to the non-galvanized surface of the top flanges of steel members described in 506.03.08. Ensure that the dry film thickness of the prime coat is within the range of 1 to 2.5 mils.

Paint galvanized surfaces using a two-coat paint system consisting of an epoxy polyamide as an intermediate coat and an aliphatic urethane as a finish coat selected from an inorganic zinc coating system (IEU) listed in the QPL. Provide a certification of compatibility of the paint system with galvanized surfaces from the paint system manufacturer. Use the finish color coat noted on the Plans.

906.06.02 Surface Preparation

THE SECOND PARAGRAPH IS REPLACED WITH THE FOLLOWING:

Blast clean the non-galvanized surface of top flanges of steel members described in 506.03.08 according to SSPC-SP 6. Ensure that galvanizing of adjacent surfaces is not damaged during the cleaning process. Ensure that the surface area of steel being blast cleaned is not greater than the surface area of steel that can be prime coated in the same day.

THE LAST SENTENCE IN THE FOURTH SECOND PARAGRAPH IS REPLACED WITH THE FOLLOWING:

Repair blast damaged primed surfaces using a wire brush, or, if visible rust occurs, reblast the surface according to SSPC-SP 6, re-clean, and re-prime the repaired area.

THE FOLLOWING IS ADDED:

Prepare all galvanized surfaces to be painted in accordance with ASTM D 6386. Remove unsightly areas including rough and/or heavy galvanizing as directed according to SSPC-SP2 and SSPC-SP3. Apply wash primer compatible with galvanizing and selected paint system, or brush-off blast the entire surface as indicated on the approved drawings. Do not use steel shot for brush-off blast. Use a blast media with a low level of aggressiveness, such as crushed walnut shells, corn cobs or bi-carbonate of soda for example, but not inclusive. For faying surfaces, hand brush the surface prior to bolting. If a wash primer is used, provide the manufacturer's certification of compatibility with the selected paint system.

SECTION 908 – BOLTS AND BOLTING MATERIAL

908.01 STEEL BOLTING MATERIALS

908.01.02 Nuts and Washers

Lubricate all galvanized nuts. Use a lubricant containing a dye of any color that contrasts with the color of the galvanizing so that a visual check can be made for the lubricant at the time of field installation. Furnish nuts to be galvanized that are tapped oversize the minimum amount required to allow assembly on the bolt thread in the coated condition. Ensure nuts conform to the requirements of AASHTO M 291 (ASTM A 563) and the rotational capacity test specified.

SECTION 909 – DRAINAGE

909.02.08 Ductile Iron Water Pipe

THE ENTIRE SUBPART IS CHANGED TO:

Use ductile iron water pipe conforming to ANSI/AWWA C151/A21.51. Use cement lined, ductile iron pipe with mechanical joints conforming to AWWA C151. Do not field weld ductile iron pipe. Perform required welding of a ductile iron pipe assembly in a fabrication shop.

Use gate valves conforming to ANSI/AWWA C500. Use Jersey City Standard Valves, M&H Metropolitan mechanical joint valves manufactured by Dresser Company or approve equal. Use non-rising stem with a 2-inch operating nut operated by turning to the right. For gate valves 16" and greater, furnish valves with bypass. Ensure valves are 100 percent solid heat cured epoxy coated, holiday free in the waterway.

Use butterfly valves conforming to ANSI/AWWA C504, Class 150B, mechanical joint with rubber seat mounted on the disk. Furnish butterfly valves with a 2-inch square operating nut opened by turning to the right. Ensure valves are 100 percent solid heat cured epoxy coated, holiday free in the waterway. Butterfly valves will not be permitted on water mains 16-inch and less.

Use Jersey City "Standard" valve boxes manufactured by Bingham and Taylor or approved equal. Use adjustable screw type valve boxes with a minimum diameter of 8 1/4 inch with the box extending from the surface to 3 inches above the valve bonnet base. Use cast iron valve boxes with a standard coal tar foundry dip and with a cast iron water drop cover with the word "WATER" cast in the cover.

Use 3/4-inch diameter threaded steel bars with a minimum yield stress of 36,000 pounds per square inch for tie rods.

For pipes through 30-inch diameter, use Dresser Style 153 coupling. For larger diameter pipe, use Dresser Style 38 couplings.

Use casing pipe conforming to ASTM A 139, Grade B, spiral seam or ASTM A 53, Type S, Grade B with a minimum wall thickness of 3/4 inch. Coat and paint casings in the fabrication shop. Fusion bond epoxy coat the casings internally and externally. Prepare the casings for coating in accordance with the manufacturer's recommendations. Use fittings fabricated from pipe material. Use butt welds at joints in casing pipe.

Install pipe in casing pipe with stainless steel spacers with manufacturer-supplied runners, bands, liners, studs and nuts. Ensure runners are high pressure molded glass reinforced polyester insulating runners. Ensure bands are 12 inches wide, 14 gauge, Grade 304 stainless steel two-piece bands. Ensure nuts, studs, and washers are Grade 304 stainless steel. Ensure liners are polyvinyl chloride. Install 1/8 inch minimum thickness wrap-around type end seals.

For all water pipe on bridges less than or equal to 24 inches diameter, wrap the pipe with a 2-inch thickness of fiberglass insulation. Use a single layer of fiberglass pipe insulation as manufactured by Owens Corning or approved equal. Wrap the insulation with a protective layer of aluminum roll jacketing with a minimum thickness of 0.016 inches. Ensure jacketing has an integrally bonded moisture barrier over the entire surface in contact with the insulation. Apply jacketing in the field in accordance with the manufacturer's recommendations. Ensure the insulation and jacketing are custom fit around all joints and fittings so that the entire pipe on the bridge and all appurtenances are fully protected, and a neat appearance is provided. Do not insulate pipe expansion joints. Provide insulation at pipe supports and wrap the outside of the pipe and support assembly in a manner which will not be affected by axial movement relative to the fixed portion of slide-type supports.

Submit certification of compliance, as specified in 106.07, for ductile iron water pipe, insulation, casing, valves, hydrants, fittings and appurtenances.

THE FOLLOWING SUBPART IS ADDED:

909.02.09 Fiberglass Pipe for Bridge Storm Drainage

Fabricate fiberglass pipe conforming to ASTM D2996, RTRP-12EA1-2122 and fiberglass pipe fittings conforming to ASTM D3840.

Ensure that all fiberglass pipe, fittings and adhesives use pigmented resin throughout the wall and the color is concrete gray or designated color with UV stabilized resin. Painted gel-coat or exterior coating is not acceptable.

Ensure that adhesives are in accordance with the pipe manufacturer and adhesive manufacturer's recommendations.

SECTION 911 – SIGNS, SIGN SUPPORTS, AND DELINEATORS

911.02.02 Breakaway Sign Supports for Ground Mounted Signs

THE ENTIRE SUBPART IS CHANGED TO:

Fabricate and construct breakaway sign supports for ground mounted signs using materials conforming to the requirements in Table 911.02.02-1.

Table 911.02.02-1 Materials for Breakaway Sign Supports			
Item	Test Method	Type or Grade	Galvanizing
Aluminum Materials (other than bracket)	911.01.01		
Bracket	B308	6061-T6	
Structural steel shapes	ASTM A709	Grade 36	ASTM A123
Steel Sheet	ASTM A1011	Grade 36	ASTM A 653
Bolts (except special bolt for coupling)	ASTM A325		ASTM A153
Special bolt for coupling	ASTM A449		ASTM A153
Cap Screw	ASTM A307		ASTM A153
Lock Washer	ANSI B18-21-1		ASTM A153

Nut	ASTM A563	Grade DH	ASTM A153
Coupling	AMS 6378 F		ASTM A153
Steel Hinge Plate	AISI 4130		ASTM 123
Anchor Rod	AISI 1045		
Anchor Coil	AISI 1008		
Anchor Washer	908.04		
Anchor Ferrule	908.04		

Submit mill certificates for the component materials.

911.02.03 Non-Breakaway Sign Supports for Ground Mounted Signs
THE TEXT OF THIS SUBPART IS DELETED.

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911.03 FLEXIBLE DELINEATORS

1. Delineator Dimensions.

b. Guide Rail Mounted.

THE ENTIRE TEXT IS CHANGED TO:

Ensure that the unit for beam guide rail mounted flexible delineators has a minimum width of 3 inches and a minimum thickness of 0.100 inch. Use units of a height that will ensure that the top of the reflective area is 5 ± 2 inches above the top of post.

Design the base of the unit to mount over the I-beam blockout or to the top of a wood or synthetic blockout, of the beam guide rail.

c. Barrier Curb Mounted.

THE ENTIRE TEXT IS CHANGED TO:

For barrier curb mounted flexible delineators, use a delineator that is $3\text{-}1/2 \times 3\text{-}1/2$ inches, with a minimum thickness of 0.100 inch, and that has a base that forms a "T" shape with the panel for mounting on the side of the barrier curb, and is flexible or hinged so as to return to its original position after being struck.

THE FOLLOWING IS ADDED:

- d. Construction Barrier Curb Mounted.** For construction barrier curb top mounted flexible delineators, use a delineator that is 6 x 12 inches with a minimum thickness of 0.100 inch. For construction barrier curb side mounted flexible delineators, use a delineator that is $3\text{-}1/2 \times 3\text{-}1/2$ inches with a minimum thickness of 0.100 inch, and that has a base that forms a "T" shape with the panel for mounting on the barrier curb and is flexible or hinged so as to return to its original position after being struck.

4. Retroreflective Sheeting.

b. Guide Rail Mounted.

THE ENTIRE TEXT IS CHANGED TO:

Ensure that the sheeting is a minimum of 3 inches square and is mounted on the upper portion of the delineator.

THE FOLLOWING IS ADDED:

- d. Construction Barrier Curb Mounted.** Ensure that the sheeting for top mounted flexible delineators is 6 x 12 inches and the sheeting for side mounted flexible delineators is $3\text{-}1/2 \times 3\text{-}1/2$ inches.

Submit a certification of compliance, as specified in 106.07, for delineators.

SECTION 912 – PAINTS, COATINGS, TRAFFIC STRIPES, AND TRAFFIC MARKINGS

912.02 COATINGS

THE FOLLOWING SUBSECTION IS ADDED:

912.02.05 Metalizing

A. Description.

1. **Qualifications.** The metalizing applicator executing the metalizing work shall have a minimum of 5 years of documented previous experience in providing surface preparation for metalizing and metalizing application services in the shop, with a minimum history of 3 successfully completed similar projects. The metalizing applicator shall be certified per the requirements of SSPC-QP 3. Submit experience and qualification of personnel executing the metalizing work.

The thermal spray technicians shall have a minimum of 5 years of experience in the operation of thermal spray equipment, preferably in bridge application, shall be qualified in accordance with ANSI/AWS C2.18, and must hold a certificate of satisfactory completion of training from the equipment manufacturer.

A SSPC certified Quality Control Supervisor shall be on the thermal spray company's staff and provide a Quality Control Plan to the RE prior to the onset of work. The Quality Control Supervisor shall meet the requirements of Thermal Spray Supervisor as per SSPC-QP 6. Additionally, the Quality Control Supervisor shall have a minimum of 5 years experience with satisfactory performance in abrasive blast cleaning of steel surfaces according to SSPC-SP10 and shall have performed similar duties on two successful metalizing projects.

2. **Codes and Standards.** The provisions set forth in the latest issue of the following codes and standards shall apply unless otherwise indicated on the Plans:

ASTM B 833, Standard Specification for Zinc Wire for Thermal Spraying (Metallizing).

ASTM C 633, Test Method for Adhesive/Cohesive Strength of Flame Sprayed Coatings.

ASTM D 4285, Method for Indicating Oil or Water in Compressed Air.

ASTM D 4417, Test Method for Field Measurement of Surface Profile of Blasted Steel.

NACE Standard RP0287, Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surfaces Using a Replica Tape.

ASTM D 4541, Test Method for Pull-Off Strength of Coating Using Portable Adhesion Testers.

ANSI/AWS C2.18, Guide for the Protection of Steel with Thermal Spray Coatings of Aluminum, Zinc, and Their Alloys and Composites.

SSPC-CS 23.00/AWS C2.23M/NACE No. 12, Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and their Alloys and Composites for the Corrosion Protection of Steel.

SSPC Publication, The Inspection of Coatings and Linings: A Handbook of Basic Practice for Inspectors, Owners, and Specifiers. SSPC-AB 1, Mineral and Slag Abrasives.

SSPC-AB 2, Specification for Cleanliness of Recycled Ferrous Metallic Abrasives. SSPC-AB 3, Ferrous Metallic Abrasives.

SSPC-PA 1, Shop, Field, and Maintenance Painting of Steel.

SSPC-PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.

SSPC-QP 3, Standard Procedure for Evaluating Qualifications of Shop Painting Applicators

SSPC-QP 6, Standard Procedure for Evaluating the Qualifications of Contractors Who Apply

Thermal Spray (Metallizing) for Corrosion Protection of Steel and Concrete Structures

SSPC-SP 1, Solvent Cleaning

SSPC-SP 10/NACE No. 2, Near-White Blast Cleaning. SSPC-SP 11, Power Tool Cleaning to Bare Metal

SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning.

3. **Quality Control Plan.** Provide a written quality control plan that will be submitted to the RE for approval. The plan shall include the procedure to be followed and equipment to be used for all processes outlined herein, including surface preparation and metalizing and seal coat application. Such a plan shall include a method of adhesion testing, thickness measuring, bend test protocol, testing frequency, and MSDS sheets for material utilized on the project. Plan shall outline the quality assurance procedures and any safety precautions that must be followed by workers and inspectors. A micrograph study, performed by an independent laboratory, shall be supplied with the QC Plan, depicting less than 10 percent porosity in the thermal spray coating. No work shall commence until the RE has approved the plan.
4. **Job Reference Standard.** A job site pass/fail Job Reference Standard (JRS), representative of the work to be performed, shall be prepared by the metalizing applicator. The JRS will be used to evaluate the suitability of the application process. The JRS shall be made on a steel plate approximately 18 × 18 × 0.25 inch and shall be made with the actual equipment and process parameters and procedures (surface preparation, metalizing, sealing, and testing) that shall be used for the contracted work. The JRS shall be made in similar environmental conditions as the work to be performed. Thickness measurements and adhesion tests shall be performed on the JRS per this specification. The JRS will be deemed unsatisfactory if any of the measurements or test results is less than the values indicated herein. For steel assemblies exhibiting acute angles between structural members to be metalized in the shop after assembly, a similarly scaled steel, blasted mockup must be put together emulating the angles encountered. This mockup shall be metalized by the coating applicator, disassembled and adhesion testing shall be performed on the metalizing in the acute angle, per these specifications. If the mockup fails the adhesion test, the applicator shall change the application technique and/or adjust equipment to obtain proper adhesion results, thickness measurements and appearance requirements in acute angles.
5. **Job Control Record.** Maintain a Job Control Record (JCR) detailing the essential job information and the in-process quality control checkpoints required by this standard. The JCR shall include information on safety precautions, and the equipment, parameters, and procedures for surface preparation, thermal spraying, and sealing.
6. **Evaluation and Validation.** The RE will evaluate the applicator's credentials, qualifications, staff experience, and suitability of the applicator's metalizing process submitted and demonstrated according to these specifications. Before beginning any metalizing work the Contractor shall perform a demonstration for surface preparation, metalizing, and sealing, using the equipment, materials, and process procedures proposed for the contract work. The demonstration shall be witnessed by a representative of the Department for validating the metalizing application process. The Job Reference Standard should be made during this demonstration and witnessed by the RE or a representative of the Department.

B. Materials.

1. **Metalizing.** Certified alloy wire is required, and shall be composed of 85 percent zinc and 15 percent aluminum by weight. Wire shall meet the requirements of ASTM B-833 Standard Specification for Zinc and Zinc Alloy Wire for Thermal Spraying (Metalizing) for the Corrosion Protection of Steel. The Contractor shall present the DCES with results of testing for chemical analysis for each lot of wire used on the job. The Contractor shall obtain written certification from the manufacturer of the alloy and will provide the certifications for each lot of wire a minimum of 5 business days prior to commencement of metalizing. The metalizing 85/15 alloy shall have a minimum tensile bond of 1000 pounds per square inch.

Porosity of the metalized coating should be less than 10 percent with less than 5 percent air inclusions in the film, and should be fully bonded to the substrate with no air pockets between the coating and substrate. Micrograph analysis of each bend coupon made during the contract pre-award evaluation, demonstration, and validation is required to determine compliance. A metallographic sample shall be prepared and inspected for interconnected porosity. There shall be no interconnected porosity to the substrate for the contract specified thickness, intended technique of application, number of passes, and thickness applied per pass.

2. **Abrasive for Blast Cleaning.** Angular blast media shall be steel grit, evaluated per SSPC-AB 3 for new abrasive material, and shall be capable of producing an angular anchor tooth profile of 3 to 5 mils. If abrasive material is to be recycled, the abrasive material shall be evaluated prior to each reuse per the requirements of SSPC-AB 2.
3. **Sealer.** Sealer shall be the same intermediate coating used for the duplex coating for the galvanized sections of the member. The sealant shall be recommended by the supplier for use on metalized surfaces. Coordination between the galvanizer, metalizer and steel fabricator is required in the selection of the sealer.
4. **Submittals.** Submit the detailed procedures for surface preparation, metalizing application, and application of sealer coat, conforming to these specifications. The procedures shall detail the equipment, application process, in-process quality control, and Job Control Record to be used for the contract work. The information shall include:
 1. Detailed procedures for surface preparation, thermal spraying, seal coating, and the in-process quality control checkpoints.
 2. Equipment (surface preparation, thermal spraying, seal coating, and the in-process quality control) to be used and for which the detailed procedures apply.
 3. Product Data and MSDS sheets for sealer.
 4. Blasting media, thermal spray feedstock materials, and seal coat product.
 5. Job Reference Standard.
 6. Job Control Record.
 7. Repair defective coatings per ANSI/AWS C2.18.

Submit this information at least 10 days prior to Evaluation and Validation to be performed in the shop. Information shall include the planned date for demonstration and validation so that the Engineer or a representative of the Department can be one site for inspection during the demonstration and validation.

C. Construction Details.

1. **Surface Preparation.** Prior to blast cleaning, steel surfaces shall be Solvent Cleaned in accordance with SSPC- SP 1, Solvent Cleaning, to remove all visible oil, grease, dirt, salt, and other contaminants. Clean all surfaces to be metalized to SSPC-SP 10, Near-White Blast Cleaning, standards. The surfaces shall be free of all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint, and other foreign matter. All cleaning and coating shall be performed at the same facility. Surface finish and cleanliness shall be confirmed according to SSPC-VIS 1 standards. In the event of a dispute, the written SSPC SP-10 standard will take precedence.

Hardened flame cut edges shall be ground with a disk wheel grinder to a smooth contour prior to abrasive blasting.

The substrate shall have an angular anchor tooth profile of 2 to 4 mils. Surface Profile measurements shall be made using X-course profile tape and a micrometer, as outlined in ASTM D4417. "Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel/NACE Standard RP0287, Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surfaces Using a Replica Tape." Spot measurements shall be made approximately every 2000 square feet for automated blasting or 200 square feet for manual blasting. Take 3 measurements for each spot in an area approximately 1.5 square inches. Average the measurements and record in the Job Control Record.

Compressed air shall be free of oil and water and shall meet ASTM D 4285, method for Indicating Oil or Water in Compressed Air. Utilize a compressed air system capable of delivery at the nozzle of 125 cubic feet per minute at 120 pounds per square inch. To minimize any contamination, use an oil/water separator on the airline. 120 pounds per square inch of compressed air maintains the proper atomization of the molten wire producing the optimum spray pattern.

The suitability of the blasting, media, procedures, and equipment shall be validated in the evaluation, demonstration, and validation.

2. **System Requirements.** Only certified spooled metalizing wire, which is properly drawn, spooled and packaged, should be used.

The metalizing equipment shall be set up, calibrated, and operated according to the manufacturer's instructions and technical manuals or the metalizing applicator's refinement thereto and as validated by the Job Reference Standard.

Spray parameters shall be set for spraying the specified thermal spray material and, at a minimum, be validated with the bend test. A bend test shall be satisfactorily performed at the beginning of crew and shift change.

A copy of the spray parameters used shall be attached to the Job Control Record.

3. Substrate Condition. The steel surface temperature shall be at least 5 °F above the dew-point.

For flame spraying, preheat the initial starting area to approximately 250 °F to prevent condensation of moisture in the flame onto the substrate. Validate preheating and non- preheating requirements with a tensile bond measurement and a bend test.

Time between the completion of the final anchor-tooth blasting (or final brush blasting) and the completion of the thermal spraying should be no greater than 6 hours for steel substrates. In high-humidity and damp environments, shorter holding periods shall be used. If rust bloom or a degraded coating appears at any time within the 6-hour window, the procedure outlined in Section 6, Surface or Coating Degradation shall be followed.

In low-humidity environments or in enclosed spaces using industrial dehumidification equipment, it will be possible to retard the oxidation of the steel and hold the surface finish for more than 6 hours. The metalizing applicator, with the approval of the RE, can validate a holding period greater than 6 hours by determining the acceptable temperature-humidity envelope for the work enclosure by spraying and analyzing bend coupons and tensile-bond coupons.

A 1-mil to 2-mil flash coat of the metalizing may be applied within 6 hours of completing surface preparation to extend the holding period for up to 4 further hours beyond the complete application of the flash coat. The final metalizing thickness, however, shall be applied within 4 hours of the completion of the application of the flash coat provided the metalizing can be maintained free of contamination.

Validate the use of the flash TSC holding period with a tensile-bond measurement and a bend test.

- a. Clean and abrasive blast a representative job area and three bend-test coupons.
- b. Apply a flash metalizing to the representative job area and the three bend coupons.
- c. Wait the delay period in representative environmental conditions and apply the final metalizing thickness.
- d. Perform adhesion test and bend test on coupons.
- e. Flash metalizing and holding period are acceptable if the tensile bond and the bend test are satisfactory.

4. Metalizing. The applied 85/15 alloy metalizing thickness shall be a minimum of 10 mils and a maximum of 12 mils. For each coated component, the applied thickness shall be measured using a SSPC PA2 Type 2 fixed probe gauge properly calibrated per certified coating thickness calibration standards, and measurements shall be recorded in the Job Control Report (JCR). Use a measurement line to measure the peaks and valleys of the metalizing, taking the average value of five readings along a line at 1-inch intervals. For complex geometries and geometric transitions, use a measurement spot approximately 1.5 square inches, and do not measure the peaks and valleys of the metalized coating. Record all measurements in the JCR. If upon inspection, and prior to sealer application, the metalizing thickness is less than the above stated requirements, the applicator shall apply additional metalizing to meet the thickness requirements.

No coating shall be applied unless the following conditions are met:

1. The receiving surface shall be clean and absolutely dry.
2. The surface temperature and ambient air temperature are as recommended by the coating equipment manufacturer except in no case shall coating work be performed when surface and ambient air temperatures are less than 40 °F or greater than 100 °F.
3. The receiving surface temperature shall be at least 5 °F above the dew point.
4. The relative humidity shall not exceed 85 percent.

All coating applied in violation of these conditions shall be completely removed, and the affected surface cleaned and recoated in accordance with the stated requirements at no additional cost to the State.

The top of top flanges embedded in concrete shall only be coated for one inch from each edge.

- a. **Coating Uniformity.** Maintain a constant spraying distance, maintain a constant rate of application and maintain the angle of the gun head at a constant 90 degrees to the surface. Fanning will not be permitted. Apply metalizing in horizontal and then vertical passes to eliminate any thin spots in the coating. Apply the specified coating thickness in overlapping passes. Coaters shall determine the best distance between the spray gun and receiving surface so as to promote uniform coverage and prevent discontinuity of the applied coating film. Confirm the suitability of the crossing-pass thickness with a tensile bond measurement, a bend test, and metallographic sample testing for interconnected porosity. The deposited coating shall be uniform without blisters, cracks, loose particles, or exposed steel as examined with 10× magnification.
 - b. **Surface Roughness.** Surface roughness of the metalized coating should be less than 4 mils in order to avoid unfilled valleys and low areas in the film.
 - c. **Masking.** Areas of steel that need to be bolted or welded shall be masked off with duct tape. Any residue left behind by duct tape shall be removed prior to welding.
5. **Sealer.** Sealer shall be applied and cured according to the paint manufacturer's instructions for use with metalizing, or as directed by the RE.

The seal coat shall be thin enough to penetrate into the body of the metalizing and seal the interconnected surface porosity. Typically the seal coat is applied at a spreading rate resulting in a theoretical 1.5 mil dry-film thickness.

Sealer should be applied as soon as possible after thermal spraying, but shall be applied within 8 hours after application of metalizing. If a sealer cannot be applied within 8 hours, it shall be verified that the metalizing has not been contaminated by visual inspection, and is dust-free using the clear cellophane tape test per ISO 8502-3 before applying the sealer.

If moisture is present or suspected in the pores of the metalizing, the steel should be heated to 250 °F to remove the moisture prior to seal coat application. When possible, the steel shall be heated from the reverse side of the metalizing to minimize oxidation and contamination of the metalizing prior to sealing.

During application of the seal coat, it shall be visually validated that there was complete coverage of all intended areas. Companion steel coupons positioned near the metalizing shall receive a seal coat as well. The wet and dry film thicknesses of the seal coat on these companion coupons shall be used to verify that the correct thickness of seal coat is being applied to the metalizing. Measurements shall be recorded in the JCR.

6. **Surface or Coating Degradation.** If rust bloom, blistering or a degraded coating appears at any time during the application of the metalizing, the following procedure applies:
1. Stop spraying
 2. Mark off the satisfactorily sprayed area.
 3. Call the Thermal Spray Inspector/Foreman to observe and evaluate the error.
 4. Report the deficiency to the purchaser and record the deficiency.
 5. Repair the unsatisfactory area by removing the degraded metalizing, re-blast to a minimum near-white metal finish (SSPC-SP 10 standard), and returning to the specified anchor tooth profile depth.
 6. Recoat the blasted area as per this specification.
 7. Record the actions taken to resume the job in the JCR.
7. **Field Repairs.** The only field work allowed to be done under this item is touch-up work after all steel erection and all concrete placement has been completed. All areas requiring field repairs shall be clearly marked. All the requirements of this specification shall apply to field coating material with the following modifications:

1. All dirt, grease and other foreign matter shall be removed in accordance with SSPC-SP 1, Solvent Cleaning. Clean the damaged area of all loose and cracked coating by power tool to bare metal in accordance with SSPC-SP 11, Power Tool Cleaning to Bare Metal.
2. Roughen the damaged area and the surrounding 2 inches to produce a suitable anchor for the coating. All repaired areas shall be tested for proper anchor tooth profile in accordance with ASTM D 4417 and as per this specification.
3. All damage to the coating system shall be corrected by the contractor in accordance with the requirements of this specification and to the satisfaction of the RE at no additional cost to the State.
4. The overlap of thermal spray edges shall be tested for proper adhesion at each repair location in accordance with this specification.

8. **Adhesion Test.** Random adhesion testing shall be performed for each coated component, utilizing self aligning portable pull-off adhesion testing equipment, in accordance with ASTM D 4541 standards. The minimum tensile bond value shall be 1000 pounds per square inch.

Use adhesive recommended by the instrument manufacturer, or equivalent. Attach adhesive manufacturer's instructions to the job control record.

9. **Test Frequency.** One portable tensile-bond measurement shall be made every 500 square feet. If the tensile bond is less than the contract specification, additional tensile bond measurements shall be made to identify the limits or boundaries of the degraded metalizing. Any degraded metalizing shall be removed and reapplied as per Section 6, Surface or Coating Degradation.

Adhesion test shall be performed on coupons without sealant coats.

10. **Bend Test.** Conduct a bend test at the beginning of each work shift or crew change:

1. Use carbon steel coupons of approximate dimensions 2×4 inches to 8×0.050 inch.
2. Surface preparation according to contract specification.
3. Spray 10-mil to 12-mil thick metalizing in crossing passes, laying down approximately 3 to 4 mils for each pass.
4. Bend coupons 180° around a 0.5-inch diameter mandrel.

Bend test passes if there is no cracking or only minor cracks with no spalling or lifting (by a knife blade) from the substrate. Bend test fails if the coating cracks with lifting (by a knife blade) from the substrate. Bend test shall be performed on coupons without sealant coats.

11. **Safety Precautions.**

- a. **Eye Protection.** Always protect eyes from flying particles and from the injury that can result from excessive ultraviolet, infrared and visible light radiation that occurs during operation of this equipment. Goggles or helmet should be worn to protect the eyes from flying particles. Standard safety glasses are not enough protection.
- b. **Respiratory Protection.** Always use proper respiratory devices when operating equipment. Some metals are toxic and others can be damaging to the respiratory system. Use a hood type ventilation system, with a continuous flow of filtered air. Minimum air flow to the hood shall be 6 cubic feet per minute.
- c. **Skin Protection.** Always wear protective clothing and gloves when operating equipment. Intense ultraviolet radiation is emitted by the arc and can cause serious burns to exposed skin.
- d. **Ear Protection.** Always wear ear protection or soft rubber ear plugs to protect against hearing loss when operating equipment.
- e. **Special Health Hazards.** Magnetic fields from high electric currents can affect pacemaker operation. Wearer should consult physician before going near equipment.

12. **General Safety Procedures.** All personnel concerned with metalizing should become familiar with safety procedures for abrasive blasting and electric arc or flame spray metalizing. Observe all standard and special safety precautions taken with electrical equipment.

- a. **Dust Hazard.** Finely divided air-borne material in a confined area should be treated as an explosive. Specifically, aluminum dust and water may generate hydrogen gas.
- b. **Electric Shock.** Do not touch live electrical parts. Observe all of the safety precautions when using the DC arc power source.
- c. **Fire Prevention and Protection.** The electric arc creates intense heat and sparks. Do not point the gun head at any person or anything that will burn.

13. Weather Considerations. Thermal spraying in low-temperature environments (below freezing):

- 1. Substrate shall meet the surface temperature and holding period specified in Section 3, Substrate Condition. No moisture or condensation is permissible on the surface during surface preparation and thermal spraying.
- 2. Qualify metalizing period with a tensile-bond measurement and a bend test. Meet the tensile bond and metallographic requirements specified herein.

912.03.01 Epoxy Traffic Stripes

B. Glass Beads.

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

Ensure that glass beads do not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic.

912.03.02 Thermoplastic Traffic Markings

THE FOLLOWING IS ADDED TO THE FIRST PARAGRAPH:

Ensure that glass beads do not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic.

912.04.01 Latex Paint

THE FOLLOWING IS ADDED TO THE SECOND PARAGRAPH:

Ensure that glass beads do not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic.

SECTION 913 – GUIDE RAIL, FENCE, AND RAILING

913.01.05 Miscellaneous Hardware

SUBPART 3 OF THE FIRST PARAGRAPH IS CHANGED TO:

- 3. Use plates for guide rail on bridges and buried guide rail terminals conforming to ASTM A 36 and galvanized according to ASTM A 123.

SECTION 914 – JOINT MATERIALS

914.04.01 Preformed Elastomeric (Compression Type)

B. Joint Sealer.

THE LAST SENTENCE OF THE SECOND PARAGRAPH IS CHANGED TO:

If splicing of a sealer is allowed, ensure that the sealer at the splice point has no significant misalignment at its sides or top and that misalignment at the bottom does not exceed half of the bottom wall thickness.

SECTION 918 – ELECTRICAL MATERIALS

918.01 CONDUIT AND FITTINGS

- 4. **Flexible Nonmetallic Conduit.**

THE FOLLOWING IS ADDED:

For colored conduits (other than black and natural) ensure the “X” designation as part of the Cell Classification under Section 6.2 of ASTM D 3350 is “E”.

For ITS Conduit Type __, one of the conduits that is designated for electrical use is to be extruded integrally colored red to indicate its use for Electrical wiring.

- 5. ITS Conduit Type A.** Use galvanized steel multi-duct conduit with a nominal 4 inch diameter outer conduit with four, 1-1/4 inch preassembled inner ducts for installation on bridges and through bridge structures. Provide multi-duct with an outer conduit having threaded connectors and inner ducts having a bell and spigot type connection. Ensure inner ducts, and any spacers used internally, are dielectric. Ensure the conduit complies with all applicable Electronic Industry (EIA/TIA), International Telegraph and Telephone Consultative Committee (CCITF), ANSI, and ASTM standards, National and State Electric Codes, and FDDI specifications.

a. General.

1. Ensure that the outer conduit is a nominal 4 inch galvanized steel conduit, suitable for exposed installation, and conforming to UL 6, ASA C-80.1, Federal Specification W-W-C-581, and ASTM A 588. Ensure the conduit is manufactured from milled steel tubing with a wall thickness similar to Schedule 40 pipe. Ensure the conduit is hot-dipped galvanized inside and out throughout its entire length including the threads. Ensure the minimum weight of galvanized coating is one ounce per square foot.
2. Ensure that the inner duct assembly consists of 4 PVC, color coded ducts. Ensure each duct is a nominal 1-1/4 inch diameter with an inside diameter of 1.194 inches and minimum wall thickness of 0.063 inches. Ensure the four ducts are preassembled in the factory and inserted into the outer conduit.
3. Ensure that the inner ducts are pre-lubricated to meet a dynamic coefficient of friction of 0.027 when used with HDPE jacketed fiber optic cable.
4. Ensure that the inner ducts are manufactured from PVC material to match the outer conduit expansion and contraction characteristics.
5. Ensure that internal spacers are factory installed to hold the inner ducts in proper spacing and alignment. Ensure spacers are molded from a high impact PVC plastic, and are factory certified to withstand all handling pressures and stresses.
6. Ensure that external spacers for the support of the conduit on a structure and separation of conduits on a structure are be fabricated from aluminum (such as Uni-Strut), and are factory certified to withstand all handling pressures and stresses.
7. Ensure that the conduit is designed to provide for connecting (coupling) one complete section of conduit assembly to the next section by use of a threaded end on the outer conduit and gasketed bell joint on one end of each of the four inner ducts, and a spigot end at the other end of the inner ducts. Ensure the conduit sections are designed to assemble spigot into bell for the inner ducts and by threaded type connector for the outer conduit.
8. Ensure that the seals at the outer conduit and the inner ducts are anti-reversing.
9. Ensure that the coupling is manufactured from hot-dipped galvanized steel, is factory assembled, and is supplied with lead-ins to facilitate assembly. Ensure that the couplings are designed and factory certified to handle normal expansion and contraction.
10. Ensure that each complete conduit section is identically keyed to provide for proper alignment of the inner ducts.
11. Ensure that conduit couplings are provided to couple PVC or fiberglass multi-duct conduit to galvanized steel multi-duct conduit.
12. Ensure that special termination kits are provided by the conduit manufacturer for terminating the conduit in manholes and junction boxes. Ensure that the kits provide for a water tight seal of conduit to structure wall.
13. Ensure that complete conduit sections, including outer conduit and inner ducts, are manufactured in 10-foot sections, and a midbody gasket to provide for water tight integrity.

14. Use complete, manufactured, conduit rigid bend sections, including outer conduit and inner duct, complete with bell and spigot on the inner ducts. Ensure that the outer conduit rigid metallic conduit sweep elbows conform to UL 6.

b. Color Coding and Labeling.

1. Ensure that inner-ducts are distinguishable from each other by color coding as indicated on the Plans. Ensure that the entire duct is colored by adding an industry standard coloring additive to the duct material, not by an external applied coloring.
2. Ensure that the outer duct has a longitudinal print line that denotes, "Install This Side Up, NJDOT Fiber Optic Cable", to allow for the proper alignment of the inner ducts. Ensure that the outer duct is marked with data to trace the plant location, date, shift, and machine used in the manufacturing process.

c. Shipping. Ensure that the conduit is packaged for shipment at the factory. Ensure that the conduit is assembled into manageable bundles. Ensure that each section of conduit is shipped with protective caps over each end of the section. Conduit that arrives at the job site without the protective cover in place over both ends, will be rejected by the RE.

d. Testing. Ensure that the complete conduit sections including outer conduits, inner ducts, and all spacers and connection parts are certified by the manufacturer as complete and free of defects.

918.12 PEDESTALS, POLES, TRANSFORMER BASES, AND MAST BRACKET ARMS

THE FIRST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

Fabricate pedestals, poles, transformer bases, and mast bracket arms for traffic signal, highway lighting, and camera standards with materials according to the appropriate ASTM standard and the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

THE SECOND PARAGRAPH IS CHANGED TO:

Ensure that standard aluminum poles, lighting, bracket arms, and traffic signal mast arms and pedestrian signal standards have a rotary, sand-polish finish giving a nonreflecting outer surface. Ensure that decorative aluminum poles are in conformance with the standard details with the exception that they all are to be black powder coated. Ensure that decorative luminaires are King 75 Watt 4500k K804 Coronet Photometric File #CE838.IES. Ensure that decorative poles, bases, mast arms, arm adaptors, and luminaires conform to the finish shown on the Plans. Ensure that steel traffic signal poles and arms are manufactured in accordance with the standard details with the exception that they all are to be black powder coated.

THE FOLLOWING IS ADDED:

918.15 DECORATIVE LUMINAIRES

Use decorative luminaires with a Light Emitting Diode (LED) light source and that comply with the following;

A. General Requirements.

1. Ensure that each luminaire consists of an assembly that utilizes LEDs as the light source. In addition, provide a complete luminaire consisting of a housing, LED array, and electronic driver (power supply).
2. Ensure that each luminaire is rated for a minimum operational life of 50,000 hours at an average operating time of 11.5 hours per night at 104 °F while maintaining greater than 70% of its initial lumen output (L70).
3. Ensure that the rated operating temperature range is -22 °F to 104 °F.
4. Ensure that each luminaire is capable of operating above 104 °F. However, it is not expected to comply with photometric requirements at elevated temperatures.
5. Ensure that the photometry complies with IESNA LM-79 when conducted at 77 °F ambient temperature.
6. Ensure that each luminaire meets all parameters of this specification throughout the minimum operational life when operated at the average nighttime temperature.

7. Ensure that the individual LEDs are constructed such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
8. Ensure that luminaire is constructed such that LED modules may be replaced or repaired without replacement of the whole luminaire.
9. Ensure that each luminaire is listed with Underwriters Laboratory, Inc. under UL1598 for luminaires, or an approved equivalent standard from a nationally recognized testing laboratory, and has a certifying label.

B. Photometric Requirements.

1. Optical Assemblies: Ensure that LEDs are provided with discreet over optical elements to provide an IESNA Type II or III distribution. Ensure that additional distributions for glare control are used when direct source requires mitigation. Accomplish mitigation without the use of external shielding elements.
2. Ensure that optical assemblies have a minimum efficiency of 85% regardless of distribution type. Ensure that all LEDs and optical assemblies are mounted parallel to the ground. Ensure that all LEDs provide the same optical pattern such that catastrophic failures of individual LEDs will not constitute a loss in the distribution pattern.
3. Ensure that no more than 2% of the total luminaire lumens are in the 80° to 90° range and no lumens are emitted above 90°.
4. Light Color/Quality: Ensure that the luminaires have a correlated color temperature (CCT) of 4,500 K \pm 275 K. Ensure that the color rendition index (CRI) is a nominal 70. Ensure that binning of LEDs conforms to ANSI / G, NEMA SSL 3-2010.
5. Ensure that 78% of the lumens are to the street side of the luminaire.
6. Ensure that each fixture has a Lamp Lumen Depreciation (LLD) factor over its rated L70 lifespan duration of no less than 0.90.
7. Ensure that the luminaires for the upper roadway that are mounted on lighting standards and lighting arms are King Luminaire K803 with 8000 Series 75W LED Engine, Type II Optics, 70 white CREE XPG 4500K LEDS and a lumen output of 5512 lumens. Ensure that the luminaire is provided with a shallow lens.
8. Ensure that the luminaires for the lower roadway that are mounted on pendant mountings shall be King Luminaire K704 with 5000 Series 60W LED Engine, Type II Optics, white CREE XPG 4500K LEDS and a lumen output of 3514 lumens. Ensure that the luminaire shall be provided with a sag lens.

C. Thermal Management Requirements.

1. Ensure that the thermal management (of the heat generated by the LEDs) is of sufficient capacity to assure proper operation of the luminaire over the expected useful life.
2. Ensure that the LED manufacturer's maximum thermal pad temperature for the expected life is not exceeded.
3. Ensure that thermal management is passive by design. The use of fans or other mechanical devices will not be allowed.
4. Ensure that the luminaire has a minimum heat sink surface such that LED manufacturer's maximum junction temperature is not exceeded at maximum rated ambient temperature.
5. Ensure that the heat sink material is aluminum.
6. Ensure that the pendant LED luminaire uses a dynamic fluid cooling system for heat control.
7. Provide a fully enclosed, self-contained design of the LED Light Engine, that ensures that cool air from outside of the fixture is drawn upwards by convection, around the internal heat sinks, and flows out of the fixture through a vented housing system. This dynamic air flow system draws heat away from the LED chips, allowing them to be kept well below the recommended heat levels for optimum performance.

D. Electrical Requirements.

1. Ensure that drive current to the LEDs does not exceed 350mA and the luminaire has a minimum efficacy of 87 lumens per watt. Ensure that the luminaire does not consume power in the off state.
2. Operation Voltage: Ensure that the luminaire operates from a 60 HZ 13 HZ AC line over a voltage ranging from 108 VAC to 305 VAC. Ensure that fluctuations of line voltage have no visible effect on the luminous output.
3. Power Factor: Ensure that the luminaire has a power factor of 0.90 or greater.
4. THD: Ensure that total harmonic distortion (current and voltage) induced into an AC power line by a luminaire does not exceed 20 percent.
5. Surge Suppression: Ensure that the luminaire onboard circuitry includes surge protection devices (SPD) to withstand high repetition noise transients as a result of utility line switching, nearby lightning strikes, and other interference. Ensure that the SPD protects the luminaire from damage and failure from common and differential mode transient peak currents up to 10 kA minimum. Ensure that the SPD conforms to UL 1449. Ensure that SPD performance has been tested according to procedures in ANSI/IEEE C62.41-2:2002, Category C high exposure and ANSI C136.2 10kV BIL. Ensure that if the SPD fails, it fails in such a way that the luminaire no longer operates. Ensure that the SPD is field replaceable.
6. Operational Performance: Ensure that the LED circuitry prevents visible flicker to the unaided eye over the voltage range specified above.
7. RF Interference: Ensure that LED Drivers meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.
8. Ensure that drivers are an IP66 rated UL class 2 power unit as per UL 1310 with a Class A sound rating and comply with FCC rules and regulations as per Title 47 CFR part 15.
9. Ensure that all LED fixtures come standard with a 10kV module for transient line surge protection.

E. Physical and Mechanical Requirements.

1. Provide a die cast aluminum two part housing with an upper electrical compartment for the electronics and a lower section for the heat sinks and LED boards. Ensure that access to the electrical compartment is tool-less. Ensure that the die cast aluminum housing is designed to prevent the buildup of water on the top of the housing and prevent water from entering the glassware. Ensure that the housing has a cast-in pipe fitting on top capable of accommodating 2" ID pipe (2-3/8" OD).
2. Ensure that the maximum weight of the luminaire is 60 pounds and the maximum effective projected area does not exceed 1.0 (without glassware).
3. Ensure that the housing is black in color with a flat or semigloss sheen.
4. Ensure that the assembly and manufacturing process for the LED luminaire is designed to assure all internal components are adequately supported to withstand mechanical shock and vibration. Ensure that the luminaire is capable of withstanding vibration, meeting ANSI C136.31 American Standard for Roadway and Area Lighting Equipment - Luminaire Vibration for both normal and bridge operation (3G minimum).
5. Ensure that the luminaire housing is UL wet location listed.
6. Ensure that the optical assembly of the luminaire shall be protected against dust and moisture intrusion per the requirements of 1P-66 (minimum) to protect all optical components.
7. Ensure that the electronics/ power supply enclosure meets the requirements for NEMA/UL wet location.
8. Ensure that the circuit board and power supply are contained inside the luminaire. Ensure that electrolytic capacitors used in the power supplies are rated for -40 °F to 220 °F, long life (greater than 5000 hours), and operate at no more than 70% of their rated voltage, and 70% of rated current.
9. Ensure that the housing is aluminum with a nominal 2.5 mil thick paint finish able to withstand a 3000 hour salt spray test as specified in ASTM B 117.

10. Ensure that each refractor or lens is made from UV inhibited high impact optical grade acrylic and is resistant to scratching.
11. Ensure that all LED fixtures are capable of mounting to a 2" diameter vertical tenon as shown on the Plans. When mounted to a lighting arm, provide an adapter with the fixture.

F. Quality Assurance.

1. Ensure that luminaires are fully assembled and individually electrically tested prior to shipment.
2. Ensure that the manufacturer of LED luminaires demonstrates a suitable testing program incorporating high heat, high humidity and thermal shock test regimens to ensure system reliability and to substantiate lifetime claims.
3. Ensure that the working drawing submission includes complete documentation showing that the qualifying requirements within this specification are met. Indicate the proper Lamp Lumen Depreciation (LLD) factor to be used for the submitted fixture type with the working drawings.
4. Submit a certificate of compliance, as specified in 106.07, for all materials, components and assemblies.

SECTION 919 – MISCELLANEOUS

THE FOLLOWING IS ADDED:

919.15 POLYESTER MATTING

Provide polyester matting of commercial quality that is a composite of polyester base fiber and vinyl chloride resin and is permeable to air and water, but shall prevent sunlight from reaching the soil. Ensure that the matting resists ultraviolet light, mildew and algae. Ensure that the matting is self-extinguishing when removed from flame. Ensure that the matting has a minimum thickness of 1/4 inch.

THE FOLLOWING IS ADDED:

919.16 LATEX EMULSION ADMIXTURE

Latex emulsion admixture is a nonhazardous, film-forming, polymeric emulsion in water to which all stabilizers have been added at the point of manufacture. Ensure that it is homogeneous and uniform in composition.

The latex is a styrene-butadiene polymeric emulsion stabilized with anionic, nonionic, and polyorgano-siloxane fluid surfactant in which the anionic surfactant is a sodium alkyl sulfate.

Ensure that latex modifiers are prequalified by a testing agency and conform to the requirements listed in the prequalification test program for styrene-butadiene latex emulsions of the FHWA Report No. FHWA-RD-78-35. Furnish a certified copy of the test properties according to 106.07.

Before submitting a mix design according to 507, submit a sample of the latex emulsion admixture to the Department Laboratory for testing for conformity to the following requirements:

Polymer (solids), percent.....	46 - 50
Butadiene, percent of polymer.....	32 - 36
Styrene, percent of polymer	64 - 68
pH	9.0 - 11.0

The percent of solids will be determined according to Section 990, NJDOT M-2. Other properties will be determined according to the procedure in the above referenced FHWA Report.

DIVISION 1000 – EQUIPMENT

SECTION 1001 – TRAFFIC CONTROL EQUIPMENT

THE FOLLOWING SUBSECTION IS ADDED:

1001.04 PORTABLE VARIABLE MESSAGE SIGN WITH REMOTE COMMUNICATION

Provide a NTCIP compliant portable variable message sign as described under 1001.02 equipped with broadband cellular modem.

THE FOLLOWING IS ADDED:

Provide a NTCIP compliant portable variable message sign as described under 1001.02 with the exceptions noted below and each equipped with broadband cellular modem.

Ensure that the sign panel is capable of displaying three lines of text with variable size characters.

Ensure nine characters are displayed per line for posting travel times. For this nine character requirement, smaller size characters may be allowed that meets MUTCD guidelines.

Ensure that the panel is also capable of displaying eight (8) characters per line with a minimum character height of eighteen (18) inches.

1001.05 PORTABLE TRAILER MOUNTED CCTV CAMERA ASSEMBLY

Provide a Portable Trailer Mounted CCTV Camera Assembly (PTMCCA) with the following:

A. Trailer Platform

1. Maximum size, including tongue, 14 feet long by 7 feet wide by 8 feet high.
2. NJDOT approved lighting package to include electrical brake and marker lights with wire connections.
3. Primed and painted with powder coated orange color.
4. Fitted with manual telescoping outriggers with adjustable jacks sized to counter full mast extension.
5. Four 3500 pounds, drop leg, top wind screw jacks.
6. All equipment secured to prevent theft or separation from platform.
7. 24/7 operation in all weather conditions.
8. One locking NEMA-4 equipment box for operational controls.
9. Removable wheels (with wheel locks) when trailer is in deployed position.
10. Operation manual with a copy placed in the storage bin.

B. Mast

1. 150 pounds payload capacity.
2. 29 feet to 32 feet of extension with capability to mount antenna at 20 feet, 25 feet or at the top, 10 feet maximum nested length of mast - 3 to 9 sections.
3. Un-guyed.
4. Driven by galvanized steel cable.
5. Spiral conduit for cables.
6. Compactly retractable when nested into storage container at the bottom & foldable for easy transport.
7. Operated by a power winch with a safety brake.

8. Capable of being raised or lowered during sustained wind speeds of 30 miles per hour.

C. Power Source

Equip the PTMCCA with either a diesel charged or a solar charged battery system. Ensure that the PTMCCA is also capable of operating on 120-volt AC electrical service. The Department may require a solar charged battery system in noise sensitive areas. Provide the power with a battery backup system capable of providing continuous operation when the primary power source fails. Ensure that the power source meets the following requirements:

1. Diesel. Ensure that the fuel tank is capable of operating the sign for a period of 72 hours without refueling. Equip with an exhaust muffler and a United States Department of Forestry approved spark arrester. Ensure that the engine is shock mounted to reduce vibration and locked in a ventilated enclosure.
2. Solar. Provide solar panels capable of recharging the batteries at a rate of 4 hours of sun for 24 hours of camera usage. Ensure that the battery capacity is capable of operating the sign for a period of 18 days without sunlight.

D. Electronics

1. Cellular (CDMA), microwave, or 802.11 bandwidth option.
2. Work lights in all cabinets.
3. Remote trailer diagnostics (battery level, charging output, etc.).

E. Camera and Software

Ensure that the camera has the following characteristics:

1. Dome Camera in a heavy duty plastic dome or with a weather resistant case.
2. Impact resistant viewing window.
3. Minimum resolution of NTSC 704 (H) x 480 (V).
4. Backlight compensation.
5. Image stabilization.
6. Light Sensitivity 0.02 lux NIR Mode.
7. Auto Focus with Manual Focus capability.
8. Auto White Balance with Manual White Balance capability.
9. Motorized Zoom up to 16x optical, 10x digital.
10. Motorized Pan-Tilt, pan 360°, tilt 180°.
11. Thermostatically controlled heater and defroster -50° to 140°F operating range.
12. Windshield wiper.
13. 24/7 operation in all weather conditions.
14. Time and date stamp.

Ensure the software provides the following functionality:

1. Remote control of pan, tilt and zoom.
2. Display of streaming video in MPEG format, motion-JPEG, and single snapshot JPEG images, remotely interchangeable by using central software.
3. Preset controls of pan/tilt/zoom combinations. Ensure all presets are accessible from a drop-down menu with descriptive name of preset. Set first 8 presets with quick-launch icons with graphical representation of the preset views.
4. Display of all the project's web cams in a single view screen.

5. Display of local time and weather conditions including temperature and humidity.
6. Saving images and sending e-mail images.
7. Viewing archived images via a graphical calendar control and storing archived images at least every five minutes.
8. Three levels of password protection: administrator, user, and guest, individual user accounts.
9. Monitoring and controlling the cameras using web access.

SECTION 1009 – HMA PLANT EQUIPMENT

1009.01 HMA PLANT

A. Requirements for HMA Mixing Plants.

THE FOLLOWING IS ADDED AFTER THE SECOND PARAGRAPH:

The HMA producer is required to have a quality control (QC) program plan approved annually by the ME as per Materials Approval Procedure MAP-102. The HMA producer is required to ensure that the QC plan conforms to the requirements outlined in the report entitled “Hot Mix Asphalt Quality Control Program Plan” prepared by the Department of Transportation and New Jersey Asphalt Paving Association. Failure to follow these requirements will result in rejection of HMA materials supplied by the HMA producer and removal of the HMA supplier from the QPL.

THE FOLLOWING SUBSECTION IS ADDED AFTER 1009.02:

1009.03 ASPHALT-RUBBER BINDER BLENDING EQUIPMENT

Provide equipment for preparation of Asphalt-Rubber Binder. Ensure that the unit is equipped with a crumb rubber feed system capable of continuously supplying the asphalt cement feed system, and is capable of fully blending the individual crumb rubber particles with the asphalt cement. Use an asphalt-rubber binder storage tank that is equipped with a heating system capable of maintaining the temperature of the binder between 325 and 375 °F during the reaction. Ensure the asphalt-rubber binder storage tank is also equipped with an internal auger mixing device, oriented horizontally in the tank, capable of maintaining a uniform mixture of the asphalt-rubber binder.

Ensure that the tanks for storage of asphalt-rubber binder are equipped to uniformly heat the material to the required temperature under effective and positive control at all times. Ensure that heating is accomplished so that no flame comes in contact with the heating tank.

Provide a circulating system of sufficient capacity for the binder to ensure continuous circulation between the storage tank and proportioning units during the entire operating period. Ensure that the discharge end of the binder circulating pipe is maintained below the surface of the binder in the storage tank to prevent discharge of hot binder into the open air.

Ensure that pipe lines and fittings are steam or oil jacketed, electrically or otherwise heated, and insulated to prevent heat loss.

Provide valves according to AASHTO T 40, except ensure that a sampling valve is also located in the lowest third of each storage tank.

If the plant has been equipped with a water injection type asphalt foaming system, ensure that the system will allow the proper amount of asphalt rubber binder to be supplied continuously or provide a by-pass to ensure that the proper amount of asphalt rubber binder is supplied to the mix.

SECTION 1011 – PRECAST AND PRESTRESSED CONCRETE PLANT EQUIPMENT

1011.03 ME’S OFFICE

THE SECOND PARAGRAPH SUBPART 2 & 3 ARE CHANGED TO:

ROUTE 139
PULASKI CONTRACT 2

2. One high-speed broad band connection with a minimum speed of 3 megabits per second (mbps) with dynamic IP address (DSL, Cable, etc.).
3. Two desks and 2 chairs.

NJDOT TEST METHODS

THE FOLLOWING TEST METHODS ARE ADDED:

NJDOT B-10 – OVERLAY TEST FOR DETERMINING CRACK RESISTANCE OF HMA

A. Scope. This test method is used to determine the susceptibility of HMA specimens to fatigue or reflective cracking. This test method measures the number of cycles to failure.

B. Apparatus. Use the following apparatus:

1. **Overlay Tester.** An electro-hydraulic system that applies repeated direct tension loads to specimens. The machine features two blocks, one is fixed and the other slides horizontally. The device automatically measures and records a time history of load versus displacement every 0.1 sec at a selected test temperature.

The sliding block applies tension in a cyclic triangular waveform to a constant maximum displacement of 0.06 cm (0.025 in.). This sliding block reaches the maximum displacement and then returns to its initial position in 10 sec. (one cycle).

2. **Temperature Control System.** The temperature chamber must be capable of controlling the test temperature with a range of 32 to 95 °F (0 to 35 °C).
3. **Measurement System.** Fully automated data acquisition and test control system. Load, displacement, and temperature are simultaneously recorded every 0.1 sec.
4. **Linear Variable Differential Transducer (LVDT).** Used to measure the horizontal displacement of the specimen (+/- 0.25 in.). Refer to manufacturer for equipment accuracy for LVDT.
5. **Electronic Load Cell.** Used to measure the load resulting from the displacement (5000 lb capacity). Refer to manufacturer for equipment accuracy for load cell.
6. **Specimen Mounting System.** Used two stainless steel base plates to restrict shifting of the specimen during testing. The mounting jig holds the two stainless steel base plates for specimen preparation.
7. **Cutting Template.**
8. **Two Part Epoxy.** Two part epoxy with a minimum 24 hour tensile strength of 600 psi (4.1 MPa) and 24 hour shear strength of 2,000 psi (13.8 MPa).
9. **10 lb weight (4.5 kg).** Used to place on top of specimens while being glued to specimen platens.
10. **¼ inch Width Adhesive Tape.** Placed over gap in plates to prevent the epoxy from bonding the plates together.
11. **Paint or Permanent Marker.** Used to outline specimens on platens for placement of epoxy.
12. **3/8-in. Socket Drive Handle with a 3-in. (7.6 cm) extension.**

C. Procedure. Perform the following steps:

1. Sample Preparation.

- a. **Laboratory Molded Specimens** - Use cylindrical specimens that have been compacted using the gyratory compactor (AASHTO T 312). Specimen diameter must be 6 inches (150 mm) and a specimen height must be 4.5 inches +/- 0.2 inches (115 +/- 5 mm).

Note 1 - Experience has shown that molded laboratory specimens of a known density usually result in a greater density (or lower air voids) after being trimmed. Therefore, it is recommended that the laboratory technician produce molded specimens with an air void level slightly higher than the targeted trimmed specimen. Determine the density of the final trimmed specimen in accordance with AASHTO T 166.

- b. **Core Specimens** – Specimen diameter must be 6 inches +/- 0.1 inch (150 mm +/- 2 mm). Determine the density of the final trimmed specimen in accordance with AASHTO T166.

2. Trimming of Cylindrical Specimen.

Before starting, refer to the sawing device manufacturer's instructions for cutting specimens.

- a. Place the cutting template on the top surface of the laboratory molded specimen or roadway core. Trace the location of the first two cuts by drawing lines using paint or a permanent marker along the sides of the cutting template.
- b. Trim the specimen ends by cutting the specimen perpendicular to the top surface following the traced lines. Discard specimen ends.
- c. Trim off the top and bottom of the specimen to produce a sample with a height of (1.5 inches +/- 0.02 inches (38 mm +/- 0.5 mm)).
- d. Measure the density of the trimmed specimen in accordance with AASHTO T 166. If the specimen does not meet the density requirement as specified for performance testing for the mix being tested, then discard it and prepare a new specimen.
- e. Air dry the trimmed specimen to constant mass, where constant mass is defined as the weight of the trimmed specimen not changing by more than 0.05% in a 2 hour interval.

3. Mounting Trimmed Specimen to Base Plates (Platens).

- a. Mount and secure the base plates (platens) to the mounting jig. Cut a piece of adhesive tape approximately 4.0 inches (102 mm) in length. Center and place the piece of tape over the gap between the base plates.
- b. Prepare the epoxy following manufacturer's instructions.
- c. Cover a majority of the base plates (platens) with epoxy, including the tape. Glue the trimmed specimen to the base plates.
- d. Place a 10 lb (4.5 kg) weight on top of the glued specimen to ensure full contact of the trimmed specimen to the base plates. Allow the epoxy to cure for the time recommended by the manufacturer. Remove the weight from the specimen after the epoxy has cured.
- e. Turn over the glued specimen so the bottom of the base plates faces upward. Using a hacksaw, cut a notch through the epoxy which can be seen through the gap in the base plates. The notch should be cut as evenly as possible and should just begin to reach the specimen underneath the epoxy. Great care should be taken not to cut more than 1/16 inch (1.58 mm) into the specimen.
- f. Place the test sample assembly in the Overlay Tester's environmental chamber for a minimum of 1 hour before testing.

4. Start Testing Device. Please refer to manufacturer's equipment manual prior to operating equipment.

- a. Turn on the Overlay Tester. Turn on the computer and wait to ensure communication between the computer and the Overlay Tester occurs.
- b. Turn on the hydraulic pump using the Overlay Tester's software. Allow the pump to warm up for a minimum of 20 minutes.
- c. Turn the machine to load control mode to mount the sample assembly.

5. Mounting Specimen Assembly to Testing Device. Enter the required test information into the Overlay Tester software for the specimen to be tested.

- a. Mount the specimen assembly onto the machine according to the manufacturer's instructions and the following procedural steps.
 1. Clean the bottom of the base plates and the top of the testing machine blocks before placing the specimen assembly into the blocks. If all four surfaces are not clean, damage may occur to the machine, the specimen, or the base plates when tightening the base plates.
 2. Apply 15 lb-in of torque for each screw when fastening the base plates to the machine.

6. Testing Specimen.

- a. Perform testing at a constant temperature recommended by the New Jersey Department of Transportation for the mixture in question. This is typically either 59 °F (15 °C) or 77 °F (25 °C).

Note 3 – Ensure the trimmed specimen has also reached the constant temperature required.

- b. Start the test by enabling the start button on the computer control program. Perform testing until a 93% reduction or more of the maximum load measured from the first opening cycle occurs. If 93% is not reached, run the test until a minimum of 1,200 cycles.
- c. After the test is complete, remove the specimen assembly from the Overlay Tester machine blocks.

D. Report. Include the following items in the report:

1. Date and time molded or cored.
2. NJDOT mixture identification.
3. Trimmed specimen density.
4. Starting Load.
5. Final Load.
6. Percent decline (or reduction) in Load.
7. Number of cycles until failure.
8. Test Temperature

NJDOT B-11- DETERMINING GRADATION OF CRUMB RUBBER FOR ASPHALT MODIFICATION

A. Scope. This method is used to determine the gradation of the crumb rubber for asphalt-rubber binder

B. Apparatus. Use the following apparatus:

1. Oven capable of maintaining a temperatures of 140 ± 10 °F for drying sample to a constant weight.
2. Rubber balls having a weight of 8.5 ± 0.5 grams, a diameter of 24.5 ± 0.5 mm, and a Shore Durometer “A” hardness of 50 ± 5 per ASTM Designation D 224
3. No. 8, 16, 30, 50, 100, and 200 sieves conforming to AASHTO M 92.
4. Mechanical sieve shaker conforming to AASHTO T 27.
5. Balance conforming to AASHTO M 231 and having a minimum capacity of 100 grams with a precision of 0.1 gram.

C. Procedure. The crumb rubber for asphalt rubber binder is required to conform to the gradations specified below when tested in accordance with ASTM Designation C 136 except as follows:

1. Obtain 100 ± 5 grams from the crumb rubber sample and dry to a constant weight at a temperature of not less than 135 °F nor more than 145 °F and record the dry sample weight.
2. Place the crumb rubber sample and 5.0 grams of talc in a one pint jar, then shake it by hand for a minimum of one minute to mix the crumb rubber and the talc. Continue shaking or open the jar and stir until the particle agglomerates and clumps are broken and the talc is uniformly mixed.
3. Place one rubber ball on each sieve. After sieving the combined material for 10 ± 1 minutes, disassemble the sieves. Brush remaining material adhering to the bottom of a sieve into the next finer sieve. Weigh and record the weight of the material retained on the No. 8 sieve and leave this material (do not discard) on the scale or balance. Ensure that observed fabric balls remain on the scale or balance and are placed together on the side of the scale or balance to prevent the fabric balls from being covered or disturbed when placing the material from finer sieves on to the scale or balance. Add the material retained on the next finer sieve (No. 16 sieve) to the scale or balance. Weigh and record that weight as the accumulative weight retained on that sieve (No. 16 sieve). Continue weighing and recording the accumulated weights retained on the remaining sieves until the accumulated weight retained in the pan has been determined. Before discarding the crumb rubber sample, separately weigh and record the total weight of the fabric balls in the sample.
4. Determine the weight of material passing the No. 200 sieve (or weight retained in the pan) by subtracting the accumulated weight retained on the No. 200 sieve from the accumulated retained weight in the pan. If the material passing the No. 200 sieve (or weight retained in the pan) has a weight of 5 grams or less, cross out the recorded number for the accumulated weight retained in the pan and copy the number recorded for the accumulated weight retained on the No. 200 sieve and record that number (next to the

crossed out number) as the accumulated weight retained in the pan. If the material passing the No. 200 sieve (or weight retained in the pan) has a weight greater than 5 grams, cross out the recorded number for the accumulated weight retained in the pan, subtract 5 grams from that number and record the difference next to the crossed out number. The adjustment to the accumulated weight retained in the pan is made to account for the 5 grams of the talc added to the sample. For calculation purposes, the adjusted accumulated weight is the same as the adjusted accumulated weight retained in the pan. Determine the percent passing based on the adjusted total sample weight and recorded to the nearest 0.1 percent.

- D. **Report.** Report all test results on ME provided forms.

NJDOT B-12 – DETERMINING ROTATIONAL VISCOSITY OF ASPHALT RUBBER BINDER

- A. **Scope.** This method presents procedures for sampling and testing of asphalt-rubber binder in the field using a hand held portable rotational analog or digital viscometer.

- B. **Apparatus.** Use the following apparatus:

1. **Viscometer.** A hand held high range rotational viscometer. Analog models with indicator needles and scaled dial displays or digital read out viscometers may be used. Analog models that have been found acceptable include Rion Model VT-04E and Haake Model, VT-02. Digital models that have been found acceptable include Haake VT 2 Plus.
2. **Rotor.** A cylinder with a diameter of 24 ± 1.1 millimeters, height of 53 ± 0.1 millimeters, and a vent hole attached to a spindle or shaft with length of 87 ± 2 millimeters that is compatible with the selected viscometer. Acceptable rotors include Rion No. 1, Haake No 1, or an equivalent.
3. **Thermometer.** Digital with metal jacket probe accurate to 1 °F.
4. **Sample Containers.** Clean 1 gallon metal cans with lids and wire bale.
5. **Viscosity Standard Oils.** Fluids calibrated in absolute viscosity centipoise (cP).
6. **Viscometer Holder.** Clean metal container or stand for safely storing the viscometer between tests.
7. **Level Surface.** Level surface not directly on the ground.
8. **Heat Source.** A controllable heat source (i.e. a hot plate, gas stove, or burner) to maintain the temperature of the asphalt-rubber sample at 350 ± 3 °F while measuring viscosity.
9. **Personal Equipment.** Eye protection and heat resistant gloves.

- C. **Procedure.** Perform the following steps:

1. **Calibration of Equipment.** Calibrate the equipment as follows:
 - a. Verify the accuracy of the viscometer by comparing the viscosity results obtained with the hand held viscometer to 3 separate calibration fluids of known viscosities ranging from 1000 cP to 5000 cP. The known viscosity value are based on the fluid manufacturer's standard test temperature or based on the test temperature versus viscosity correlation table provided by the fluid manufacturer.
 - b. The viscometer is considered accurate if the values obtained are within 300 cP of the known viscosity.
 - c. Verify the calibration of the rotational viscometer using viscosity standards before use at each site.
2. **Sampling Asphalt-Rubber Binder.** Provide new sample containers and ensure that they are clean before using. Before sampling, draw at least 1 gallon from an appropriate sample valve on the interaction tank and discard. Then reopen the sample valve and draw at least 3/4 of a gallon for testing.
3. **Preparing Asphalt-Rubber Binder Samples for Testing.** Prepare the asphalt-rubber binder as follows:
 - a. Immediately transport the sample to the testing area. Ensure that the testing area is close to the sampling location to reduce the potential for temperature loss.
 - b. Set the open asphalt-rubber binder sample container on the level surface on or over the heat source.
 - c. To prevent scorching or burning, manually stir the asphalt-rubber binder sample using a metal stir rod or the temperature probe.

- d. Continue stirring until a consistent asphalt-rubber binder temperature of 350 ± 3 °F is achieved. Record the actual test temperature with the corresponding viscosity measurement.
 - e. Insert the viscometer spindle and rotor into the hot asphalt-rubber binder sample near the edge of the can. Ensure that the spindle and rotor are not inserted deeper than the immersion depth mark on the shaft and are not plugging the vent hole. During insertion, the spindle and rotor may be tilted slightly to keep the vent hole clear.
 - f. Allow the rotor to acclimate to the temperature of the asphalt-rubber binder for approximately 1 minute. During acclimation, stir the sample thoroughly and measure the temperature.
 - g. Orient the sample and the rotor so that the rotor is near the center of the sample, align the depth mark on the shaft with the asphalt-rubber binder surface, and level the viscometer in order to measure viscosity.
- 4. Testing.** Analog viscometers include a level bubble to help orient the device to ensure that the rotor and shaft remain vertical. Digital viscometers may not include a level bubble. If a level bubble is not included, attach a small adhesive bubble to the viscometer or use a framework with a level bubble.

Test the asphalt-rubber binder as follows:

- a. As soon as the viscometer is leveled and the depth mark is even with the asphalt-rubber binder surface, begin rotor rotation. When using a digital viscometer, activate the continuous digital display according to the manufacturer's recommendations. Read and record the peak viscosity value (The peak measurement typically represents the viscosity of the asphalt-rubber binder; report and log that value. As the rotor continues to turn, it "drills" into the sample and spins rubber particles out of its measurement area. This may cause thinning of the material in contact with the rotor erroneously indicating a drop in the apparent viscosity of the asphalt-rubber binder) from the graduated scale labeled with the corresponding rotor number or from the digital display.
 - b. After completing the first measurement, move the viscometer rotor away from the center of the sample can without removing it from the asphalt-rubber binder sample. Turn off the rotor rotation.
 - c. Stir the asphalt-rubber binder sample thoroughly.
 - d. Repeat Steps 1, 2, and 3. Take 3 measurements and average the results to determine the viscosity.
 - e. Return the viscometer to its holder with the rotor suspended in a suitable solvent. Before using the rotor again, wipe off the solvent and dry the rotor to avoid solvent contamination of the next sample.
- D. Calculations.** Some meters read in units of mPa·s (0.001 Pascal·seconds) or dPa·s (0.1 Pa·s), while others may read in centipoise (cPs) units. The conversion is $1 \text{ Pa} \cdot \text{s} = 1000 \text{ cPs}$.
- E. Report.** Include the following items in the report:
1. Date and time sampled.
 2. Location of asphalt-rubber binding blending plant.
 3. Test temperature and viscosity.
 4. Rotor designation.
 5. Viscometer model and serial n

NJDOT R-1 – OPERATING INERTIAL PROFILER SYSTEMS FOR EVALUATING PAVEMENT PROFILES

THIS ENTIRE TEST METHOD IS CHANGED TO:

- A. Scope.** This test method describes the procedure for operating, verifying the calibration of an ASTM E 950 Class 1 Inertial Profiler System (IPS) and testing riding surface for pavement profiles evaluation.
- B. Apparatus.** Use an IPS that meets the requirements of AASHTO M 328 and ASTM E 950, Class 1 and the following:

1. Certify the IPS according to AASHTO R 56 at least every 2 years. If a system component is replaced, re-certify the system. Perform the certification at a site approved by the Department.
2. The data system provides the raw profile data in an ASCII format acceptable to the Department.
3. The computer program uses a high-pass filter set at 300 feet and reads an ASCII or text file for computing the International Roughness Index (IRI) in inches per mile.
4. The current version of *ROADRUF*, *ProVal*, or other Department approved pavement profile analysis software is used to compute the IRI.

C. Procedure. Perform the following steps:

1. Operate the IPS according to AASHTO R 57 and ASTM E 950.
2. On a daily basis before data collection, check the equipment and operating system for operational stability and calibration. Perform necessary calibration procedures according to equipment manufacturer's procedures and applicable standards. Operators shall maintain a log documenting the calibration history.
3. Ensure that the operators of the IPS have completed a profile training course, such as NHI Course 131100, have been trained specifically on the IPS they will be operating, and are proficient in the operation of the IPS.
4. Make provisions to automatically start and stop the IPS recording at the beginning and end of testing.
5. Ensure retroreflective traffic striping tape or other approved mechanism is placed at the beginning and end of each direction of travel for automatically triggering the start and stop of profile measurements.
6. Collect at least 0.05-mile of data before the area to be tested to allow the system to stabilize before profile measurements are obtained. Collect data in a continuous run through the length to be tested. If the run is interrupted, discard the results and re-run the length.
7. Test the full extent of each wheel path of each lane in the longitudinal direction of travel. The wheel path is defined as being located approximately 3 feet on each side of the centerline of the lane and extending for the full length of the lane. Lanes are defined by striping.
8. Run three tests each wheel path and report average of three runs each wheel path.
9. Exclude locations where the traffic striping includes turn lanes that cause the through traffic lane to cross over a longitudinally paved joint, ramps, and lanes such as acceleration and deceleration lanes of less than 1,000 feet of continuous through treatment.
10. Report single IRI value average of 3 runs unless otherwise directed. The single IRI value shall be each 0.01 mile length for each lane, ramp, and shoulder and 0.005 mile for each overlaid bridge structure.

STATE ATTACHMENT NO. 1

STATE OF NEW JERSEY EQUAL EMPLOYMENT OPPORTUNITY SPECIAL PROVISIONS FOR CONSTRUCTION CONTRACTS FUNDED BY WHOLLY OR PARTIALLY STATE FUNDS

I. GENERAL

It is the policy of the New Jersey Department of Transportation (hereafter "NJDOT") that its contracts should create a workforce that reflects the diversity of the State of New Jersey. Therefore, contractors engaged by the NJDOT to perform under a construction contract shall put forth a good faith effort to engage in recruitment and employment practices that further the goal of fostering equal opportunities to minorities and women.

The contractor must demonstrate to the NJDOT's satisfaction that a good faith effort was made to ensure that minorities and women have been afforded equal opportunity to gain employment under the NJDOT's contract with the contractor. Payment may be withheld from a contractor's contract for failure to comply with these provisions.

Evidence of a "good faith effort" includes, but is not limited to:

1. The Contractor shall recruit prospective employees through the State Job bank website, managed by the Department of Labor and Workforce Development, available online at <http://NJ.gov/jobCentralNJ>;

Note: Posting shall not be required where the employer intends to fill the job opening with a present employee, a laid-off former employee, or a job candidate from a previous recruitment, where pre-existing legally binding collective bargaining agreements provide otherwise, or where an exception has been granted to the NJDOT by the Department of Labor and Workforce Development.

2. The Contractor shall keep specific records of its efforts, including records of all individuals interviewed and hired, including the specific numbers of minorities and women;
3. The Contractor shall actively solicit and shall provide the NJDOT with proof of solicitation for employment, including but not limited to advertisements in general circulation media, professional service publications and electronic media; and
4. The Contractor shall provide evidence of efforts described at 2 above to the NJDOT no less frequently than once every 12 months.
5. The Contractor shall comply with the requirements set forth at N.J.A.C. 17:27.

The Contractor is required to implement and maintain a specific Affirmative Action Compliance Program of Equal Employment Opportunity in support of the New Jersey "*Law Against Discrimination*", N.J.S.A. 10:5-31 et seq., and according to the Affirmative Action Regulations set forth at N.J.A.C. 17:27-1.1 et seq.

The provisions of N.J.S.A. 10:2-1 through 10:2-4 and N.J.S.A. 10:5-31 et seq., as amended and supplemented) dealing with discrimination in employment on public contracts, and the rules and regulations promulgated pursuant thereunto, are hereby made a part of this contract and are binding upon the Contractor.

Noncompliance by the Contractor with the requirements of the Affirmative Action program for Equal Employment Opportunity may be cause for delaying or withholding monthly and final payments pending corrective and appropriate measures by the Contractor to the satisfaction of the Department.

The Contractor will cooperate with the state agencies in carrying out its Equal Employment Opportunity obligations and in their review of its activities under the contract.

The Contractor and all its subcontractors, not including material suppliers, holding subcontracts of \$2,500 or more, will comply with the following minimum specific requirement activities of Equal Opportunity and Affirmative Action set forth in these special provisions. The Contractor will include these requirements in every subcontract of \$2,500 or more with such modification of language in the provisions of such contracts as is necessary to make them binding on the subcontractor.

During the performance of this contract, the contractor agrees as follows:

1. The Contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the Contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.
2. The Contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.
3. The Contractor or subcontractor, where applicable, will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The Contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.
5. When hiring or scheduling workers in each construction trade, the Contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the The Division of Public Contracts Equal Employment Opportunity Compliance (hereafter "Division") may, in its discretion, exempt a Contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, a, b, and c, as long as the Division is satisfied that the Contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The Contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

- a. If the Contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the Contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the Contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the Contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the Contractor or subcontractor agrees to afford equal employment opportunities to minority and women workers directly, consistent with this chapter. If the Contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the Contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (b) below; and the Contractor or subcontractor further agrees to take said action immediately if it determines or is so notified by the Division that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.
- b. If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (a) above, or if the Contractor does not have a referral agreement or arrangement with a union for a construction trade, the Contractor or subcontractor agrees to take the following actions:
 - (1) To notify the Public Agency Compliance Officer, the Division, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;
 - (2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;
 - (3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the Contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;
 - (4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the Contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;
 - (5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as with applicable State and Federal court decisions;
 - (6) To adhere to the following procedure when minority and women workers apply or are referred to the Contractor or subcontractor:
 - (i) The contractor or subcontractor shall interview the referred minority or women worker.
 - (ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the Contractor or subcontractor shall in good faith determine the qualifications of such individuals. The Contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However a Contractor or subcontractor shall determine that the individual at least possesses the requisite skills and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Division. If necessary, the Contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (c) below.

- (iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in paragraph (i) above whenever vacancies occur. At the request of the Division, the Contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.
 - (iv) If, for any reason, said Contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the Contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the Public Agency Compliance Officer and to the Division.
 - (7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, and on forms made available by the Division and submitted promptly to the Division upon request.
- c. The Contractor or subcontractor agrees that nothing contained in (b) above shall preclude the Contractor or subcontractor from complying with the hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (b) above without regard to such agreement or arrangement; provided further, however, that the Contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the Contractor or subcontractor agrees that, in implementing the procedures of (b) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the Contractor shall submit to the Public Agency Compliance Officer and the Division an initial project workforce report (Form AA 201) provided to the public agency by the Division for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7.

The Contractor and each subcontractor must submit monthly employment and wage data to the Department via a web based application using electronic Form CC-257R. Instructions for registering and receiving the authentication code to access the web based application can be found at:

<http://www.state.nj.us/transportation/business/Civilrights/pdf/CC257.pdf>

Instructions on how to complete Form CC-257R are provided in the web application. Submit Form CC-257R through the web based application within 10 days following the end of the reporting month.

All employment and wage data must be accurate and consistent with the certified payroll records. The Contractor is responsible for ensuring that their subcontractors comply with these reporting requirements. Failure by the Contractor to submit Monthly Employment Utilization Reports may impact the contractor's prequalification rating with the Department.

- d. The Contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance as may be requested by the Division from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Public

Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code (NJAC 17:27)**.

- e. The Contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and off-the-job programs for outreach and training of minority and female trainees employed on the construction projects.

II. EQUAL EMPLOYMENT OPPORTUNITY POLICY

The Contractor agrees that it will accept and implement during the performance of this contract as its operating policy the following statement which is designed to further the provision of Equal Employment Opportunity to all persons without regard to their age, race, color, religion, creed, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex and to promote the full realization of Equal Employment Opportunity through a positive continuing program:

"It is the policy of this company that it will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex and that it will take Affirmative Action to ensure that applicants are recruited and employed and that employees are treated during employment without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship."

III. EQUAL EMPLOYMENT OPPORTUNITY OFFICER

The Contractor will designate and make known to the Department contracting officers an Equal Employment Opportunity Officer (hereafter "EEO Officer") who will have the responsibility for and must be capable of effectively administering and promoting an active Equal Employment Opportunity program and be assigned adequate authority and responsibility to do so.

IV. DISSEMINATION OF POLICY

- A. All members of the Contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, will be made fully cognizant of, and will implement, the Contractor's Equal Employment Opportunity Policy and contractual responsibilities to provide Equal Employment Opportunity in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - 1. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every 6 months, at which time the Contractor's Equal Employment Opportunity Policy and its implementation will be reviewed and explained. The EEO Officer or other knowledgeable company official will conduct the meetings.
 - 2. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable company official covering all major aspects of the Contractor's Equal Employment Opportunity obligations within 30 days following their reporting for duty with the Contractor.
 - 3. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate company official in the Contractor's Procedures for locating and hiring minority and women workers.
- B. In order to make the Contractor's Equal Employment Opportunity Policy known to all employees, prospective employees and potential sources of employees, i.e., schools, employment agencies,

labor unions (where appropriate), college placement officers, etc., the Contractor will take the following actions:

1. Notices and posters setting forth in the Contractor's Equal Employment Opportunity policy, as set forth in Section 2 of these Equal Employment Opportunity Special Provisions will be placed in conspicuous places readily accessible to employees, applicants for employment and potential employees.
2. The Contractor's Equal Employment Opportunity Policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate channels.

V. RECRUITMENT

- A. In all solicitations and advertisements for employees placed by or on behalf of the Contractor, the Contractor will state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. All such advertisements will be published in newspapers or other publications having a large circulation among minorities and women in the area from which the project workforce would normally be derived.
- B. The Contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority and women applicants, including, but not limited to state employment agencies, schools, colleges and minority and women organizations. To meet this requirement, the Contractor will, through his/her EEO Officer, identify sources of potential minority and women employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the Contractor for employment consideration.
- C. In the event the Contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the Contractor's compliance with Equal Employment Opportunity contract provisions. (The US Department of Labor has held that where implementations of such agreements have the effect of discriminating against minorities or women, or obligates the Contractor to do the same; such implementation violates Executive Order 11246, as amended).
- D. In the event that the process of referrals established by such a bargaining agreement fails to provide the Contractor with a sufficient number of minority and women referrals within the time period set forth in such an agreement, the Contractor shall comply with the provisions of "Section IX Unions" of the EEO Special Provisions.

VI. ESTABLISHMENT OF GOALS FOR CONSTRUCTION CONTRACTORS

- A. The New Jersey Department of Transportation has established, pursuant to N.J.A.C. 17:27-7.2, the minority and women goals for each construction contractor and subcontractor based on availability statistics as reported by the New Jersey Department of Labor, Division of Planning and Research, in its report, "EEO Tabulation - Detailed Occupations by Race/Hispanic Groups" as follows:

**MINORITY AND WOMEN EMPLOYMENT GOAL OBLIGATIONS FOR CONSTRUCTION CONTRACTORS
AND SUBCONTRACTORS**

COUNTY	MINORITY % PERCENTAGE	WOMEN % PERCENTAGE
Atlantic	18	6.9
Bergen	22	6.9
Burlington	15	6.9
Camden	19	6.9
Cape May	5	6.9
Cumberland	27	6.9
Essex	53	6.9
Gloucester	9	6.9
Hudson	60	6.9
Hunterdon	3	6.9
Mercer	30	6.9
Middlesex	24	6.9
Monmouth	15	6.9
Morris	16	6.9
Ocean	7	6.9
Passaic	36	6.9
Salem	10	6.9
Somerset	20	6.9
Sussex	4	6.9
Union	45	6.9
Warren	5	6.9

The Division of Public Contracts Equal Employment Opportunity Compliance has interpreted Section 7.2 of the State of New Jersey Affirmative Action Regulations as applicable to work hour goals for minority and women participation.

If a project is located in more than one county, the minority work hour goal will be determined by the county which serves as the primary source of hiring or, if workers are obtained equally from one or more counties, the single minority goal shall be the average of the individual goal for the affected counties.

- B. The State Division of Public Contracts Equal Employment Opportunity Compliance may designate a regional goal for minority membership for a union that has regional jurisdiction. No regional goals shall apply to this project unless specifically designated elsewhere herein.
- C. When hiring workers in the construction trade, the Contractor and/or subcontractor agree to attempt, in good faith, to employ minority and women workers in each construction trade, consistent with the applicable county or, in special cases, regional goals.
- D. It is understood that the goals are not quotas. If the Contractor or subcontractor has attempted, in good faith, to satisfy the applicable goals, he will have complied with his obligations under these EEO Special Provisions. It is further understood that if the Contractor shall fail to attain the goals applicable to this project, it will be the Contractor's obligation to establish to the satisfaction of the Department of Transportation that it has made a good faith effort to satisfy such goals. The

Contractor or subcontractor agrees that a good faith effort to achieve the goals set forth in these special provisions shall include compliance with the following procedures:

1. Requests shall be made by the Contractor or subcontractor to each union or collective bargaining unit with which the Contractor or subcontractor has a referral agreement or arrangement for the referral of minority and women workers to fill job openings. Requests shall also be made for assurances for the referral of minority and women workers to fill job openings. Requests shall also be made for assurances from such unions or collective bargaining units that they will cooperate with the Contractor or subcontractor in fulfilling the Affirmative Action obligations of the Contractor or subcontractor under this contract. Such requests shall be made prior to the commencement of construction under the contract.
2. The Contractor and its subcontractors shall comply with Section IX, Unions of these EEO Special Provisions and, in particular, with Section IX, Paragraph D, if the referral process established in any collective bargaining arrangement is failing to provide the Contractor or subcontractor with a sufficient number of minority and women referrals.
3. The Contractor and its subcontractors shall notify the Department's Compliance Officer, the Division of Public Contracts Equal Employment Opportunity Compliance of the Department of Treasury and at least one approved minority referral organization of the Contractor's or subcontractors work force needs and of the Contractor's or subcontractor's desire for assistance in attaining the goals set forth herein. The notifications should include a request for referral of minority and women workers.
4. The Contractor and its subcontractors shall notify the Department's Compliance Officer and the Division of Public Contracts Equal Employment Opportunity Compliance of the Department of Treasury in the event that a union or collective bargaining unit is not making sufficient minority and women referrals to enable the Contractor or subcontractor to attain the workforce goals for the Project.
5. The Contractor and its subcontractors shall make standing requests to all local construction unions, the state training and employment service and other approved referral sources for additional referrals of minority and women workers until such time as the project workforce is consistent with the work hour goals for the project.
6. The Contractor and its subcontractors shall make standing requests to all local construction unions, the state training and employment service and other approved referral sources for additional referrals of minority and women workers until such time as the project workforce is consistent with the work hour goals for the project.
7. In the event that it is necessary to lay off some of the workers in a given trade on the construction site, the Contractor and its subcontractors shall ensure that fair layoff practices are followed regarding minority, women and other workers.
8. The Contractor and its subcontractors shall comply with the other requirements of these EEO Special Provisions.

VII. PERSONNEL ACTIONS

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to age, race, color, creed, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. The following procedures shall be followed:

- A. The Contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- B. The Contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

- C. The Contractor will periodically review selected personnel actions in-depth to determine whether there is evidence of discrimination. Where evidence is found, the Contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- D. The Contractor will promptly investigate all complaints of alleged discrimination made to the Contractor in connection with his/her obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the Contractor will inform every complainant of all of his/her avenues of appeal.

VIII. TRAINING AND PROMOTION

The Contractor will assist in locating, qualifying, and increasing the skills of minority group and women workers, and applicants for employment.

Consistent with the Contractor's workforce requirements and as permissible under State regulations, the Contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs, for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The Contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

The Contractor will periodically review the training and promotion potential of minority group and women workers and will encourage eligible employees to apply for such training and promotion.

IX. UNIONS

If the Contractor relies in whole or in part upon unions as a source of employees, the Contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and women workers. Actions by the Contractor either directly or through a Contractor's association acting, as agent will include the procedures set forth below:

- A. The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract of understanding, a notice advising the labor union or workers' representative of the Contractor's commitments under both the law against discrimination and this contract and shall post copies of the notice in conspicuous places readily accessible to employees and applicants for employment. Further, the notice will request assurance from the union or worker's representative that such union or worker's representative will cooperate with the Contractor in complying with the Contractor's Equal Employment Opportunity and Affirmative Action obligations.
- B. The Contractor will use their best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- C. The Contractor will use their best efforts to incorporate an Equal Employment Opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their age, race, color, creed, sex, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, or nationality.
- D. The Contractor is to obtain information as to the referral practices and policies of the labor union except to the extent that such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the Contractor, the Contractor shall so certify to the NJDOT and shall set forth what efforts have been made to obtain such information.

- E. In the event the union is unable to provide the Contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the Contractor will, through independent recruitment efforts, fill the employment vacancies without regard to age, race, color, creed, sex, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, or nationality making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The US Department of Labor has held that it shall be no excuse that the union with which the Contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees). In the event the union referral practice prevents the Contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these Special Provisions, such Contractor shall immediately notify the NJDOT.

X. SUBCONTRACTING

- A. The Contractor will use his best efforts to solicit bids from and to utilize minority group and women subcontractors or subcontractors with meaningful minority group and women representation among their employees. Contractors may use lists of minority owned and women owned construction firms as issued by the NJDOT and/or the New Jersey Unified Certification Program (NJUCP).
- B. The Contractor will use his best efforts to ensure subcontractor compliance with their Equal Employment Opportunity obligations.

XI. RECORDS AND REPORTS

- A. The Contractor will keep such records as are necessary to determine compliance with the Contractor's Equal Employment Opportunity obligations. The records kept by the Contractor will be designed to indicate:
 - 1. The work hours of minority and non-minority group members and women employed in each work classification on the project;
 - 2. The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women (applicable only to Contractors who rely in whole or in part on unions as a source of their workforce);
 - 3. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and women workers; and
 - 4. The progress and efforts being made in securing the services of minority group and women subcontractors or subcontractors with meaningful minority and women representation among their employees.
- B. All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the NJDOT.
- C. The Contractor shall submit monthly reports to the NJDOT after construction begins for the duration of the project, indicating the work hours of minority, women, and non minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on a form supplied by the NJDOT.

XII SPECIAL CONTRACT PROVISIONS FOR INVESTIGATING, REPORTING AND RESOLVING EMPLOYMENT DISCRIMINATION AND SEXUAL HARASSMENT COMPLAINTS

The Contractor hereby agrees to the following requirements in order to implement fully the nondiscrimination provisions of the Supplemental Specifications:

The Contractor agrees that in instances when it receives from any person working on the project site a verbal or written complaint of employment discrimination, prohibited under N.J.S.A. 10:5-1 et seq. 10:2-1 et seq., 42 U.S.C. 2000 (d) et seq., 42 U.S.C. 2000(e) et seq. And Executive Order 11246, it shall take the following actions:

1. Within one (1) working day commence an investigation of the complaint, which will include but not be limited to interviewing the complainant, the respondent, and all possible witnesses to the alleged act or acts of discrimination or sexual harassment.
2. Prepare and keep for its use and file a detailed written investigation report which includes the following information:
 - a) Investigatory activities and findings.
 - b) Dates and parties involved and activities involved in resolving the complaint.
 - c) Resolution and corrective action taken if discrimination or sexual harassment is found to have taken place.
 - d) A signed copy of resolution of complaint by complainant and Contractor.
(In addition to keeping in its files the above-noted detailed written investigative report, the Contractor shall keep for possible future review by the NJDOT all other records, including, but not limited to, interview memos and statements.)
3. Upon the request of the NJDOT provides to the NJDOT within ten (10) calendar days a copy of its detailed written investigative report and all other records on the complaint investigation and resolution.
4. Take appropriate disciplinary actions against any Contractor employee, official or agent who has committed acts of discrimination or sexual harassment against any Contractor employee or person working on the project. If the person committing the discrimination is a subcontractor employee, then the Contractor is required to attempt to effectuate corrective and/or disciplinary action by the subcontractor in order to establish compliance with project's contract requirements.
5. Take appropriate disciplinary action against any Contractor employee, official or agent who retaliates, coerces or intimidates any complainant and/or person who provides information or assistance to any investigation of complaints of discrimination or sexual harassment. If the person retaliating, coercing or intimidating a complainant or other person assisting in an investigation is a subcontractor's employee, then the Contractor is required to attempt to effectuate corrective and/or disciplinary action taken by the subcontractor in order to establish compliance with the project's contract requirements.
6. Ensure to the maximum extent possible that the privacy interests of all persons who give confidential information in aid of the Contractor's employment discrimination investigation are protected.
7. In conjunction with the above requirements, the Contractor herein agrees to develop and post a written sexual harassment policy for its workforce.
8. The Contractor also agrees that its failure to comply with the above requirements may be cause for the New Jersey Department of Transportation to institute against the Contractor any and all enforcement proceedings and/or sanctions authorized by the contract or by state and/or federal law.

STATE ATTACHMENT NO. 2

PAYROLL REQUIREMENTS FOR 100% STATE PROJECTS

1. Each contractor and subcontractor shall furnish the RE with payroll reports for each week of contract work. Such reports shall be submitted within 10 days of the date of payment covered thereby and shall contain the following information:
 - A. Each employee's full name and the last four digits of social security number of each such employee.
 - B. Each employee's specific work classification (s).
 - C. Entries indicating each employee's basis hourly wage rate(s) and, where applicable, the overtime hourly wage rate(s). Any fringe benefits paid to the employee in cash must be indicated.
 - D. Each employee's daily and weekly hours worked in each classification, including actual overtime hours worked (not adjusted).
 - E. Each employee's gross wage.
 - F. The itemized deductions made.
 - G. The net wages paid.
2. Each contractor or subcontractor shall furnish a statement each week to the RE with respect to the wages paid each of its employees engaged in contract work covered by the New Jersey Prevailing Wage Act during the preceding weekly payroll period. The statement shall be executed by the contractor or subcontractor or by an authorized officer or employee of the contractor or subcontractors who supervises the payment of wages. Contractors and subcontractors must use the certification set forth on New Jersey Department of Transportation Form FA-7 "Statement of Compliance," or the same certification set forth on (1) U.S. Department of Labor Form WH-348, (2) the reverse side of U. S. Department of Labor Form WH-347, or (3) any form with identical wording.
3. Contractor and subcontractor shall maintain complete social security numbers and home address for employees. Government agencies are entitled to request or review all relevant payroll information, including social security numbers and addresses of employees. Contractors and subcontractors are required to provide such information upon request.

STATE ATTACHMENT NO. 3

AMERICANS WITH DISABILITIES ACT 100% STATE FUNDED CONTRACTS

Equal Opportunity For Individuals With Disabilities.

The CONTRACTOR and the STATE do hereby agree that the provisions of Title II of the American With Disabilities Act of 1990 (the "ACT") (42 U.S.C. Section 12101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the STATE pursuant to this contract, the CONTRACTOR, agrees that the performance shall be in strict compliance with the Act. In the event that the CONTRACTOR, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the CONTRACTOR shall defend the STATE in any action or administrative proceeding commenced pursuant to this Act. The CONTRACTOR shall indemnify, protect, and save harmless the STATE, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The CONTRACTOR shall, at its own expense, appear, defend, and pay any and all charges for legal services and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the STATE'S grievance procedure, the CONTRACTOR agrees to abide by any decision of the STATE which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the STATE or if the STATE incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the CONTRACTOR shall satisfy and discharge the same at its own expense.

The STATE shall, as soon as practicable after a claim has been made against it, give written notice thereof to the CONTRACTOR along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the STATE or any of its agents, servants, and employees, the STATE shall expeditiously forward or have forwarded to the CONTRACTOR every demand, complaint, notice, summons, pleading, or other process received by the STATE or its representatives.

It is expressly agreed and understood that any approval by the STATE of the services provided by the CONTRACTOR pursuant to this contract will not relieve the CONTRACTOR of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the STATE pursuant to this paragraph.

It is further agreed and understood that the STATE assumes no obligation to indemnify or save harmless the CONTRACTOR, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the CONTRACTOR expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the CONTRACTOR'S obligations assumed in this Agreement, nor shall they be construed to relieve the CONTRACTOR from any liability, nor preclude the STATE from taking any other actions available to it under any other provisions of this Agreement or otherwise at law.

STATE ATTACHMENT NO. 4

SMALL BUSINESS ENTERPRISE UTILIZATION ATTACHMENT 100% STATE-FUNDED CONTRACTS

I. UTILIZATION OF SMALL BUSINESS ENTERPRISE (SBE) BUSINESSES AS CONTRACTORS, MATERIAL SUPPLIERS AND EQUIPMENT LESSORS.

The New Jersey Department of Transportation advises each contractor or subcontractor that failure to carry out the requirements set forth in this attachment shall constitute a breach of contract and, after notification to the applicable State agency, may result in termination of the agreement or contract by the Department or such remedy as the Department deems appropriate. Requirements set forth in this section shall also be included in all subcontract agreements in accordance with State of New Jersey requirements.

II. POLICY

It is the policy of the New Jersey Department of Transportation that Small Business Enterprises, as defined in N.J.A.C. 12A: 10A-1.2 et seq., and N.J.A.C. 17:14-1.2 et seq., shall have the maximum opportunity to participate in the performance of contracts financed wholly with 100% state funds.

III. CONTRACTOR'S SMALL BUSINESS OBLIGATION

The New Jersey Department of Transportation and its Contractor agree to ensure that Small Business Enterprises (SBE), as defined in N.J.A.C. 12A: 10A-1.2 et seq., and N.J.A.C. 17:14-1.2 et seq., have maximum opportunity to participate in the performance of contracts and subcontracts financed wholly with 100% state funds. In this regard, the New Jersey Department of Transportation and all Contractors shall take all necessary and reasonable steps to ensure that Small Business Enterprises are utilized on, compete for, and perform on NJDOT construction contracts. The New Jersey Department of Transportation and its Contractors shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of State-funded contracts.

IV. COMPLIANCE

To signify and affirm compliance with the provisions of this attachment, the bidder shall complete the Schedule of Small Business Participation "Form CR-266S" included in the Proposal and all forms and documents required in Sections VII and VIII of these provisions which will be made a part of the resulting contract.

V. SMALL BUSINESS GOALS FOR THIS PROJECT

NOTE: SUBCONTRACTING GOALS ARE NOT APPLICABLE IF THE PRIME CONTRACTOR IS A REGISTERED SMALL BUSINESS ENTERPRISE (SBE) FIRM.

- A. This project includes a goal of awarding 10 % percent of the total contract value to subcontractors qualifying as **SMALL BUSINESSES**.
- B. Only Small Business Enterprises registered prior to the date of bid, or prospective Small Business Enterprises that have submitted to the New Jersey Commerce and Economic Growth Commission on or before the day of bid, a completed "State of New Jersey Small Business Vendor Registration Form" and all the required support documentation, will be considered in determining whether the contractor has met the established goals for the project. Early submission of required documentation is encouraged.
- C. If a prospective Small Business Enterprise fails to meet the eligibility standards for participation the department's Small Business Program, the contractor shall, prior to the award, make reasonable outreach efforts to replace that ineligible subcontractor with a registered Small Business whose participation is sufficient to meet the goal for the contract.

- D. Prospective Small Businesses whose registration applications are denied or rejected by the New Jersey Commerce and Growth Commission are ineligible for participation on the project to meet Small Business goals, regardless of any pending appeal action in progress.
- E. A directory of registered Small Businesses Enterprise firms is available upon request to the New Jersey Commerce and Growth Commission or the New Jersey Department of Transportation, Division of Civil Rights/Affirmative Action. The directory is to be used as a source of information only and does not relieve the Contractor of their responsibility to seek out Small Businesses Enterprises not listed.

VI. COUNTING SMALL BUSINESS ENTERPRISE PARTICIPATION

- A. Each Small Business Enterprise (SBE) is subject to a registration procedure to ensure their SBE eligibility prior to the award of contract. In order to facilitate this process, it is advisable for the bidder to furnish the names of proposed SBEs to the Department before bid opening. Once a firm is determined to be a bona fide SBE by the New Jersey Commerce and Growth Commission, the total dollar value of the contract awarded to the SBE is counted toward the applicable goal.
- B. The Contractor may count toward its SBE goal only expenditures to SBEs that perform a commercially useful function in the work of a contract. A SBE is considered to perform a commercially useful function when it is responsible for execution of a distinct element of the work of a contract and carrying out its responsibility by actually performing, managing and supervising the work involved. To determine whether a SBE is performing a commercially useful function, the Contractor shall evaluate the amount of work subcontracted, industry practice and other relevant factors.
- C. If an SBE does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own work force, or the SBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, you must presume that it is not performing a commercially useful function.
- D. If a Contractor is part of a Joint Venture and one or more of the Sole Proprietorships, Partnerships, Limited Liability companies or Corporations comprising the Joint Venture is a registered SBE, the actual payments made to the Joint Venture for work performed by the SBE member, will be applied toward the goal. Payments made to the Joint Venture for work performed by a non-small business firm will not be applied toward the applicable goal.
- E. If the Contractor is a registered SBE, payments made to the Contractor for work performed by the Contractor will be applied toward the SBE goal. Payments made to the Contractor for work performed by non-SBE's will not be applied toward the goal.
- F. When a SBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted towards the SBE goals only if the SBE's subcontractor is also a SBE. Work that a SBE subcontracts to a non-SBE firm does not count toward the assigned goal.

VII. SUBMISSION OF CONTRACTOR'S AFFIRMATIVE ACTION PLANS

- A. Contractors are required to submit annually on their due date, their firm's Affirmative Action Program to the Division of Civil Rights/Affirmative Action. Contractors must have an **approved** Affirmative Action Program in the Division of Civil Rights/Affirmative Action no later than seven (7) State business days after receipt of bids. No recommendations to award will be made without an approved Affirmative Action Program on file in the Division of Civil Rights/Affirmative Action.
- B. The Annual Affirmative Action Program will include, but is not limited to the following:
 - 1. The name of the company's Liaison Officer who will administer the Small Business Enterprise Program.
 - 2. An explanation of the affirmative action methods used in seeking out and considering Small Business Enterprises as subcontractors, material suppliers or equipment lessors.

3. An explanation of affirmative action methods which will be used in seeking out future Small Business Enterprises as subcontractors, material suppliers or equipment lessors after the award of the contract and for the duration of said project.
- C. The following shall be submitted either with the bid or to the Division of Civil Rights/Affirmative Action no later than seven (7) state business days after the receipt of bids.
1. SBE FORM CR-266S Schedule of SBE Participation. The Contractor shall list all SBEs that will participate in the contract including scope of work, actual dollar amount and percent of total contract to be performed. This form should be submitted only if the goal level established for the contract has been met or exceeded;

Note: If a change occurs to the Contractor's original Form A submission which was previously approved by the Division of Civil Rights/Affirmative Action, a Revised Form CR-266S must be submitted naming the replacement Small Business Enterprise subcontractors. A written explanation should be included with the submission of the revised Form CR-266S.
 2. Request for Exemption - In the event the Contractor is unable to meet the specified goal level, that Contractor must submit a written request for a partial or full exemption from the SBE goal. This request shall include the names of all SBE firms that the contractor will utilize on the contract and shall describe the specific work to be performed by each SBE together with the actual dollar amount of that work. Additionally, this request must address the Contractor's efforts to make Reasonable Outreach Efforts as enumerated in Section VIII.
 3. Additional Information - The Department in its sole discretion may request additional information from the Contractor prior to award of the contract in order to evaluate the Contractor's compliance with the SBE requirements of the bid proposal. Such information must be provided within the time limits established by the department. The Contractor shall, prior to the award of the contract, submit a completed SBE "Form CR-266S", even if it has been granted an exemption from the SBE goal.

VIII. REASONABLE OUTREACH EFFORTS

If a Contractor fails to meet the goal for Small Business Enterprise participation, the Contractor shall document its reasonable outreach efforts to meet the SBE goal. Reasonable outreach shall include, but not be limited to the following:

- A. Attendance at a pre-bid meeting, if any, scheduled by the Department to inform SBE's of subcontracting opportunities under a given solicitation.
- B. Advertisement in general circulation media, trade association publications, and small business enterprise-focus media for at least 20 days before bids are due. If 20 days are not available, publication for a shorter reasonable time is acceptable.
- C. Written notification to SBE's that their interest in the contract is solicited;
- D. Efforts made to select portions of the work proposed to be performed by SBEs in order to increase the likelihood of achieving the stated goal;
- E. Efforts made to negotiate with SBE's for specific sub-bids including at a minimum
 1. The names, addresses and telephone numbers of SBE's that were contacted;
 2. A description of the information provided to SBE's regarding the plans and specifications for portions of the work to be performed; and
 3. A statement of why additional agreements with SBE's were not reached;
- F. Information regarding each SBE the bidder contacted and rejected as unqualified and the reasons for the bidder's conclusion;
- G. Efforts made to assist the SBE in obtaining bonding or insurance required by the Bidder or the Department.

IX. ADMINISTRATIVE RECONSIDERATION

- A. If the Division of Civil Rights/Affirmative Action determines that the apparent successful bidder has failed to make reasonable outreach efforts to meet the requirements of this section, the Department must, before awarding the contract, provide the bidder an opportunity for administrative reconsideration.
- B. As part of this reconsideration, the bidder will have the opportunity to provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so. NJDOT will send the bidder a written decision on reconsideration, explaining the basis for finding that the bidder did or did not meet the SBE goal or make an adequate good faith effort to do so.
- C. Within seven (7) State business days of being informed by the Division of Civil Rights/Affirmative Action that it is not a responsible bidder because it has not made or documented sufficient outreach efforts to SBEs, a bidder may make a request in writing to the Director, Division of Procurement, PO Box 605, Trenton, New Jersey, 08625-0605; Telephone (609) 530-6355. The Director, Division of Procurement, does not participate in the initial determination of whether reasonable outreach was performed by the Contractor.

X. RESPONSIBILITY AFTER AWARD OF THE CONTRACT

If at any time following the award of contract, the Contractor intends to sublet any portion(s) of the work under said contract, or intends to purchase material or lease equipment not contemplated during preparation of bids, said Contractor shall take affirmative action:

- A. To notify the RE, in writing, of the type and approximate value of the Contractor intends to accomplish by such subcontract, purchase order or lease.
- B. To signify and affirm compliance with the provisions of this Section, the Contractor shall submit the Post-Award SBE Certification Form to the Regional Supervising Engineer with his application to sublet or prior to purchasing material or leasing equipment. Post Award SBE forms may be obtained from the RE.
- C. To give small business enterprise firms equal consideration with non-small business firms in negotiation for any subcontracts, purchase orders or leases.

XI. CONSENT BY DEPARTMENT TO SUBLETTING

- A. The Department will not approve any subcontracts proposed by the Contractor unless and until said contractor has complied with the terms of this SBE Utilization Attachment.
- B. The Contractor shall provide the RE with a listing of firms, organizations or enterprises to be used as subcontractors on the proposed project. Such listing shall clearly delineate which firms are classified as SBEs.
- C. Notification of a subcontractor's termination shall be sent to the Department by the Contractor through the RE.

XII. CONCILIATION

In cases of alleged discrimination regarding these and all equal employment opportunity provisions and guidelines, investigations and conciliation will be undertaken by the Division of Civil Rights/Affirmative Action, New Jersey Department of Transportation.

XIII. DOCUMENTATION

- A. Records and Reports

The Contractor shall keep such records as are necessary to determine compliance with its Small Business Enterprise Utilization obligations. The records kept by the Contractor will be designed to indicate:

1. The names of the small business enterprise subcontractors, equipment lessors and material suppliers contacted for work on this project.
 2. The type of work to be done, materials to be utilized or services to be performed other than by the prime contractor on the project.
 3. The actual dollar amount of work awarded to SBE's.
 4. The progress and efforts being made in seeking out and utilizing Small Business Enterprise firms. This would include solicitations, quotes and bids regarding project work items, supplies, leases, etc.
 5. Documentation of all correspondence, contacts, telephone calls, etc, to obtain the services of Small Business Enterprise firms on this project.
- B. The contractor shall submit reports, as required by the Department, on those contracts and other business transactions executed with Small Business Enterprise firms in such form and manner as may be prescribed by the Department.
- C. All such records must be maintained for a period of three (3) years following acceptance of final payment and will be available for inspection by the Department.

XIV. PAYMENT TO SUBCONTRACTORS

The Contractor agrees to pay its subcontractors in accordance with the Specifications.

XV. SANCTIONS

Failure of a Contractor to comply with these provisions may result in bid rejection, reduced classification, suspension, debarment, or the institution of other appropriate action by the New Jersey Department of Transportation.