I-81 VIADUCT PROJECT - PHASE 1, CONTRACT 2

PIN 3501.91, Contract D900056

DB CONTRACT DOCUMENTS

REQUEST FOR PROPOSALS

PART 3

PROJECT REQUIREMENTS

Final November 4, 2022

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SECTION 1 GENERAL

1.1 PURPOSE

This Part 3 establishes the basic Requirements of the Project. The Contract Documents, NYSDOT standard drawings, manuals and specifications, and the referenced Design Codes and Manuals shall be followed for the preparation of design and construction documents and the execution of the Work. Any proposed deviation from the Contract requirements or NYSDOT standards shall be submitted to the Department's Design Quality Assurance Engineer for review, and shall require the submission of a Non-conformance Report or Design Exception per Section 5.5, where the Design-Builder is to identify, explain, and justify any deviation from the established criteria to the Department's Design Quality Assurance Engineer.

All designs shall be prepared in U.S. Customary units. The Design-Builder shall be responsible for converting any mapping, plans, etc. into U.S. Customary units as necessary for the completion of the Project.

The design and construction shall be in conformance with the latest edition of the New York State Department of Transportation, Standard Specifications, with addenda, issued by the Office of Engineering, current as of the date of Proposal submission, excluding Section 100, which is superseded by Part 2, Section DB 100 of the Contract Documents, and except as otherwise noted in these Contract Documents.

The Design-Builder shall prepare Project Specifications for the Project, for Work Items not covered by the NYSDOT Standard Specifications or applicable Special Specifications, and shall prepare Design Plans for the Project in accordance with NYSDOT standards for general content and format, and in accordance with the Contract and subject to Department approval.

The Design-Builder shall prepare and submit a Non-conformance Report (in accordance with the provisions of DB §105-11C) for any Work proposed to be or actually performed that does not conform to the Contract requirements and for any deviations from NYSDOT standards.

1.2 SCOPE

The Design-Builder shall be responsible for complying with all terms of the Contract Documents. The Design-Builder shall review and understand all terms and conditions of the Contract Documents prior to the commencement of the Project and shall be responsible for determining the full Scope of the Project by undertaking a thorough examination of the Contract Documents, the Reference Documents and the Project Site.

1.3 SCOPE OF WORK – MAJOR ITEMS

The scope of work for the Project includes but is not limited to the following items:

A) Improvements to the new section of I-81 (former I-481) between I-690 and Kirkville Road (Interchange 5) including)

1. Construction of a third southbound (auxiliary) lane between Kirkville Road (Interchange 5 southbound on-ramp) and I-690 (Interchange 4 southbound off-ramp)
2. Construction of a third northbound (auxiliary) lane between I-690 (Interchange 4 northbound on-ramp) and Kirkville Road (Interchange 5 northbound off-ramp)
3. Mill & pave existing highway section
4. Drainage improvements

B) Bridge No. 14, BIN 1093571 – I-481SB over CSX Rail Yard

1. Widen bridge to accommodate three travel lanes, including extension of abutments, foundations, and superstructure to accommodate needed width
2. Replacement of concrete bridge deck, including jointless details with sleeper slabs at the abutments
3. Minimize number of joints on the bridge
4. Concrete and steel repairs
5. Replacement of concrete bridge barrier
6. Replacement of bearings and pedestals
7. Structural Steel Painting

C) Bridge No. 15, BIN 1093572 – I-481NB over CSX Rail Yard

1. Widen bridge to accommodate three travel lanes, including extension of abutments, foundations, and superstructure to accommodate needed width
2. Replacement of concrete bridge deck, including jointless details with sleeper slabs at the abutments
3. Minimize number of joints on the bridge
4. Concrete and steel repairs
5. Replacement of concrete bridge barrier
6. Replacement of bearings and pedestals
7. Structural Steel Painting

D) Bridge No. 17, BIN 1093562 – I-481NB over Route 290 (Manlius Center Road)

1. Replace superstructure
2. Replace bearings and pedestals

E) Bridge No. 16, BIN 1093561 – I-481SB over Route 290 (Manlius Center Road)

1. Replace superstructure
2. Widen bridge to accommodate three travel lanes, including extension of abutments, foundations, and superstructure to accommodate needed width
3. Replace bearings and pedestals

F) Improvements to the new section of I-8 (former I-481) between Interchange 4 (I-690) and Interchange 3 (Dewitt/Fayetteville)

1. Reconstruct portions of the 4-lane to 3-lane merge between Interchange 4 (I-690 eastbound ramp) along I-81 southbound (former I-481) to Kinne Road bridge
2. Reconstruct and lengthen the auxiliary lane along I-81 northbound (former I-481 northbound) from Interchange 3 (Genesee Street to I-81 northbound on ramp) to Kinne Road bridge
3. Mill and pave existing highway section
4. Drainage improvements

G) Reconstruct portions of Interchange 3 (Dewitt/Fayetteville) 1093562 – I-481NB over Route 290 (Manlius Center Road)

1. Reconstruct and widen I-81 southbound (former I-481) off ramp to East Genesee Street westbound and install a traffic signal at the intersection of the off ramp and East Genesee Street. Reconstructed ramp to include turning lanes to East Genesee Street in both the east and west direction.
2. Remove the off ramp from I-81 southbound (former I-481) to East Genesee Street eastbound

3. Reconstruct a portion of the East Genesee Street westbound to I-81 southbound (former I-481) ramp and merging lane
4. Reconstruct and widen a portion of East Genesee Street eastbound from approximately 250' west of Ambergate Road to the I-81 southbound (former I-481) bridge
5. Mill and pave existing highway section
6. Drainage improvements

H) Improvements to the NYS Route 5/92 intersection (Lyndon Corners)

1. Construct an additional lane on East Genesee Street eastbound and Highbridge Road eastbound, beginning at approximately 600' west of the NYS Route 5/92 intersection continuing approximately 1000' east of the NYS Route 5/92 intersection
2. Mill and pave existing highway section
3. Drainage improvements

I) Reconstruct the existing I-81/I-481 Southern Interchange

1. Demolish the existing ramp that connects northbound I-81 to northbound I-481
2. Demolish the existing ramp that connects southbound I-481 to southbound I-81, includes BIN 1069090
3. Demolish the existing ramp that connects southbound I-481 to northbound I-81
4. Demolish the existing ramp that connects East Brighton Avenue to existing I-81 northbound
5. Reconstruct a portion of East Brighton Ave, includes BIN's 1069110 and 1069120
6. Relocate existing East Glen Avenue to align with new I-81 southbound (former I-481) ramp to East Brighton Avenue and installation of a traffic signal; this work to include four ramps at East Glen Avenue: BL 81 southbound (former I-81) to East Glen Avenue, East Glen Avenue to BL 81 southbound (former I-81), I-81 northbound to East Glen Avenue and East Glen Avenue to BL 81 northbound (former I-81), includes BIN 1031510
7. Construct a new ramp from existing I-81 northbound to new BL 81 northbound (former I-81)
8. Construct a new 2 lane portion of BL 81 southbound (former I-81) to I-81 southbound, includes 1031501
9. Construct a new ramp from BL 81 southbound (former I-81 to new I-81 northbound (former I-481)
10. Construct a new 2 lane mainline roadway from existing I-81 northbound to new I-81 northbound (former I-481)
11. Construct a new 2 lane mainline roadway from new I-81 southbound (former I-481) to I-81 southbound
12. Remove five existing bridges and construct six new bridges
13. One bridge replacement (BIN 1031501)

J) Bridge No. 2, BIN 1031510 – East Glen over existing I-81

1. To be removed

K) Bridge No. 3, BIN 1069090 – Existing I-481 SB to I-81 SB bridge over Existing I-81 SB

1. To be removed

L) Bridge No. 4, BIN 1069100 – Existing I-81 SB ramp bridge to I-481 NB over I-81 NB

1. To be Removed

M) Bridge No. 5, BIN 1069110 – Brighton Ave bridge over Existing I-481 ramps from existing I-81 SB and existing I-81 NB
1. To be removed

N) Bridge No. 6, BIN 1069120 – Brighton Ave over existing ramps to I-81 NB and I-81 SB
1. To be removed

O) Bridge No. 1, BIN 1031501 – I-81 SB over East Seneca Turnpike
1. Bridge to be replaced, construct both a new superstructure and substructure

P) Bridge No. 7 – East Brighton Ave over New I-81
1. Construct new superstructure and substructure

Q) Bridge No. 8 – BL 81 SB to I-81 NB ramp bridge over BL 81
1. Construct new superstructure and substructure

R) Bridge No. 9 – New I-81 NB bridge over BL 81 NB
1. Construct new superstructure and substructure

S) Bridge No. 10 – New I-81 NB bridge over BL 81 NB and BL 81 SB to I-81 NB ramp
1. Construct new superstructure and substructure

T) Bridge No. 11 – New I-81 SB bridge over BL 81 NB and BL 81 SB to I-81 NB ramp
1. Construct new superstructure and substructure

U) Bridge No. 12 – New I-81 NB over East Seneca Turnpike
1. Construct new superstructure and substructure

V) Bridge No. 13 – Relocated East Glen Ave over BL 81
1. Construct new superstructure and substructure

W) Installation of noise walls along I-81 (former I-481) between Rock Cut Road and I-81/I-690 interchange

X) Installation of an aesthetic visual barrier wall along BL-81 (former I-81)

1.4 COORDINATION WITH OTHER PROJECTS

The Design-Builder shall coordinate the work so as not to conflict with other projects occurring within or abutting the Contract limits. It is expected that the following projects will be under construction during construction of this Contract:

PIN/Description:	3501.87 - I-81 over Colvin Street, deck replacement
WZTC:	On-site detour utilizing Cross overs/lane shifts, lane closure
Current schedule:	LET Spring 2023
Contractor:	TBD

Contact Information:	Michael Washburn
Brief Project Description:	Bridge Preservation, Deck replacement project, BIN 103549

PIN/Description:	3756.80 – 3R Highway Project, East Brighton Avenue and East Seneca Turnpike
WZTC:	Lane/shoulder closures
Current schedule:	LET December 2023
Contractor:	TBD
Contact Information:	City of Syracuse
Brief Project Description:	3R Highway Project on E. Brighton Ave and E. Seneca Turnpike from Thurber Street to Syracuse City line, City of Syracuse

PIN/Description:	3501.90/D900054 I81 Viaduct, Contract 1
WZTC:	Lane/shoulder Closures
Current schedule:	NTP Winter 2022
Contractor:	TBD
Contact Information:	TBD
Brief Project Description:	Contract 1 includes work on I481, north of Kirkville Road interchange through the northern interchange of I81/I481

PIN/Description:	3501.94 - I81 Viaduct, Contract 5.
WZTC:	Lane/shoulder Closures
Current schedule:	LET Sep 2023
Contractor:	TBD
Contact Information:	Elizabeth Parmley, Project Director, NYSDOT
Brief Project Description:	Contract 5 includes work on BL81, E. Brighton Ave to Burt St, City of Syracuse

PIN/Description:	3807.17 – I-481 Ground Mounted Sign Replacement project
WZTC:	Shoulder Closures
Current schedule:	LET Nov 2023
Contractor:	TBD
Contact Information:	TBD
Brief Project Description:	Ground mounted sign replacement project on I-481 between I-81 and I-690, City of Syracuse, Towns of Onondaga, and DeWitt.

PIN/Description:	3807.50 / D264632 – Bridge JOC.
WZTC:	Lane/shoulder Closures
Current schedule:	Construction Completion Jun 2023
Contractor:	Crane-Hogan Structural Systems
Contact Information:	Dan Heffernan, NYSDOT Region 3 Construction
Brief Project Description:	Bridge Joint and Deck Repairs, Onondaga County

1.5 THIRD PARTY AGREEMENTS (NON-UTILITY)

Agreements are in process with CSX.

For information regarding Preliminary DB Utility Work Agreements, refer to Section 12 of this Part 3.

1.6 DESIGN CODES AND MANUALS

In addition to this Part 3, Project Requirements, the Design-Builder must comply with all applicable engineering codes and standards, including those of the various Federal, State, and local jurisdictions.

If codes, standards and/or manuals are specified herein for the design of an element of the Project, then the edition(s) in effect on the Proposal due date, as adopted by the Department, shall be applicable to the Project. Responsibility for design remains with the Design-Builder in accordance with the terms and conditions of the Contract. If a code, manual or standard is subsequently modified by the issuer, the Design-Builder shall notify the Department of such modification(s) and request the Department's decision regarding application of the modification(s).

All Work shall conform to the following documents. In the event of a conflict between the codes and the referenced documents listed below, the more stringent requirements, as determined by

the Department, shall apply.

For Work not specifically covered by the individual sections of the *Project Requirements*, the Design-Builder shall, at a minimum, apply the Standards normally applied by NYSDOT for such Work, to the extent they do not conflict with express requirements in the Contract Documents. The Design-Builder shall be solely responsible for ensuring that it identifies and applies all correct Standards.

AASHTO:

- A Guide for Accommodating Utilities within Highway Right-of-Way
- A Policy on Design Standards - Interstate System
- A Policy on Geometric Design of Highways and Streets
- Construction Handbook for Bridge Temporary Works
- Guide Design Specifications for Bridge Temporary Works
- Guide for the Design of Pavement Structures (with Supplement)
- Guide Specification for Bridge Railings (1989)
- Guide Specifications for LRFD Seismic Bridge Design
- LRFD Bridge Construction Specifications
- Manual for Assessing Safety Hardware (MASH)
- Manual for Bridge Evaluation
- Manual on Subsurface Investigations
- Mechanistic-Empirical Pavement Design Guide (MEPDG),
- Roadside Design Guide
- Roadway Lighting Design Guide
- Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

AISC:

- Steel Construction Manual

AREMA:

- AREMA Manual for Railway Engineering

ANSI:

- ANSI/AASHTO/AWS D1.5 Bridge Welding Code
- ANSI/IES Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, RP-8-18

Asphalt Institute:

- Drainage of Asphalt Pavement Structures

ASTM:

- E2213-03 Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems
- E2259-03 Standard Guide for Archiving and Retrieving ITS-Generated Data
- E2468-05 Standard Practice for Metadata to Support Archived Data Management Systems
- E2655-08 Standard Guide for Reporting Uncertainty of Test Results and Use of the Term Measurement Uncertainty in ASTM Test Methods

CSX:

- Public Project Information for Construction and Improvement Projects That May Involve the Railroad
- Standard Specifications for the Design and Construction of Private Sidetracks
- Minimum Safety Requirements for Contractors Working on CSX Property
- CSXT Design and Construction Standard Specifications for Pipeline Occupancies
- CSXT Standard Clearance Matrix and CSXT Clearance Diagram
- Specification Section 34 11 26.13 – Ballast

Federal Geographic Data Committee:

- GIS Standards

FHWA:

- FHWA NHI-10-024 Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes
- FHWA NHI-01-004 River Engineering for Highway Encroachments
- FHWA NHI-05-123 Soil Slope and Embankment Designs
- FHWA NHI-11-032 GEC No. 3 LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations
- FHWA HI-99-007 Rock Slopes Reference Manual
- HEC 18 Evaluating Scour at Bridges
- HEC 23 Bridge Scour and Stream Instability Countermeasures
- Manual of Uniform Traffic Control Devices (MUTCD)
- Pavement Publications

- Standard Highway Signs and Markings (SHSM) Book
- Steel Bridge Design Handbook
- Technical Advisory T6640.8A, 10/30/87 (environmental analyses)
- Traffic Monitoring Guide

NFPA:

- NFPA 70 – National Electrical Code (NEC)
- 502: Standard for Road Tunnels, Bridges, and Other Limited Access Highways

NYSDEC:

- Standards and Specifications for Erosion and Sediment Control (SESC)
- Stormwater Management Design Manual (SMDM)

NYSDOT:

- Annual Report titled "Axle Factor Update"
- Approved Materials List
- Bridge Detail (BD) Sheets US Customary (NYSDOT BD Sheets)
- Bridge Inspection Manual
- Bridge Inventory Manual
- Bridge Manual
- Bridge Safety Assurance Seismic Vulnerability Manual
- Comprehensive Pavement Design Manual
- Consultant Instructions (CIs)
- Design Consultant Manual
- Engineering Bulletins (EBs)
- Engineering Instructions and Directives (EIs and EDs)
- Environmental Procedures Manual (EPM) / The Environmental Manual (TEM)
- GCP-17, Procedure for the Control of Granular Materials
- Geotechnical Design Manual, including all appendices
- Highway Design Manual (HDM)
- Land Surveying Standards and Procedures Manual
- NYSDOT LRFD Bridge Design Specifications
- Manual for Uniform Record Keeping

- Materials Bureau - Applicable Sampling and Testing Manuals, Inspection Manuals, and Materials Methods.
- New York State Supplement to the Manual on Uniform Traffic Control Devices
- Overhead Sign Structure Design Manual
- Policy and Standards for the Design of Entrances to State Highways
- Policy on Highway Lighting
- Prestressed Concrete Construction Manual (PCCM)
- Project Development Manual
- Reference Marker Manual
- Rules and Regulations Governing the Accommodation of Utilities within the State Highway Right of Way
- Special Specifications as indicated in the Contract Documents
- Standard Specifications for Construction and Materials
- Steel Construction Manual (SCM)
- Structures Design Advisories
- Structures Technical Advisories
- U.S. Customary Standard Sheets
- Work Zone Traffic Control Manual
- ROW Mapping Procedure Manual

The above is a partial listing of applicable NYSDOT Engineering Manuals and Guidelines. The Design-Builder shall perform the Work in conformance with all NYSDOT Engineering Manuals and Guidelines in effect on the Proposal due date.

OSHA:

- PART 1926 - Safety And Health Regulations For Construction

SPC:

- Society of Protective Coatings Standards

USACOE:

- Manual No. 1110-2-3506, Grouting Technology

USDOJ:

- ADA Accessibility Guidelines for Buildings and Facilities

USDOT:

- ADA Standards for Transportation Facilities

1.7 REQUIREMENTS

The "Requirements" subsection of the individual sections of *Part 3 – Project Requirements* establishes the Department's expectations with respect to specific Project elements. These include administrative, managerial and technical considerations as deemed appropriate to the subject, and encompass performance specifications, design criteria, and directive instructions as the Department deems best suited to the subject. The Design-Builder shall develop its Definitive Design, Design Plans and Project Specifications in conformance with this *Part 3 – Project Requirements*.

The Design-Builder shall be responsible for meeting all requirements and terms contained in this *Part 3 – Project Requirements* unless explicitly stated otherwise.

The specific requirements in this *Part 3 – Project Requirements* may be more stringent and shall govern over the criteria given in the Standards. Where a specific requirement in this *Part 3 – Project Requirements* is more stringent than the criteria specified in a Standard, said specific requirement shall become the basis for determining compliance. Non-standard features needing justification and FHWA and/or NYSDOT approval are defined as those not meeting the criteria cited in the Standards listed in this *Part 3 – Project Requirements*.

1.8 DELIVERABLES

Deliverables to be submitted by the Design-Builder throughout the design and construction of this Project, and upon completion of the Project, are specified in the NYSDOT manuals listed in Section 1.6 of this Part 3 – Project Requirements. The Design-Builder may submit deliverables for the Department's consideration or consultation and written comment in addition to those cited in the NYSDOT manuals. The Design-Builder shall include such additional submittals in its review plan and revise the review plan as necessary to incorporate sufficient advance notice to the Department. Unless otherwise indicated, t is the goal of the Department that all review and comments be completed within 10 business days.

Unless otherwise indicated elsewhere in the Contract Documents, or directed by the Department's Project Manager, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Bentley Microstation.dgn format and Bentley InRoads.alg and dtm format, Microsoft Word®, Microsoft Excel®, ArcMAP, or searchable portable document format (PDF) files, with no copy or password protection on the file content, unless otherwise indicated in a specific section of this Part 3 - Project Requirements or a Standard cited in a specific section of this Part 3 - Project Requirements.

1.9 INDICATIVE PLANS

The Indicative Plans, <u>if provided to the Design-Builder in Part 6 – RFP Plans</u>, convey an overall potential solution to the Project's needs that the Design-Builder may choose to consider in developing its design. The designs presented herein have been developed to a point sufficient to present the general concepts of the Project and specifically to show the current highway boundaries and the extent of property acquisitions provided by the Department. The Indicative Plans are not mandatory, with the exception of elements specifically mentioned elsewhere in this Part 3.

1.10 DIRECTIVE PLANS

The Directive Plans, if provided to the Design-Builder in Part 6 – RFP Plans, depict required elements and components of the Project within specifically defined parameters. The Design-Builder has no latitude to adjust components or details shown on Directive Plans, unless specifically noted or through an approved Alternative Technical Concept (ATC).

1.11 CADD

CADD formatting for Design and As-Built Plans shall conform to the Department's CADD Drafting Standards and CADD Design Standards in effect on the Proposal due date.

1.12 SCHEDULE OF PROJECT COMPLETION

All work on the design, and on the construction, shall be completed in accordance with Part 2, DB Section 100, 103-06, Article 4, but in no case shall the Project Completion Date be later than December, 2025.

1.13 WORK PAYMENT SCHEDULE

Progress Payments will be made as each Work Item is completed to the satisfaction of the Department's Construction Quality Assurance Engineer. Progress payments shall be subject to the requirements of DB §109-01. Payments for Design, Construction Inspection and Laboratory activities will be made in conformance with DB § 109-01 (B).

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 1 – ITEM 800.06000115 BIN 1093571 – BRIDGE NO. 14 – I-81 SB OVER CSX RAILYARD – REHABILITATION & WIDENING	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Demolition and Removal of Existing Bridge Elements	15%	
Demolition and Removal of Existing Approach Slabs	4%	
Construct Foundations Related to Bridge Widening	10%	
Construct Substructures Related to Bridge Widening	10%	
Construct Abutments and Wingwalls Related to Bridge Widenings	14%	
Reconstruct Piers 1 - 5	10%	
Fabricate and Install Bearings and Superstructure	14%	
Construct Reinforced Concrete Bridge Deck	14%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	3%	
Clean and Paint Structural Steel	5%	

Fabricate and Install Approach Guide Railing and Fencing	3%	
Construct Concrete Barriers	5%	
ITS, Lighting, Signage, and Striping	5%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 2 – ITEM 800.06000215 **BIN 1093572 – BRIDGE NO. 15 – I-81 NB OVER CSX RAILYARD – REHABILITATION & WIDENING**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Demolition and Removal of Existing Bridge Elements	15%	
Demolition and Removal of Existing Approach Slabs	4%	
Construct Foundations Related to Bridge Widening	10%	
Construct Substructures Related to Bridge Widening	10%	
Construct Abutments and Wingwalls Related to Bridge Widenings	14%	
Reconstruct Piers 1 - 5	10%	
Fabricate and Install Bearings and Superstructure	14%	
Construct Reinforced Concrete Bridge Deck	14%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	3%	
Clean and Paint Structural Steel	5%	
Fabricate and Install Approach Guide Railing and Fencing	3%	
Construct Concrete Barriers	5%	
ITS, Lighting, Signage, and Striping	5%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 3 – ITEM 800.06000315 **BIN 1093561 – BRIDGE NO. 16 – I-81 SB OVER RT 290–REHABILITATION & WIDENING** **BIN 1093562 – BRIDGE NO. 17 – I-81 NB OVER RT 290 – REHABILITATION**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Demolition and Removal of Existing Bridge Elements	15%	
Demolition and Removal of Existing Approach Slabs	5%	
Construct Foundations Related to Bridge Widening	10%	
Construct Abutments and Wing Walls Related to Bridge Widening	10%	
Fabricate and Install Bearings and Superstructure	24%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	10%	
Construct Drainage System	4%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	8%	
Signage and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 4 – ITEM 800.06000415 **BIN 1031501 – BRIDGE NO. 1 – 1-81 SB OVER EAST SENECA TURNPIKE – REPLACEMENT**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Demolition and Removal of Existing Bridge Elements	15%	
Demolition and Removal of Existing Approach Slabs	5%	
Construct Foundations	16%	
Construct Substructures and Wingwalls	18%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	20%	
Construct Reinforced Concrete Bridge Deck	18%	

Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
Signage and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 5 – ITEM 800.06000515 **BRIDGE NO. 7 – EAST BRIGHTON AVE. OVER NEW I-81 – NEW STRUCTURE**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Demolition and Removal of BIN 1069110 – Bridge No. 5 – Existing East Brighton Ave. over I-481 Ramp from I-81 SB and I-81 NB (Bridge Elements and Approach Slabs)	10%	
Demolition and Removal of BIN 1069120 – Bridge No. 6 – Existing East Brighton Ave. over Ramp to I-81 NB and I-81 SB (Bridge Elements and Approach Slabs)	10%	
Construct Foundations	15%	
Construct Substructures and Wingwalls	15%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	20%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
ITS, Signage, Lighting, and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 6 – ITEM 800.06000615 **BRIDGE NO. 8 – BL 81 SB TO I-81 NB RAMP BRIDGE OVER BL 81 – NEW STRUCTURE**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Construct Foundations	20%	
Construct Substructures and Wingwalls	20%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	20%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
ITS, Signage, Lighting, and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 7 – ITEM 800.06000715 **BRIDGE NO. 9 – NEW I-81 NB BRIDGE OVER BL 81 NB –** **NEW STRUCTURE**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Construct Foundations	20%	
Construct Substructures and Wingwalls	20%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	20%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	

Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
ITS, Signage, Lighting, and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 8 – ITEM 800.06000815 **BRIDGE NO. 10 – NEW I-81 NB BRIDGE OVER BL 81 SB TO I-81 NB RAMP – NEW STRUCTURE**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Construct Foundations	20%	
Construct Substructures and Wingwalls	20%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	20%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
ITS, Signage, Lighting, and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 9 – ITEM 800.06000915 **BRIDGE NO. 11 – NEW 1-81 SB BRIDGE OVER BL 81 NB AND BL 81 SB TO I-81 NB RAMP – NEW STRUCTURE**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Construct Foundations	20%	

Construct Substructures and Wingwalls	20%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	20%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
ITS, Signage, Lighting, and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 10 – ITEM 800.06001015 **BRIDGE NO. 12 – 1-81 NB BRIDGE OVER EAST SENECA TURNPIKE – NEW STRUCTURE**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Construct Foundations	20%	
Construct Substructures and Wingwalls	20%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	20%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
ITS, Signage, Lighting, and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 11 – ITEM 800.06001115 **BRIDGE NO. 13 – RELOCATED EAST GLEN AVENUE OVER BL 81 NB AND BL 81 SB – NEW STRUCTURE**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[1]**
Work Zone Traffic Control	10%	
Construct Foundations	18%	
Construct Substructures and Wingwalls	20%	
Construct Pedestals and Bearings	10%	
Construct Superstructure	22%	
Construct Reinforced Concrete Bridge Deck	20%	
Construct Reinforced Concrete Approach Slabs	5%	
Construct Drainage System	5%	
Fabricate and Install Approach Guide Railing and Fencing	5%	
Construct Concrete Barriers	6%	
ITS, Signage, Lighting, and Striping	3%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 12 – ITEM 800.06001215 **EXIT 3 TO THE NORTHERN PROJECT LIMIT (not including Bridge Work), INCLUDING ROUTE 5 AND ROUTE 5/92 INTERSECTION**	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)[(1)]**
Work Zone Traffic Control	10%	
At-Grade Work including Clearing & Grubbing, and Permanent Ramp/Roadway Removal	15%	
Ground Improvement	10%	
Embankment Construction	15%	
Paving Work, including New Construction/Full Depth Reconstruction and Milling/Resurfacing	26%	
Construct New and Maintain Existing Drainage	15%	
Landscaping and Site Restoration	5%	
Removal and Replacement of Guiderail	10%	
ITS, Signage, Lighting, Striping, and Traffic Signals	15%	

Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 13 – ITEM 800.06001315 SOUTHERN INTERCHANGE, INCLUDING ADJACENT WORK TO AND FROM THE SOUTHERN INTERCHANGE (not including Bridge Work)	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)(1)**
Work Zone Traffic Control	10%	
At-Grade Work including Clearing & Grubbing, and Roadway Removal	10%	
Ground Improvement	5%	
Embankment Construction	25%	
Paving Work, including New Construction/Full Depth Reconstruction and Milling/Resurfacing	26%	
Construct New and Maintain Existing Drainage	15%	
Landscaping and Site Restoration	5%	
Removal and Replacement of Guiderail and Barrier	10%	
ITS, Signage, Lighting, Striping, and Traffic Signals	15%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 14 – ITEM 800.06001415 NOISE BARRIERS & VISUAL BARRIER	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)(1)**
Work Zone Traffic Control	5%	
Perform Site Preparation, including Clearing and Grubbing	6%	
Fabricate Noise Barriers, including Aesthetic Treatments	30%	
Fabricate Visual Barrier, including Aesthetic Treatments	15%	
Demolish existing Noise Barriers	10%	

Construct Noise Barrier Foundations	15%	
Construct Visual Barrier Foundation	5%	
Install Noise Barrier Panels	20%	
Install Visual Barrier Panels	10%	
Provide Survey and GIS Data	5%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

WORK PAYMENT SCHEDULE		
WORK PAYMENT SCHEDULE NO. 15 – ITEM 800.06001515 BRIDGE DEMOLITION AND REMOVAL	**MAXIMUM PERCENT OF LUMP SUM PRICE**	**PERCENT OF LUMP SUM PRICE (To be completed by D-B)(1)**
Work Zone Traffic Control	10%	
Demolition and Removal of Existing Bridge Elements for BIN 1031510 – Bridge No. 2 – Existing East Glen Avenue over I-81	25%	
Demolition and Removal of Existing Bridge Elements for BIN 1069090 – Bridge No. 3 – Existing I-481 SB to I-81 SB over I-81 SB	40%	
Demolition and Removal of Existing Bridge Elements for BIN 1069100 – Bridge No. 4 – Existing I-81 SB Ramp to I-481 over I-81 NB	25%	
Demolition and Removal of Existing Approach Slabs for BIN 1031510 – Bridge No. 2 – Existing East Glen Avenue over I-81	5%	
Demolition and Removal of Existing Approach Slabs for BIN 1069090 – Bridge No. 3 – Existing I-481 SB to I-81 SB over I-81 SB	5%	
Demolition and Removal of Existing Approach Slabs for BIN 1069100 – Bridge No. 4 – Existing I-81 SB Ramp to I-481 over I-81 NB	5%	
Landscaping and Site Restoration	10%	
Punch list work, Site Cleanup and Restoration	2% (fixed)	2% (fixed)
Final Acceptance (Per DB §109-09B)	1% (fixed)	1% (fixed)
Final Agreement (Per DB §109-09D)	1% (fixed)	1% (fixed)

Notes: (1) See Work Payment Schedule included in ITP, Appendix E. Percent of Lump Sum Price to be completed by the Proposer. Total percentage for all work items shall equal 100%.

(2) Subsequent to Selection of Best Value, the Design-Builder may submit to the Department a more detailed Work Payment Schedule which breaks individual work items into multiple stages, for the Department's review and acceptance. However, the sum of the percentages proposed for each stage shall equal the percentage for that work item submitted by the Design-Builder included on Form WPS, and in no case shall the payment for any individual stage be more than 50% nor less than 10% of the total percentage bid for that work item.

(3) Payment will be verified through the CPM Cost Loaded schedule per SP-8 and SP- 3.

1.14 INTERIM COMPLETION MILESTONE

This Project's Interim Completion Milestones, if applicable, are defined as shown in Form SCD.

The Interim Completion Milestone Dates may not be changed without written approval by the Department's Project Manager.

SECTION 2 PROJECT MANAGEMENT

2.1 DESIGN-BUILDER'S ROLE

The Design-Builder shall have responsibility for controlling and managing the Work, including the responsibility for quality management as defined in the Contract Documents, Part 3, Section 4,5 and 6. This section summarizes the Management Plans to be produced by the Design-Builder in accordance with the Contract Documents.

2.2 MANAGEMENT PLANS AND SCHEDULES

2.2.1 Management Plans and Schedule Requirements

The Design-Builder shall submit to the Department's Project Manager, for review and comment or approval (as applicable), all the Management Plans listed in Table 2-1. Unless otherwise specified in the Contract Documents, if the Department provides comments on a Management Plan, the Management Plan shall be revised and resubmitted to the Department's Project Manager within 30 calendar days of receipt of the Department's written comments and resubmitted as required until accepted or approved. Following receipt of the Department's acceptance or approval of the individual Management Plans, as described in the Contract Documents, the Management Plans shall be resubmitted to the Department's Project Manager as the Design-Builder's consolidated Project Management Plan for the Project.

Table 2-1 – Project Management Plans

Plan Title	Contract Document Reference	Initial Plan Submitted with the Proposal?	Submittal Deadline
Workforce Participation Plan	DB 105-21	No	60 Days after NTP
Safety Plan	Part 3, Section 2.2.3	No	30 Days after NTP or 30 days prior to beginning any construction Work
Quality Control Plan*	Part 3, Section 4.2.3	Yes	30 Days after NTP
Overall Design-Build Team Organization Plan	Part 3, Section 2.2.5	Yes	25 Days after NTP
Design Management Plan	Part 3, Section 2.2.6	No	30 Days after NTP
Construction Management Plan	Part 3, Section 2.2.7	No	45 Days after NTP
Design Review Plan	Part 3, Section 2.2.8	No	10 Days after NTP
Transportation Management Plan/Emergency Response Plan	Part 3, Section 19.3.10	No	30 Days after NTP
Initial Baseline Progress Schedule	Part 3, Section 2.3	Yes	15 Days after NTP

Risk Management Plan	Part 3, Section 2.2.10	Forms R1 and R2 are submitted with the Technical Proposal	75 Days after NTP
Railroad Management Plan	Part 3, Section 2.2.11	Yes	45 Days after NTP

* Requires Department approval

2.2.2 Workforce Participation Plan

The Design-Builder shall develop a Workforce Participation Plan to meet the requirements of DB §105-21 and submit it to the Department's Project Manager for review and comment.

2.2.3 Safety Plan

The Design-Builder shall submit a written Project-specific Safety Plan which documents the Design-Builder's safety policy and which identifies and addresses specific health and safety concerns to be encountered on the Project to the Department for review and acceptance. Before the Work begins, and periodically throughout the Project, the Design-Builder's Project supervision staff shall meet with the Department's Project Manager to review and discuss the status of safety issues on the Project. An appropriate notice shall be posted at the job Site that the Project's Safety Plan is available for examination by any worker employed on the Project.

The Design-Builder shall implement, review, and update the Safety Plan and introduce a program for assuring that the Safety Plan is followed at all times. The Design-Builder shall coordinate with all authorities and relevant entities as necessary to ensure compliance with the Safety Plan.

The Design-Builder's Safety Plan shall provide for the following:

A) Planning, management, and design to avoid hazards;

B) Detection of potential hazards;

C) Timely correction of hazards;

D) Dedication to the protection of the public and the workers;

E) Active participation of all persons involved with the Contract;

F) Dedicated safety staff;

G) Liaison with the Department's safety monitoring staff; and

H) Safety training and safety meetings.

I) The Department will monitor and audit the Design-Builder's safety performance.

The Design-Builder shall ensure that all its employees and those of the Subcontractors of any tier (including labor-only) are under an obligation at all times to fully conform to the provisions of the Safety Plan. In the event that the Design-Builder's employees or its Subcontractors fail to conform

to the provisions of the Safety Plan, the Design-Builder shall take appropriate disciplinary measures. Such measures shall include suspension, removal of offending employees from the Site, and dismissal. The obligations and requirements of this Section shall be included in the terms and conditions of employment of all employees of the Design-Builder and all Subcontractors of any tier, including labor-only Subcontractors.

No construction Work shall progress and no payment shall be made to the Design-Builder until the Safety Plan is accepted by the Department.

2.2.3.1 Content of the Safety Plan

The Safety Plan shall be comprehensive and include all required actions, activities, rules, and mitigation relative to the safety of the Work. An appropriate notice shall be posted on the Project Site that the Project Safety and Health Plan is available for examination by any worker employed on the Project. The Safety Plan shall include the following items:

A) Policy statement indicating the Design-Builder's commitment to safety, stating goals for OSHA recordable and lost-time incidence rates;

B) Identification of Department and Design-Builder safety officers, including responsibility definitions, an organization chart, reporting procedures, safety inspection procedures, and audit programs;

C) References to all applicable Governmental Rules;

D) An employee safety education and training plan for required training for all workers, including a separate program and Hazardous Materials Communications Plan for workers involved with Hazardous Materials remediation, required toolbox meetings, and required posting of information, Hazard Communication Training (29 CFR Section 1926.59), Safety Training and Education (29 CFR Section 1926.21), and other training required by 29 CFR Section 1926;

E) Procedures to address Project health and safety concerns, including housekeeping, material handling and storage, personal protective equipment, wall and floor openings, scaffolds, ladders, welding, flame cutting, electrical equipment, lock-out or tag-out, motor vehicles, heavy equipment, small tools, concrete forms, steel erection, cranes and hoisting, work platforms, fire prevention and protection, sanitation, confined space entry, blasting and explosives, identification of restricted areas and measures to barricade, fence, cover and otherwise prevent access to such areas, fall protection, working over water, electrical safety, drilling, lifting, work zone safety, night time safety, excavation and trench, silica, lead safety, asbestos, backing policy, overhead and underground utilities, pavement striping, radiation safety, power tools, lifting, histoplasmosis, and other items;

F) Industrial hygiene, including respiratory protection, noise, Hazardous Materials, MSDS, and lists of hazardous chemicals present;

G) Fire protection and prevention (including provisions prohibiting the storage of any flammable materials beneath, or within the proximity of any structure, at any time);

H) Emergency and rescue procedures, including detailed procedures for all types of emergencies, such as medical, fire, chemical spill, property damage, bomb threat, severe weather, flooding, explosion, and earthquakes;

I) Incident investigation, reporting, and record keeping;

J) Policy for substance abuse;

K) Security provisions;

L) Safety requirements and procedures for surveyors and engineering personnel conducting Site investigations and Verification Sampling and Testing;

M) Procedures for compelling worker compliance with health and safety requirements; and

N) Procedures to address distraught, emotionally disturbed persons and/or homeless persons.

The Safety Plan shall contain a list of the detailed safety procedures to be followed. Safety procedures shall be prepared separately for individual activities and these detailed procedures shall be appendices to the Safety Plan.

Certain of these items may be submitted in the format of the Design-Builder's health and safety program, with the Project's Safety Plan limited to Project-specific issues.

The Design-Builder shall be responsible for ensuring that each Subcontractor employed on the Project complies with the requirements of this Section. The Design-Builder shall provide to the Department a Safety Plan covering all Work to be done by a specific Subcontractor prior to that Subcontractor starting Work. As an alternative, the Design-Builder may provide a certification that all activities performed by, and workers employed by, Subcontractors will be subject to the Design-Builder's Safety Plan. Submission of the required Safety Plan by the Design-Builder and its acceptance by the Department shall not be construed to imply approval of any particular method or sequence for addressing health and safety concerns or to relieve the Design-Builder from the responsibility to adequately protect the health and safety of all workers involved in the Project as well as any members of the public who are affected by the Project.

In accordance with the New York State Labor Law §220-h, all laborers, workers, and mechanics shall be certified prior to performing any work on the Contract as having successfully completed a course in construction safety and health approved by the US Department of Labor's Occupational Safety and Health Administration (OSHA) that is at least 10 hours in duration. The Design-Builder shall attach proof of completion to first certified payroll for initial workers, and to subsequent payrolls for new or additional workers. The Design-Builder shall clearly indicate on subsequent payrolls any workers not previously employed on that Contract. If no proof of completion has been submitted for a worker listed on a certified payroll, the Department's Project Manager will alert the Design-Builder to this fact. If the Design-Builder cannot provide proof of completion and the worker continues to work, the Department will notify the Design-Builder in writing with a copy to the NYSDOL by e-mail at PWAsk@labor.state.ny.us.

2.2.3.2 Submittal of the Safety Plan

Prior to the start of any field Work or construction, the Design-Builder shall submit its Safety Plan to the Department's Project Manager and the Department's Safety Construction Coordinator for written acceptance, based on the Design-Builder's Safety Plan information contained in its Proposal along with the incorporated comments of the Department's Project Manager and any other required updating. The Safety Plan shall be a controlled document to be issued by the Design-Builder to, at least, the following persons:

A) The Department's Project Manager;

B) The CQAE;

C) The Department's safety monitoring coordinator;

D) The Design-Builder's Project Manager;

E) The Design-Builder's Safety Manager;

F) Subcontractors of any tier, including labor-only Subcontractors; and

G) The Design-Builder's Quality Manager.

Other controlled copies shall be distributed as determined by the Design-Builder and the Department's Project Manager. Uncontrolled copies shall be issued as considered necessary by the Design-Builder.

The Design-Builder shall maintain a traceable record of the issuance of the controlled copies including numbering and acknowledgement of receipt. Revisions of the Safety Plan shall be issued to all recipients of the controlled copies and managed in the same way as the controlled copies.

2.2.3.3 Revisions to the Safety Plan and Procedures

The Department's Project Manager may require a revision to the Safety Plan or any safety procedure in order to ensure compliance with the Contract. The Design-Builder shall, following discussion with the Department's Project Manager, issue such revision within 30 days of receipt of the instruction. A revision shall include an addition, omission, or revision, as applicable.

The Design-Builder shall review the Safety Plan and any safety procedure in order to revise it in accordance with activities and experiences on the Site. Such revision, from time to time, shall enhance the standards of safety being implemented on the Site. At the very least, procedures shall be reviewed and new procedures issued whenever the character or extent of any activity is changed or a new activity of a different nature is introduced which necessitates such revision.

In addition to such revision, the Design-Builder shall make a formal review of the Safety Plan once every 12 months on or near the anniversary of NTP. Such formal review shall consider all matters pertaining to safety planning and implementation, including accident reports, inspections, audits, suggestions from meetings, and other sources, such as, the Department's Project Manager and hazard analysis reviews. Within seven days of finishing this review, the Design-Builder shall issue

a review report to the Department's Project Manager, giving the conclusions of the review and identifying the revisions to be made to the Safety Plan.

Within 30 days of the issue of the review report, the Design-Builder shall issue a revised Safety Plan for review and written acceptance by the Department's Project Manager.

2.2.3.4 The Design-Builder's Safety Organization

The Design-Builder shall designate a member of its board of directors, if it is a corporation or a joint venture, or a principal of its organization who shall be responsible and directly accountable to the Department in all matters concerning safety. The Design-Builder shall also require the Design-Builder's Project Manager to be responsible and directly accountable to this designated safety board member or principal in all matters concerning construction safety.

The Design-Builder shall appoint, within 30 days of NTP, a Safety Manager whose Project duties shall be solely connected with the safety aspects of the Project and who shall report directly to the designated safety board member or principal. Such an appointment shall be subject to written acceptance by the Department's Project Manager. The Safety Manager shall implement, maintain, and monitor compliance with the Safety Plan and all safety procedures, and be based full-time at the Site.

The Safety Manager is responsible for adopting and implementing the company's health and safety program and ensuring that the program complies with Occupational Safety and Health Administration (OSHA) and NYSDOT Standard Specifications. The Safety Manager must also identify health and safety concerns that apply to each construction site, investigate any safety concerns brought to their attention and administer the proper procedure to correct the concern. The Safety Manager shall train new construction workers and current employees the proper safety and health procedures to be in compliance with OSHA and NYSDOT Standard Specifications, conduct annual employee training sessions to update workers on safety procedures and responsibilities and ensure that all employees have the required Proper Protective Equipment and that it is utilized during the construction operation being performed.

The Design-Builder shall provide and maintain an organizational structure that shall ensure the effective control of the Project's safety assurance tasks by the Design-Builder's safety staff. Such staff shall be engaged solely in safety assurance. Responsibilities and task subdivision shall be clearly identified in the Safety Plan, and shall show direct lines of communication and reporting between the Design-Builder's Safety Manager and the designated safety board member or principal and between the Design-Builder's Safety Manager and the Design-Builder's Project Manager.

The Design-Builder shall not remove the appointed Safety Manager without the prior written consent of the Department's Project Manager. The Design-Builder shall nominate a replacement at the same time consent is sought.

If the Safety Manager is removed from the Project, a suitably qualified and immediately available replacement shall be proposed to the Department's Project Manager within 14 days of receipt of the notice requiring the removal.

The Design-Builder shall provide adequate numbers of supporting staff for the Safety Manager, including a deputy to act in his/her absence.

The Design-Builder shall not commence any Work on the Site until the Safety Manager has been appointed and accepted by the Department's Project Manager, and has commenced duties on the Site.

The Design-Builder shall ensure that all Subcontractors of any tier whatsoever, including labor-only Subcontractors, shall provide adequate safety staff.

Each Subcontractor of every tier, including labor-only Subcontractors, shall have a safety supervisor who shall have appropriate experience and training. Each Subcontractor safety supervisor shall be responsible for implementing and maintaining its respective safety plan. Subcontractor safety supervisors shall devote a substantial amount of their time to such duties. All Subcontractor safety plans shall at all times conform to the Design-Builder's Safety Plan.

Breaches of the Design-Builder's Safety Plan or other conduct prejudicial to safety may be cause for the Department's Project Manager to require the removal of any employee, including the Design-Builder's Project Manager or Safety Manager, from the Site.

The Design-Builder shall give authority to the Safety Manager and safety staff to issue stop orders that instruct employees of the Design-Builder and its Subcontractors of any tier, including labor-only Subcontractors, to cease operations and take urgent and appropriate action to make the Site safe and prevent unsafe working practices or other infringements of the Safety Plan or breach of any Governmental Rules.

The Design-Builder shall require its Safety Manager to verify by Inspection that the requirements of this Section and the Design-Builder's Safety Plan and safety procedures are being strictly complied with. In the event of any non-compliance, the Safety Manager shall forthwith issue an instruction to stop Work until the non-compliance is rectified. If the Design-Builder considers the non-compliance to be of a minor nature, implementation may be delayed 24 hours, with the Department's consent. If the Department's Project Manager states that such delay is acceptable, the Design-Builder may suspend implementing the instruction for 24 hours and resume working. During the 24-hour period, the Design-Builder shall rectify the non-compliance.

No Work shall be performed on Site unless the Design-Builder's Safety Manager or designated deputy is on Site. Subcontractors shall not perform work at the Site unless the specified safety supervisors are on the Site.

2.2.4 Quality Control Plan

See Section 4.2.3.1.

2.2.5 Overall Design-Build Team Organizational Plan

The Design-Builder shall update the Initial Overall Design-Build Team Organization Plan by combining the Organizational Structure Chart and the Communication Protocol Graphic and narrative and expanding upon these initial submittals into a more comprehensive document. It shall describe the design and construction organizational arrangements it intends to implement. The organizational arrangements described should clearly identify responsibilities and reporting lines of staff, particularly relating to Key Personnel.

The Design-Builder shall include an organization chart and communication protocol graphic (on an 11" x 17" sheet of paper), illustrating the Proposer's Key Personnel and their prospective roles

and responsibilities, as well as other principal participants and any known Subcontractors having a material role in the Project's design Work, design check Work, construction Work and construction inspection Work.

The Design-Builder shall describe the interrelationships and interfaces between each discipline within the Proposer's organization (e.g., design, design check, shop drawing preparation and review, construction, and quality management).

The Overall Design-Build Team Organization Plan shall also describe the interrelationships and interfaces between the Design-Builder's organization, the Department and other governmental agencies, utility owners, stakeholders, businesses, the public and other contractors working in the vicinity and impacted by the construction of the Project. This description shall also, at a minimum, address the following activities:

A) Reviews of plans and permits;

B) Progress, workshop, partnering and utility coordination meetings; and

C) Construction, engineering and inspection activities.

2.2.6 Design Management Plan

The Design-Builder shall provide a Design Management Plan and submit it to the Department's Project Manager for Review and Comment.

The Design Management Plan shall include the Design-Builder's approach to managing the Project, including:

A) The Design-Builder's understanding of the Project Requirements.

B) The Design-Build Team's organizational structure and lines of responsibility.

C) The Design Builder's approach to delivering the Project, including how the Design-Builder will address logistical challenges of the Project, scheduling to complete the Project on time and on or under budget with emphasis on quality, design, and construction.

D) How the Design-Builder will manage and coordinate the design, design quality control and design reviews.

E) The means of reporting on the design progress; the means of tracking quality control reviews and the resolution of comments on the design and describes how design non-conformance issues will be resolved.

F) How the design effort will be coordinated with construction activities and construction means and methods for the Project.

G) A description of the proposed methods to control the design progression for the overall project to support the construction schedule.

2.2.7 Construction Management Plan

The Design-Builder shall provide a Construction Management Plan, which may include relevant material submitted with its Proposal and submit it to the Department's Project Manager for Review and Comment.

The Construction Management Plan shall provide how well the Design-Builder understands and is organized to manage construction, construction quality control and the tools that will be implemented to provide seamless interaction with the Department's Construction Quality Assurance Engineer for the construction of a quality Project; provides how the progress of the construction work is reported to the Department and for control of the Work; provides how non-conformance issues in construction will be resolved; provides the method of updating the Baseline Schedule; provides how the work will be progressed in coordination with other agencies; provides the methods of maintaining detours and evaluates how the interaction with the Construction Inspection Professional Engineering Firm and the Materials Testing Firm/Laboratory will occur and how these firms will contribute to the Construction Management and quality of the Project.

2.2.8 Design Review Plan

The Design-Builder shall prepare and submit a written Design Review Plan within 10 days of NTP to the Department's Project Manager for review and comment. The Plan shall describe the level of design that the Designer will accomplish for each of the planned stages of design development and provide a description and/or checklist for each Design Unit clearly identifying the design product that will be reviewed.

2.2.9 Transportation Management Plan/Emergency Response Plan

The Design-Builder shall develop a Transportation Management Plan/Emergency Response Plan to meet the requirements of Part 3, Section 19.3.10 and submit it to the Department's Project Manager for review and comment.

2.2.10 Project Risk Management

2.2.10.1 Project Risk Management Plan

During the conceptual design phase, project risks were identified by NYSDOT. These risks, the *NYSDOT I-81 Viaduct Project – Phase 1, Contract 2 Risk Register*, can be found in Part 5. The Design-Builder, as part of their proposal, submitted additional risks in Form R2 as per ITP Appendix C3.1 A 2. Forms R1 and R2 are provided in the ITP, Appendix E.

The Design-Builder's Quality Manager shall prepare a Risk Management Plan (RMP) and submit it to the Department's Project Manager for review and comment. The Design-Builder's RMP shall cover all phases of the Project including design, procurement, construction and demolition, and shall include but not be limited to the following elements as a minimum:

A) The Design-Builder's risk management policy for the Project;

B) Project team roles and responsibilities concerning risk management;

C) A "Unified Project Risk Register" consisting of <u>all</u> identified risks from NYSDOT's *I-81 Viaduct Project – Phase 1, Contract 2 Risk Register*, the Design-Builder's additional risks identified in Form R2, and any new risks that may have developed since the Design-

Builder submitted their proposal. The "Unified Project Risk Register" shall be in the same MS Excel format as the *I-81 Viaduct Project – Phase 1, Contract 2 Risk Register* found in Part 5 and in the reference documents. The Design-Builder shall review, assess, and modify the "Unified Project Risk Register" as follows:

1) Assign risk ratings (Probability, Time, and Cost Impact) to the additional risks submitted by the Design-Builder in Form R2 as part of their proposal, and any new risks; the Department's instructions for rating risks can be found on the Instructions worksheet within the MS Excel *NYSDOT I-81 Viaduct Project – Phase 1, Contract 2 Risk Register*.
2) Revise risk ratings that were identified in the *NYSDOT I-81 Viaduct Project – Phase 1, Contract 2 Risk Register* as necessary
3) Revise risk response strategies as necessary for all risks

D) The Design-Builder's Quality Manager's proposed approach to monitoring and managing risks including monthly risk reviews and updates at appropriate milestones and whenever risk levels change, status reporting, and/or when new risks are identified that may impact risks already identified. The Department may elect to observe risk identification workshops;

The Design-Builder's Quality Manager shall provide a copy of the RMP and the Unified Project Risk Register to the Department within 75 days after NTP. When there is substantive change to the RMP or the Risk Register, a revised RMP and Register shall be provided to the Department for review and comment. The Department reserves the right, throughout the entire duration of the project, to review and provide written comment on any item in the risk register that, in the opinion of the Department, is of relevance or concern to the Department.

2.2.10.2 Risk Identification Workshop

During the RMP development process, the Design-Builder shall hold a minimum of one (1) risk identification workshop. The Quality Manager shall be responsible for facilitating the workshop including but not limited to the following:

1. Developing a workshop agenda and determining the length of the risk identification workshop;
2. Scheduling the risk identification workshop at a location agreed to by invited participating risk stakeholders (risk owners);
3. Sending out pre-risk identification workshop materials including but not limited to the draft RMP;
4. Facilitating and conducting the workshop;
5. Documenting, compiling, and communicating any feedback, comments, results, and action items identified during the risk identification workshop;
6. Revising the RMP to reflect any necessary changes resulting from the workshop.

The Quality Manager shall send workshop participant materials, including but not limited to the draft RPM, a minimum of 10 calendar days prior to the scheduled workshop. The Risk Identification Workshop shall occur prior to the RMP submittal deadline (within 75 calendar days after NTP) and at a time where comments and/or revisions based on the Risk Identification Workshop can be incorporated into the Final RMP submittal.

2.2.10.3 Risk Management Meetings

The Quality Manager shall conduct a minimum of one (1) risk management meeting per month throughout the duration of the project. Risk management meetings shall be attended by risk owners. At the risk management meetings, the Quality Manager shall review and discuss the unified risk register with participants and document the following:

- Status of active risks;
- Any on-going work efforts regarding active risks;
- Future workplan for each active risk;
- How each active risk could impact the current and future cost, schedule, scope, or quality of the project;
- Risk response strategies to address each active risk.

After each risk management meeting, the Quality Manager shall document and communicate the results within a maximum of 5 work days to all stakeholders.

2.2.10.4 Risk Management Documentation

The final submittal RMP, any revisions to the RMP during the contract, along with all risk management meeting reports shall be made part of the official project documentation files.

2.2.11 Railroad Management Plan

The Design-Builder shall develop a Railroad Management Plan, which may include relevant material submitted with its Proposal and submit it to the Department's Project Manager for review and comment.

The Railroad Management Plan shall provide how well the Design-Builder understands and is organized to manage railroad coordination with CSXT, comply with their requirements, and the tools that will be implemented to provide seamless interaction with the various stakeholders for the construction of a quality Project; and provides how the progress of the railroad construction work is reported to the Department and for control of the Work.

The Railroad Management Plan and Design-Builder's schedule shall include 45 days for CSXT reviews requiring CSXT's coordination or approval.

2.3 BASELINE PROGRESS SCHEDULE

The Design-Builder shall submit the Initial Baseline Progress Schedule that was submitted with the Technical Proposal, including any updates that may be necessary due to a NTP date change.

In addition, the Design-Builder shall expand and develop the Initial Baseline Progress Schedule in accordance with DB §108-01 and Part 5, Special Provision SP-3.

Design shall be considered complete when all Design related documents have been completed and accepted by the Department including: all calculations, specifications, records of design quality control reviews and procedures; descriptions of and justification for any non-standard features created or retained as a result of the design; resolution of any non-conformance reports; and submission of "As Built" drawings.

Construction shall be considered complete when: the entire Scope of Work has been completed; any damage to the area caused by the Design-Builder's performance of the Work has been

repaired to the satisfaction of the Department; all construction quality control documents, test and inspection reports and forms have been completed; As-Built drawings have been completed; and the work site(s) have been cleaned of any debris.

2.4 MEETINGS

The Design-Builder shall participate in meetings as indicated in this Section. The Design-Builder shall record minutes of all meetings and distribute them within five days of the meeting. Meeting minutes shall clearly identify the following:

A) Action items and issues;

B) The party responsible for the action item;

C) The status of issues; and

D) Due dates for identified action items.

Action items and issues shall be retained on the minutes until the required action is completed and/or the issue is resolved.

It is the Department's policy to use the principles of partnering to guide the management of Design-Build contracts and the Design-Build program within the parameters covered by the laws, regulations, and other policies that govern the work. The Design-Builder shall convene or participate in meetings designed to foster the principles of partnering in accordance with Part 2 § DB 103-05.

The Design-Builder shall record the minutes for each meeting.

2.4.1 Pre-Work Conference

The Department's Project Manager will consult with the Design-Builder and arrange and lead a Pre-Work Conference meeting promptly after issuance of NTP.

The Design-Builder shall be represented by all appointed key personnel. See Section 3 for information regarding the Design-Builder's key personnel.

The Pre-Work Conference will take place at a location determined by the Department's Project Manager in the Project vicinity.

The agenda of the Pre-Work Conference shall include the following items:

A) Planned activity for the first 60 days after NTP;

B) Submission of the list of intended Subcontractors;

C) Submission of the Plans required under the Contract (Reference Part 3, Section 2.2);

D) The Department's Project Manager or the Design-Builder may add other items to this agenda; and

E) Schedule Development and Submissions.

At the Pre-Work Conference, the Design-Builder shall submit a list of intended Subcontractors and vendors. In addition, the Design-Builder will be required to update the list of Subcontractors and vendors as the Work progresses so that the Department will have, at all times, a current and accurate list of Subcontractors along with the Work that they perform and vendors along with the items that they supply. The required forms for the submission of Subcontractor information will be supplied by the Department.

2.4.2 Value Engineering and Proposal Concepts Evaluation Meetings

This meeting may be combined with the Pre-Work Conference.

2.4.3 Design Mobilization Meeting

The Design-Builder's Project Manager will consult with the Department's Project Manager and will arrange and lead a meeting at the Designer-Builder's Project office prior to the Design-Builder's initiating design Work. The Design-Builder's key personnel who will be responsible for activities on the agenda shall attend the meeting.

The agenda shall be developed in consultation between the Department's Project Manager and the Design-Builder and prepared by the Design-Builder and shall include the following:

A) Organization for design;

B) Review of qualifications of design QC staff;

C) Design workshop agenda (see Section 5.11.1);

D) Location of design personnel;

E) Design schedule and time allocations for Design Reviews; and

F) Design Quality Control and Quality Assurance.

2.4.4 Site Mobilization Meeting

The Design-Builder's Project Manager will consult with the Department's Project Manager and arrange and lead a meeting at the Design-Builder's office prior to the Design-Builder's occupying any part of the Site. The Design-Builder's key personnel who will be responsible for activities on the agenda shall attend the meeting.

The agenda shall be developed in consultation between the Department's Project Manager and the Design-Builder and prepared by the Design-Builder and shall include the following items:

A) Use of premises by the Department and the Design-Builder;

B) Department's requirements;

C) Temporary utilities and facilities;

D) Security and "housekeeping";

E) Right-of-way and construction survey;

F) Schedule for establishing Work areas, temporary facilities, and facilities and equipment for Department's staff;

G) Temporary works; and

H) Plans for early construction, if any.

2.4.5 Progress Meetings

Progress meetings shall be held at least weekly throughout the duration of the Project. The Design-Builder shall prepare (1) a meeting agenda in consultation with the Department's Project Manager and (2) a current summary of all issues (including reference to the relevant version of any report, schedule or other document) to be included in the next monthly progress report with respect to each item listed in § DB 108-01 (E), and distribute copies of the meeting agenda, the issues summary and draft minutes of the previous meeting to all planned participants at least one day prior to the meeting. The Design-Builder shall lead the meetings.

The Design-Builder's key personnel shall attend the progress meetings.

The Progress Meetings cover the following items:

A) Confirmation of minutes of the previous meeting and matters arising at the previous meeting;

B) Review of Construction progress and planned activities, including a four week look ahead;

C) Review of Design progress and planned activities, including a four week look ahead of Design and Management Plan submittals;

D) NCRs – review newly issued and the status of outstanding NCRs;

E) RFIs – review outstanding and overdue RFIs which could impact planned progress;

F) Field observations, problems, and decisions;

G) Identification of issues affecting planned progress;

H) Maintenance of quality and Work standards;

I) Safety;

J) Environmental issues;

K) Schedule submissions and updates;

L) Work Zone Traffic Control;

M) Status of Change Orders, if any;

N) Utilization of DBEs, M/WBEs and other small businesses; and

O) Public Involvement Plan.

2.4.6 Special Meetings

The Department's Project Manager may require special meetings at any time and that all or specified Design-Builder key personnel attend.

2.5 COMPUTER AND NETWORKING REQUIREMENTS

The Department requires the Design-Builder and its Construction Inspection Professional Engineering Firm (CIPE) to obtain NYSDOT RSA Tokens (software tokens preferably) that are necessary to access the Virtual Desktop Infrastructure (VDI). VDI is the where the Design-Builder and its CIPE can access software applications required for the contract. Instructions for obtaining RSA tokens and installing and using VDI can be found here:

https://www.dot.ny.gov/portal/page/portal/main/businesscenter/contractors/construction-division

Upon request, the Department will also supply the Design Builder with a CSMIN network connection at the CIPE Field Office with the following Computer and Networking equipment through a third-party vendor:

- 1 Wireless connection with Router
- 3 fully configured laptops w/ accessories (for RE, OE, and Chief Inspector)
- 1 Multi-Function Printer

The Design-Builder shall provide ALL additional Computer and Networking equipment to the CIPE as necessary. The Design-Builder will need to provide separate high-speed communication into the CIPE office for all non-CSMIN users. A separate printer will be needed for the non-CSMIN users, as their laptops/computers will not be networked to the CSMIN Multi-Function Printer (MFP). It is recommended that the Design-Builder test the network connection success prior to fully equipping its staff and the CIPE firm, to ensure both hardware and software compatibility.

The following computer related specifications reflect the current technology utilized by the Department when making Citrix Connections and are provided for informational purposes only:

- 2/HM65 Chipset, and Intel HD Graphics 3000 (or equivalent);
- 2nd Generation Intel Core i5 2620M Processor, 2.70GHz (Turbo up to 3.40GHz), 1333MHz, 4MB L3 Cache;
- Mobile Intel HM65 Chipset;
- 14" diagonal LED-backlit HD anti-glare (1366x768);
- Intel HD Graphics 3000;
- 4 GB 1333 MHz DDR3 SDRAM – Dual Channel Active;
- 250 GB 7200 RPM 2.5 inch hard drive – or 120 GB Intel SSD;
- DVD R/W SuperMulti DL Drive;
- Full Keyboard;
- Broadcom 4313 GN 802.11 g/b/n 1x1 Wi-Fi Adapter;
- 65W Hardware Kit;
- 6 cell Li-ion Battery; and

- Integrated Gigabit Ethernet

Computers shall have VDI Horizon Client installed, which can be accessed at:

https://desktop.ny.gov/

2.6 DEPARTMENT'S CONSULTATION AND WRITTEN COMMENTS

The Department's review, oversight, audit, and inspection activities are referred to as "consultation and written comment" (see Part 2, DB §105-23). The Department's consultation and written comment will be provided to the Design-Builder in writing. The Design-Builder shall be responsible for addressing the Department's comments and shall indicate in writing whether it concurs with the comments. If the Design-Builder does not concur with the Department's comments, then the Department and Design-Builder will work together to resolve the issue before proceeding.

If agreement cannot be reached, the issue must be resolved as provided in the Contract Documents for dispute resolution in accordance with Part 2 DB §105-14.

2.7 PROJECT WISE

ProjectWise is the preferred platform to be used to organize, manage, distribute/share and archive electronic Project design documents for NYSDOT. However, the Design-Builder may propose to utilize another internet-based platform for these purposes, subject to the Department's acceptance. Should an alternate platform be selected, access is to be provided to FHWA-NY Division personnel. The documents to be posted to the selected platform typically include but are not limited to:

- Final design report and any modifications predicated by the Design-Builder's actions;
- All studies and supporting reports;
- Permit Applications and Permits;
- Survey and ROW mapping;
- Photos taken prior to and during design;
- CADD and 2D/3D models files including current NYSDOT-supported Microstation and InRoads file formats;
- Engineering calculations to support designs;
- All drawing submissions (Definite, Interim, Final, RFC, As-Built, etc.);
- Engineer of Record's estimate based on Work Payment Schedule; and
- Public Information.

All files posted to the selected platform shall be in accordance with the file naming convention and submission procedures as defined in Appendix 14 of the NYSDOT Project Development Manual.

The Design-Builder shall ensure that all electronic design documents are stored on the selected platform. Updates of engineering documents shall be provided on a monthly basis.

Regardless of the platform utilized during the progression of the Project, all files shall be posted to ProjectWise on a monthly basis, at a minimum, by the Design-Builder in accordance with the criteria listed above. The Quality Manager shall provide a status update regarding the posting of files to ProjectWise in the Monthly Quality Manager Report.

The Design-Builder shall obtain a ProjectWise account by contacting the Department's Project Manager and providing the required account information per Appendix 14 of the Project Development Manual.

This contract has additional Document Control Management and Reporting requirements. Refer to Part 5, SP-16 for additional information.

SECTION 3 PROJECT TEAM

3.1 GENERAL

This section sets out requirements relating to the Design-Builder's Project Team.

Note that Subconsultants may not be included on more than one team with the exception of the Construction Inspection Services. The Construction Inspection subconsultant may be proposed on more than one team provided that their firm is not involved in the preparation of the Technical Proposal and complies with all non-collusion and conflict of interest provisions.

3.2 KEY PERSONNEL

The positions listed below shall be the Design-Builder's key personnel for the Project. Key Personnel are preferred to have experience on projects of a similar size, type of work, and complexity as this Project, and should meet the qualifications described below. Proposed staff with qualifications less than those described below will receive a reduced score compared to staff that meet or exceed the described qualifications. Any requirements described as "**shall** have..." or "**shall** be…" are determined to be minimum response requirements. The Design-Builder shall provide personnel that meet these minimum requirements.

The Design-Builder's Project Manager shall be the Design-Builder's representative and single point of contact with the Department.

The Department's Project Manager may designate other Key Personnel positions as needed at any time during the Contract.

Note that Key Personnel, and their firm, may not appear in the Key Personnel submission of more than one team with the exception of the Resident Engineer. The Resident Engineer may be proposed on more than one team provided that their firm is not involved in the preparation of the Technical Proposal and complies with all non-collusion and conflict of interest provisions.

3.2.1 Directory / Organization Chart

Within 15 days after NTP, the Design-Builder shall submit to the Department's Project Manager a directory and organizational chart showing all of its Key Personnel. The directory shall be updated throughout the Contract as changes occur. The directory shall include the names, titles, areas of responsibility, office address and location, office telephone and fax numbers, and cellular and/or pager numbers of key personnel. The Design-Builder shall provide information sufficient for the Department to contact any of the Key Personnel on a 24-hour basis for the duration of the Contract.

The Department's Project Manager shall provide a directory of the Department's Project staff to the Design-Builder.

3.2.2 Availability of Key Personnel

Key Personnel shall be available to work on the Project for the duration of the Contract.

If any of the Key Personnel are to be unavailable from the Project for more than one week, the Design-Builder shall designate a deputy to represent the absent Key Personnel and inform the Department's Project Manager accordingly.

In the event that any of the Key Personnel involved in the design of the Project are not sufficiently participating in the design of the Project, as determined by the Department, the Department's Project Manager shall have the authority to require their increased involvement.

3.2.3 Changes in Key Personnel

The Design-Builder shall assign the Key Personnel identified in the Design-Builder's Proposal to this Project. Except in exceptional circumstances, as determined by the Department's Project Manager, the Design-Builder shall submit the names and qualifications of proposed replacement Key Personnel to the Department's Project Manager 30 days in advance of any replacement of any Key Personnel.

Requests for changes must be made using Form RFC, and shall be submitted along with a completed Form R – Summary of Individual's Experience and the information specified in the Form RFC for that Key Personnel position, including a narrative (max one page) justifying why the proposed Key Personnel change is being requested. In any event, the Design-Builder shall promptly notify the Department's Project Manager if any Key Personnel leaves the Design-Build Team.

The Design-Builder may change Key Personnel only upon receipt of a written consent from the Department's Project Manager. Replacement personnel must have equal or better qualifications than the Key Personnel identified in the Proposal. The Department's Project Manager may require written justification from the Design-Builder explaining the replacement of any Key Personnel. The Department's Project Manager shall be the sole judge as to whether replacement staff members are acceptable.

It is imperative that the Key Personnel identified in the Design-Builder's Proposal remain on the Project for the duration of the Project until Project Completion. Changes to the Key Personnel shall result in a Key Personnel Change Assessment Fee in the amount listed in the ITP for each Key Personnel position substitution, regardless of whether the Department accepts the alternate personnel as equal or better.

3.2.4 Key Personnel

3.2.4.1 Project Manager

Shall have a minimum of 15 years but preferably 20 years of demonstrated experience in construction and construction management of bridge and/or transportation and/or infrastructure projects, with preferably similar size and type of work as this Project, and preferably including projects with compressed timelines, and community information requirements. Such experience in construction and management-of-construction shall include at least one bridge infrastructure construction project having a construction value in excess of $50,000,000. The Project Manager, who should have Design-Build experience, and preferably New York State Department of Transportation Design Build experience, and have extensive project management experience, can hold only this one Key Personnel position. The Project Manager should have New York State Department of Transportation contract administration experience. It is preferred, but not required, that this individual be licensed and currently registered as a Professional Engineer in the State of New York. The Project Manager shall dedicate no less than 100% of their work time to this project.

3.2.4.2 Design Manager

Shall be licensed and currently registered as a Professional Engineer in the State of New York, shall be an owner or employee of the Designer and shall have a minimum of 15 years demonstrated experience in managing design for infrastructure and bridge projects, preferably of similar scope as this Project. The Design Manager shall have Design-Build experience and should have specific experience on projects of similar size and type. The Design Manager can hold only this one Key Personnel position. The Design Manager shall dedicate no less than 100% of their work time to this project for the first year and no less than 40% for the remainder of the project.

3.2.4.3 Quality Manager

Shall have demonstrated experience in bridge design and infrastructure construction with at least 10 years' experience in quality management, quality assurance and quality control activities, including preparation and implementation of Quality Plans and procedures for design and construction. The Quality Manager shall additionally have at least 5 years' experience in the design of bridges, highways and civil infrastructure; at least 5 years' experience in construction field engineering and inspection of bridges, highways and civil infrastructure; and at least 5 years of Project Management experience. The Quality Manager can hold only this one Key Personnel position. The Quality Manager should have experience of quality systems based on ISO 9001 and should have experience with the quality systems of the Department in both design and construction standards. The Quality Manager shall dedicate no less than 100% of their work time to this project for the first year and no less than 50% for the remainder of the project.

3.2.4.4 Resident Engineer

Shall be licensed and currently registered as a Professional Engineer in the State of New York and shall have demonstrated at least 10 years' experience in bridge and highway construction inspection, including at least 5 years as a Resident Engineer. A Resident Engineer with NYSDOT Construction Engineer in Charge (EIC) experience greater than 10 years or a combination of EIC and Area Construction Supervisor (ACS) experience of 20 years with no less than 5 years EIC experience is also acceptable as demonstrated on Form R. The Resident Engineer shall have performed the above duties on a project within the last 5 years.

The Resident Engineer, who shall have Design-Build experience, and preferably New York State Department of Transportation Design Build experience, can hold only this one Key Personnel position. The Resident Engineer shall dedicate no less than 100% of their work time to this project.

3.2.4.5 Lead Structural Engineer

Shall be licensed and currently registered as a Professional Engineer in the State of New York, shall be an owner or employee of the Designer and shall have a minimum of 15 years demonstrated experience in managing structural design for infrastructure and bridge projects, preferably of similar scope as this Project; also should have Design-Build experience, and shall have specific structural experience on projects of similar size and type. The Lead Structural Engineer can hold only this one Key Personnel position. The Lead Structural Engineer shall dedicate no less than 75% of their work time to this project for the first year and no less than 40% for the remainder of the project.

3.2.4.6 Lead Civil Engineer

Shall be licensed and currently registered as a Professional Engineer in the State of New York, shall be an owner or employee of the Designer and shall have a minimum of 15 years demonstrated experience in managing civil/highway design for infrastructure and bridge projects, preferably of similar scope as this Project. The Lead Civil Engineer should have Design-Build experience and shall have specific highway experience on projects of similar size and type. The Lead Civil Engineer can hold only this one Key Personnel position. The Lead Civil Engineer shall dedicate no less than 75% of their work time to this project for the first year and no less than 40% for the remainder of the project.

3.2.4.7 Lead Geotechnical Engineer

Shall be licensed and currently registered as a Professional Engineer in the State of New York, shall be an owner or employee of the Designer and shall have a minimum of 15 years demonstrated experience in managing civil/highway design for infrastructure and bridge projects, preferably of similar scope as this Project. The Lead Civil Engineer should have Design-Build experience and shall have specific highway experience on projects of similar size and type. The Lead Civil Engineer can hold only this one Key Personnel position. The Lead Civil Engineer shall dedicate no less than 75% of their work time to this project for the first year and no less than 40% for the remainder of the project.

3.2.4.8 Project Superintendent

Shall have at least 15, but preferably 20 years of demonstrated experience overseeing work on bridge and highway construction projects. Experience shall include directing and coordinating the activities of a contractor’s workforce and all subcontractors, ensuring work progressed according to schedule, within budget and that material and equipment were delivered to the site on time. The Project Superintendent, who should have Design-Build experience, and preferably New York State Department of Transportation Design Build experience, can hold only this one Key Personnel position and shall dedicate no less than 100% of their work time to this Project. The Project Superintendent shall have experience as Project Superintendent on a bridge project valued at $50,000,000 or more.

3.2.4.9 Rail Coordinator:

Shall have a minimum of 10 years, but preferably 15 years demonstrated experience in coordinating matters related to railroads and public authorities, preferably of similar scope as this Project. The Rail Coordinator should be aware of Department policies, rules, regulations, design standards and practices, and construction requirements. The Rail Coordinator should be licensed and currently registered as a Professional Engineer in the State of New York and can hold only this one Key Personnel position. The Rail Coordinator shall dedicate no less than 100% of the work time required to plan, monitor, coordinate, and construct at locations relative to stakeholders associated with this Project until all coordination and field work has been completed and accepted.

3.2.5 Other Personnel:

The Design-Builder shall provide Other Personnel that meet these minimum requirements.

3.2.5.1 Environmental Compliance Manager

The Environmental Compliance Manager shall report directly to the Project Manager and shall have the primary responsibility for ensuring that all of the Project's environmental requirements are satisfied. The Environmental Compliance Manager shall have a minimum of 10 years demonstrated experience in environmental permitting and associated requirements, compliance with environmental regulations, including Section 106 of the National Historic Preservation Act, environmental design, and construction management and compliance on large, complex transportation or bridge projects with complex environmental permitting requirements and commitments. This experience shall be in relation to federal and state environmental permitting requirements and regulations and coordination with federal and state environmental regulatory and advisory agencies. The Environmental Compliance Manager should have experience in managing others undertaking environmental activities, with highway and bridge engineering drawings and concepts, and working cooperatively with design engineers and construction staff. The Environmental Compliance Manager shall also have experience with Section 106 consultation, facilitating and overseeing archaeological/Native Nation monitoring during construction, and the process for re-assessing and installing noise barriers.

3.2.5.2 DBE/Civil Rights Compliance Manager

The Design-Builder shall provide for at least one employee or subcontractor (the DBE Civil Rights Compliance Manager), who has at least four years of experience in the areas of civil rights compliance, including contract compliance, DBE, EEO and OJT administration. The responsibilities of the DBE Civil Rights Compliance Manager shall be ensuring compliance with all civil rights requirements and Local Hire provisions of the Contract. These responsibilities include but are not limited to: monitoring compliance on a day-to-day basis; conducting contract compliance reviews; coordinating technical assistance activities for DBEs; disseminating information on available business and subcontracting opportunities so that DBEs are provided an equitable opportunity to compete and perform the work on behalf of the Contractor; disseminating information on available employment and training opportunities so that minorities, females, and economically disadvantaged persons are provided an equitable opportunity to perform the work of the Contract. All DBE participation will be reviewed and approved by the Agencies prior to being counted towards the Contract DBE goal. The DBE Civil Rights Compliance Manager will work with NYSDOT along with a collaborative of workforce development organizations, such as WorkSmart NY, Syracuse Build, Pathways to Apprenticeship, Syracuse Educational Opportunity Center, and Urban Jobs Tasks Force, to ensure that local residents from the Syracuse Community are being identified for training, employment and deployment opportunities with the Design Builder, on the I-81 Viaduct Project.

3.2.5.3 Utility Coordination Manager

The Design-Builder shall provide a single dedicated person responsible for managing all utility coordination who shall hold no other key personnel role on this project. This person shall be referred to as the Utility Coordination Manager. The Design-Builder's Utility Coordination Manager shall be responsible for managing all utility coordination, including, but not limited to, the following:

A) Ensuring that all utility coordination and activities are conducted in accordance with the requirements of the Contract Documents;

B) Identifying all existing utilities and coordinating any new utility installations;

C) Reviewing Department prepared proposed utility permit application packages and commenting on each permit application as related to the Design-Builder's utility relocation drawings;

D) To maintain a log of all submittals, meetings and coordination with Utility owners;

E) Attending utility meetings, preparing and distributing minutes of all utility meetings, and ensuring expedient follow-up on all unresolved issues;

F) Distributing all plans, conflict matrixes and changes that affect utility owners and making sure this information is properly coordinated;

G) Coordinating the execution and performance of Work required for any utility Work needed within the Project;

H) Preparing and coordinating the execution of Final DB Utility Work Agreements between the Design-Builder, Department, and utility owners;

I) Assisting with the resolution of utility conflicts;

J) Providing periodic Project updates to the Department's Project Manager as requested; and

K) Coordination with the Department on any issues that arise concerning reimbursement of utility work costs.

SECTION 4 DESIGN-BUILDER'S QUALITY PROGRAM

4.1 GENERAL

A) The Design-Builder shall implement and maintain an effective quality program to manage, control, document, and ensure that the Work complies with the requirements of the Contract Documents.

B) The Design-Builder shall designate a Quality Manager (QM), who shall be identified as one of the Design-Builder's Key Personnel, shall be responsible for overseeing the overall quality program and the preparation, implementation and update of the Design-Builder's Quality Program (DBQP), including management, design and construction.

C) The Design-Builder's executive management shall review the quality program at defined intervals sufficient to ensure its continuing suitability and effectiveness in satisfying the requirements of this standard and the Design-Builder's stated quality policy and objectives. Management reviews shall be held at least at 3-month intervals. Records of such reviews shall be maintained. Minutes shall be taken of the review meetings and these minutes shall be maintained as quality records. Copies of minutes shall be provided to the Department's Project Manager on request.

4.2 ELEMENTS OF THE DESIGN-BUILDER QUALITY PROGRAM

4.2.1 Quality Policy

The Design-Builder's executive management shall define and document its policy for quality, including objectives for quality and its commitment to quality. (In the context of this Section 4, "executive management" shall mean those persons to whom the Design-Builder's Project Manager reports and who has overall responsibility for the Design-Builder's performance.) The quality policy shall be relevant to the Design-Builder's organizational goals and the expectations and needs of the Department. The Design-Builder shall ensure that this policy is understood, implemented and maintained at all levels of the organization.

The Design-Builder shall have a published statement of its commitment to quality and the organization's quality objectives signed by its responsible executive(s). It shall explain the commitment in terms of the services provided to the Department, and the responsibilities assumed by the Design-Builder to discharge its contracted accountabilities relative to the Department's overall responsibility to Stakeholders and the public-at-large, for assuring quality in the constructed facility. The statement shall be made known to and understood by all staff and be included in the Quality Control Plan.

Executive management's commitment to quality shall be demonstrated by the quality policy being signed by the responsible executive(s) and management's direct involvement in verifying the implementation and understanding of the quality policy.

All employees shall be made aware of the Design-Builder's quality policy. The indoctrination on quality policy may be formal and can be accomplished by various means depending on the size of the Project, the structure of the Design-Builder's management staff and number of employees.

4.2.2 Quality Program Organization

A) General

The Quality Program shall set up a “quality program team” which shall be distinct and separate from the design and construction production organization. The quality program team shall report directly to the Design-Builder’s management through the Design-Builder’s Quality Manager. The Quality Program shall include an organization chart showing names, titles, responsibilities, authority, and the interrelationship between those involved in managing and directing the Quality Program, including all subcontractors, vendors, suppliers and consultants.

B) Responsibility and Authority

1) Executive management shall have the responsibility to plan and determine the overall direction of the Design-Builder and its relationship to the quality efforts. Executive management shall ensure the quality policy is documented and understood by all employees and management shall further ensure the implementation of the quality policy by everyone in the organization.

2) The quality program shall be an integral part of the overall management system and as such shall be supported and implemented from the top down. On a Design-Build project most employees are involved in either managing, performing or verifying work that affects quality. It shall not be the sole domain of the design checkers, quality control (QC) inspectors or QC personnel. All workers, including design and construction production personnel (including those of subcontractors) shall be aware of the quality program requirements that govern their respective work.

3) A description of the organizational arrangements (such as a chart) shall be available and be maintained up to date. All key roles and persons, and lines of communication and authority between the Design-Builder and the Department and their representative(s), and with other organizations involved shall be identified.

4) The responsibility, authority and the interrelation of personnel who manage, perform and verify work affecting quality shall be defined and documented, particularly for personnel who need the organizational freedom and authority to:

   a) Initiate action to prevent the occurrence of any nonconformities relating to the product, process and quality system;

   b) Identify and record any problems relating to the product, process and quality system;

   c) Initiate, recommend or provide solutions through designated channels. It shall be everyone's responsibility to report any and all quality and safety problems;

   d) Verify the implementation of the solutions to quality problems in a timely manner. The verification shall also investigate if the solution to the identified problem created another quality problem; and

e) Establish controls, including stopping work, if necessary, once a significant quality problem is identified until the cause of the problem can be identified and the required corrective action can be implemented.

C) Design-Builder's Quality Manager

1) The Design-Builder's executive management shall appoint a Quality Manager who, irrespective of other responsibilities, shall have a defined authority for:

a) Ensuring that a quality program is established, implemented and maintained; and

b) Reporting on the performance of the quality program to the Design-Builder's management for review and as a basis for improvement of the quality system.

2) The Quality Manager shall not report to the Design-Builder's Project Manager, but shall be directly responsible to and report on the performance of the quality program to executive management not directly responsible for design or construction.

3) The Quality Manager shall be present and available for consultation with the Department's Project Manager and other Department staff on an on-call basis throughout the duration of the Project. The Quality Manager shall attend the scheduled progress meetings as a minimum and such other meetings as the Department's Project Manager may request, including individual meetings between the Quality Manager and Department staff.

4) The Quality Manager shall be the primary point of contact to the Department for all issues relating to the Design-Builder's Quality Control Plan (preparation, review, implementation and updates).

5) The Proposer's Design QC Engineer and Construction QC Engineer and their respective staffs shall report directly to the Quality Manager.

D) Resources

1) The Design-Builder shall identify resource requirements and provide adequate resources, including the assignment of trained personnel, for management, performance of work and verification activities including internal quality audits.

2) The Design-Builder shall have a system for assuring that the project is adequately staffed and that resources are provided. In addition, the Design-Builder shall have in place adequate training measures to perform such activities as design reviews, verification activities, receiving, in-process and final inspections and internal quality audits.

3) The Quality Program shall outline DBQP personnel staffing levels for the duration of the project and identify the source of staffing (management, professional, technical, and labor) and shall deal with the integration of resources into the specific Contract requirements.

4) Other resources shall also be addressed such as computers, craft tools, equipment and facilities to execute the DBQP and the project successfully.

4.2.3 Quality Control Plan (Design and Construction)

The Quality Control Plan shall cover the following items:

A) The Design Builder Quality Control Plan (QCP) shall contain all processes and procedures necessary to ensure complete quality assurance and quality control for all major activity categories: design; materials; equipment; testing; construction; start-up; coordination; workmanship; fabrication; and, document control for both on-Site and off-Site Work by the Design-Builder (including subcontractors, suppliers, laboratories and consultants).

B) The QCP shall include a list of RF-1 items and estimated quantities to facilitate the decision-making regarding the items of work that provide an opportunity for statistical verification and testing of materials by the CQAE.

C) The QCP shall describe the quality system to be implemented at all levels of the Design-Builder's organization, to include Sub-Design-Builders (design and construction).

D) The QCP shall detail the role of the Design-Builder, each Principal Participant, the Designer, the Design and Construction QC Engineers, and other team members having a significant quality role.

E) The Quality Control Plan shall cover temporary and permanent components.

F) the Quality Control Plan shall detail how the Design-Builder intends to engage the Department's Design Quality Assurance Engineer and Construction Quality Assurance Engineer during all activities described in the Quality Control Plan.

G) The QCP shall address the topics contained in the Quality Control Plan Outline included in Appendix C and follow the format presented in same appendix.

H) Separate volumes addressing design (Design Quality Control Plan (DQCP)) and construction (Construction Quality Control Plan (CQCP)) may be produced which shall comprise the QCP.

I) The Design-Builder shall submit the Design-Builder's QCP for Review and Approval within 30 Calendar Days after the Notice to proceed. The CQCP shall be approved by the by the Department before commencement of construction Work.

J) When developing its CQCP, the Design-Builder shall provide a level of construction inspection and documentation consistent with those indicated in the Department's Contract Administration Manual, Materials Inspection Manual and Construction Inspection Manual. The Design-Builder can obtain additional information regarding Department approved procedures at:

https://www.dot.ny.gov/main/business-center/contractors/construction-division.

K) In developing its Quality Control Plan, the Design-Builder shall establish appropriate controls in its management, design, construction / installation and documentation procedures to ensure that environmental mitigation requirements are met and documented.

NEPA environmental approval for the subject project has been granted based on analysis and documentation of potential environmental impacts of the identified preferred alternative. This analysis is summarized along with any identified environmental commitments and depicted in the Design Report/Environmental Document for the subject project. If during detailed design and/or construction the Design-Builder introduces design elements, variations, or methodologies that potentially induce environmental impacts that differ from those identified in the approved Design Report/Environmental Document or is unable to comply with established environmental commitments then the NEPA process for this project will need to be re-evaluated prior to proceeding with construction. This requirement also applies to proposed variations which may affect resources covered under Section 106, Section 4(f), Executive Order 11990 (wetlands), and other applicable federal and state environmental regulations. The need to re-evaluate the NEPA process may impact the overall project schedule.

4.2.3.2 Quality Control Plan Submittal

A) The Design-Builder shall use the Initial Quality Control Plan submitted with the Technical Proposal, modify and develop it, as necessary per this provisions of this requirement and submit it to the Department's Project Manager for written approval.

B) If the Department provides comments, the Quality Control Plan shall be revised and resubmitted to the Department's Project Manager within 14 calendar days of receipt of the Department's written comments and resubmitted as required until Approved by the Department's Project Manager.

C) No offsite fabrication Work or Construction Work shall commence before the Construction Quality Control Plan has been approved by the Department's Project Manager. No payment will be made to the Design-Builder until the Quality Control Plan has been approved by the Department.

4.2.3.3 Quality Control Plan Reviews and Updates

As work progresses, the Design-Builder shall update the Quality Control Plan to reflect current conditions. The Design-Builder and/or the Department's Project Manager may identify the need for revisions to the Quality Control Plan. The Design-Builder shall submit any revisions or updates to the Quality Control Plan to the Department's Project Manager for approval within 30 days of the identification of the need for a revision.

4.2.4 Document and Data Control

4.2.4.1 General

The Design-Builder shall establish and maintain documented procedures to control all documents and data that relate to the requirements of this Section 4.2.4 including, to the extent applicable, documents of external origin such as standards and the Department plans.

The Design-Builder shall be responsible for the establishment and implementation of documented procedures for ensuring all documents essential to the quality of the delivered product or service are properly controlled. This shall include, but is not limited to, contracts, plans, specifications, master drawing lists or equivalent documents, critical procedures and work instructions, Quality System manuals, Project Quality Control Plans and data (e.g., computer data bases, computer files).

Procedures should recognize that there is a finite life to electronic storage media. Consideration should be made for those “documents” which only exist in the electronic media.

4.2.4.2 Document and Data Approval and Issue

The Design-Builder shall be responsible to see that the documents and data are reviewed and approved for adequacy by authorized personnel prior to issue. A master list or equivalent document-control procedure identifying the current revision status of documents shall be established and be readily available to preclude the use of invalid and/or obsolete documents.

The Design-Builder shall be responsible for establishing, documenting, maintaining, and, implementing a procedure which clearly defines the process for document review, resolution of comments and approval authority.

Quality Management System documentation shall also be controlled to ensure its proper authorization and distribution.

No construction work activities shall be accomplished using unreleased, unauthorized or outdated design documents.

This control shall ensure that:

A) The pertinent issues of appropriate documents are available at all locations where operations essential to the effective functioning of the quality system are performed; and

B) Invalid and/or obsolete documents are promptly removed from all points of issue or use, or otherwise assured against unintended use:

   1) Superseded, revised and voided documents shall be removed from all work areas and the employees whose work is governed by those documents shall be informed of the changes to ensure compliance to the new or revised requirements;

   2) A master document list, or equivalent, shall be maintained to identify the status and current revision of all controlled documents. The Master List, or equivalent, shall be controlled and be available to all holders of controlled documents; and

   3) Any obsolete documents retained for legal and/or knowledge-preservation purposes are suitably identified. Superseded, revised and voided documents can be maintained for legal and/or historic information. However, the documented procedure must describe the method of identifying and storing these documents in a manner that ensures they are not inadvertently used by an unknowing individual. There shall also be a record retention plan for the Design-Builder.

4.2.4.3 Document and Data Changes

The Design-Builder shall identify and include in the Quality Control Plan, the process for the initiation, review and approval of all document changes prior to issuance of those changes.

Changes to documents and data shall be reviewed and approved by the same functions/organizations that performed the original review and approval, unless specifically designated otherwise. If this is not possible then the designated approval authority shall have adequate background and experience upon which to base the decision. The designated functions/organizations shall have access to pertinent background information upon which to base their review and approval.

Where practical, the nature of the change shall be identified in the document or the appropriate attachments.

4.2.5 Procurement and Purchasing

4.2.5.1 General

The Design-Builder shall establish and maintain documented procedures to ensure that purchased services and products conform to Department requirements.

The Design-Builder shall be responsible for establishing, documenting and maintaining procedures for the evaluation and selection of suppliers, vendors and subcontractors. The procedures shall detail the requirements for all important activities, such as preparation of purchase orders, contracts for services, bid lists and vendor quality requirements, including pre-award audits, in-process inspections and product acceptance.

4.2.5.2 Evaluation of Subcontractors, Suppliers and Vendors

The Design-Builder shall:

A) Evaluate and select subcontractors on the basis of their ability to meet subcontract requirements including the quality system and any specific quality-control requirements;

B) Control the evaluation and selection of suppliers, vendors and subcontractors. Procedures, rather than just a statement of policy in the Quality Control Plan, shall be used;

C) Describe the evaluation and selection process for suppliers, vendors and subcontractors of all tiers and describe the priority of quality in the evaluation and selection criteria in the Quality Control Plan;

D) Define the type and extent of control exercised by the Design-Builder over subcontractors. This shall be dependent upon the type of services or products, the impact of subcontracted Work on the quality of final product and, where applicable, on the quality audit reports and/or quality records of the previously demonstrated capability and performance of subcontractors; and

E) Establish and maintain quality records of acceptable subcontractors. Records shall be maintained to document the selection, control exercised over, performance, delivery, quality, etc. of all contractors (subconsultants, vendors) and subcontractors.

The methods the Design-Builder elects to use to control the delivery of the contracted service or product may include, but are not limited to:

A) Design reviews;

B) Shop inspection;

C) Receiving inspection;

D) Witnessed inspection hold points;

E) Issuance of a certificate of compliance or analysis;

F) Testing and approval of a prototype or sample;

G) Provision and approval of a Quality Control Plan prior to contract award; and

H) Quality system audits.

The procedures shall detail how subcontractors (including consultants) will be presented to the Department for approval (DB §108-05).

4.2.5.3 Procurement and Purchasing Data

Procurement and purchasing documents shall contain data clearly describing the service or product ordered, including where applicable:

A) The type, class, grade or other precise identification. For steel products purchase documentation shall include mill certifications which indicate domestic steel origin-Buy America;

B) The title or other positive identification, and applicable issues of specifications, plans, process requirements, inspection instructions and other relevant technical data, including requirements for approval or qualification of product, procedures, process equipment and personnel; and

C) The title, number and issue of the quality-system standard to be applied.

The Design-Builder shall review and approve procurement/purchasing documents for adequacy of the specified requirements prior to release.

The documented procedure shall identify how and by whom procurement and purchasing documents are reviewed, how comments are resolved and who in the organization has the authorization for final approval of the document.

4.2.5.4 Verification of Purchased Service or Product

A) Design-Builder Verification at Subcontractor's Premises

1) Where the Design-Builder proposes to verify purchased product or service at the subcontractor's premises, the Design-Builder shall specify verification arrangements and the method of product release in the procurement/purchasing documents.

2) The procurement/purchasing document shall include any requirement for the organization performing verification at its subcontractor's facilities. The method of verification and release of the product or service shall be specified in advance. This may also mean the purchase order or specifications carry specific instructions on how the process verification will be performed to assure the final product will meet all of the procurement/purchasing requirements.

B) The Department Verification of Subcontracted Product or Service

1) The Design-Builder or the Department's representative shall be afforded the right to verify at the subcontractor's premises and the Design-Builder's premises that subcontracted product or service conforms to specified requirements. Such verification shall not be used by the Design-Builder as evidence of effective control of quality by the subcontractor.

2) The Department shall have the right of access to the Design-Builder and/or subcontractor facility to inspect, audit or otherwise verify the specified procurement/purchasing requirements are being fulfilled. The right of access may be extended to authorized personnel and contracted third parties. The Design-Builder is obligated to perform verification actions, regardless of what the Department does. The Department's verification may not be substituted for the Design-Builder's actions.

3) Verification by the Department shall not absolve the Design-Builder of the responsibility to provide acceptable product or service, nor shall it preclude subsequent rejection by the Department.

4) The subcontractors shall be responsible for fulfilling all of the specified procurement requirements regardless if the Department, Design-Builder or agent performed any tests or inspections. The Design-Builder shall provide the Department an acceptable product or service, regardless of the extent of the Department's verification. Even if the Department has performed verification actions at the Design-Builder's facilities, the product may still be rejected if it is not acceptable.

4.2.6 Control of Department Supplied Items

The Design-Builder shall establish and maintain documented procedures for the control of verification, storage and maintenance of the Department-supplied items provided for incorporation into the Project or for related activities. Any such item that is lost, damaged or is otherwise unsuitable for use shall be recorded and reported to the Department (see Section 4.2.15).

One of the most significant products provided to the Design-Builder by the Department is design information in the form of plans and specifications, as well as proprietary information, and these items shall be protected with the same vigilance as any hardware items supplied. Any apparent deficiency or ambiguity shall be identified to the Department for its necessary action.

The technical characterizations of the site, such as the boring log or soil report data supplied by the Department for consideration in designing the structural system for the product are examples of the Department supplied products for the structural consultant.

When such items are encountered, documented procedures shall exist which detail the receipt/ acceptance, storage and maintenance (preservation) of these items.

When items are considered inadequate for the task required, documented procedures shall detail the process used to report such deficiencies to the Department.

4.2.7 Product Identification and Traceability

Where appropriate, the Design-Builder shall establish and maintain documented procedures for identifying the product by suitable means from receipt and during all stages of production, delivery and installation.

This means that the Design-Builder shall establish and maintain documented procedures whereby items of work for which records are to be kept shall be identifiable. Examples of this on a construction site include the numbering of concrete pours in a structure or the establishment of a grid matrix for identifying columns.

The Design-Builder shall include document title, a unique document number, the Contract Number, the Bridge BIN (when applicable), the Department's name, the Design-Builder's name, the preparer's name, the date and revision number on all Project deliverables.

The filing and retrieval of operating manuals, certificates of compliance and/or analysis, inspection status and nonconforming product shall be traceable to the items. Records shall be kept that identify the installed location of the equipment/materials.

Where and to the extent that traceability is a specified requirement, the Design-Builder shall establish and maintain documented procedures for unique identification of individual product or batches. This identification shall be recorded.

The intent of this Section 4.2.7 is to ensure the Design-Builder can effectively identify the root cause of a problem and to implement effective corrective and preventive actions to resolve and prevent future occurrences of the problem.

4.2.8 Process Control

The Design-Builder shall plan and control the work and when necessary, shall prepare a documented process plan defining how work is to be carried out. Documentation may be in the form of a narrative, flow chart or control points.

The Design-Builder shall identify and plan the production, installation and servicing processes which directly affect quality and shall ensure that these processes are carried out under controlled conditions. Controlled conditions shall include the following:

A) Documented procedures defining the manner of production, installation and servicing, where the absence of such procedures could adversely affect quality. This requirement deals with the planning and control of all work processes, other than design control processes, that are critical to the adequacy of the delivered Project;

B) Establishment and documentation of the method(s) for scheduling, monitoring, and reporting on the status of each significant aspect of the design or other Project tasks. The methods shall be consistent with the size and complexity of the effort. Such schedules shall identify required inputs from others and submittals to the Department and to relevant government authorities;

C) An assessment by the Design-Builder of this requirement is essential to ensure compliance. The key phrase of this requirement is “where the absence of such procedures could adversely affect quality”;

D) Use of suitable production, installation and servicing equipment, and a suitable working environment;

E) Compliance with reference standards/ codes, Quality Control Plans and/or documented procedures. Referenced standards shall be available to the people of the location where the work is to be performed to ensure compliance to the specified requirements;

F) Monitoring and control of suitable process parameters and product characteristics;

G) The approval of processes and equipment, as appropriate. Procedures shall identify who has the responsibility, authority and expertise for the approval of various processes to ensure their adequacy;

H) Criteria for workmanship, which shall be stipulated in the clearest practical manner (e.g., written standards, representative samples or illustrations); and

I) Suitable maintenance of equipment to ensure continuing process capability.

4.2.9 Inspection and Testing

4.2.9.1 General

The Design-Builder shall establish and maintain documented procedures for inspection and testing activities in order to verify that the specified requirements for the Project are met. The required inspection and testing, and the records to be established, shall be detailed in the Quality Control Plan or documented procedures.

This section shall address inspection/testing methodology, methods of control, documentation, acceptance and distribution of results.

Written procedures are required. In general, QC inspections shall be performed to written criteria with specified levels of acceptability based on clearly defined accept/reject criteria. Reports shall be signed and dated by QC inspection personnel and results clearly indicated.

The Design-Builder shall establish, document and maintain procedures for inspection and testing activities.

QC Inspection and testing shall be performed in accordance with written procedures developed by the Design-Builder, or the proper issue of test procedures issued by industry, government and/or code bodies available to test personnel.

Verification of compliance with specifications and/or requirements by means of inspection and testing is required:

A) On receipt of materials;

B) At intermediate stages; and

C) When work is completed.

The criteria for compliance are defined in the contract specification, as are appropriate sampling and testing requirements.

Checkpoints and hold points (Work that must be inspected and approved by the assigned QC Inspector before Work can proceed), shall be clearly established and identified on the Project execution schedule or other suitable means. QC Inspection procedures, logistics and reporting of results shall be clearly defined, developed and implemented.

4.2.9.2 Incoming Product Inspection and Testing

The Design-Builder shall ensure that incoming product is not used or processed (except in the circumstances described in Section 4.2.10.2) until it has been inspected or otherwise verified as conforming to specified requirements. Verification of the specified requirements shall be in accordance with the Quality Control Plan and/or documented procedures.

The Plan shall include incoming product inspection that shall include but not be limited to:

A) Documentation review;

B) Physical inspection of materials and/or equipment;

C) Identification of items per the purchase order and shipping list, tag number or marking;

D) Verification of quantity and size;

E) Dimensional checks, when applicable;

F) Verification of protective coatings if applicable; and

G) Examination of item(s) for condition and shipping damage.

The Design-Builder shall maintain an adequate checking and approving procedure to ensure that all its work, including the monitoring, testing and approving of such work at the head office and on-site meets the Department's requirements and the Contract specifications.

In determining the amount and nature of receiving inspection, the Design-Builder shall consider the amount of control exercised at the subcontractor's premises and the recorded evidence of conformance provided.

4.2.9.3 In-Process Inspection and Testing

The Design-Builder shall:

A) Inspect and test the product as required by the Quality Control Plan and/or documented procedures; and

B) Hold product until the required inspection and tests have been completed or necessary reports have been received and verified.

4.2.9.4 Final Inspection and Testing

The Design-Builder shall jointly conduct all final inspection and testing with the Department in accordance with the Contract requirements and the Quality Control Plan and/or documented procedures to complete the evidence of conformance of the finished Project to the specified requirements.

The Design-Builder shall have documented procedures to ensure that the final observation and testing where applicable have been completed.

Records of final inspection and test are required to verify compliance to specified requirements has been achieved (see Section 4.2.16).

The Quality Control Plan and/or documented procedures for final inspection and testing shall require that all specified inspection and tests, including those specified either on receipt of product or in-process, have been carried out and that the results meet specified requirements.

4.2.9.5 Inspection and Test Records

The Design-Builder shall establish and maintain records which provide evidence that the product has been inspected and/or tested. These records shall show clearly whether the product has passed or failed the inspections and/or tests according to defined acceptance criteria. Where the product fails to pass any inspection and/or test, the procedures for control of nonconforming product shall apply (see Section 4.2.13).

Inspection and test records for inspections and tests performed by Design-Builder, the Department and/or third party shall show whether the product has passed or failed according to defined acceptance criteria. Product that fails inspection becomes nonconforming product. Also, the records shall identify the inspection authority responsible.

4.2.10 Control of Inspection, Measuring and Test Equipment

4.2.10.1 General

The Design-Builder shall establish and maintain documented procedures to control, calibrate and maintain inspection, measuring and test equipment (including test software) used by the Design-Builder to demonstrate the conformance of product to the specified requirements. Inspection, measuring and test equipment shall be used in a manner which ensures that the measurement uncertainty is known and is consistent with the required measurement capability. When an out-of-tolerance (OOT) condition shall exist on equipment, a systemic approach shall be taken to identify what the OOT values were, when, where, and how the OOT equipment was used to identify what areas contain potential risk.

Where test software or comparative references such as test hardware are used as suitable forms of inspection, they shall be checked to prove that they are capable of verifying the acceptability

of product, prior to release for use during production, installation or servicing, and shall be rechecked at prescribed intervals. The Design-Builder shall establish the extent and frequency of such checks and shall maintain records as evidence of control (see Section 4.2.16).

Where the availability of technical data pertaining to the measuring equipment is a specified requirement, such data shall be made available, when required by the Department for verification that the measuring equipment is functionally adequate.

Effective test procedures shall contain comprehensive listings of required equipment, tools, and apparatus to successfully and conclusively perform the test. Matters of “repeatability” and “reproducibility” shall also be addressed together with precision of measured results and calibration thresholds of measuring devices.

Comprehensive operations, maintenance, setup, and dimensional arrangements for the measuring, testing devices and equipment shall also be included in order to allow for their practical layout and installation at the measuring location. The Design-Builder’s QC Engineering Firm shall establish, document, and maintain procedures for the control of inspection, measuring, and test equipment. It shall be the Design-Builder's responsibility through the Quality Manager, to assess the subcontractor (see Section 4.2.5.2) to ensure the required procedures exist and are implemented.

The Design-Builder and the QC Engineering Firm shall be responsible for ensuring applicable requirements of this section are addressed.

This Section 4.2.10 applies to inspection or testing and surveying equipment. The Quality Control Plan shall address:

A) Definition of the responsibility and authority for the inspection, measuring and test equipment;

B) Procedures for selecting measurements, determining accuracy and precision required, and obtaining equipment which meets those requirements;

C) Disposition of nonconforming equipment;

D) Procedures for identification, maintenance, and storage of measuring equipment;

E) Record keeping;

F) Calibration frequency;

G) Calibration status including indicators;

H) Disposition of items checked with equipment found to be out of calibration; and

I) Traceability of primary and secondary calibration standards.

4.2.10.2 Control Procedure

The Design-Builder, through the QC Engineering Firm, shall:

A) Determine the measurements to be made and the accuracy required, and select the appropriate inspection, measuring and test equipment that is capable of the necessary accuracy and precision;

B) Identify all inspection, measuring and test equipment that can affect product quality, and calibrate and adjust them at prescribed intervals, or prior to use, against certified equipment having a known valid relationship to internationally or nationally recognized standards. Where no such standards exist, document the basis used for calibration;

C) Develop a master calibration listing indicating the inspection and test equipment that is used. The log shall include as a minimum, the identification number, item description, and the required frequency of calibration and accuracy requirements. It is not intended that calibration is required for non-precision tools and instruments such as measuring tapes, concrete slump cones, rulers, weld radius gauges, etc.;

D) Define the process employed for the calibration of inspection, measuring and test equipment, including details of equipment type, unique identification, location, frequency of checks, check method, acceptance criteria and the action to be taken when results are unsatisfactory;

E) Identify inspection, measuring and test equipment with a suitable indicator or approved identification record to show the calibration status;

F) Maintain calibration records for inspection, measuring and test equipment (see Section 4.2.16);

G) Assess and document the validity of previous inspection and test results when inspection, measuring or test equipment is found to be out of calibration;

H) Ensure that the environmental conditions are suitable for the calibrations, inspections, measurements and tests being carried out;

I) Ensure that the handling, preservation and storage of inspection, measuring and test equipment is such that the accuracy and fitness for use are maintained; and

J) Safeguard inspection, measuring and test facilities, including both test hardware and test software, from adjustments which would invalidate the calibration setting.

4.2.11 Inspection and Test Status

The inspection and test status of product shall be identified by suitable means, which indicate the conformance or nonconformance of product with regard to inspection and test performed. The identification of inspection and test status shall be maintained, as defined in the Quality Control Plan and/or documented procedures, throughout production, installation, and servicing of the product to ensure that only product that has passed the required inspections and tests is dispatched, used or installed.

The Design-Builder shall establish, document, implement and maintain an effective system for identifying and implementing the inspection and test status of Project products and services. The system shall utilize a method to identify conforming, nonconforming, indeterminate, downgraded, scrap, and rejected material.

Lack of nonconformance identification shall not be an indication of acceptance.

4.2.12 Control of Nonconforming Product

4.2.12.1 General

The Design-Builder shall establish and maintain documented procedures to ensure that product that does not conform to specified requirements is prevented from unintended use or installation. This control shall provide for identification, documentation, evaluation, segregation (when practical), disposition of nonconforming product, and for notification to the functions concerned.

There shall be documented procedures to assess nonconformance in the Design-Builder's work and in the work provided by other contractors, including the Department. The procedures shall safeguard against use of inaccurate or otherwise inappropriate information or data.

The procedures shall identify the individual(s) responsible for verifying the nonconformance, documenting it, processing the documentation in accordance with the procedures, and determining the effective corrective action/preventive action (see Section 6.2.14) to resolve the nonconformance.

Procedures shall also cover nonconformances which arise during construction. They shall address the situation where it is discovered that work does not conform to the requirements after the work item has previously been subjected to the established checking and approval process. The procedures shall also address work that is discovered or suspected to contain errors or omissions after delivery to the Department.

Work shall be immediately brought under control to limit the impact it could have on associated work, where it may have been used as input. Procedures shall include methods to inform those to whom the nonconforming material had been provided as valid information and to retrieve and isolate from use known copies of the material until a determination can be made about how to proceed. Nonconformances might be manifested as incorrect plans, errors in calculation (numerical or procedural), survey data that might be based on an incorrect benchmark or route, or even a correct design based on superseded specifications.

4.2.12.2 Review and Disposition of Nonconforming Product

The Design-Builder shall define the responsibility for review and authority for the disposition of nonconforming product.

A nonconformance shall be defined as any condition in equipment, materials, or processes which does not comply with required plans, specifications, codes, standards, documentation, records, procedures, or contract requirements which cause the acceptability of equipment, materials, or processes to be unacceptable or indeterminate.

Nonconforming product shall be reviewed in accordance with documented procedures. It may be:

A) Reworked to meet the specified requirements;

B) Required that further engineering evaluation be performed to determine if the non-conformance effects design intent/contract compliance;

C) Accepted with or without repair by consent of the Department;

D) Regarded for alternative applications; or

E) Rejected or scrapped.

The procedures shall also address the disposition of nonconforming items and the steps necessary to verify that the nonconformances have been adequately addressed and that the item then be characterized as conforming.

Where required by the Contract, the proposed use or repair of product which does not conform to specified requirements shall be reported for consent by the Department. The description of the nonconformity that has been accepted, and repairs shall be recorded to denote the actual condition (see Section 4.2.16).

The Design-Builder shall keep and maintain records of nonconforming findings (see Section 4.2.16). Also, each nonconformance record shall contain all deliberations, retesting, and resolution activities, findings, and decisions.

Repaired and/or reworked product shall be re-inspected in accordance with the Quality Control Plan and/or documented procedures.

Repair shall require the involvement of the Department, the Designer, and/or an authorized third party to review the condition and determine that although it does not meet the specified requirements, the overall impact is such that the resulting condition is acceptable.

4.2.13 Corrective and Preventive Action

4.2.13.1 General

The Design-Builder shall establish and maintain documented procedures for implementing corrective and preventive action.

This Section 4.2.13 encompasses two aspects of dealing with nonconformities. The first is implementation and effectiveness of previously implemented corrective actions.

The second is preventive action (P/A) which plays a major role in this requirement. Most procedures addressing corrective action (C/A) need to include preventive action. The investigation of nonconformances needs to look into three possible causes. They are the product, the process, and the quality system.

These nonconformances may be identified by either internal or external audits or during regular inspections or design reviews. The appropriate authority to implement, verify, and review the effectiveness of both preventive and corrective actions shall be identified. Written procedures shall be prepared and implemented to determine the root causes of nonconformances and to revise existing procedures and work instructions or to establish new ones to prevent the identified situations that cause or allow nonconformances to develop.

Any corrective or preventive action taken to eliminate the causes of actual or potential nonconformities shall be to a degree appropriate to the magnitude of problems and commensurate with the risks encountered.

The Design-Builder shall implement and record any changes to the documented procedures resulting from corrective and preventive action.

4.2.13.2 Corrective Action

The Design-Builder shall maintain and document a procedure for dealing with complaints, ensuring the recording, investigating and determining the appropriate corrective action, if any, that shall be taken.

The procedures for corrective action shall include:

A) The effective handling of complaints and reports of product nonconformities;

B) Investigation of the cause of nonconformities relating to product, process and quality system, and recording the results of the investigation (see Section 4.2.16);

C) Determination of the corrective action needed to eliminate the cause of nonconformities;

D) Application of controls to ensure that corrective action is taken and that it is effective; and

E) The tracking of complaints and identified nonconformance, and the actions taken to resolve them is an indicator of the effectiveness of the quality system.

Determination and implementation of an effective corrective action requires knowing the root cause of the problem and planning the most effective method of resolving the problem.

Follow-up action shall investigate to see if the corrective action resolved the identified problem, and also to ensure the corrective action did not have an undesirable effect on another element of the quality system.

4.2.13.3 Preventive Action

The Design-Builder shall establish, document, and maintain procedures for implementing preventive actions.

The procedures for preventive action shall include:

A) The use of appropriate sources of information such as processes and work operations which affect product quality, concessions, audit results, quality records, service reports and the complaints to detect, analyze, and eliminate potential causes of nonconformities;

B) Determination of the steps needed to deal with any problems requiring preventive action;

C) Initiation of preventive action and application of controls to ensure that it is effective; and

D) Confirmation that relevant information on actions taken is submitted for management review (see Section 4.1.C).

4.2.14 Handling, Storage, Packaging, Preservation, and Delivery

4.2.14.1 General

The Design-Builder shall establish and maintain documented procedures for handling, storage, packaging, preservation and delivery (HSPPD) of product.

The procedures which shall be developed apply to all parties involved on a Project, beginning with the Design-Builder writing the specifications all the way through to the personnel responsible for the start-up and turn-over of the facility to the Department. The specific application of the requirements is determined by the function performed: Design-Builder, manufacturer, distributor, vendor, warehousing, equipment operators, and installer.

The engineer writing the specifications shall be responsible for identifying any special HSPPD requirements and assuring the requirements are identified in the appropriate Project documents. Procurement shall be responsible for assuring the vendor, distributor and/or subcontractors are aware of the requirements and are also aware of their responsibilities to identify all requirements to their subcontractors.

Procedures shall be developed and implemented for designating which items require special handling, storage or maintenance. Development of the HSPPD procedures and work instructions are affected by the other elements of this Part 3 and therefore should be reviewed for applicability and requirement inclusion.

4.2.14.2 Handling

The Design-Builder shall provide methods of handling products that prevent damage or deterioration.

Handling is any physical or electronic movement. Project materials are usually handled numerous times from producer to installation and start-up. Procedures appropriate to the circumstances shall be developed and implemented to assure handling is done in a manner that prevents damage or deterioration of the material/equipment. There shall be assurances that handling requirements are documented and understood.

The procedures shall cover special handling by people and/or machines. Requirements for maintenance of identification and traceability shall be identified.

Special handling clothing and precautions shall be identified for all hazardous materials with assurances that only qualified and trained personnel handle the material. The handling procedures shall include instructions to follow for decontamination and notification of authorities and responsible parties in the event of an accident.

4.2.14.3 Storage

The Design-Builder shall use designated storage areas or stock rooms to prevent damage or deterioration of product, pending use or delivery. Appropriate methods for authorizing receipt to and dispatch from such areas shall be stipulated.

In order to detect deterioration, the condition of product in stock shall be assessed at appropriate intervals.

Items requiring protection shall be identified and protected as necessary to prevent loss, damage deterioration or loss of identification.

Special storage requirements shall be clearly defined for materials and equipment which is received on the Project; this includes plans, records and operating manuals. A master list shall be maintained indicating applicable purchase orders, including quantity, product identification, documentation and records required, receiving inspection requirements and items requiring special storage or maintenance.

Materials shall be segregated to prevent cross contamination or environmental contamination.

Material with limited shelf life shall be identified and procedures developed and implemented to identify means of assuring usage of material prior to expiration date. The procedures shall also identify the disposal of materials that may be toxic, hazardous or might otherwise have an adverse effect on the environment or on unsuspecting humans.

4.2.14.4 Packaging

The Design-Builder shall control packing, packaging, and marking processes (including materials used) to the extent necessary to ensure conformance to specified requirements.

Engineering or procurement documents shall specify applicable packaging requirements to ensure no damage, contamination or deterioration occurs in the course of packaging and transporting the material and equipment. Procedures/work instructions shall clearly define all special packing and packaging and marking process requirements (i.e., export crating, moisture barrier, regulatory requirements, climate control, identification, and all contract requirements).

Labeling of hazardous materials, special handling instructions and notification of authorities and Design-Builder shall be clearly and plainly identified on the packaging.

4.2.14.5 Preservation

The Design-Builder shall apply appropriate methods for preservation and segregation of product when the product is under the Design-Builder's control.

Procedures shall include special unpacking instructions, controlled conditions necessary to prevent or deter deterioration of material or equipment, prevention of corrosion and/or contamination, and required servicing.

4.2.14.6 Delivery

The Design-Builder shall arrange for the protection of the quality of product after final inspection and test. Where contractually specified, this protection shall be extended to include delivery to destination.

When delivery of equipment and/or materials to the job site is the responsibility of the Design-Builder, they shall develop procedures or reference appropriate standards to protect the items during delivery.

4.2.15 Control of Quality Records

The Design-Builder shall establish and maintain documented procedures for identification, collection, indexing, access, filing, storage, maintenance, and disposition of quality records.

Quality records shall be maintained to demonstrate conformance to specified requirements and the effective operation of the quality system. Pertinent quality records from the subcontractor shall be an element of these data.

Records shall be kept of documents which serve as evidence that quality is achieved in work on a Project. Records shall be adequately identified, filed, and stored. Retention periods and the storage medium of such records shall be established in accordance with Contract requirements.

All quality records shall be legible and shall be stored and retained in such a way that they are readily retrievable in facilities that provide a suitable environment to prevent damage or deterioration and to prevent loss. Quality records shall be made available for evaluation by the Department per Contract requirements.

The Design-Builder shall develop and implement procedures to store, retrieve, and dispose of the documents required by the quality management system, including but not limited to correspondence, certifications, design calculations, plans, reports of design reviews, and audit reports. In storage, whether active Project files or long term archives, documents that are designated as records shall be originals or reproducible copies and shall be legible, accurate, identified, and indexed so they can be associated with specific Projects. They shall be retrievable in a timely manner. Storage criteria shall be set to specify allowable storage media and ensure physical protection from damage or loss, which could involve duplicate storage facilities for some types of records.

Management shall identify records necessary to provide objective evidence of contract review, procedure compliance, design review (when applicable), training, and completion and acceptance of inspection and testing, or to provide traceability of equipment or items to documentation.

A list of Project-required records shall be developed, retained and/or turned over to the Department prior to completing the Work.

4.2.16 Internal Quality Audits

The Design-Builder shall establish and maintain documented procedures for planning and implementing internal quality audits to verify whether quality activities and related results comply with planned arrangements and to determine the effectiveness of the quality system.

Internal quality audits shall be conducted in accordance with sound auditing principles. The frequency of the audits shall be appropriate to the importance and complexity of a Project or corporate operation, but shall at least be on a quarterly basis. Audits shall be initiated early enough in the life of a Project to assure effective quality control during all phases. The audits shall include Project management as well as technical work activities.

Internal quality audits shall be carried out by personnel independent of those having direct responsibility for the activity being audited.

The internal quality audit program shall provide verification that the quality system is operating and being implemented as planned. Audits should be conducted on a planned and scheduled basis, consistent with the importance of the activities being performed.

The results of the audits shall be recorded and brought to the attention of the personnel having responsibility in the area audited. The management personnel responsible for the area shall take timely corrective action on deficiencies found during the audit.

Follow-up audit activities shall verify and record the implementation and effectiveness of the corrective action taken.

The results of internal quality audits shall be reviewed in management review meetings. In accomplishing management review the results of internal audits and their attendant C/A status shall be reviewed for adequacy and effectiveness.

Auditor qualifications shall be established and documented by the Design-Builder. Staff assigned auditing tasks shall be qualified accordingly, with qualification records maintained as quality records. Auditing need not be a full-time assignment, but staff assigned auditing tasks shall have no direct responsibilities for the function or work they audit.

Audits shall be carefully planned and executed to avoid or minimize disruption of the audited activity. Results shall be provided promptly to personnel responsible for the audited activity and their management. Corrective action shall be developed to identify the root causes and to institute measures to prevent the types of deficiencies identified in the audit. Corrective actions shall be monitored through review of documents, surveillance, or follow-up audits. These actions should be conducted in a timely manner to determine the effectiveness of corrective action that is implemented. Records of corrective actions should be kept together with the respective audit records.

Records of internal audits shall be maintained by the Design-Builder.

4.2.17 Training

The Design-Builder shall establish and maintain documented procedures for identifying training needs and provide for the training of all personnel performing activities affecting quality. Personnel performing specific assigned tasks shall be qualified on the basis of appropriate education, training and/or experience, as required. Appropriate records of training shall be maintained (see Section 4.2.16). Subcontractors shall be trained on the Design-Builder's Quality Program as needed, and on project contract requirements applicable to their work.

The Design-Builder shall establish documented procedures and records to ensure that the skills and professional judgment of their personnel are developed appropriately for their intended roles, through training and/or the recorded accumulation of experience; with systematic reviews of their competence at determined levels, and before any deployment of new roles.

Training shall focus on improving competency and skill for those performing activities that materially impact quality.

Procedures established shall include:

A) Position descriptions defining the requirements of the various positions required in conducting activities affecting quality;

B) Personnel records documenting each person's experience and current education and training accomplished, both formal and informal, relative to current or projected position assignments;

C) Documented evaluation of that experience and training, including a determination of what training is required to become fully qualified for the activities to which the person is intended to be assigned;

D) A documented plan to accomplish the training deficiency;

E) Records documenting accomplishment of that training; and

F) Education, experience and licensure used as a basis for qualifications of individuals should be verified.

All qualification and training records are quality records and shall be maintained accordingly (Section 4.2.16).

Project personnel shall be trained in all the special Project procedures applicable to their work.

Craft journeymen with special skills need not be trained but their competency shall be verified and a record maintained of the verification.

SECTION 5 DESIGN, DESIGN QUALITY CONTROL AND QUALITY ASSURANCE

This section sets out requirements relating to the development of designs by the Design-Builder, and design review processes.

5.1 DESIGN REQUIREMENTS

A) The Design-Builder shall provide design studies, reports, calculations, computer input and output files, plans, and specifications as required for the Design-Builder to provide all documents and files in accordance with the requirements of the Contract. The Design-Builder shall:

1) Manage and perform the Design Work pursuant to the requirements of the Contract Documents.
2) Manage and perform the Quality Control for the Design Work.
3) Manage, coordinate, and obtain all necessary approvals and permits.
4) Prepare all Design Documents under the direct supervision of the Design-Builder's Designer.
5) Verify pertinent dimensions and other relevant existing conditions in the field prior to the Submittal of the design plans.

B) In addition to the Contract Documents, the Design-Builder shall comply with all other applicable engineering codes and standards, including those of the various Federal, State, and local jurisdictions. Codes, standards and/or manuals in effect on the proposal due date, as adopted by the Department, shall be applicable to the Project.

C) Design plans and specifications, together with all pertinent supporting documents and data, shall be subject to Review by the Department. See Appendix D – Quality Assurance Plan Program Guide.

D) Third Party, Utility, County or locality specific requirements, to the extent cited, apply only with respect to that portion of the Work performed for such Third Party, Utility Owners, or County.

5.2 DESIGN UNITS

A) A Design Unit is a distinct portion of the Project of which the design is performed as a contiguous, integrated unit.

B) It is the intent of the Department to allow construction of specific Design Units to begin prior to completing the final design of all Design Units. Construction of a specific Design Unit may begin at any time after the applicable design review and comment and acceptance by the Department of the Release for Construction Design, provided that the design conforms to all applicable codes and Contract requirements, all safety measures are in place, equipment/material are ready and all the Department's concerns have been addressed to the satisfaction of the Department's Project Manager. Construction may progress in increments determined by the Design-Builder, at the Design-Builder's risk, provided each increment of construction is covered by calculations, drawings and

specifications that have been reviewed by the Department and meet the requirements for Release for construction.

C) The Design-Builder shall package all calculations, designs, and drawings for the Work into separate Design Units and, if necessary, sub-units. Design of each Design Unit or sub-unit shall be performed in a contiguous, integrated manner. Each Design Unit shall comprise similar and coherent parts of the Project that can be checked and reviewed as a self-contained package with due consideration for accommodating interfaces with other Project components.

D) Within 30 Calendar Days of NTP, the Design-Builder shall provide a written report and schedule updating information submitted with the Design-Builder's Proposal and identifying each Design Unit. The Design-Builder shall prepare and submit the Design Unit report to the Department for Review and Comment. The written report shall include the following:

1) Design Unit description, including scope of design Work within each Design Unit (including sub-units, if necessary), including limits and interface points.
2) Planned review stages and dates, including specific information to be reviewed, planned review dates (measured from NTP date) and percent complete represented by each review.
3) Responsible Engineer for the Design Unit.
4) Locations where design Work will be performed.

5.3 DESIGN DOCUMENT ORGANIZATION

The Design-Builder shall arrange Design Documents in a systematic order and identify them with alpha/numeric designations based on discipline designations, locations, and sequential numbering. Design-Builder shall present their proposed organization at the Design Mobilization meeting.

5.4 DESIGN CERTIFICATION

5.4.1 General

The Design-Builder shall provide Design Certification by the Project Manager, the Design Manager, the Design QC Engineer, and the Quality Manager that each design unit Submittal at every stage of design development, as described in Section 5.7, is:

A) Consistent and compliant with all applicable requirements of the Contract Documents.

B) Consistent with all other elements of the Project.

C) Accurate, complete, and in a form and level of detail that is appropriate to the design stage to which it applies.

D) Coordinated among all requirements of the Contract Documents.

E) Have been prepared in accordance with the Design-Builder's Quality Control Plan.

5.4.2 Design Quality Control Engineer

The Design-Builder shall assign a Design QC Engineer. The Design QC Engineer shall report to the Design-Builder's Quality Manager.

The Design QC Engineer shall be responsible for the Quality Control of all Work conducted by the Designer, including Quality Control related to design support during construction, design changes, and completion of As-Built Plans. The Design QC Engineer shall be a licensed Professional Engineer in the State of New York.

The Design-Builder's Design QC Engineer shall assess and evaluate the Design-Builder's design QC activities in order to be able to certify to the Design-Builder and to the Department that the design Quality Control activities comply with the Quality Control Plan and Contract requirements.

The Design QC Engineer shall have Quality Control responsibilities related to the following:

A) Design of permanent and major temporary components;

B) Changes in design of permanent components;

C) As Built Plans

D) Identifying and reporting non-conformities/non-compliance; and

E) Tracking, monitoring, and reporting on status of outstanding design-related non-conformance reports.

5.4.3 Supervision and Seals

A) Prior to delivering any Release for Construction Documents to the Department or to any of the Design-Builder's construction teams:

1) The contents of the Release for Construction Documents shall be individually signed and sealed by the licensed Professional Engineer or Architect under the laws of the State of New York responsible for the specific content included in the documents.

2) The Design Manager and Design QC Engineer shall provide certification signature on the title sheet.

5.5 DESIGN EXCEPTIONS

All design deviations from specified standards or design-related Contract requirements are defined as Design Exceptions. Design Exceptions must be submitted to the Department's Design QA Engineer for review and Approval. It is the goal of the Department to respond to all Design Exceptions within 20 working days. All requests for deviations and exceptions must be submitted with a justification report detailing the reasons to retain a non-standard or substandard feature or for providing an improvement that does not bring the feature up to standard or does not meet the Contract requirements. The Department is under no obligation to accept any Design Exception, but each shall be evaluated on a case-by-case basis. Design Exceptions must be submitted to the Department no later than the Interim Design Review and shall not be incorporated into design

submissions until approved. For Expedited Design Units, Design Exceptions must be submitted to the Department no later than the Definitive Design Review.

The approval of a Design Exception is in no way direction from the Department to incorporate the requested deviation. Therefore, any additional changes to or impacts on the design, construction, schedule, or cost of the Project that may result from the implementation of the content of the Design Exception is the sole responsibility of the Design-Builder.

Design Exceptions are not intended to retroactively relieve the Design-Builder of a requirement. If a design review reveals a non-conformance with the Contract requirements, the Department will prepare a Design Non-Conformance Report and submit it to the Design-Builder for action. The Design-Builder shall note the Non-Conformance and resolution in the monthly report and provide written confirmation to the Department when the Non-Conformance is corrected.

All Design Reviews shall include a comment and Non-Conformance report resolution process where unresolved comments and non-conformance reports are discussed and a written action plan and schedule for resolution of unresolved comments and Non-Conformance reports is developed. The Design QC Engineer will lead the process.

Any Design Non-Conformance Reports issued by the Design QC Engineer or the Department must be addressed and resolved by the Design-Builder to the satisfaction of the Department prior to any design being released for construction.

5.6 EXISTING CONDITIONS

The Design-Builder shall ensure that the condition of existing buildings, structures, roadways, sidewalks, paths, trails, lighting, and signal and/or ITS equipment, or other property that is to remain in place or is to be modified is not adversely affected by the performance of the Work. The Design-Builder shall perform appropriate property pre-condition surveys and associated monitoring, and shall repair any damage determined to be caused by the Work. All repair to damage shall be at the Design-Builder's expense.

5.7 STAGES OF DESIGN DEVELOPMENT

The Design-Builder shall make a single comprehensive design check and Design Review for each Design Unit at the stages of design development specified below:

1) Definitive Design;
2) Interim Design;
3) Final Design;
4) Release for Construction Design;
5) Working Plans; and
6) As-Built Plans.

Expedited Design Units shall follow the design development as outlined in Section 5.7.5. The intent of each stage of design development and Design Review is to verify that the design complies with the Contract requirements; allows components of Design Units to be released for construction; and/or in the case of reviews of Work Plans, to allow construction to continue.

Design Reviews or design checks shall be completed as specified in Section 5.8, for each Design Unit at each stage of design development.

The Design-Builder shall time the Design Review to be consistent with the Baseline Progress Schedule.

The Design-Builder shall determine the appropriate level of design completion for each stage using the requirements of the Contract Documents, good industry practice, and the designated Submittal requirements for each stage in order to ensure all Project requirements are met.

5.7.1 Definitive Design

The Design-Builder shall prepare and submit a Definitive Design for each Design Unit to the Department for review and comment.

The Definitive Design submission shall represent conceptual design of the character and all features of the project and serve to validate project requirements and the construction cost. The Definitive Design submission shall be preceded by or include the Design Criteria Report and Basis of Design Report per Section 5.10.

5.7.2 Interim Design

The Design-Builder shall prepare and submit an Interim Design for each Design Unit to the Department for review and comment.

The Interim Design submission shall represent the overall size, character, and features of the Project and serve to thoroughly convey the designer's intentions, define elements such as major demolition, structural, track work, utilities, earth work, environmental considerations, shoring and temporary support and ancillary, work, operations, and materials. The Interim Design Submission shall include, at a minimum, Design Plans, Project Specifications, and Calculations as described in Section 5.10 for major design components and shall incorporate comments generated by the Definitive Design Review.

5.7.3 Final Design

The Design-Builder shall prepare and submit a Final Design for each Design Unit to the Department for review and comment.

The Final Design submission shall be a 100% complete set of the Design Criteria Report, Basis of Design Report, Design Plans, Project Specifications, and Calculations as described in Section 5.10, and shall incorporate comments generated by the Definitive and Interim Design Reviews and bring construction documents to a substantially complete level.

5.7.4 Release For Construction Documents

The Design-Builder shall prepare and submit Release for Construction Documents for each Design Unit to the Department for review, comment, and acceptance. Release for Construction Documents (RFCD) shall be signed and sealed by the Design-Builder.

The RFCD submission shall be a 100% complete, signed, and sealed set of the Design Criteria Report, Basis of Design Report, Design Plans, Project Specifications, and Calculations as

described in Section 5.10, and shall incorporate comments generated by the Definitive, Interim and Final Design Reviews. The RFCD may only be issued by the Design-Builder after all previous comments related to the elements, whether in the subject Submittal or not, have been addressed and appropriately incorporated, non-conformances have been corrected, and appropriate approvals and permits have been obtained.

The Design-Builder shall submit Release for Construction Documents to the Department for review, comment, and acceptance before commencing the Construction Work contained in the RFCD.

5.7.5 Expedited Design Unit

An Expedited Design Unit may be requested by the Design-Builder on a limited basis (no more than 20% of the total number of Design Units). The Design-Builder must demonstrate to the Department that there is a high degree of urgency that requires the acceleration of the design package. Expedited Design Units shall be identified and discussed at the Design Workshop and are subject to approval by the Department as part of the Design Review Plan and Design Unit Report.

In the case of an Expedited Design Unit, the Design-Builder shall submit the Definitive Design submission, Final Design submission, and the Release for Construction submission.

5.7.6 Conformed Release For Construction Documents

A) The Design-Builder shall at all times maintain a conformed, electronic .dgn and .pdf format, set of all RFCD plans, specifications, and shop drawings. The conformed RFCD shall also include formally issued revisions made after release for construction, but are not construed as as-built records.

B) The conformed RFCD shall be electronically accessible to the Department from Project and remote locations at all times. The conformed RFCD shall contain master indexes such that relevant plans, specifications, or shop drawings can be easily located.

5.7.7 Working Plans

The Design Builder shall submit Working Plans as applicable for all Project elements. Working Plans shall include the development and production of working drawings and shop drawings needed for the scope of work. The Design-Builder shall be responsible for the review and approval of all Working Plans, including certification that they are in compliance with the accepted design documents. The review, approval, and certification process shall be in conformance with the Design-Builder's Quality Control Plan, Section 5.8.6 and Section 5.10.8. Working Plans shall be submitted to the Department for review and comment, prior to their being issued for construction.

The Design-Builder shall invite the Department to participate in the review of Working Plans before formal submittal. The Department may invite the Stakeholders to participate in reviews of Working Plans.

Working Plans include those documents prepared by the Design-Builder to supplement Design Plans to specify additional details and procedures for construction of the Project, including the following:

A) Construction details;

B) Demolition Plans;

C) Erection plans;

D) Fabrication plans;

E) Transportation plans;

F) Storage plans;

G) Field design change plans;

H) Stress sheets;

I) Shop plans;

J) Lift plans (see additional requirements in Section 14.7);

K) Bending diagrams for reinforcing steel;

L) Falsework plans;

M) Temporary Structure Plans (see additional requirements in Section 14.7);

N) Material Waste Area Grading Plans;

O) Other Plans required to adequately describe the Work in accordance with the Contract;

P) Similar data required for the successful completion of the Work;

Q) Material and product data from Manufacturers; and

R) Calculations.

5.7.8 As-Built Plans

As-Built Plans shall be developed by the Design-Builder's Designer and include the as-built information as documented and provided by the Resident Engineer. As-Built Plans are critical to document the location of utility facilities and other underground information during construction, because the information cannot be collected later without excavation, restoration, etc. They are also critical for accurate documentation of the structural components completed and installed during a project. As-Built Plans shall document all field revisions which have already occurred but are not the mechanism to authorize the revision.

The Resident Engineer shall submit "red-line" as-built mark-ups within 5 calendar days after completion of the work shown on the RFC plan sheet to the CQAE for concurrence and to the Design-Builder's Designer to incorporate as part of the As-Built Plans. The Design-Builder shall submit the complete As-Built Plans package in electronic .dgn and .pdf formats no later than 30 calendar days after completion of all field work. The As-built Plans shall be a compiled package of each Design Unit which shall include a Project Title Sheet and As-Built Drawing list for the entire compiled package i.e. All Design-Units shall be combined into ONE compiled package.

The drawings do not need to be reordered but shall be combined with a continuous series of sheet numbers for the entire package as noted in the As-built Drawing list. For “bundled bridge” projects or similar projects consisting of multiple locations of construction, each project location shall receive a separate compiled package. The As-Built plan sheets are to be prepared in the same manner as the original plan sheets, which may include color, shaded areas, and other display attributes. As-builts plans shall conform to NYSDOT CAD Standards, except as modified in this section. The Design-Builder shall check, review and certify that the as-built package is an accurate record of the constructed project and in accordance with Section 5.8.7. As-built plans shall be signed and sealed.

The As-Built record includes:

- RFC Plan Sheets (As designed and accepted with all revisions prior to construction)
- Shop Drawings (All approved structural drawings)
- Field Change Sheets (If created)
- As-Built Plan Sheets (as described above)

5.8 DESIGN REVIEWS

The Designer’s organization shall check all design documents (drawings, plans, specifications, calculations, and reports) and Working Plans produced by the Design-Builder’s organization. The Design QC Engineer shall certify that these documents have been checked per Contract requirements and the Design-Builder’s Quality Control Plan. The Design QC Engineer’s written certification shall provide the certification specified in Section 5.4.

The Design-Builder shall submit Definitive, Interim, Final Design, and Release for Construction Documents to the Department’s Design Quality Assurance Engineer for consultation and written comment. The Department may invite other Project Stakeholders to participate. The Design-Builder shall address and/or resolve the Department comments in consultation with the Department.

The Design-Builder’s time and cost impacts of revisions arising from Department’s and Stakeholders’ participation in Design Reviews and/or caused by Design-Builder’s non-compliance with Contract requirements, including the Department’s and Stakeholder’s time for reviewing revisions, shall be borne by the Design-Builder.

The Design-Builder shall notify and invite the Department to participate in all Design Reviews conducted by the Design QC Engineer. The Department may also invite Project Stakeholders and affected Utility Owners to participate. The Department will provide Consultation and Written Comment (based on the Department and Stakeholder participation) regarding these Design Reviews.

For Design Reviews conducted by the Design QC Engineer, the Design QC Engineer shall provide a Design Review report (a tabulation of comments and resolutions) for each Design Unit at the conclusion of each Design Review. The Design Review reports will identify any actions arising from the reviews. The report shall note items requiring corrective action on the Design Non-Conformance Report. The Design QC Engineer shall send the Design Non-Conformance Report to the Designer and a copy to the Department.

5.8.1 Definitive Design Review

The Definitive Design Review shall be the first Design Review after Award and is intended to verify that the design concepts proposed by the Design-Builder meet Contract requirements. The Definitive Design Review shall verify the following:

A) The design concepts, including conceptual construction phasing, constructability, governing future design development are defined consistent with Contract requirements;

B) The final Basic Project Configuration, including any additional non-standard features not previously defined in the RFP Project Requirements; For projects that are classified Projects of Division Interest (PODI) Level 1 – Full Federal Oversight, these additional non-standard features shall be submitted to the Department's Project Manager for review and approval by FHWA;

C) The design concepts are substantiated and justified by adequate Site investigation and analysis, including confirmation of the presence or non-presence of hazardous materials (asbestos, lead paint, contaminated soils in bridge approach areas);

D) Final Rights-Of-Way requirements;

E) The specific standards applicable to the proposed concepts are identified and appropriate;

F) The availability of required Materials/Equipment; and

G) The design meets Project quality requirements and required design QC procedures have been followed.

If the Definitive Design is amended subsequent to the Definitive Design Review, the Design-Builder shall re-check and re-certify the design as an additional Definitive Design Review.

5.8.2 Interim Design Reviews

The Interim Design Review shall be the Design Review after Definitive Design.

The Interim Design Review(s) shall verify that the concepts and parameters established and represented by Definitive Design are being followed and that Contract requirements continue to be met. The Design-Builder shall specifically highlight, check, and bring to the attention of the Department any changes to information presented at Definitive Design. Interim Design Plans shall include Standard Specification and/or Special Specification Pay Items for all construction items presented in the Plans. The Design-Builder shall submit the Interim Design for Consultation and Written Comment by the Department's Design QA Engineer.

5.8.3 Final Design Review

The Final Design Review shall be the Design Review after Interim Design, or after Definitive Design in the case of Expedited Design Units. The Design-Builder and the Department shall use the Final Design Review to verify that the concepts and parameters established and represented by the Design-Builder are being followed and that Contract requirements continue to be met. The Design-Builder shall specifically highlight, check and bring to the attention of the Department any

changes to information presented at previous design reviews. The Design-Builder shall submit final design for Consultation and Written Comment by the Department's Design QA Engineer.

5.8.4 Release for Construction Review

The Release for Construction Review shall be the Design Review after Final Design. The Design-Builder and the Department shall use the Release for Construction Review to verify that the concepts and parameters established and represented by the Design Builder are being followed and that Contract requirements continue to be met. The Design-Builder shall specifically highlight, check, and bring to the attention of the Department any changes to information presented at the Final Design stage. The Design-Builder shall present the information for Release for construction review to the Department for Consultation and Written Comment by the Department's Design QA Engineer.

By submitting the Release for Construction Packages, the Design-Builder is confirming that the following items have occurred:

A) The Designer has conducted its design QC checks throughout the design process in compliance with the Quality Control Plan and certifies in writing that the design is complete to the appropriate level or stage of review, checked and ready to be released for construction;

B) The Design QC Engineer has signed the title sheet for the drawings, certifying the following (the title sheet can be formatted to include the items of certification):

    1) Design checks have been completed;

    2) Work conforms to Contract requirements;

    3) Any deviations or design exceptions have been approved in writing by the Department;

    4) Design QC activities are following the Design-Builder's Quality Control Plan; and

    5) All outstanding issues or comments from Design Reviews have been resolved;

C) The Responsible Engineer has signed all drawings prepared under his/her direction. For those drawings and documents included in the submittal that are prepared by a Manufacturer or Supplier or other Persons not under his/her direct supervision, the Responsible Engineer will affix a stamp that indicates the design shown on the sheet or document conforms to the overall design and Contract requirements;

D) The Design Manager has signed the title sheet to the drawings certifying to the items contained in Section 3.2.4.3. (The title sheet can be formatted to include the items of certification);

E) The design has undergone constructability review and is constructible as represented;

F) Work Plans, Project Specifications and related documents for the portion of the Project to be constructed are complete and checked in accordance with this Section 5.8;

G) The design and drawings for WZTC and temporary erosion control and environmental measures applicable to the Work are complete;

H) Adequate stakes, lines, and/or monuments necessary to control the Work have been established on the Site;

I) The Release for Construction plans and specifications have been stamped “Release for Construction” and signed by the Designer before being issued; and

J) The Department’s Design Quality Assurance Engineer has provided Consultation and Written Comment regarding the design.

The Design-Builder shall not begin any demolition or construct any permanent components or major temporary components until the Department’s Design Quality Assurance Engineer has signed the Release for Construction package to verify that all the reviews are complete and that all comments have been resolved satisfactorily.

To accommodate the Design Quality Assurance Engineer’s signature, the Design-Builder shall provide space in the title block of all sheets adjacent to the Professional Seal blocks, stating that “This drawing has undergone reviews as required under RFP Part 3, Section 5.8.4 of the Contract Documents.”

5.8.5 Expedited Design Unit Review

Per Section 5.7.5, Expedited Design Units shall be submitted, at a minimum, for Definitive Design, Final Design, and Release for Construction. The review of all Expedited Design Units shall conform to the relevant Design Review processes as described in the sections above.

5.8.6 Working Plans Review

The Review of Working Plans shall include documents submitted per Section 5.7.7. The Design-Builder shall schedule and conduct Working Plan reviews only after the Design-Builder has approved the Working Plan. The Design-Builder and the Department shall use the review of Working Plans to verify that the Design-Builder has met the appropriate standard of care for the component and that the Design-Builders Quality Control Plan procedures have been followed. The Design-Builder shall submit Working Plans for Consultation and Written Comment by the Department’s Design QA Engineer or Construction QA Engineer, as determined by the Department.

5.8.7 As-Built Review

As-Built Plans and Project Specifications shall incorporate complete information that defines the Work as constructed to meet the Contract requirements and as documented by the Resident Engineer.

The Design-Builder shall submit As-Built Plans to the Department for review and Design Acceptance in accordance with Section 5.7.8. The Design-Builder shall submit a conformed set of As-Built Plans to the Department’s Project Manager within thirty calendar days following completion of all Work. Design Acceptance by the Department will not occur until the As-Built Plans are submitted, reviewed and corrected to the satisfaction of the Department.

5.8.8 Design Quality Assurance Review Durations

It is intended that design review durations by the Design Quality Assurance Engineer be as short as possible. To make this possible the Design-Builder shall develop a design schedule that clearly shows the occurrence of design reviews (definitive designs, interim designs, final designs, Release for Construction designs, etc.) so that the Design Quality Assurance Engineer can be prepared to receive the documents and set time aside to complete the review.

Also, it is intended that the Design Quality Assurance Engineer will be at the designer's office as often as necessary to comment on the design and attend the designer's progress and quality review meetings so as to be fully aware what the details of the design are and to give early comments on the design. It would be expected that these informal "over the shoulder" reviews will allow the formal submission of designs to be reviewed quickly and with few if any comments.

Designs will be reviewed by the Design Quality Assurance Engineer and the formal reviews will be completed within the following time frames after the design documents are received.

- Definitive design review – 5 business days
- Interim design review – 10 business days
- Final design review – 5 business days
- Release for Construction design review – 5 business days
- Working Plan review – 5 business days

In the event of an Expedited Design Unit, designs will be reviewed by the Design Quality Assurance Engineer and the formal reviews will be completed within the following time frames after the design documents are received.

- Definitive design review – 5 business days
- Final design review – 10 business days
- Release for Construction design review – 5 business days
- Working Plan review – 5 business days

Review durations for Design Unit Submittals that contain Special Specifications, including Special Specifications that are being submitted to the Department for the first time, shall be determined on a case by case basis.

As a prerequisite to ensuring that these review durations by the Design Quality Assurance Engineer are achieved, the Design-Builder shall provide documentation demonstrating that all the Designer's Quality Control activities have been completed for the plans, specifications, and necessary calculations in accordance with the Design-Builder's Quality Control Plan and the Contract Requirements.

5.8.9 Comment Resolution

Department comments from Design Reviews will be recorded and transmitted to the Design-Builder. The Design-Builder shall record its proposed disposition and response to each comment

and meet with the Department to resolve outstanding comments and dispositions. Resubmissions of Design Units may be required in order to resolve comment.

5.9 SCHEDULE FOR DESIGN CHECKS AND REVIEWS

The Design-Builder is responsible for scheduling and conducting Design Reviews to meet design and/or construction needs of the Baseline Progress Schedule. It is recognized and anticipated that the Design Review process and frequency, duration and intensity of Design Reviews may vary with the complexity of the individual Design Units and the associated construction activities. The duration of Design Reviews shall be discussed and mutually agreed between the Department and Design-Builder during the Design Workshop (Section 5.11.1) and verified and modified by mutual agreement during the course of the Project. The Design-Builder shall give written notice of scheduled Design-Reviews to the Design Quality Assurance Engineer at least one week prior to any review.

The Design-Builder shall include the agreed Design Review schedule for all Design Units as part of the Baseline Progress Schedule. The Design Review schedule shall be reviewed monthly. The Design-Builder shall not schedule more than two concurrent Design Reviews per discipline without the Department's concurrence.

Except for As-Built Plans, plans to be reviewed shall be in the form of sufficient copies of Design Plans and Project Specifications and supporting data and reports assembled for review to accommodate participants in the Design Review(s).

The Design-Builder shall make specified submittals of checked designs in accordance with Section 5.8. Submissions shall be complete for each Design Unit, but may be combined for multiple Design Units at any one time upon the Department's concurrence. The Design-Builder shall submit each Design Unit for Consultation and Written Comment by the Design QA Engineer. The Design-Builder shall provide written responses to all comments provided by the Design QA Engineer.

For each Design Unit, the Design-Builder shall include design checks and Design Reviews as indicated in Section 5.8, and such additional reviews as may arise. The Design-Builder shall allow the time for the Department's participation and input to any Design Review conducted by the Design-Builder's Design QC Engineer. The Design-Builder shall incorporate this schedule into Design-Builder's Baseline Progress Schedule and report progress and updates in the monthly updates. The Design-Builder shall keep the Department up to date on exact timing of reviews and Release for construction Design Reviews through the scheduled progress meetings.

5.10 COMMON DESIGN DOCUMENTS

Certain types of Design Documents are required for all elements and engineering disciplines. In addition to the Submittal requirements listed in each Section of the Technical Provisions, the Design-Builder shall prepare and submit the following Design Documents for every element and engineering discipline.

5.10.1 Design Criteria Report

The Contract Documents provide design criteria for some designs. The Design-Builder shall develop design criteria for the remaining designs. The Design Criteria Report shall identify how the requirements of the Contract Documents have been interpreted in terms of the configuration, performance, and all other requirements. Design Criteria shall also specify the relevant editions

of all codes and standards applicable to each design. The Design Builder may submit the Design Criteria as part of the Basis of Design Report as defined in Section 5.10.2.

5.10.2 Basis of Design Report

A) The first submittal related to a Design Unit shall include, or be preceded by, a Basis of Design Report (BODR). Each BODR submitted shall be a portion of the comprehensive BODR. The Design-Builder shall submit each BODR for Review and Comment by the Department. The Release for Construction Documents for a given Design Unit shall not be submitted for Department review until all comments on the BODR are closed.

B) The Design-Builder shall create and maintain a comprehensive Basis of Design Report (BODR) for the Project. The comprehensive BODR shall be made up of the BODRs submitted for each Design Unit

C) The Design-Builder shall submit the comprehensive Basis of Design Report Record Document for Review and Comment upon completion of all elements of the BODR. Department acceptance of the comprehensive Basis of Design Report is a requirement of Final Acceptance

D) The BODR Record Document shall be logically organized wherein each of the major Work elements are organized, including:

1) Table of Contents.
2) Executive Summary.
3) Project Controls.
4) Design Work.

E) The BODR shall address the following as applicable to each element:

1) Design methodology and approach.
2) Key assumptions:
   i. Identify applicable design criteria (the Design Criteria as defined by Section 5.10.1 can be included here as part of the Basis of Design Report), considerations, influences, and factors.
   ii. Identify concurrent design activities.
   iii. Identify construction approach, including sequence, phasing and staging (if applicable).
   iv. Identify any deviations from the FEIS and any associated revisions to governmental approvals.

5.10.3 Project Plans

The Work shall be performed in accordance with the details as shown on the Design Plans prepared by the Designer and those Work Plans prepared by the Design-Builder. It shall be solely the Design-Builder's responsibility to provide Work Plans of such a nature as to develop a finished

product in accordance with Design Plans, Project Specifications, and Contract requirements. The Design-Builder shall verify pertinent dimensions in the field prior to conducting a Work Plans review. Participation in the review of the Design-Builder's Design Plans and/or Work Plans by the Department (or Stakeholders, if invited by the Department) shall not relieve the Design-Builder of the responsibility for the satisfactory completion of the Work.

All Release for Construction Design and As-Built Plans shall be signed and stamped/sealed by the appropriate Responsible Engineer and shall include, on the title sheet for the plans, certification signatures of the Design Manager and the Design QC Engineer.

5.10.4 Project Specifications

Written specifications shall be provided that document the requirements for materials, equipment, systems, standards and workmanship for the Work and performance of related services. Every submittal starting with Interim Design shall include specifications. The Design-Builder shall use the NYSDOT Standard specifications, and the NYSDOT special specifications as included in Part 8 of this RFP. In the event that a NYSDOT spec needed to cover the project work doesn't exist, the Design Builder shall develop, and submit a new special specification for review and comment, and approval by the Department.

The Design-Builder shall prepare Project Specifications based on Contract requirements, including the Department's Standard Specifications, Construction and Materials Section 200 through 700). The Design-Builder may perform the following activities:

A) Use the Department's Standard Specifications as supplemented by the Contract;

B) Prepare supplements to the Standard Specifications; and/or

C) Prepare new Specifications to cover Work not covered by the Standard Specifications.

Project Specifications, including the Sections 200 through 700 of the Department's Standard Specifications, will be reviewed by the Design-Builder and the Department during Design Reviews to verify that the Project Specifications provide a level of quality that meets or exceeds the Contract requirements and are suitable and appropriate to control the Work. Development and implementation of Project Specifications will not require a Change Order provided that the Project Specifications are of equal or greater quality than the Specifications presented in Contract Documents. The Design-Builder shall be responsible for demonstrating that the Project Specifications meet or exceed the standard of quality established by the Specifications in the Contract Documents. Any deviation that results in lesser quality will require Department approval and may require the execution of an Order-on-Contract. The Department shall determine, at its sole discretion, if the Project Specifications meet the Contract Requirements.

Project Specifications shall define the type and frequency of QC sampling and testing to be conducted for the Work covered by a Project Specification.

A pay item index corresponding to the item numbers called out throughout the design plans shall be submitted with the design submissions for each Design Unit, beginning with the Interim Design submission. The index shall list all item numbers applicable to that Design Unit, and include any new special specifications developed for the project and approved by the Department.

5.10.5 Calculations

The Design-Builder shall prepare and submit calculations for Design Units including but not limited to structural elements, final geometry, pavement, hydraulics, hydrology, storm water management, mechanical, electrical, and drainage. The Design-Builder shall prepare and submit calculations necessary to support that the design meets all Contract requirements. For Level 1 Risk Items, as defined in Part 3 Appendix D, calculation submissions shall include the editable files from the relevant computer programs that were utilized to perform the analysis, including but not limited to finite element analysis models.

5.10.6 Revisions to Design

After a design is complete and the Work is ready to be executed, or is being executed, or is complete, all subsequent design changes and modifications shall be identified, documented, reviewed and approved by authorized personnel before their implementation.

The Design-Builder shall deal with any changes to design initiated by the Design-Builder as an entirely new design. The Design-Builder shall not be entitled to any increase in the Contract Price or extension of time in such circumstances.

5.10.7 Design Changes Before Construction

Design changes may occur prior to construction or may occur after final design, and may be initiated by the Design-Builder or the Department.

For all design changes requiring calculations, the Designer and the Design QC Engineer shall conduct a documented check of all calculations. All design changes requiring alteration of design documents released for construction shall undergo all review and certification procedures included for original design documents in the Design-Builder's Quality Control Plan.

If a design change takes place after acceptance of the Released for Construction Documents, the Design-Builder shall prepare a Notice of Design Change (NDC) and submit it the Design Quality Assurance Engineer for review and comment.

The NDC shall have a cover sheet that includes the following information: description of the change; identification of the Design Unit Plans, Specifications, calculations and other documents impacted by the change; the reason for the change; list of other Design Units that will be impacted by the change; and description of impacts to the Project schedule if any.

5.10.8 Design Support During Construction

The Designer shall verify during construction that the conditions encountered are consistent with the design and related Contract Documents. The Designer shall prepare necessary adjustments in the Design Plans, Working Plans, and Project Specifications, and submit to the Department for review, comment, and acceptance. The Designer and the Design QC Engineer shall check any such changes in accordance with the Quality Control Plan. The Design QC Engineer shall certify the change in writing as meeting the Contract requirements. The Design-Builder shall incorporate the adjustments in the As-Built Plans. The Design-Builder shall retain copies of the Design QC Engineer's written certifications and submit the certifications to the Department.

5.11 DESIGN COORDINATION

5.11.1 Design Workshop

Within 10 Calendar Days of NTP, the Design-Builder shall arrange a design workshop to familiarize the Design-Builder's personnel, Department staff, and others associated with design to review design concepts, issues, status, and review procedures. The Department and the Design-Builder shall jointly develop the agenda of the workshop and how it will be organized (e.g., by Design Unit and engineering discipline). The intent of the workshop is to make the subsequent Design Reviews more effective and efficient for all parties. The workshop will focus on a review of the critical design elements and criteria and on how the Designer plans to organize its design and conduct the reviews.

5.11.2 Over the Shoulder Reviews

The interaction between Designer and Department staff or Department appointed consultant staff will be continuous throughout the design process through the "over-the shoulder" reviews that typically would consist of activities, such as:

A) Participating in design meetings.

B) Responding to design requests for information or clarification.

C) Auditing of design quality process and records.

At a minimum, over the shoulder reviews shall be held prior to the Interim Design and Final Design submissions of all Design Units.

5.12 QUANTITY ESTIMATES

To facilitate determining sampling and testing requirements, the Design-Builder shall provide quantity estimates for the Work. The quantity estimates shall be in units that facilitate sampling and testing, i.e., the units shall be consistent with the units used to determine frequency of sampling and testing. For example, if "X" numbers of compaction tests are specified to be taken for every "Y" cubic yards of embankment, the quantity estimate would need to be in cubic yards of embankment. Quantity estimates shall be provided with Release for Construction Documents.

5.13 DESIGN DOCUMENTATION

5.13.1 Progress Tracking

The Design-Builder shall include engineering and design progress and changes in its Baseline Progress Schedule (including Work on any design change) in the monthly updates.

5.13.2 Design Quality Records

The Design QC Engineer shall prepare and submit monitoring reports to the Department of all design issues and review comments resulting from the scheduled and additional checks and reviews, including "over-the-shoulder" reviews.

The Design-Builder shall also maintain an auditable record of all Quality Control Plan procedures. An independent auditor shall be able to determine by reviewing documentation if all procedures included in the Quality Control Plan have been followed.

The Design-Builder shall submit reports of checks and reviews within seven Calendar Days of the completion of the review.

The Design-Builder shall develop, implement, and maintain a log of design Non-Conformance Reports and/or notices indicating dates issued, reasons, status, or resolution and date of resolution.

5.13.3 Design QC Engineer Report

The Design QC Engineer shall submit a monthly report directly to the Department's Project Manager by the third working day of the following month that includes the following:

A) Summary of reviews conducted;

B) Nonconforming Work and current status and/or disposition (based on design non-conformance log, Section 5.13); and

C) Submission(s) from Design-Builder and status.

5.13.4 Final Design Report

Upon completion of the final design for each Design Unit, including all its components and elements, the Design QC Engineer shall notify the Design-Builder, with a copy to the Department, of any outstanding monitoring report issues or unresolved review comments.

5.14 SUMMARY OF SUBMITTALS

Item	Section	Submittal	Action
1	5.2	Design Units Report	Review and Comment
2	5.5	Request for Design Exceptions or Design Waivers	Review and Approval
3	5.7.1	Definitive Design Documents	Review and Comment
4	5.7.2	Interim Design Documents	Review and Comment
5	5.7.4	Release for Construction Documents	Review and Acceptance

6	5.7.3	Final Design Documents	Review and Comment
7	5.7.7	Working Plans	Review and Comment
8	5.7.8	As-Built Documents	Review and Comment
9	5.10.1	Design Criteria Report	Review and Comment
10	5.10.2	Basis of Design Report Record Document	Review and Comment

SECTION 6 CONSTRUCTION QUALITY CONTROL AND QUALITY ASSURANCE

6.1 GENERAL

The Design-Builder shall develop and implement a quality program for all phases of the Project, including design, construction, maintenance, safety and environmental compliance. The Design-Builder, through its Design-Build Quality Control Plan, shall have the responsibility for the quality of the Work, including all Work and products of Subcontractors, fabricators, Suppliers, and vendors. The Department, in its oversight role through Quality Assurance (QA), reserves the right to and will conduct verification oversight inspections, acceptance testing, audits, sampling and testing, and Independent Assurance (IA).

The Design-Builder shall be capable of ensuring that procurement, shipping, handling, fabrication, installation, cleaning, Inspection, construction, testing, storage, examination, repair, maintenance, and required modifications of all Materials, Equipment, and elements of the Work will comply with the requirements of the Contract Documents and that all Materials incorporated in the Work and all Equipment and all elements of the Work will perform satisfactorily for the purpose intended.

6.2 QUALITY CONTROL – CONSTRUCTION INSPECTION – AND TESTING OF MATERIALS

The Design-Builder's Quality Control responsibilities during construction include Construction Inspection as well as sampling and testing of materials.

6.2.1 Construction Inspection Quality Control

All construction processes, procedures, and workmanship shall be inspected by the Design-Builder's Construction Quality Control (QC) Inspectors. The QC Inspectors shall include the observations, measurements, and documentation specified in Appendix A, and/or included in the Design-Builder's Quality Control Plan. Inspection observations, measurement, results, non-conformances, and corrective actions shall be documented on the Design-Builders forms acceptable to the Department and/or on the appropriate MURK form or Department reporting form. Inspection observation and documentation shall include description of the construction activity and location by Specification section.

The Design-Builder's Independent Construction Inspection Professional Engineering Firm shall provide all required oversight, direction, testing, reviews and inspections for the purpose of assuring that the construction and inspection activities are being performed in compliance with the Contract requirements, including, but not limited to, the Design Plans, Specifications and the Design-Builder's approved Quality Control Plan and the Department's standards and practices. In addition, the Independent Construction Inspection Professional Engineering Firm shall have the responsibility to perform sufficient inspections and/or tests of the Design-Builder's Work to determine that the Work performed by the Design-Builder and the inspections and/or tests performed by the Materials Testing Firm or Laboratory are in compliance with the Contract requirements (See Appendix A). This includes a determination that the Work is constructed to established lines and grades and that any required measurements for payments are performed to the prescribed accuracy. QC Inspections shall verify that the standards for methods of construction are followed by the Design-Builder. The Independent Construction Inspection Professional Engineering Firm's Resident Engineer shall also verify that all required Construction QC Inspection and testing occurs as specified, and that daily reports and other required Contract administration documents are prepared and provided as specified. The Independent Construction Inspection Professional Engineering Firm's Resident Engineer shall provide information to the

Department's Construction Quality Assurance Engineer regarding percentages of Work complete for monthly payment estimates and verify quantities of any unit-priced Work items.

In addition, the Resident Engineer shall prepare daily reports that describe the Construction QC activities performed each day, relevant conversations with the Construction QA Engineer, discussions with the Design-Builder, visits by agencies with regulatory responsibility and indications of acceptable or unacceptable work (as recorded by Non-Conformance Reports) by the construction inspectors.

The Resident Engineer and their staff shall have the responsibility and authority to direct the Design-Builder to take the necessary corrective action if any deviations from the Contract requirements occur and, if necessary, order the Work to be suspended. The Quality Control activities that shall be performed by the Resident Engineer and their staff shall include, but not be limited to:

A) Ensure that adequate staffing and supervision of appropriately qualified inspection staff is maintained at all times;

B) Review the performance of the Materials Testing Laboratory for compliance;

C) Review the Design-Builder's construction activities for compliance to the Department's standards and specifications;

D) Ensure that any construction is in conformance with plans and specifications that have been stamped and signed by the designer and initialed by the Department's Design QA Engineer;

E) Daily (twice or more for night time operations) review the Work Zone Traffic Control for all Work Sites to ensure that they comply with all Department Standards and they are safe for the traveling public and workers;

F) Review the overall safety of all Work Sites to ensure that they are safe for the workers, the inspection staff and the public;

G) Review the Project records (including procurement documentation) to ensure they are compliant with MURK, Site Manager Requirements (see Section 6.9.1), and NYSDOT practice;

H) Perform inspections and tests to document acceptability of the work for payment;

I) Review and approve the Design-Builder's invoices and recommend payment to the Department's Construction Quality Assurance Engineer;

J) Originate non-conformance reports for any material test failures or construction work effort, safety, or work-zone non-compliance;

K) Maintain a log with the status of all non-conformance reports, with an emphasis on outstanding resolutions to non-conformances;

L) Recommend corrective action to the Department's Construction Quality Assurance Engineer if there are deficiencies found in the Work performed by the Design-Builder;

M) Coordinate field inspection activities between the Design-Builder's Construction personnel, QC inspection staff, and Department QA staff; and

N) Recommend acceptance to the Department's Construction Quality Assurance Engineer.

6.2.2 Construction Quality Control Testing and Sampling

Materials shall be sampled and tested by the Construction QC Inspectors working for the Design-Builder's Professional Engineering Construction Inspection Firm or Materials Testing Firm or Laboratory in accordance with Appendix B. Copies of all test results shall be furnished to the Design-Builder's Project Manager, the Design-Builder's Quality Manager, and the Department's Construction Quality Assurance Engineer within 24 hours of the test results.

References in the Contract to a New York Department of Transportation test method or test designation of the American Association of State Highway and Transportation Officials (AASHTO.), the American Society for Testing and Materials (ASTM) or any other recognized national organization, shall mean the latest revision of that test method or Specification for the Work in effect on the Proposal Due Date, as adopted by the Department, unless otherwise noted. The Design-Builder shall comply with the latest modifications as published by the Department's Materials Bureau (see EB11-043). All Inspection, Sampling and Testing shall be in accordance with the procedural directives issued by the NYSDOT Materials Bureau.

6.2.3 Quality Control Personnel – Certifications/Qualifications

The Design-Builder shall maintain a list of construction QC staff that describes what test certifications each person currently holds and the certification expiration date. The Design-Builder's QC staff will be allowed 30 Days from Award of the Contract to obtain the certifications.

QC Inspectors shall test and sample only those Materials for which they are certified to test. Reports of each test shall be recorded on the MURK form prescribed for that test. All tests that do not pass specified requirements will be added to a log of non-conformance reports for resolution and corrective action.

The minimum frequency of QC sampling and testing shall be consistent with Appendix A and the individual Project Specifications accepted by the Department's Project Manager.

The Design-Builder's staffing levels for inspection and materials samplers shall be consistent with those for NYSDOT-inspected Projects.

All Design-Builder QC Inspectors are required to be certified, for the type of work they are inspecting, in accordance with NHI, NYSDOT Technician Certification Program, or the North East Transportation Technician Certification Program (NETTCP; www.nettcp.com) for the following technician roles: Concrete Inspector, HMA Paving Inspector, Soils and Aggregate Inspector, Drilled Shaft Inspector, Driven Pile Inspector, and Subsurface Inspector; and Concrete, HMA Plant, Soils and Aggregate Lab, and PG Asphalt Binder technicians. Technicians that perform field inspection of Portland cement concrete shall possess a current certification from the American Concrete Institute as Concrete Field-Testing Technician Grade I. NYSDOT's HMA Plant QC/QA Technician Certification Program is administered by the New York State Construction Materials Association; NYSDOT's Concrete Field Inspection certification is the American Concrete Institute (ACI) Level I; the HMA Density Monitoring Technician Certification Program is administered by NYS Chapter of Association of General Contractors, Albany, NY.

The Design-Builder's QC Inspector(s) designated as the responsible person in charge of Work Zone Traffic Control shall have sufficient classroom training, or a combination of classroom training and experience, to develop needed knowledge and skills. Acceptable training should consist of a formal course presented by a recognized training program which includes at least two full days of classroom training within the last 5 years. A minimum of two days classroom training is normally required, although one day of classroom training plus responsible experience may be considered. Recognized training providers include American Traffic Safety Services Assoc. (ATSSA), National Safety Council (NSC), Federal Highway Administration's National Highway Institute (FHWA-NHI), and accredited colleges and universities with advanced degree programs in Civil/Transportation/Traffic Engineering. Former DOT employees may be considered on the basis of at least one day of formal classroom training combined with responsible M&PT experience within the last 5 years.

Courses considered acceptable include the following:

A) FHWA – NHI 38003 – Design and Operation of Work Zone Traffic Control

B) NSC – Work Zone Traffic/Traffic Control Zone

C) ATSSA – Worksite Traffic Supervision

1) Construction Zone Safety Inspector

2) Traffic Control in Urban and Utility Work Areas

D) DOT – M&PT for EIC's and Responsible Persons

6.3 QUALITY ASSURANCE – ACCEPTANCE AND/OR VERIFICATION AND AUDITING, SAMPLING AND TESTING

6.3.1 Quality Assurance Verification and Auditing

Construction Quality Assurance acceptance or verification and auditing of the Design-Builder's work will be performed by the Department's Construction Quality Assurance Engineer assigned to the Project, as outlined in Appendix D – Quality Assurance Plan Program Guide. The Construction Quality Assurance Engineer may have additional staff to assist him/her in performing Construction Quality Assurance activities.

The Construction Quality Assurance Engineer and staff shall have access to all activities and records of the Design-Builder, the Independent Construction Inspection Professional Engineering Firm, and the Materials Testing Firm or Laboratory retained by the Design-Builder for the purpose of assuring that the construction and inspection activities are being performed in compliance with the Contract requirements, including, but not limited to, the Design Plans, Specifications and the Design-Builder's approved Quality Control Plan and the Department's standards and practices.

In addition, the Department's Construction QA Engineer and staff shall have the authority to perform sufficient inspections and/or tests of the Design-Builder's Work to either accept or verify that the Work performed by the Design-Builder and the inspections and/or tests performed by the Independent Construction Inspection Professional Engineering Firm and the Materials Testing Firm or Laboratory are in compliance with the Contract requirements (See Appendix A). This includes assurance that the Work is constructed to established lines and grades and that any

required measurements for payments are performed to the prescribed accuracy. Periodic QA Inspections will verify that the standards for critical methods of construction are followed by the Design-Builder. The Department's Construction QA Engineer and staff will also audit and verify that the Construction QC Inspection occurs as specified, including but not limited to all QC tasks outlined in Section 6.2, and that daily reports and other required Contract administration documents are prepared and provided as specified.

The Department's Construction Quality Assurance Engineer may observe any testing performed by the QC Inspectors or the Materials and Testing Firm or Laboratory. If the Construction Quality Assurance Engineer observes a deviation from the specified sampling or testing procedures, the Construction Quality Assurance Engineer will verbally describe the observed deviation to the Design-Builder's Construction QC Engineer, followed by a written Non-Conformance Report covering the deviation to the Design-Builder's Construction QC Engineer and Design-Builder's Project Manager within twenty-four hours.

Members of the Department's Construction QA staff will be assigned responsibility for verifying and auditing the Quality Control Construction Inspection and materials sampling and testing activities of the Design-Builder. The methods employed for verification may include audits of items and processes defined in the Design-Builder's Quality Control Plan to ensure compliance with the plan. In addition, the Department's Construction QA staff will conduct periodic reviews and audits of construction activities to verify that the methods and in-process and/or completed work elements meet the Contract specifications and standards. The Department will perform sampling and testing for either acceptance or verification of the sampling and testing performed by the Design-Builder. The Department may also direct the Design-Builder to perform sampling and testing of materials. At no point may the inspections performed through the Department's Quality Assurance substitute for the Design-Builder's Quality Control requirements.

The acceptance testing and/or verification and auditing performed by the Department's Construction QA Engineer and staff will document the acceptance of the Work for payment purposes. Discrepancies (failures of QA test results, significant audit findings) will be documented in Non-Conformance Reports which the Design-Builder must address.

6.3.2 Quality Assurance Sampling and Testing

Quality Assurance Sampling and Testing will be performed by the Department or its designated representatives assigned to this Project. QA technicians will be certified in accordance with the Department's Technician Certification Program. The Quality Assurance testing will be performed independently from the construction QC sampling and testing.

All Materials are subject to inspection, sampling, and testing at any time before Final Acceptance of the Work by the Department's Construction Quality Assurance Engineer and their staff.

All sampling and testing for acceptance will be in conformance with 23 CFR 637 and approved Department procedures using qualified, certified individuals and utilize qualified, accredited materials laboratories. When the Design-Builder's QC materials test results are used in the acceptance decision, the Department will verify the QC data through random independent QA sampling and testing. When the Design-Builder's QC materials test results are not used in the acceptance decision, QA data will be used to form the acceptance decision.

At no time will QA testing be performed with the same sampling and testing devices as the QC testing. QA Sampling and Testing will be conducted randomly and independently to verify

acceptance decisions on materials. QA Sampling and Testing will be performed as directed by the Department's Construction Quality Assurance Engineer. The QA technicians will complete daily inspection records. The reports will detail the Work performed that Day clearly indicating pass/fail test results. All QA tests which do not conform to the Contract requirements will immediately trigger a Construction Non-Conformance Report for the Design-Builder's reconciliation. The QA technicians will be familiar with the Quality Control Plan and assure that construction QC samplers and testers adhere to that plan. A list of QA technicians will be maintained that indicates what test certifications each person currently holds and the certification expiration date.

6.3.3 Independent Assurance

The Department will conduct all Independent Assurance (IA) activities with a goal of conducting a minimum of one IA inspection annually on all inspection personnel whose data is used in the acceptance decisions on this Project. Results from the IA testing may not be used as part of the acceptance data.

6.4 COMPETENCE

If a concern arises as to the competence of any certified individual conducting Construction Inspection or Quality Control activities, including the Resident Engineer, regardless of their specific role on the project, this concern must be documented in writing to the Design-Builder's Project Manager and the Department's Project Manager. The concern will be investigated as deemed necessary by the Department's Project Manager. If this investigation substantiates the concern, corrective action or decertification will follow the established technician certification processes and protocols.

6.5 DESIGN-BUILDER'S CONSTRUCTION QUALITY CONTROL ORGANIZATION

All QC sampling and testing staff and laboratories shall meet the qualification requirements of 23 CFR 637 and be subject to the Approval of the Department.

6.5.1 Independent Construction Inspection Professional Engineering Firm (Quality Control Engineering Firm)

The Design-Builder shall retain the services of an Independent Construction Inspection Professional Engineering Firm, to oversee, manage, certify and perform construction QC activities as specified in this Section 6, other Contract Documents and the Design-Builder's Quality Control Plan. The Independent Construction Inspection Professional Engineering Firm shall not be owned by or be an affiliate of the Design-Builder, any Principal Participant or construction Subcontractor. The Independent Construction Inspection Professional Engineering Firm shall be responsible for management and scheduling all QC Inspection and quality control sampling and testing of all items of construction Work for this Contract, as well as inspection of its Work for conformance to the Contract requirements.

The Construction QC Engineer and all Construction QC Inspection Personnel and their support staff shall be employees of the QC Engineering firm or employees of firm(s) acting as subconsultants to the QC Engineering Firm. The QC Engineering Firm shall report directly to the Design-Builder's Quality Manager and shall not report to the Design-Builder's Project Manager.

6.5.2 Construction Quality Control Engineer

The Design-Builder shall assign a full time on-site Construction QC Engineer, who may be the Resident Engineer working for the Independent Construction Inspection Professional Engineering Firm as described in Section 6.2.1. This individual shall meet the minimum qualifications as described in Section 3.4.

The Design-Builder's Construction QC Engineer shall be responsible for overall management and supervision of the Design-Builder's construction QC programs and shall be a New York-licensed professional engineer. The Design-Builder's Construction QC Engineer shall report directly to the Design-Builder's Quality Manager. The Design-Builder's Construction QC Engineer shall also maintain open and frequent communication with the Department's Construction QA Engineer.

The Design-Builder's Construction QC Engineer, or his/her designees, shall be granted the authority to make needed improvements to the quality of Work, including the suspension of the Work if required.

The Design-Builder's Construction QC Engineer shall be responsible for coordinating the schedules of construction QC Inspectors with the Design-Builder's construction activities so as not to delay Design-Builder's operations due to Construction QC Inspection, sampling, and testing activities. Daily interaction between the Design-Builder's QC staff and the Department's QA staff will be a critical element to avoid delay of the Design-Build operations and schedule.

6.5.3 Staffing Levels

The actual size of the field/Site staff shall reflect the complexity, needs, shifts and composition of QC activities consistent with Work in progress. See Section 6.2.3 for staff qualifications and certifications required.

Minimum staff requirements are described in Section 3.

The resumes of the staff shall be submitted to the Department's Construction QA Engineer for review. Any QC staff not having the qualifications or certifications specified will be removed from the Project and replaced with a person qualified for that position (see Section 6.2.3).

At any time that any QC staff causes the Department's QA Engineer to have concerns regarding their competency, the actions in Section 6.4 shall apply.

The Design-Builder shall obtain Department approval before removal or dismissal of any construction QC staff.

The QC staffing schedule shall be updated as necessary throughout the Contract duration to reflect accurate forecasting of QC staffing requirements.

6.6 QUALITY CONTROL LABORATORIES

Laboratory QC testing shall be conducted by testing laboratories, retained by the Design-Builder or the QC Engineering firm under subcontract, that comply with the requirements for Department certification for applicable tests. Laboratories shall be accredited by the AASHTO Material Reference Laboratory (AMRL), the Concrete Cement Reference Laboratory (CCRL), the National Precast Concrete Association (NPCA) for precasters, and the Prestressed Concrete Institute (PCI), as appropriate for the work being constructed. Department certification shall be obtained

for all AASHTO and ASTM test methods to be performed by the testing laboratory. Certification shall also be obtained for AASHTO and ASTM test methods that are modified or referenced by NYSDOT test methods.

Satellites (field laboratories) of these laboratories may be used where appropriate for the tests being conducted. The Equipment in the satellite laboratories shall be certified and calibrated at the start of Work and as required thereafter. Certification shall be the responsibility of the Design-Builder and will be audited by the Department.

The laboratory shall have written policies and procedures to assure portable and satellite laboratories performing testing activities on the Project are capable of providing testing services in compliance with applicable test methods. The policy and procedures shall address Inspection and calibration of testing Equipment as well as a correlation testing program between the accredited laboratory and portable or satellite facilities.

The Department reserves the right to evaluate testing Equipment for compliance with specified standards and to check testing procedures and techniques and equipment calibration dates.

The Department also reserves the right to access the testing facilities of the testing laboratories, to witness the testing and verify compliance of the testing procedures, testing techniques, and test results.

The Department's rights to check Equipment, procedures, and techniques and to access testing facilities shall also apply to the Federal Highway Administration (FHWA) for Federal-aid projects and to other Project Stakeholders when the Design-Builder is performing Work on their facilities.

6.6.1 Field Laboratories

A) QA Field Laboratory

The Design-Builder shall furnish field laboratories and field offices in accordance with the Quality Control Plan as approved by the Department. The Design-Builder shall provide a separate field verification laboratory in accordance with Standard Specifications § 637-2.02, Field Laboratory, and any other requirements included in the Contract Documents, for the exclusive use by the Department.

B) QC Laboratory

All laboratories and tests used by the Design-Builder shall be performed by qualified laboratories. The Department shall have access to the laboratories as and when requested to observe the testing and review documentation. Independent verification testing may be performed at the Department's field laboratory or any laboratory of their choosing.

6.7 ASBESTOS

Asbestos Containing Materials (ACMs) and locations may have been preliminarily identified in the Project area. The Design-Builder shall be responsible for confirming and identifying any other materials or locations that contain asbestos that will be impacted as part of the work.

The Design Builder shall monitor the abatement of any ACM by licensed asbestos contractors for compliance with the Contract documents, applicable Federal EPA and OSHA regulations, Industrial Code Rule 56 and any specified regulatory variance of the code. This shall include

review of all abatement contractor submittals, monitoring of on-site use of personal protective equipment, and enforcement of work area delineation and operation requirements as prescribed by the aforementioned laws. The Design Builder shall be responsible for any required project monitoring/compliance air sampling as required by subpart 56-17 of Industrial Code Rule 56 and/or any specified regulatory variance of the code. The Design Builder shall provide the Department with an asbestos monitoring report, including daily contractor activity logs, work area inspection reports, final visual reports, compliance air sampling results, removed ACM quantities, and any other associated record keeping documentation maintained for the asbestos work. If additional suspected ACMs are encountered during construction, which require abatement, the Design-Builder shall immediately notify the Construction Quality Assurance Engineer and perform any needed material sampling and laboratory testing required. In addition, the Design-Builder shall advise the Construction Quality Assurance Engineer of any necessary project design modifications needed due to the additional ACM and perform such modifications.

Due to conflict of interest, the equity partners (i.e. the Design-Builder constructor and possibly others) cannot directly perform the abatement and/or monitoring component of the Asbestos work and shall be required to subcontract the abatement and monitoring work to qualified subcontractors that meet the regulatory requirements for performing such work.

Required Qualifications: These asbestos management services must be separate and independent from the abatement contractor and accomplished by a New York State Department of Labor (NYSDOL) licensed handler(s) that employ appropriately certified personnel for Project monitoring and compliance air sampling. Laboratory services for asbestos compliance air and material bulk samples must be appropriately accredited by the New York State Department of Health (NYSDOH) under the Environmental Laboratory Approval Program (ELAP). The staff of the independent monitoring/compliance air sampling firm shall demonstrate previous project oversight/compliance monitoring work conducted in accordance with the rules and regulations of 12 NYCRR Part 56. Previous asbestos monitoring/compliance air sampling work shall demonstrate specification/regulatory enforcement during abatement, compliance air sampling and bulk sample collection/analysis, and project documentation preparation. While not mandatory, previous transportation-related asbestos experience is preferred.

6.7.1 Documentation Required

A) Current NYSDOL Handler License

B) Current NYSDOL Staff Certifications

C) Current NYSDOH ELAP accreditation of laboratory for respective analysis (bulk or air)

6.8 DESIGN-BUILDER SCHEDULING AND NOTICE TO THE DEPARTMENT

The Design-Builder shall notify the Department in writing by Friday noon of each week of planned construction activities, including fabrication, for the following two weeks to allow the Department to schedule its resources. The Design-Builder shall deliver this information at the weekly coordination meeting where related discussion will occur. For activities (such as, fabrication) occurring out of the immediate Project area or out of state (beyond 100 miles of the Project), the Design-Builder shall give the Department at least 21 Calendar Days' notice of planned Work.

6.9 DOCUMENTATION

The Design-Builder shall collect and preserve each of the following types of data in written form concurrently during Design-Builder's performance of the Work, all of which shall be in a form acceptable to the Department and in conformance with MURK.

A daily log for construction-related activities shall be maintained by Design-Builder's Project Manager or his/her designee(s), using Form MURK 2 or another form acceptable to the Department's Project Manager. The Design-Builder's Project Manager shall record daily, in a narrative form, all significant occurrences on the Project, including unusual weather, asserted occurrences, events and conditions causing or threatening to cause any significant delay or disruption or interference with the progress of any of the Work, significant injuries to person or property and a listing of each activity depicted on the current monthly plan update which is being actively performed. Also, traffic accidents in the Project area shall be noted, as well as lane closures in effect at the time of the accident.

For Utility-related Work such data shall be maintained separately for each Utility facility.

For harmful/Hazardous Material Remediation Work, such data shall be maintained separately for each site.

Records shall include the Contract Number, the specific Bridge BIN (where applicable) and document all QC operations, Inspections, activities, and tests performed, including the Work of Subcontractors. The Design-Builder may use the forms provided by the Department or its own forms providing equivalent information. Such records shall include any delays encountered and Work noted that does not conform to the requirements of the Contract and design together with the corrective actions taken regarding such Work.

The Design-Builder shall complete and submit appropriate documentation at the following times and frequencies:

A) **Monthly:**

1) *See* DB §108;

2) Red-line as-built documentation shall be provided to the CQAE for review and comment. Upon acceptance of red-line as-built documentation by the CQAE, the QC team shall deliver the red-line as-built documentation to the Design Quality Control Engineer. Re-line as-built documentation shall include, but not be limited to, the following:

   a) Pile tip elevations

   b) Invert elevations

   c) Survey location of all existing and new utilities

   d) Engineering data that represents the final adjustments to the as-built work

B) **Weekly:** The Design-Builder shall maintain and submit records that include factual evidence that required activities or tests to have been performed, including the following:

1) Type, number, and results of QC and control activities, including reviews, Inspections, tests, audits, monitoring of Work performance, and Materials analysis;

2) Closely-related data such as qualifications of personnel, procedures, and Equipment used;

3) The identity of the QC Inspector or data recorder, the type of test or observation employed, the results, and the acceptability of the Work, and action taken in connection with any deficiencies noted;

4) Nature of non-conforming Work and causes for rejection;

5) Proposed corrective action;

6) Corrective actions taken; and

7) Results of corrective actions.

6.9.1 SiteManager Software

SiteManager is a comprehensive web-based construction management software product used by the Department that covers the complete construction and materials management process from contract award through contract finalization. The Design-Builder and the Department shall use SiteManager for activities including the following:

A) Field Collection Daily Work Report (DWR) – Every member of the Design-Builder's Construction Inspection Professional Engineering Firm shall produce Daily Work Report(s) that shall be input into SiteManager. The DWRs shall include weather, staff and equipment, Work Item progress, sampling and testing, the progress of the work activity being monitored, information on any Work Zone Traffic Control that was in place during the Work activity, information on any incidents that may have occurred during the course of the day, and diaries. The DWR and Diary entries shall conform to the NYSDOT Manual of Uniform Record Keeping Contract Administration Manual. In general, each inspector shall produce a DWR. The Construction Inspection Professional Engineering Firm shall enter the material approval information into SiteManager and generate the payment request;

B) SiteManager shall be used for Orders-on-Contract such as Time Extensions and Scope of Contract. SiteManager has an automated Approval Work Flow. The Work Flow for approval of DWRs, payments and change orders will be determined by the Department in consultation with the Construction Inspection Professional Engineering Firm;

C) SiteManager shall be used by the Construction Inspection Professional Engineering Firm to generate Progress Payment requests subject to the review and approval of the Department's Project Manager;

D) SiteManager shall be used for materials management. Material management within Site Manager includes item master and automated contract material associations; approved lists (inspectors, testers, calibrated equipment, welders, qualified labs, producers/suppliers); sampling and testing requirement definition, and tracking of standard AASHTO tests. The Construction Inspection Professional Engineering Firm staff shall be responsible for entering material test results into SiteManager. Test results for all material testing (e.g. concrete

cylinders, elastomeric bearings, etc.) shall be conducted in certified labs and shall be transmitted to the CI Firm for entry into SiteManager.

Following the Notice To Proceed the Design-Builder shall populate SiteManager, via the SiteManager function labeled “Change Order”, with the Work Payment Schedule Work Items (Note: Not an actual Change Order). As a design is developed by the Design-Builder’s Designer, the Designer shall produce a list of Specification Items that can be associated with a NYSDOT Standard Specification Item and a corresponding quantity for that Work Item. The development and use of special specifications will be permitted.

As designs are finalized and prior to construction activities, the Construction Inspection Professional Engineering Firm shall populate SiteManager with the Specification Items and quantities used in those designs using the “Orders-on-Contract” function. This will be a zero-value Order-on-Contract entered using the SiteManager function labeled “Change Order” (Note: Not an actual Change Order). The entries will be subject to review and approval by the Department’s Project Manager. These items shall be entered into SiteManager prior to the start of construction so that the full functionality of SiteManager may be utilized by the Construction Inspection Professional Engineering Firm to monitor the progress of Work.

The Construction Inspection Professional Engineering Firm shall perform sampling/testing and obtain appropriate material certifications for all incorporated Work and shall enter second level work breakdown items into SiteManager, detailed to the degree necessary, to assign and quantify subcontractor work and to allow for the inspection and material testing of all work incorporated into the Project. Special Specification Items will require manual entry for material testing and certification requirements.

The percent complete value of all Work Payment Schedule Work Items shall be determined from the progress of completed Work as shown on the Design-Builder’s approved P6 CPM Schedule.

The Department will provide the necessary software and training for the use of SiteManager. The training requires approximately one week to be completed. Following Notice To Proceed, the Design-Builder shall contact the Department’s Project Manager to arrange for the training of the Design-Builder’s and Construction Inspection Professional Engineering Firm’s staff. The cost of time for the training for the Design-Builder’s and Construction Inspection Professional Engineering Firm’s staff will be the Design-Builder’s responsibility. The Construction Inspection Professional Engineering Firm shall access SiteManager over the Internet through Citrix. Details on how to access SiteManager will be provided at the time of the training.

Items and quantities that are input into SiteManager will be transferred into EBO, which is the Department’s software package for monitoring Sub-Contractors and the Design-Builder’s DBE compliance. The Design-Builder’s DBE/Civil Rights Compliance Manager shall assign all items of Work which are being performed by a DBE Sub-Contractor to that Sub-Contractor in EBO to facilitate monitoring of the Design-Builder’s compliance with DBE goals.

6.9.2 Computer and Networking Requirements

Computer and Networking equipment described in Contract Document, Part 3, Project Requirements, shall be provided by the Design-Builder for the duration of the Project.

6.10 MATERIAL CERTIFICATES OF COMPLIANCE

When the Design-Builder purchases materials from providers/suppliers on the Department's approved Materials or source list, the Design-Builder shall obtain and retain a certificate of compliance from the provider/supplier covering the Material and/or the source.

Documentary evidence that Material and Equipment conform to the procurement requirements shall be available at the job Site no less than 24 hours prior to installation or use of such Material and Equipment. This documentary evidence shall be retained at the job Site and shall be sufficient to identify the specific requirements, such as Contract Documents, codes, standards, or specifications, met by the purchased Material and Equipment. The effectiveness of the QC by the Design-Builder's own forces and Subcontractors shall be assessed by the Design-Builder and the QC engineering firm at intervals consistent with the importance, complexity, and quantity of the product or services.

The Department reserves the right to inspect and review these documents at any time.

At the completion of the Project, the Design-Builder shall submit with the final invoice a certificate of compliance signed by the Design-Builder's Project Manager and the Construction QC Engineer indicating that all materials incorporated in the Project conform to the Contract requirements.

6.11 FINAL ACCEPTANCE

The Department has the responsibility and authority for Final Acceptance of all Work.

The Design-Builder shall complete all Work and provide all documents, certifications, and other information in accordance with the Contract Documents. Final Acceptance shall be based on QA acceptance testing and/or QC testing verified by verification testing and the final Inspection. Any deviations from the sampling and testing methods and frequencies indicated in the individual Specifications shall require Department Approval prior to the start of construction on any affected Work.

Final Acceptance shall be based on certificates of compliance and/or Manufacturer's test results where specified in the individual specification.

Deficient Materials and products shall be brought into compliance with Specifications or replaced. The method of reconciliation shall be noted in the log of failed tests.

Upon Final Acceptance copies of all project records shall be transferred to the Department.

SECTION 7 ENVIRONMENTAL

7.1 SCOPE

Except as otherwise detailed herein, the Design-Builder shall be responsible for preparing its design, obtaining environmental approvals, carrying out construction activities, performing Quality Control, and undertaking other activities, including hazardous materials inspection and testing, as needed to ensure compliance with the Project's Environmental Requirements and all applicable environmental laws and regulations.

Both permanent and temporary impacts to wetlands, based on the Indicative design, are identified in Part 6 – Indicative Drawings. The Indicative design for this contract permanently impacts 0.28 acres and temporarily impacts 0.494 acres of Federal Wetlands and Surface Waters. The Indicative design impacts 0.27 acres of state wetlands. The Design-Builder shall not exceed these proposed impacts.

7.2 ENVIRONMENTAL APPROVALS

The Department has determined that this Project is a National Environmental Policy Act (NEPA) Class I project in accordance with 23 CFR 771. NEPA Class I projects require the preparation of an Environmental Impact Statement (EIS) to determine the impact that project alternatives would have on the environment.

The Department has determined that this project is classified as a "non-Type II" action, indicating that it has the potential for significant environmental impacts or substantial controversy on environmental grounds. In accordance with 17 NYCRR Part 15, given that a Federal EIS has been prepared, NYSDOT and other New York State agencies undertaking a discretionary action for the Project have no obligation to prepare a separate EIS under New York's State Environmental Quality Review Act (SEQR).

The following environmental approvals/permits have been obtained or are in the process of being obtained by the Department:

Permit or Approval	Approving Agency	Regulatory Authority
Section 404 Permit pursuant to the Clean Water Act	U.S. Army Corps of Engineers	33 USC §§ 1251-1387 and 33 CFR §§ 320-330
Section 401 Water Quality Certification pursuant to the Clean Water Act	U.S. Army Corps of Engineers and New York State Department of Environmental Conservation	33 USC §§ 1251-1387 and 33 CFR §§ 320-330
Protection of Waters / Freshwater Wetlands Permit	New York State Department of Environmental Conservation	NYSDEC/NYSDOT Memorandum of Understanding Regarding ECL Articles 15 and 24 (February 19, 1997); ECL Article 15, Title 5; 6 NYCRR Part 608; ECL Article 24; 6 NYCRR 663
Wetlands Finding	Federal Highway Administration	Executive Order 11990 of 1977; USDOT Order 5660.1A,

		"Preservation of the Nation's Wetlands," August 24, 1978
Section 4(f) Finding pursuant to Section 4(f) of the USDOT Act	Federal Highway Administration in consultation with the U.S. Department of Interior and the State Historic Preservation Office	49 USC § 303; 23 CFR Part 774
Section 7 Consultation pursuant to the Endangered Species Act	Federal Highway Administration and U.S. Fish and Wildlife Service	16 USC §§ 1531-1544; 50 CFR Part 402
New York State Endangered Species Act	New York State Department of Environmental Conservation	ECL Article 1, Title 5 § 11-0535; 6 NYCRR Part 182

The Design-Builder is responsible to obtain all other environmental permits and approvals needed for the Project, or as otherwise stipulated here, and not previously obtained by the Department. Approvals previously secured for the Project will be included in Part 7 – Engineering Data.

The Design-Builder may request a review by the Department of any permit/approval applications which must be submitted to third parties. For any such review requested, the Design-Builder shall allot five (5) business days for the Department to review and comment on the completeness and adequacy of the application materials. It shall then be the Design-Builder's discretion to address any Department comments or elect to move forward with the application materials as submitted.

If during detailed design and/or construction the Design-Builder introduces design elements, variations, or methodologies that potentially induce environmental impacts not covered under the obtained approvals/permits by the Department, then the Design-Builder shall re-evaluate the NEPA process for this Project and obtain the necessary Environmental Approvals/Permits for the Project prior to proceeding with construction. This requirement also applies to proposed variations which may affect resources covered under Section 106, Section 4(f), Executive Order 11990 (wetlands), and other applicable federal and state environmental regulations.

7.3 REQUIREMENTS

7.3.1 General

A) The Design-Builder shall procure all Environmental Approvals as needed for all Design-Builder-located areas, including staging, borrow and disposal sites, and any other areas used by the Design-Builder, for its convenience, in the execution of the Project;

B) The Design-Builder shall be responsible for preparing all permit application materials and obtaining all Environmental Approvals necessary for the Project and not already obtained by the Department, including those that are precipitated by the Design-Builder's design or actions that deviate from the requirements of any acquired permit(s) (if any). For any such approvals required to be obtained by the Design-Builder that must formally be issued in the Department's name, the Department will cooperate with the Design-Builder as reasonably requested by the Design-Builder, including execution and delivery of appropriate applications and other documentation as prepared by the Design-Builder;

C) The Design-Builder shall be solely responsible for compliance with and violations of any Environmental Requirements; and

D) The Design-Builder is responsible for any fines, non-compliance, violations, or damages incurred by reason of failure of the Design-Builder to comply with Environmental Approvals. Resulting fines or damages shall be deducted from monies owed the Design-Builder.

E) In the event that the Design-Builder requests changes to any environmental permits/approvals obtained by the Department for the Project, the Design-Builder shall be responsible for the preparation of all information including materials, investigations, surveys, testing and documentation as necessary to support said permit modification request. Based on the Design-Builder's provision of said information, the Department will undertake the requested permit/approval modification with the respective permitting agencies on the Design-Builder's behalf. The Department will not be responsible for any delay or additional cost associated with the Design-Builder's requested environmental permit/approval modification.

7.3.2 Environmental Measures and Commitments

The following is based on the Final Design Report/Final Environmental Impact Statement/Final Section 4(f) Evaluation (FDR/FEIS) as approved by FHWA on April 4, 2022. The final Environmental Measures and Commitments shall be in accordance with the Joint Record of Decision, which can be found on the project website (https://webapps.dot.ny.gov/i-81-viaduct-project).

Specific NYSDEC environmental mitigation commitments are included in the Water Resource Mitigation Table included in Part 7 - Engineering Data.

7.3.2.1 Cultural and Historic Resources

Compliance with Section 106 of the National Historic Preservation Act requires implementation of stipulations established in the executed Section 106 Programmatic Agreement among the NYSDOT, State Historic Preservation Office (SHPO), Federal Highway Administration (FHWA), Advisory Council on Historic Preservation (ACHP) and the Onondaga Nation. The Section 106 Programmatic Agreement is included in Part 5 – Special Provisions, SP-12. The Design-Builder shall be responsible for carrying out procedures and activities as identified in the Section 106 Programmatic Agreement, including but not limited to facilitating archaeological and Native Nation monitoring during construction and providing necessary information to the State within the requested timeframes.

The Design-Builder shall be aware that FHWA determined that Native Nation monitoring is warranted in locations within one quarter mile of documented existing and historic waterbody alignments where construction activities will involve excavation below ground surface (excluding existing infrastructure). Native Nation monitors will be selected and provided by the Onondaga Nation. Potential Native Nation monitoring locations are depicted in Appendix 9 of the Section 106 Programmatic Agreement included in Part 5, Special Provisions, SP-12. Specific locations for Native Nation monitoring will be determined through NYSDOT's evaluation of Design Builder's Design Plans and through consultation with FHWA, SHPO, and the Onondaga Nation in advance of construction, and will be documented in the Construction Phase Archaeological Work Plan. The Design-Builder shall be responsible for providing the information necessary for the Archaeologist to complete the Construction Phase Archaeological Work Plan and for facilitating

both the archaeological and Native Nation monitoring as presented in that plan. To conduct this necessary consultation in advance of construction activities, the Design-Builder shall provide the following to NYSDOT as soon as available:

- Design plans that specify construction activities, including the horizontal and vertical limits (i.e., depth) of anticipated soil disturbance and construction activities.
- Identification of areas where proposed construction activities will: (1) be limited to the existing pavement and underlying sub-base/bedding materials, and where no excavation is anticipated to extend below the existing sub-base (i.e., excavation is limited to approximately 24 inches below the existing ground surface) and (2) where construction activities are anticipated to extend below the existing pavement and underlying sub-base/bedding materials.
- Description of proposed sequencing and timelines of construction activities, with an emphasis on when/how excavation activities will be conducted in given areas. This should include narrative descriptions of construction activities, typical detail drawings/figures, and/or photographs of comparable construction activities sufficient for NYSDOT, archaeological monitors, and Native Nation monitors to understand anticipated construction activities.

Archaeological and Native Nation monitoring during construction shall be carried out in accordance with a Construction Phase Archaeological Work Plan, to be developed by the State's Archaeologist with information provided by the Design-Builder. The Construction Phase Archaeological Work Plan will supplement the approved Phase IB Work Plan (Appendix 2 of the Section 106 Programmatic Agreement), and using Design Plans, will document the evaluation of anticipated disturbance in archaeologically sensitive areas, describe strategies for implementing the approved Phase IB Work Plan, and describe the sequencing of archaeological and/or Native Nation monitoring based upon the anticipated construction schedule.

The Design-Builder shall facilitate the implementation of the approved Construction Phase Archaeological Work Plan, which shall include providing information and notifications to NYSDOT based on applicable procedures and protocols. The Design-Builder may be asked to temporarily halt construction for inspection by the Archaeologist and/or Native Nation monitor (see Appendix 5, Attachment 1 of the Section 106 Programmatic Agreement).

If during detailed design and/or construction, the Design-Builder introduces design elements, variations, or methodologies that would potentially result in significant environmental impacts that were not previously assessed in the Environmental Impact Statement, or if new information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts are identified, then the Design-Builder shall notify NYSDOT and provide NYSDOT with all documentation needed to receive FHWA approval prior to proceeding with construction.

If the Design-Builder determines the need to occupy property in a location not previously considered as part of the Section 106 process, it shall be the responsibility of the Design-Builder to conduct appropriate cultural resource studies and investigations for that property.

The cost associated with compliance with the Programmatic Agreement, including all work stoppages up to 1 hour in duration due to the discovery of potential cultural material, shall be included in the Design-Builder's Cost Proposal. Work stoppages in excess of 1 hour duration will be considered a delay and will be addressed in accordance with Section DB 108-04. If equipment or work is required to facilitate an extended work stoppage or additional exploration, beyond that

which is required to perform the contract work, force account records shall be kept and payment will be through the Extra Work Item.

7.3.2.2 Air Quality

A) All nonroad construction equipment in the Project shall meet the Tier 4 emissions standard, where appropriate and to the extent practicable.

B) Design-Builder shall use solar powered digital signs, including arrow panels and portable variable message signs when reasonable.

C) The Design Builder shall implement an outdoor ambient air quality monitoring program during construction that will be overseen by NYSDOT. The program shall identify the locations and durations of air quality monitoring and protocols to address any exceedances of National Ambient Air Quality Standards, should they be observed.

7.3.2.3 Noise

A) The Design-Builder shall develop a noise and vibration monitoring program for approval by the Department and shall implement the plan during construction.

B) The Design-Builder shall coordinate work operation to coincide with time periods that would least affect neighboring residences and businesses. Normal work hours shall be scheduled between 6:00 a.m. and 9:00 p.m. Nighttime, Saturday morning, and Sunday construction activities shall be limited to 70dBA Lmax at 50 feet in Noise Sensitive Areas when reasonable (schools, places of worship, medical facilities, residential areas).

C) The Design-Builder shall implement abatement measures that include shrouds or other noise curtains, acoustic fabric, soundproof housings, physical barriers, and/or enclosures to reduce noise from pile drivers, compressors, generators, pumps, and other loud equipment when reasonable.

D) The Design-Builder shall restrict the use of impact and drilling equipment including pile drivers, jackhammers, hoe rams, core drills, direct push soil probes (e.g., Geoprobe), pavement breakers, pneumatic tools, and rock drills when reasonable.

E) The Design-Builder shall equip motorized construction equipment with an appropriate well-maintained muffler and require silencers to be installed on both air intakes and air exhaust when reasonable.

F) The Design-Builder shall operate all construction devices with internal combustion engines with engine doors closed and with noise-insulating material mounted on the engine housing that does not interfere with the manufacture guidelines.

G) The Design-Builder shall transport construction equipment and vehicles carrying rock, concrete, or other materials along designated routes that cause the least disturbance to noise sensitive receptors when reasonable.

H) The Design-Builder shall use self-adjusting or manual audible back up alarms for vehicles and equipment used in areas adjacent to sensitive noise receptors.

I) The Design-Builder shall use pre-auguring equipment to reduce the duration of impact or vibratory pile driving when reasonable.

7.3.2.4 Water Quality, Surface Waters, and Wetlands

A) Fills and other demolition and construction activities in and adjacent to waters of the U.S. necessary for completion of this Project are subject to Section 404 of the Federal Clean Water Act, Section 401 of the Federal Clean Water Act and 6 NYCRR Part 608 Article 15 and 6 NYCRR Parts 663, 664 and 665 Article 24 of the New York State Environmental Conservation Law. The United States Army Corps of Engineers (USACE) and the New York State Department of Environmental Conservation (NYSDEC) are the agencies responsible for enforcement of these regulations; thus, close coordination with these agencies will be necessary for all project activities.

It is anticipated that USACE and NYSDEC permits will be required for potential impacts to the beds and banks streams at or below Ordinary High Water (OHW), as well as impacts to wetland areas. Should the Design-Builder propose impacts to waters of the U.S. not identified in the Indicative design or covered by permits obtained by the state based on the Indicative design, the Design-Builder is responsible for coordinating with the Department to obtain any necessary permits from the USACE and NYSDEC. The Department will not be responsible for any delays related to permitting due to impacts proposed by the Design-Builder.

The Design-Builder shall assume that both the USACE and NYSDEC will require that all correspondence among USACE, NYSDEC and the Design-Builder be sent through the Department.

The Design-Builder shall consider the NYSDEC in-stream work restriction dates for surface water impacts associated with the Project in order to minimize potential impacts to fish and other aquatic species.

B) The Design-Builder shall minimize temporary impacts to surface waters and wetlands to the extent practicable. Best management measures such as turbidity curtains, cofferdams, and temporary piping or diversion of any streams, creeks, and/or its tributaries shall be implemented for any in-water construction activities, as necessary, to maintain stream flow and minimize increases in suspended sediment. Disturbed streambanks shall be stabilized in accordance with the Stormwater Pollution Prevention Plan (SWPPP) and the requirements of the NYSDOT Highway Design Manual, Chapter 8 Highway Drainage, using native riparian plant species where possible. Disturbed wetland areas shall be restored using soil restoration techniques and planting of native plants where possible.

C) The Design-Builder shall develop a Restoration Plan for wetland, channel, and floodplain areas that will be temporarily disturbed during construction. One of the goals and objectives shall be to grade the land to fully reconnect the adjacent wetland. The Design-Builder shall follow all permit conditions outlined in the NYSDEC/USACE permits.

D) Under Contract 1, NYSDOT will enter into an in-lieu fee arrangement with a mitigation service provider approved by the United State Army Corps of Engineers to mitigate for the permanent loss of 0.28 acres of federally regulated wetlands in Contract 2.

E) Mitigation of 0.27 acres of state wetlands is covered under restoration work to be completed under Contract 1.

7.3.2.5 General Ecology

A) The Design-Builder shall revegetate disturbed areas in accordance with a Landscape Restoration Plan to be developed by the Design-Builder to include native plant species.

B) Migratory Bird Protection

The Design-Builder shall be aware of and comply with the Migratory Bird Treaty Act (MBTA) and shall inspect the project area and highway right-of-way, including any bridge substructures and superstructures, for bird nesting activity before performing bridge demolition, clearing and grubbing and tree removal. In particular, the Design-Builder shall be aware of known and possibly active nest sites within the project limits. Any activities that are in close proximity to or may impact or interfere with the nests of migratory birds shall be coordinated through the Department's Construction Quality Assurance Engineer and in coordination with the Department's Construction Environmental Coordinator.

7.3.3 Environmental Plans

The Design-Builder shall be responsible for preparing the following documents in conformity with all Environmental Requirements:

A) State Pollutant Discharge Elimination System (SPDES) Permit application; see Soil Erosion and Water Pollution Control;

B) Stormwater Pollution Prevention Plan (SWPPP);

C) Restoration Plan for wetland, channel, and floodplain areas temporarily impacted; and

D) Landscape Restoration Plan.

7.3.4 Soil Erosion and Water Pollution Control

The Design-Builder shall prepare and maintain on file a SWPPP complying with the New York State SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001 or current version). When phasing a project is necessary to allow for the commencement of initial site preparation and demolition work while the final site design is being prepared, the first phase ("Site Prep Phase") shall include site preparation and demolition work limited to temporary traffic shifts and crossovers, bridge foundation excavation and construction, embankment construction and/or removal, temporary drainage, temporary road widening, critical utility relocation excavation and installation, temporary erosion and sediment control measures and temporary stormwater management practices. Site Prep Phase work shall not include the construction of new permanent impervious surfaces. The Design-Builder shall prepare a separate SWPPP for each phase.

The SWPPPs for all phases shall include erosion and sediment controls. At a minimum, the SWPPPs shall include construction sequencing and phasing, cuts and fills, grading, pollution prevention measures, inspection and maintenance schedules, and drawings showing size, location and details of permanent (e.g., swales, check dams, etc.) and temporary (e.g., silt fence, construction entrance(s)/exit(s), temporary seed, mulch, etc.) erosion and sediment controls. The SWPPPs for any subsequent phases that will include permanent impervious or other construction that requires post-construction stormwater management shall include plans, details and design calculations for stormwater management practices to provide treatment of water quality volume and runoff reduction volume, stream channel protection, overbank flood, and extreme flood controls, as appropriate.

The Design-Builder shall apply for coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity for each phase after preparing a compliant SWPPP as noted above. The Design-Builder shall submit the SWPPP and a corresponding SPDES electronic Notice of Intent (eNOI) for the Site Prep Phase and an “MS4 SWPPP Acceptance Form” to the NYSDOT Project Manager for review and acceptance at least three (3) weeks prior to the scheduled start of construction. The eNOI shall include the text “DB: Site Preparation, Temporary Work and Demolition” along with the Project/Site Name. The “Post-construction Stormwater Management Practice Requirements” section of the eNOI (Questions 27-39) shall not be completed for compliant Site Prep Phase work. The Design-Builder shall submit the following items to the New York State Department of Environmental Conservation (NYSDEC) to obtain coverage under the SPDES General Permit: the eNOI, a SWPPP Preparer Certification and Owner/Operator Certification signed by the Design-Builder, and the MS4 SWPPP Acceptance Form signed by the NYSDOT. Site Prep Phase construction activities shall not commence until the date authorized on the SPDES Acknowledgement Letter from the NYSDEC.

For all subsequent phases, the Design-Builder shall prepare and submit a compliant package inclusive of the final design SWPPP and all required Post-construction Stormwater Management Practices, a fully completed SPDES eNOI, and an “MS4 SWPPP Acceptance Form,” to the NYSDOT Project Manager for review and acceptance at least three (3) weeks prior to the scheduled start of construction for each phase subsequent to the Site Prep Phase (for SWPPPs that are in compliance with the NYSDEC Technical Design Standards). SWPPPs that deviate from NYSDEC Technical Design Standards are subject to a 60-business-day NYSDEC review and authorization period. The eNOI shall include the text “DB: Phase [Phase Number]” along with the Project/Site Name. The Design-Builder shall submit the following items to the NYSDEC to obtain coverage under the SPDES General Permit: the eNOI, a SWPPP Preparer Certification and Owner/Operator Certification signed by the Design-Builder, and the MS4 SWPPP Acceptance Form signed by the NYSDOT. Construction activities for all phases shall not commence until the date authorized on the SPDES Acknowledgement Letter from NYSDEC. The Design-Builder shall submit a revised eNOI to the NYSDOT and NYSDEC if changes to the project require revisions to the SWPPP regarding the type, size and/or location of post-construction stormwater management practices, or increase in the acreage of disturbance or acreage of new impervious area.

The Design-Builder shall maintain SPDES General Permit coverage for each phase until the entire project is complete. Upon project completion, the Design-Builder shall prepare Notices of Termination (NOTs) for each phase, complete final inspections and sign Parts VII, VIII and IX of the NOT. The Design-Builder shall submit the NOTs to the NYSDOT Project Manager for acceptance and Part VI signature prior to submitting the NOTs to the NYSDEC to terminate SPDES General Permit coverage.

SPDES General Permit, electronic Notice of Intent, MS4 SWPPP Acceptance, SWPPP Preparer Certification, Owner/Operator Certification and Notice of Termination Forms and Instructions are located at:

http://www.dec.ny.gov/chemical/43133.html

7.3.5 Threatened and Endangered Species Coordination

The Design-Builder shall be aware that the Indiana bat is listed as endangered and the northern long-eared bat (NLEB) is listed as a threatened species under the Endangered Species Act of 1973. Under consultation procedures, the Department contacted the US Fish and Wildlife Service regarding any potential measures to minimize harm to NLEBs due to the proposed tree removals. The Design-Builder shall conduct tree clearing during the winter hibernation period (November 1 to March 31) for Indiana bat and northern long-eared bat. No tree clearing outside of the winter hibernation period is permitted without prior approval by the Department, FHWA, NYSDEC, and USFWS. The Department will conduct bridge bat surveys during the roosting season and prior to construction to determine if there is any evidence of bats actively using them. Should bats or evidence of bats be identified at any point during the removal of any trees or structures, then the Design-Builder shall stop work and contact the Department and NYSDEC.

A total of 7.9 acres of permanent tree loss will result from the Project and tree clearing may only occur during the winter hibernation period between November 1st and March 31st. See Section 15 for replacement conditions. In addition, should the Design-Builder require the removal of more than 7.9 acres of trees (3" or greater diameter at breast height (DBH)), or should any removals be required after March 31st and before November 1st, the Design-Builder shall be responsible for coordinating with and obtaining necessary approvals from the US Fish and Wildlife Service and FHWA.

State listed endangered plant species Carex aggregate has been identified as having the potential to occur within the state right of way. It is a violation of the Environmental Conservation Law (ECL) S9-1503 to collect or destroy listed plants without the permission of the landowner. As the landowner, NYSDOT can disturb state listed plant species, however commitments have been made to avoid the species and minimize disturbances where feasible and practical. Therefore, as a protective measure to minimize any potential for direct effects to state listed endangered plant species Carex aggregata, Item 607.41010010 – Temporary Plastic Barrier Fence shall be erected at locations as shown in Part 7 – Engineering Data and in other areas identified during construction.

7.3.6 Asbestos Containing Materials

An Asbestos Screening and Assessment of the bridge structures that will be impacted under this contract was performed by a NYS Department of Labor licensed firm using certified inspection staff. No buildings or utilities (other than those associated with the bridge structures) were surveyed during the inspection. Asbestos Containing Materials (ACMs) identified during this screening/assessment were sampled and positively analyzed for asbestos content; suspect asbestos-containing materials are presumed positive. The Asbestos Containing Material Surveys were combined into a report located in Part 7 – Engineering Data.

The Design-Builder shall be responsible for the abatement design, asbestos abatement, waste disposal and any required project monitoring/compliance air sampling during abatement of all confirmed and assumed asbestos containing materials if such materials will be disturbed during

the performance of the Work. All asbestos abatement and waste disposal shall be performed in accordance with applicable safety and health codes and all applicable State and Federal regulations. See also Section 6.7, Asbestos.

The Design-Builder (in particular, the lead constructor on the Design-Build team) is also made aware that 12 NYCRR 56 specifically prohibits the abatement contractor from directly contracting project monitoring and/or compliance air monitoring services. In order to comply with this regulatory requirement, no Principal Participant may perform any asbestos project monitoring/air sampling work for this Project. NYSDOT shall subcontract asbestos abatement and Project monitoring/compliance air sampling services to separate and independent firms.

If during the course of work, any asbestos-containing materials not already documented in the asbestos screening/assessment report or Project record plans are encountered and require disturbance, the Design-Builder shall be responsible for any needed additional asbestos assessment, abatement design, asbestos abatement, and waste disposal, and Project monitoring/compliance air sampling. All additional work shall be paid for under the Extra Work pay item.

New York State Department of Labor (NYSDOL) asbestos licensure and applicable staff certification(s) are required for Work where confirmed or presumed asbestos-containing materials are impacted. All necessary asbestos assessment and Project design Work shall be performed in conformance with policy and guidance provided in NYSDOT's The Environmental Manual (TEM).

Any ACMs associated with private utilities located within the Project limits shall be the responsibility of the private utility owner. The Design-Builder shall coordinate with the private utility owners for the remediation of any ACMs which may be identified.

7.3.7 Hazardous Waste and Non-Hazardous Contaminated Materials

Federal and State records, and other sources of information, were reviewed to assess the potential presence of subsurface contamination and other potentially hazardous waste and non-hazardous contaminated material. The results of the assessment indicate that a number of spill sites, storage tanks, and other suspect usages are proximal to the contract work locations. See Part 7 – Engineering Data for the site-specific assessment information.

Hazardous and non-hazardous contaminated soil is anticipated to be encountered during excavation at the CSX railyard. Soil excavated during construction at the CSX railyard property shall be considered potentially contaminated non-hazardous for estimating re-use and off-site disposal requirements and shall be managed in accordance with NYSDOT Standard Specification 205 – Contaminated Soil. All costs associated with this work are the responsibility of the Design-Builder. This includes the preparation of a Contaminated Material Handling Plan to provide procedures for the proper handling, testing, reuse and/or disposal of excavated material, and preparation of a Health and Safety Plan to include procedures for monitoring, and mitigating as necessary, worker and community exposure to contaminated soils during construction.

For contaminated hazardous soils encountered and requiring disturbance within the project limits, the Design-Builder shall be responsible for and include the cost in their proposal for any needed excavation, stockpiling, assessment, handling, sampling, testing, and Project monitoring/compliance. The Department will only pay, out of the Extra Work Item, the actual

verifiable costs for transportation and tipping fees associated with contaminated hazardous soils removed from the project site which exceed 250 CY. The Design-Builder shall be responsible for the work and cost associated with contaminated water, collection, containment, and disposal fees encountered during dewatering operations.

SECTION 8 GENERAL PROJECT SCOPE OF WORK

8.1 SCOPE

The Design-Builder shall perform all Work necessary to prepare the Project site(s) for construction, maintain the site(s) in suitable condition during all stages of construction including removal of all on site garbage, debris, and trash and provide cleanup and restoration of the construction site(s) and all disturbed areas within the Project Limits.

8.2 STANDARDS

The Design-Builder shall perform the Work in accordance with the applicable Standards, Codes and Manuals cited in Section 1.6, unless otherwise stipulated in this Project Requirement, or otherwise applicable to the Project.

8.3 REQUIREMENTS

The Design-Builder shall prepare site work plans showing the extent of site works; disposal and storage locations; facility removal details; and approximate volumes; and shall provide for uninterrupted Department maintenance and operations. All regulated waste shall be handled according to Section *7 – Environmental*.

The site work may include but not be limited to: clearing and grubbing; excavation and embankment; removal of pavement and pavement markings, road barriers, soil, drainage facilities, fencing, signs, and miscellaneous structures; subgrade preparation and stabilization; dust control; removal of abandoned above-ground and shallow piping and wiring, valves, meters, and other waste materials; and aggregate surfacing.

Unless specified otherwise in the Contract Documents, the Design-Builder shall remove all obstructions down to a minimum of 2 feet below the existing or proposed surrounding ground elevation or to the elevation necessary to properly construct the Work, whichever is lower.

The Design-Builder shall grade and restore all disturbed areas to match the existing surrounding ground elevation unless otherwise specified elsewhere in the Contract Documents. The Design-Builder shall cut pavement or sidewalk to full depth with straight lines at removal terminations.

The Design-Builder shall over-excavate as necessary to remove unsuitable material from under the footprint of pavements and structures and backfill with properly compacted suitable material. Topsoil may be stripped, stockpiled, and reused within the Project Limits.

The Design-Builder may only reuse materials on the Project that meet the requirements for grading and backfill materials. Disposal of obsolete, unsuitable, and surplus material is not allowed within the Right-of-Way and shall be removed.

8.3.1 Field Office

The Design-Builder shall provide, furnish and maintain a Field Office for use by the Department in accordance with the NYSDOT Standard Specifications. The Field Office shall be a Type 3 Office as described in the NYSDOT Standard Specifications.

8.3.2 Salvage

All materials removed from the Project site shall become the property of the Design-Builder, unless specifically stated elsewhere in this Part 3 - Project Requirements.

8.3.3 Surplus Quantity

Section not used.

8.3.4 Sidewalk Plowing Coordination During Winter Shutdown

Prior to the end of the construction season, the Design-Builder shall provide the State a list of new sidewalks that are open to the public that will need to be plowed by the municipality during the winter months. Before winter shutdown, the Design-Builder shall ensure that all sidewalks are free and clear of obstructions, barricades, fixed objects, etc. that would interfere with the snow plowing effort.

8.3.5 Final Cleanup

As a prerequisite to Project Completion, the construction area and all other adjoining areas, other than those owned by the Design-Builder, occupied by the Design-Builder in connection with the construction Work shall be cleaned of all surplus and discarded materials, spilled materials, excess materials left deposited on the permanent Work as a result of the Design-Builder's operations, falsework, and rubbish and temporary structures and buildings, that were placed thereon by the Design-Builder. The adjoining areas mentioned above, outside the normal limits for seeding, shall be reshaped, seeded and mulched, or otherwise restored as directed by the Department’s Project Manager at the Design-Builder's expense.

8.3.6 Webcam System

The Design-Builder shall provide appropriate technical media and materials that use strategically positioned videocam systems, in accordance with NYSDOT Special Specification 637.4000nn20, and time-lapse imagery of the construction of the project. The Design-Builder shall provide a minimum of three (3) cameras total for coverage of the work at the I81/I481 interchange. The Design-Builder shall be responsible for preparing and providing to the Department all videos, videocam systems and any other technical visual tools.

8.3.7 Project Photos/Videos

The Design-Builder shall provide monthly aerial photos and video of the project (entire project limit) to the Department’s Project Manager. These photos and videos must be in high resolution (7-10MB photos) and 4K or higher resolution of video.

SECTION 9 SURVEYING AND GIS

9.1 SCOPE

The Design-Builder shall perform all surveying tasks necessary to undertake and complete the Project including but not limited to: acquisition of terrain data (topography); mapping of roadways and appurtenances, features, bridges, and utilities as needed; locating boundaries; waterway surveys; contract control plan; construction and stakeout surveys; As-Built surveys; surveys that arise from other Project Requirements; asset inventory; and all other surveying services as necessary.

9.2 STANDARDS

The Design-Builder shall perform the surveying activities in accordance with the applicable Standards, Design Codes and Manuals cited in Section 1.6, unless otherwise stipulated in this Project Requirement or otherwise applicable to the Project.

9.3 REQUIREMENTS

9.3.1 Project Survey Control

Survey control, if available, will be provided as Reference Documents. The Design-Builder may supplement that information or conduct complete new survey as necessary to perform all the necessary surveys required to complete the Project, as the Design-Builder deems appropriate.

9.3.2 Department-supplied Data

The Department will provide the Design-Builder with the following Survey-Related Data as Reference Documents:

- ROW / Highway Boundary Geometry;
- Survey / Photogrammetric Base Mapping Planimetrics;
- Survey / Photogrammetric Digital Terrain Model; and
- Record Plans.

The Design-Builder shall be responsible for verifying any data used for the Project.

9.3.3 Survey Reports, Records and Maps

The Design-Builder shall submit to the Construction Inspection Professional Engineering Firm, all information listed under the '*Documentation*' sub-section of each chapter of the NYSDOT *Land Surveying Standards and Procedures Manual* that is applicable to its survey work. The Design-Builder shall index and submit all calculations, notes, computer files, raw data, Project reports, meeting notes, correspondence, digital images, maps, corner records, records of survey, aerial photogrammetric products, centerline alignment maps, and other maps and related items.

The Design-Builder shall be responsible for ensuring that information submitted is compatible with the applicable NYSDOT CADD standards, software and operating systems and formats.

All survey reports and maps, including bathymetric survey plans, shall be signed-and-sealed by a New York State licensed professional land surveyor.

9.3.4 Permanent Survey Markers

Ten (10) Permanent Survey Markers shall be installed in accordance with the Highway Design Manual utilizing the specifications of Item 625.06 of the NYSDOT Standard Specifications. Locations shall be determined during detailed plan development. The Design-Builder shall complete PSM Cert form (HC125) for each of the ten Permanent Survey Markers.

9.4 SURVEYING AND GIS DELIVERABLES

Deliverables shall be as stated elsewhere in the RFP documents.

SECTION 10 RIGHT-OF-WAY

10.1 SCOPE

Plans showing the existing State owned Right-of-Way (ROW) are included in the Reference Documents. The Design-Builder shall perform all the permanent Project Work within the existing State owned ROW and any additional ROW that has been, or will be, obtained for the Project.

Maps for any Right-of-Way that is in the process of being obtained or has been obtained specifically for this Project are included in Part 7 – Engineering Data of these Contract Documents.

Property releases for driveway reconnections or other work that is required are the responsibility of the Design-Builder, in close coordination with the Construction Quality Assurance Engineer. If the Design-Builder desires to enter the existing Highway ROW, during the procurement or prior to issuance of the Notice to Proceed, for the purposes of gathering engineering related data, the Design-Builder shall make an application for a NYSDOT Highway Work Permit by contacting the Regional Permit Office.

Right of ownership of all ROW and the improvements made thereon by the Design-Builder shall remain at all times with the Department. The Design-Builder's right to entry and use of the ROW arises solely from permission granted by the Department under the Contract.

10.2 REQUIREMENTS

10.2.1 Right-of-Way Fencing

Any ROW fencing that has been damaged due to construction of the Project or removed by the Design-Builder shall be replaced by the Design-Builder with new ROW fencing meeting current NYSDOT standards.

10.2.2 Property Interests Identified by the Design-Builder for its Convenience

The Design-Builder shall be responsible for the acquisition and all costs associated therewith for any temporary land or other property required for the Design-Builder's convenience outside the ROW Limits, such as for staging, lay-down, access, office space, temporary works, or other purposes. The Design-Builder shall assume responsibility for satisfying all Federal and State regulations, identifying, analyzing, and documenting the environmental impacts associated with the additional space and securing all necessary consent, including that of the Department, prior to initiating use of the space, in accordance with *DB* §*105-15*.

10.2.3 Right of Way Markers

The Design-Builder shall monument all Permanent Easements and FEE acquisitions with high type concrete monuments, except in urban areas where flush pin and cap shall be installed, in accordance with the NYSDOT Highway Design Manual and NYSDOT ROW Mapping Procedure Manual.

10.2.4 Identifying Impacts to Adjacent Properties

When the Design-Builder has progressed the project design to a point that the impacts to adjacent properties are known, the Design-Builder shall schedule a meeting (similar to a "Taking Line Review Meeting", as referenced in the Highway Design Manual Chapter 5) with the Department's

Project Manager who shall additionally invite representatives from the Regional Design Office and the Regional Right of Way Office. The Design-Builder shall present its detailed design solutions to the Department and the Department will confirm that their solution does not introduce additional impacts to adjacent property owners compared to the Indicative design and plans included in Part 6. If additional impacts to adjacent property owners result from the Design-Builder's solution, the Department's appraisal staff will reassess if any additional funds are due the property owners to ensure just compensation.

10.2.5 Status of ROW Acquisitions and Progression of Work

Refer to Table 10-1 for information regarding the availability of certain ROW parcels. Acquisition plans are included in Part 7 – Engineering Data.

The Design-Builder shall not enter any of the listed properties without written notification by the Department that the required ROW has been obtained and is available for use.

Table 10-1 – Status of ROW Acquisitions

Map(s)	Relocation	Acquisition Type	Owner(s)	Available to Design-Builder
81-1000	No	FEE WOA	Josephine M. Holl	NTP
81-1001	No	FEE WOA	Christopher R. Leins	NTP
81-1002	No	FEE WOA	Roy M. Partridge	NTP
81-1003	No	FEE WOA	Mary M. Jackowski	NTP
81-1004	No	FEE WOA	Darlene H. Scott	NTP
81-1005	No	FEE WOA	Andrew C. Krell	NTP
81-1006 / 81-1006-TE	No	FEE WOA / TE	Loretto Rest Realty Corporation	NTP
81-1007-TE	No	TE	Loretto Properties Corporation	NTP
81-1008-TE	No	TE	Loretto Housing Development Fund Co., Inc.	NTP
81-1009	No	FEE WOA & FEE	Jaquith Industries Inc.	NTP
81-4000-TE	No	TE	Joes Kwik Marts LLC	NTP
81-4100	No	FEE WOA	Frank J. Scibilia Testamentary Trust	NTP
81-4200	No	FEE WOA	Niagara Mohawk Power Corporation	NTP

10.2.6 Railroad Right of Way – Right of Entry

In order to perform the Work, the Design-Builder will have to access the project site by entering property controlled by CSXT. The Design-Builder shall adhere to the railroad property access requirements while working on property under the control of CSXT. As soon as practicable after contract award, the Department's Project Manager will convene a meeting with CSXT, and the Design-Builder for the purpose of:

A. Coordinating and confirming the Design-Builder's work schedule;

B. Determining time frames necessary for access to railroad property;

C. Assuring the Design-Builder's employees possess the required safety training from CSXT;

D. Scheduling and coordinating to ensure the presence of required flaggers and other protocols of CSXT are followed. Additional railroad requirements are included in Part 3, Section 28 and Part 5, Special Provision XX.

SECTION 11 PUBLIC INVOLVEMENT

11.1 SCOPE

The goal of the public involvement activities is to inform the public and agency participants by providing timely information throughout the design and construction process. The Design-Builder shall be responsible for supporting and cooperating with the Department for all public involvement activities.

11.2 STANDARDS

The Design-Builder, in close coordination with the Department, shall perform the Public Involvement activities in accordance with the NYSDOT Project Development Manual: Appendix 2, Public Involvement Manual.

11.3 REQUIREMENTS

11.3.1 Public Outreach

The Design-Builder shall have the primary responsibility for performing public outreach activities for the Project, but the lead in all public outreach activities shall be the Department. All public outreach activities shall be coordinated through the Department's Construction Quality Assurance Engineer (CQAE). All public communication activities must be reviewed and approved by the Department. This includes communication and notifications of key stakeholders (motorists, general public, area residents, educational institutions, emergency services, businesses, etc.) of road closure information, Project milestones or Project construction related activities that have the potential to affect the general public and/or residents in proximity to the Project area. Project milestones include, but are not limited to: the visible start of construction activities; travel pattern changes; significant Project accomplishments, and construction completion.

The Design-Builder shall be aware that outreach to the public is a critical component to the successful completion of any NYSDOT project. Design-Build projects by their nature introduce unknowns and variables that the public is not aware of due to the fact the design is not complete. In an effort to offset those potential concerns and anxieties that a yet fully vetted design could create, in the eyes of the public, outreach to the public shall commence early on this project. The Design-Builder shall be prepared to meet with appropriate stakeholders and the elected officials and the general public within 60 days following the issuance of the Notice to Proceed. The Department remains the lead on this activity but the Design-Builder will assist in coordinating the logistics, preparing the presentation material, the announcement of the meeting(s), and other outreach efforts necessary to capture the community's interest and participation. The Design-Builder shall be prepared at this time to discuss the design, the reason for said design, the construction methods, the schedule of the construction contract, the time periods of the day that the work will be on-going, and how traffic and pedestrians will be accommodated, as a minimum. This will all be coordinated with the Department's Project Manager and the discussion of this meeting and coordination will begin at the Design Workshop and shall be so listed as an agenda item for the Design Workshop.

The Design-Builder shall coordinate with and provide a minimum of two weeks advance notice to the CQAE prior to all changes to traffic patterns and the following Project milestones: start of construction; Project completion; and any other interim completion milestone(s) determined by the Department.

The Design-Builder shall provide the Department with a minimum of two weeks advance notification for each public information activity (press announcements, travel advisories, PVMS postings, etc.) to allow for proper review and comment by the Department.

The Design-Builder shall provide the Department's CQAE with a written work Schedule (including anticipated traffic changes) two weeks in advance of work that will change traffic patterns.

11.3.2 Media Relations

Media Inquiries: All media inquiries, requests for interviews from local print or broadcast news media, trade magazines or other media outlets must be referred to the CQAE for direction. The Department will coordinate and respond to all media requests. The Design-Builder shall alert all project personnel about this policy.

Press Releases and Travel Advisories: To allow for timely notice to the public, two weeks advance notice of the start of work, any lane closures, road closures, or changes to traffic patterns or project milestones is required to be given to the CQAE and the Department's Project Manager.

Notifications referenced above are in addition to the written work schedule discussed in Section 11.3.1. The Department will develop a draft travel advisory and/or press release for content and quality, which is reviewed by the Design-Builder and approved by the Department. The Department will distribute finalized press releases and travel advisories to the press and appropriate elected officials and posted on the Project website by the Department. However, the Design-Builder, under the direction of the Department, is responsible for the notification of local public officials, emergency service providers, schools, residents, businesses, and other affected parties, of any major travel pattern change.

The strategies described above are consistent with the requirements of Part 3 Section 19 – Work Zone Traffic Control and Access, and shall include Construction Bulletins, which are reviewed and approved by the Department, and published by the Design-Builder, especially focused on traffic changes, nighttime work, higher-noise construction periods or locations, or other construction activities of potential concern to the public. Under the direction of the Department, the Design-Builder shall be responsible for interaction with the affected homeowners, tenants and businesses with regards to issues including but not limited to, security of and access to their property or properties, utility services, nighttime operation, etc.

11.3.3 Public Information Meeting

The Design-Builder shall be prepared to partner with the Department on additional Public Information Meeting(s) to discuss the Project's progress with the community in an open forum format. The Design-Builder shall prepare design and construction-related information about the Project and the Design-Build process and progress, schedule or construction methods being used to advance the Project, etc., that will help inform Project stakeholders. The Design-Builder shall work in cooperation with the CQAE in determining the necessary presentation materials, but PowerPoint material shall be required. The PowerPoint and any other necessary presentation materials shall be approved by the Department.

Project update meetings including public informational meetings, as discussed above, may be required during the course of construction, depending on how smoothly the Project is progressing and the community(s) reaction and receptiveness to the construction of the Project. The

Department will determine the number, frequency, schedule, and locations of update meetings and public informational meetings, and will update this information as the project progresses.

SECTION 12 UTILITIES

12.1 SCOPE

The utility requirements set forth in Part 4 – Utility Requirements present the Design-Builder's responsibilities as they relate to existing and/or new utilities, the manner in which utilities shall be protected, relocated, upgraded, constructed or incorporated into the construction, and responsibilities for the Work.

12.2 STANDARDS

The Design-Builder shall perform all utility activities in accordance with the Contract Requirements, the applicable Standards, Codes and Manuals listed in Section 1.6 or otherwise applicable to the Project, and the standards required by the various utility companies affected by the work.

12.3 GENERAL REQUIREMENTS

The Design-Builder shall examine the record plans of the work site, make a field survey of the work site and examine all other available documents to determine the type and location of all utilities that may be affected by the Design-Builder's Work. Before any work begins the Design-Builder shall inform the Department's Project Manager what utilities are present and how they may be affected by the work.

The Design-Builder, in coordination with the Department's Project Manager (or designee) and the Regional Utility Engineer, shall meet with all the affected Utility owners or operators for the purpose of discussing the effect on the utility facilities and to agree on a plan to maintain, protect, relocate, reinstall, or other action that may be necessary for the work to progress.

All utilities must be maintained, supported and protected during construction, unless otherwise directed by the utility owner.

Any utility conduit, conductor, splice box, pull box or other item that is part of a utility system or street light system that is embedded in a concrete deck, sidewalk or other concrete element that is being removed and replaced as part of this Project shall be replaced and its location coordinated with the utility owner unless the utility owner indicates that replacement is not required. The design and construction of the replaced utility shall be in conformance with the current standards of the Utility owner.

The Design-Builder shall be responsible for repair to any damage and consequential damages to those utilities caused by his operations at the Design-Builder's expense. If the nature of the damage is such as to endanger the satisfactory operations of the utilities and the necessary repairs are not immediately made by the Design-Builder, the work may be done by the respective owning companies and the cost thereof charged against the Design-Builder.

The Design-Builder shall provide notice to the Construction Quality Assurance Engineer (CQAE) at least two weeks before construction begins on any portion of the Project. The CQAE will notify the Regional Utility Engineer of the pending construction and of any planned interruptions to service. It should be noted that utility companies set their own notification time frames and requirements. Preliminary time frames have been identified in Part 4 – Utility Requirements of these Contract Documents. The Design-Builder shall coordinate with respective Utility Owners.

12.3.1 Utility Relocation Agreements

It is anticipated that the required Final Utility Work Agreements will be executed between the Department, the Design-Builder and the owners of impacted utilities once the Design-Builder has determined the final locations of the impacted utilities. See Part 4 for details on utility inventory, coordination and relocations.

The Design Builder shall be responsible for the design and construction of these facilities as outlined in Part 4 - Utilities.

12.3.2 Other Utility Conflicts

Please see Part 4 – Utility Requirements for additional utilities in the project vicinity that may require relocation and modification.

SECTION 13 GEOTECHNICS

13.1 SCOPE

The Design-Builder shall be responsible for all Geotechnical Work necessary for the design and construction of all permanent and temporary structures, including assessing available information, planning and implementing subsurface investigations, geotechnical analysis and reporting, geotechnical instrumentation and monitoring, and protection of existing infrastructure, structures and utilities in accordance with the requirements of the Contract Documents.

These requirements are considered as a minimum and do not include all possible conditions that may be encountered in the Design-Builder's final design.

The Department is in the process of performing limited subsurface investigations, which will be provided as reference documents.

The Design-Builder shall be familiar with available geotechnical, geologic, seismic, hydrogeology, soils literature, and existing site conditions (both native and man-made), and shall interpret the existing geotechnical data pertaining to the Project Site. The Design-Builder shall form its own interpretation of the existing geotechnical data, and any additional geotechnical data the Design-Builder may obtain from its own investigations and shall produce designs compatible with geotechnical site conditions and provide for the durability of the finished product.

Unless otherwise noted in the RFP, existing substructures and retaining walls shall not be re-used or incorporated into new work unless the Design-Builder provides detailed analysis showing that all design standards associated with the new structures are met, and verification that the condition of the existing structure demonstrates a remaining service life that meets or exceeds project requirements.

13.2 STANDARDS

The Design-Builder shall perform geotechnical activities in accordance with the Contract Requirements and the applicable Standards, Design Codes and Manuals cited in Section 1.6 or otherwise applicable to the Project.

The Design-Builder shall use Bentley gINT® or similar commercial software to develop and maintain an electronic database of subsurface information including in-situ test and laboratory test results, and to produce all final subsurface exploration logs or records.

13.3 DESIGN REQUIREMENTS

13.3.1 Geotechnical Work Plan

The Design-Builder shall prepare a Geotechnical Work Plan, for the project that identifies the geotechnical scope of work that the Design-Builder plans to complete for the design and construction of the project. The Geotechnical Work Plan shall include:

A) Design-Builder's knowledge and understanding of the geotechnical, geologic, hydrogeologic and seismic settings of the Project Site and how the nature and behavior of the soil, rock, groundwater and subsurface conditions will affect the investigation, design and methods of construction;

B) Identification of key constraints, site and subsurface conditions, and a description of how the geotechnical activities will be designed and constructed to meet these constraints and conditions;

C) Types of subsurface investigations to be carried out for the Project, including locations and depths of borings, surface and/or downhole geophysical tests, and other field testing with a narrative of the in-situ tests (if applicable) and laboratory tests to be carried out;

D) A summary of the proposed geotechnical works including identification of major design and construction risks, and how these risks will be managed and mitigated;

E) A narrative on the proposed geotechnical instrumentation and how it will be used for design verification and to demonstrate prior to final project acceptance that measured performance meets predicted performance; and

F) Corrective actions to be taken if geotechnical instrumentation shows that measured performance does not meet predicted performance.

13.3.2 Geotechnical Investigations

The Design-Builder shall plan and conduct geotechnical investigations in accordance with the Department's and AASHTO Standards for subsurface exploration programs, and as deemed necessary by the Design-Builder's Lead Geotechnical Engineer to establish the geotechnical conditions and to perform all geotechnical and foundation design and analysis.

Information from existing borings and testing provided by the Department as Reference Documents may be combined by the Design-Builder with the Design-Builder's subsurface investigation to comply with the requirements of the applicable standards. It is the sole responsibility of the Design-Builder to determine if the existing borings and testing are suitable for use in the Project. It is the sole responsibility of the Design-Builder to determine the extent to which further geotechnical exploration and testing by the Design-Builder are necessary for the Project.

For each subsurface exploration, the Design-Builder shall be responsible for keeping a continuous and accurate log in accordance with NYSDOT Geotechnical Design Manual.

The Design-Builder shall determine the State Plane coordinate location and ground surface elevation for each boring and field exploration position, and shall show the actual coordinates and the datum version, the station and offset, and the elevation for each individual boring log or exploration record in accordance with Department standards. Boring shall be located using NAD83 Geodetic Reference System. Elevations shall be referenced to the Project datum and horizontal control system.

13.3.3 Geotechnical Data Report

The Design-Builder shall be responsible for preparing a Geotechnical Data Report, signed and stamped by the Lead Geotechnical Engineer. The Geotechnical Data Report shall serve as a factual depiction of the subsurface conditions and at a minimum it shall include:

A) A detailed description of the investigation methods;

B) Complete records with summary tables of investigation;

C) Complete records with summary tables of laboratory test results; and

D) An exploratory hole location plan, showing locations of any existing (pre-award) exploratory holes for which data was used by the Design-Builder plus locations of post-award exploratory hole locations undertaken by the Design-Builder; and

E) Final logs for all subsurface explorations progressed by the Design-Builder.

13.3.4 Foundation Design Report

The Design-Builder shall prepare a Foundation Design Report for each structure included in the Project which requires a foundation. The Foundation Design Report shall detail the analysis and design of each foundation element in accordance with NYSDOT and AASHTO specifications and standards. The Foundation Design Report shall be signed and stamped by the Lead Geotechnical Engineer, and as a minimum should include:

A. Description of the geology and subsurface conditions at the structure location;

B. A summary and interpretation of geotechnical engineering conditions based on the available subsurface information, including geotechnical design parameters;

C. Foundation design summary including design assumptions, design methods, design criteria, calculations, and design software output files;

D. Assessment of short-term and long-term performance of foundation elements including settlement, lateral deformation, and effects on adjacent structures;

E. Construction considerations including obstructions, dewatering, support of excavation, impact on existing structures and utilities, staging requirements, and summary of field testing needed to verify that project requirements are met.

Augercast piles and helical piles are not allowed for structure foundations.

13.3.5 Excavations and Embankments

The Design-Builder shall be responsible for assessing the stability and impacts of any new fill and cut slopes (permanent and temporary) required for the Project, and ensuring the short and long term stability of these slopes.

The Design-Builder shall assess the settlement induced by fill placements, including immediate settlement in granular soils, and both immediate and consolidation (time-dependent) settlement in cohesive soils.

Embankments for roadway foundations shall be designed so that post construction settlement within a 50-year timeframe is expected to remain within two inches of the design grade line at any point along the entire roadway surface, and differential settlement along the travel lane or shoulder surfaces shall not exceed one inch over a 100-foot length in the longitudinal direction and one-half inch along a 10 foot length in the transverse direction, or one-half inch along a 10 foot length within 10 feet of an approach slab or edge of structure. The effect of settlement on existing and proposed buried utilities shall be considered over a 100-year timeframe.

13.3.5.1 Geotechnical Design Report

The Design-Builder shall prepare a Geotechnical Design Report for areas where a proposed permanent raise in grade exceeds two feet, or where ground improvement or karst mitigation is proposed to improve soil conditions. Ground improvement is defined as the use of lightweight materials (expanded polystyrene, foamed lightweight concrete, expanded shale, etc.), excavation and replacement with granular soils, or ground improvement techniques as detailed in FHWA NHI-16-027 and NHI-16-028. Karst mitigation is defined as grouting, capping, and/or filling of sinkholes, caves, cavities, etc., as well as the use of geomembranes or closed drainage systems to control changes to surface and subsurface flows. Ground improvement and karst mitigation methods not covered by department standards and specifications require an approved ATC. The Geotechnical Design Report shall be signed and stamped by the Lead Geotechnical Engineer, and as a minimum should include:

A. Description of the geology and subsurface conditions at the site;

B. A summary and interpretation of geotechnical engineering conditions based on the available subsurface information;

C. Recommended geotechnical treatment(s) and geotechnical design parameters, including design assumptions, design methods, design criteria, calculations, and design software output files;

D. Assessment of short-term and long-term performance of embankment construction and/or proposed ground improvement/karst mitigation including slope stability, effects of time-related settlement, and lateral deformation;

E. Construction considerations including dewatering, support of excavation, impact on existing structures and utilities, and staging requirements;

F. Proposed geotechnical instrumentation for monitoring project performance. Proposed instrumentation shall verify at project acceptance that measured performance is in line with predicted performance. Details for the proposed instrumentation shall be included in the Geotechnical Instrumentation and Construction Monitoring Plan.

13.3.6 Retaining Walls

The Design-Builder shall design and construct retaining walls, if required, in accordance with Section 14 of this Part 3 - Project Requirements. The Design-Builder shall provide retaining wall designs to address internal, external, and global (overall) stability and settlements (total and differential) of the walls in accordance with the NYSDOT LRFD Bridge Design Specifications.

All retaining walls shall be evaluated and designed for seismic stability internally and externally (i.e. sliding and overturning). With regard to overall seismic slope stability (global stability) involving a retaining wall, with or without liquefaction, the Lead Geotechnical Engineer shall evaluate the impacts of failure due to seismic loading, if failure is predicted to occur.

Mechanically stabilized earth (MSE), gabion and crib walls (stretcher and header type) shall not be used.

13.3.7 Geotechnical Instrumentation and Construction Monitoring

The Design-Builder shall develop, implement, and maintain a Geotechnical Instrumentation and Construction Monitoring Plan to monitor vibrations, accelerations, vertical settlement, and lateral movement of temporary support structures and adjacent ground, and existing structures and infrastructure during construction, including ancillary structures and infrastructure within the zone of influence of construction.

The Geotechnical Instrumentation and Construction Monitoring Plan shall also include, when necessary, details of design verification geotechnical instrumentation such as settlement monitoring for embankment construction, groundwater monitoring for dewatering operations, and monitoring of other geotechnical operations proposed by the Design-Builder.

Wherever vibration-producing activities are located within 100 feet of a structure, building, or utility, the Design-Builder shall perform vibration monitoring in accordance with NYSDOT Special Specification 634.99020017 to address the potential impacts to nearby receptors due to construction or demolition activities associated with this Project. The term “receptor” includes buildings, utilities, newly constructed elements, and existing structures, for which construction impacts or work above recommended limits may be detrimental.

The Design-Builder shall provide weekly construction instrumentation monitoring reports to the Department. Monitoring reports shall be interpretive in nature, and shall enumerate any corrections applied to the data including, but not limited to any notification measures taken regarding data. The weekly reports shall include clear and explicit statements of readings exceeding any pre-determined threshold values. The Design-Builder shall maintain the instrumentation and monitor the measurements during and after construction up to Final Acceptance.

The Geotechnical Instrumentation and Construction Monitoring Plan shall be signed and stamped by the Lead Geotechnical Engineer, and as a minimum shall include:

A. Identification of receptors, including structures and/or utilities located within 100 feet of vibration-producing activities that require vibration monitoring;

B. The types and quantities of instruments to be used for monitoring, and the proposed location of the instruments;

C. Alert and Action level vibration limits for monitored structures and/or utilities, and notification protocol for instances where the limits are exceeded;

D. The frequency and duration of instrument readings; and

E. When necessary, geotechnical instrumentation for design verification including the types, quantities, locations, and frequency of readings for proposed instrumentation.

The Design-Builder shall install and take readings on vibration monitoring instruments at least two weeks prior to construction activities within the 100 foot zone of influence to establish baseline readings.

The geotechnical instrumentation shall be used to demonstrate at project acceptance that measured geotechnical performance is in line with predicted performance.

13.3.8 Temporary Works

The Design-Builder shall be responsible for the design and construction of all temporary works required for the Project.

13.4 CONSTRUCTION REQUIREMENTS

13.4.1 Dewatering and Groundwater Control

The Design-Builder shall be responsible for evaluating the potential need for dewatering and groundwater control, and for implementing such measures as appropriate, and shall evaluate the effects on existing facilities resulting from any dewatering and draw down.

13.4.2 Structure Foundations

The Design-Builder shall provide integrity, verification, and proof testing of all deep foundation elements as stated below and in accordance with Department standards. The below requirements supplement, but do not supersede, Department standards.

<u>Drilled Shaft</u>

- Static axial compressive load tests must be performed on 1% of all drilled shafts, with a minimum of one per substructure. This testing must be completed on a non-production shaft at each substructure prior to production shaft installation. Alternatively, a bi-directional static load test may be performed on the first production drilled shaft installed at each substructure (1% requirement still applies). The Department may waive the minimum requirement of one Static Axial Load Test per substructure provided that the Design-Builder demonstrates through a detailed subsurface exploration program that the project can be broken into sites with similar geologic subsurface conditions of low variability in accordance with AASHTO requirements.

- Crosshole sonic logging must be performed on all drilled shafts. This testing may be supplemented by thermal integrity profiling.

- The bottom of drilled shafts shall be inspected using a shaft inspection device (SID) if the shaft design relies on end bearing resistance.

- All production drilled shafts must have a similar design and be constructed using similar methods, including concrete placement volumes and installation pressures, as the closest test shaft. All installation data and observations must be recorded on an installation log.

<u>Micropiles</u>

- Static axial compressive load tests must be performed on 1% of all micropiles, with a minimum of one test per substructure. This testing must be completed on a non-production test pile at each substructure prior to production micropile installation. If the Design-Builder decides to alter the installation methods, or if changed subsurface conditions are encountered, additional load tests are required on non-production micropiles installed with the new methods/subsurface conditions. The Department may waive the minimum requirement of one Static Axial Load Test per substructure provided that the Design-Builder demonstrates through a detailed subsurface exploration

program that the project can be broken into sites with similar geologic subsurface conditions of low variability in accordance with AASHTO requirements.

- Proof testing of production micropiles must be performed on a minimum of two piles per substructure. Tension testing is allowed if site conditions permit.

- All production micropiles must have a similar design and be constructed using similar methods, including grout placement volumes and installation pressures, as the closest test pile. All installation data and observations must be recorded on an installation log.

Driven Piles

- Dynamic pile load tests, or equivalent verification testing, must be performed on a minimum of 2% of all driven piles, with a minimum of two tests per substructure.

- All driven piles must have a similar design and be driven to similar termination criteria as the closest load tested pile.

As part of the As-Built Plans, the Design-Builder shall provide installation records for all deep foundations installed in accordance with Department standards.

13.4.3 Excavations and Embankments

The Design-Builder shall progress all excavations in accordance with Department standards and specifications. Trench boxes are not allowed to support live traffic.

Surplus material excavated from within the Project limits that is proposed for reuse as Select material shall be stockpiled, sampled, and tested per Department standards.

The Design Builder shall construct embankments in accordance with Department standards and specifications. For ground improvement methods not covered by Department standards and specifications, construction methods, quality control, and quality assurance shall be in accordance with: FHWA NHI-16-027 and NHI-16-028, Ground Improvement Methods Volumes 1 and 2, and FHWA GEC 8, Design and Construction of Continuous Flight Auger Piles. For ground improvement methods not covered by Department standards and specifications, an approved ATC is required.

13.4.3.1 Expanded Polystyrene

Expanded Polystyrene shall not be used.

13.4.3.2 Column Supported Embankments

The use of Column Supported Embankments requires an approved ATC.

Column Supported Embankments are defined as stiff vertical columns that are designed to transfer the load of an embankment through a soft compressible soil layer to a bearing stratum. The support columns may consist of conventional driven piles (h-piles, CIP, precast, timber) or may utilize formed in place methods (soil mix columns, aggregate columns, cement based columns). A load transfer platform is typically used to distribute the embankment load to the columns.

The Design-Builder shall provide verification, integrity, and proof testing of columns as stated below and in accordance with Department and FHWA standards. The below requirements supplement, but do not supersede, Department and/or FHWA standards.

Driven Columns

- Dynamic pile load testing, or equivalent verification testing, must be performed on a minimum of 2% of all driven columns, with a minimum of one test per pile design and/or representative subsurface condition at the project site.

- All driven columns must have a similar design and be driven to similar termination criteria as the closest load tested column.

Drilled Columns

- Static axial compressive load tests must be performed on 0.2% of all drilled columns, with a minimum of one test per column design and/or representative subsurface condition at the project site. This testing must be completed on non-production columns and is to be used for design verification. For sites requiring more than 5 static axial load tests that have demonstrated consistent load test results, the Department may elect to substitute additional proof tests for required static axial compressive load tests.

- Integrity testing shall be performed on a minimum of 10% of all drilled columns. Integrity testing shall consist of, as a minimum, low strain impact and/or thermal integrity profiling.

- Proof testing of production columns must be performed on a minimum of 1% of all columns.

- All production columns must have a similar design and be constructed using similar methods, including grout/concrete placement volumes and installation pressures, as the closest test pile. All installation data and observations must be recorded on an installation log.

As part of the As-Built Plans, the Design-Builder shall provide installation records for all columns installed in accordance with Department standards.

13.4.4 Condition Surveys

13.4.4.1 Pre-Construction Condition Survey

The Design-Builder shall conduct a pre-construction inspection and survey of the existing condition of all structures and properties within 100 feet of vibration or settlement causing construction activities and generate photographic and video documentation of existing damage, leaks and cracks, in accordance with the requirements of NYSDOT Special Specification 634.99010017. The pre-construction condition survey shall form the basis against which all new cracks, existing progressive cracks, or damage will be measured.

The Design-Builder shall ensure that the pre-construction condition survey encompasses at a minimum all properties within areas that are identified by the Design-Builder to be potentially

prone to: (i) ground vibration levels, expressed as resultant peak particle velocity, in excess of 2.0 inches per second; and (ii) predicted ground settlements of greater than ¼ inch.

The Design-Builder shall record the results of the pre-construction condition survey, which shall be signed and stamped by a Professional Engineer registered in the State of New York.

13.4.4.2 Post-Construction Condition Survey

The Design-Builder shall conduct a post-construction inspection and survey of the properties covered by the pre-construction survey. The post-construction condition survey shall be performed by the Design-Builder within 20 calendar days of Project Completion, and it shall compare the post-construction conditions with the conditions documented in the pre-construction condition survey. A summary of the damages observed, if any, shall be provided at the end of the report. The location and scope of the post-construction condition survey shall match those of the pre-construction condition survey. The complete documentation of the post-construction survey, describing the comparison with the preconstruction conditions and signed by a Professional Engineer registered in the State of New York, shall be submitted to the Department, both in hardcopy and electronic format.

13.5 DELIVERABLES

Deliverables shall be as stated elsewhere in the RFP documents.

SECTION 14 STRUCTURES

14.1 SCOPE

The Design-Builder shall be responsible for all work necessary to complete the design and construction of all permanent and temporary structures required to complete the Project, including, but not limited to, the permanent bridges, noise walls, retaining walls, traffic railings/barriers, sign structures, and miscellaneous structural components. The design and construction of all structural systems and components shall provide functionality, durability, ease of maintenance and inspection, and safety.

The following new bridges shall be constructed:

Bridge No.	Feature Carried	Feature Crossed
7	East Brighton Avenue	I-81
8	BL 81 SB to I-81 NB Ramp	BL 81
9	I-81 NB	BL 81 NB
10	I-81 NB	BL 81 SB to I-81 NB Ramp
11	I-81 SB	BL 81 NB and BL 81 SB to I-81 NB Ramp
12	I-81 NB	East Seneca Turnpike
13	Relocated East Glen Avenue	BL 81 NB and BL 81 SB

The following bridge shall be replaced:

Bridge No.	BIN	Feature Carried	Feature Crossed
1	1031501	I-81 SB	East Seneca Turnpike

The following bridge shall be rehabilitated:

Bridge No.	BIN	Feature Carried	Feature Crossed
17	1093562	I-81 (former I-481) NB	Route 290 (Manlius Center Road)

The following bridges shall be rehabilitated and widened:

Bridge No.	BIN	Feature Carried	Feature Crossed
14	1093571	I-81 (former I-481) SB	CSX Railyard
15	1093572	I-81 (former I-481) NB	CSX Railyard
16	1093561	I-81 (former I-481) SB	Route 290 (Manlius Center Road)

The following bridges shall be demolished and removed:

Bridge No.	BIN	Feature Carried	Feature Crossed
2	1031510	East Glen Avenue	I-81
3	1069090	I-481 SB to I-81 SB	I-81 SB
4	1069100	I-81 SB Ramp to I-481	I-81 NB
5	1069110	Brighton Ave.	I-481 Ramp from I-81 SB and I-81 NB

6	1069120	Brighton Ave.	Ramp to I-81 NB and I-81 SB

The Design-Builder shall be responsible for the review and approval of all shop drawings needed for the scope of work. The review and approval process shall be in conformance with the Design-Builder's Quality Control Plan.

14.2 STANDARDS

The Design-Builder shall perform structural design and construction activities in accordance with the Contract Requirements and the applicable Standards, Design Codes, and Manuals cited in Section 1.6, unless otherwise stipulated in this Project Requirement or otherwise applicable to the Project.

14.2.1 Performance Engineered Concrete Mixtures

For cast-in-place concrete, the Design-Builder may use Performance Engineered Concrete Mixtures in lieu of NYSDOT Standard Specification Section 501 concrete classes. A Performance Engineered Concrete Mixture is defined as any mix proposed by the Design-Builder where f'c > 3,000 psi. Special Provision 9, entitled DB Performance Engineered Concrete Mixtures, provides the requirements for the Design Builder's use of such mixtures. When a Performance Engineered Concrete Mixture is proposed, the Design-Builder shall develop a Special Specification for the applicable construction work item, in accordance with the provisions of SP-9, and submit to the Department for review and approval a minimum of 45 days prior to its intended use.

Note these Special Provision requirements address the mixture performance criteria and development tied to NYSDOT Standard Specification 501 and do not modify any other construction specifications (i.e. 555, 557, etc.). If a Special Specification has different, or additional, mixture requirements, the Design Builder shall produce a Performance Engineered Concrete Mixture in accordance with the requirements of that specification.

If the Design-Builder intends to use Performance Engineered Concrete Mixtures, a meeting shall be scheduled with the Department no later than 60 days after Notice to Proceed to discuss the process for complying with SP-9.

14.3 DESIGN REQUIREMENTS

The Design-Builder shall design bridge structure(s), including but not limited to the following: new bridges, replacement bridges, bridge widening, bridge rehabilitation, retaining walls, sign structures, joint systems, link slabs, moment slabs, approach slabs, barriers, bearings, drainage systems, and miscellaneous structural components.

The work to be performed on the widened and/or rehabilitated structures shall include, but not be limited to, the following:

- New concrete deck and connection to the existing deck, where required.
- Design and install new superstructure framing to support the widened section of the deck. The new framing system shall be comprised of girders that are geometrically similar to the existing framing. Diaphragm spacing shall, at a minimum, be equal to the existing diaphragm spacing of the adjacent existing framing. New diaphragms shall be geometrically similar to the existing diaphragms of the adjacent existing framing.
- Where necessary, girder strengthening may only include the installation of cover plates, stiffeners, and/or additional diaphragms.

- Where longitudinal joints are being removed, or where superstructure framing is being widened, new steel diaphragms shall be installed so that all adjacent girders are connected by diaphragms.
- Design and construct new substructures and modify existing substructures as necessary to accommodate the new widened sections of the bridges as well as changes to the vertical profiles.
- Design and construct/install new decks, barriers, link slabs, joint systems, bearings, and pedestals.

The Design-Builder shall use multi-girder steel I-girder superstructures for the new, replacement, widened, and/or rehabilitated bridges.

Minimum vertical clearance shall be as defined in the Directive Notes. The minimum vertical clearance shall be met above all travel lanes and shoulders of the existing and proposed roadways at all times during, and at the conclusion of, the project.

The Design-Builder shall design, construct, maintain, and remove any temporary vehicular or pedestrian bridge in accordance with Standard Specification Section 619. The requirement to perform a seismic analysis on any temporary vehicular or pedestrian bridge is waived. All seismic detailing requirements shall apply. The Department reserves the right to assign in-process Quality Assurance inspection on any temporary bridge in the project. The provisions of notification of Sources of Supply in Section 106-01 of the Standard Specifications shall apply. Temporary vehicular bridge railing shall meet TL-3 requirements. Temporary pedestrian bridges shall be designed in accordance with the NYSDOT Standard Specifications for Highway Bridges using a design live load of 65 PSF. Any temporary vehicular bridge shall match the vertical clearance of the adjacent existing permanent bridge or provide a minimum vertical clearance of 14’-6”, whichever is greater. Any temporary pedestrian bridge shall have a minimum vertical clearance of 15’-6”. Minimum vertical clearances shall be met above all travel lanes and shoulders of the existing and proposed roadways at all times during, and at the conclusion of, the project.

The requirements of the table below shall apply to the design of all new and replacement vehicular bridges and shall apply to the analysis of any existing vehicular bridge where structural widening/modifications are performed by the Design-Builder. Where requirements are provided for both the LRFD and Standard Specification columns, both requirements shall be met. Any bridge component that does not meet these requirements in its existing state shall be strengthened or replaced as part of the scope for the Project unless noted otherwise in the Project Requirements.

Design Criteria Table

Component	NYSDOT LRFD Bridge Design Specifications	NYSDOT Standard Specifications for Highway Bridges, HS20 Loading
Existing Superstructure[1]	LRFR Inventory ***Rating Factor* ≥ 1.0**	LFR Inventory ***Rating Factor* ≥ 1.0**
Widened Superstructure[1]	LRFR Inventory ***Rating Factor* ≥ 1.0**	LFR Inventory ***Rating Factor* ≥ 1.0**

New Superstructure	***Specification Required*** with LRFR Inventory ***Rating Factor* ≥ 1.2**	LFR Inventory ***Rating Factor* ≥ 1.0**
New Bearing	***Specification Required***	Prohibited
Existing Substructure[5]	Shall satisfy ***Either Specification*** (future wearing surface excluded)	
Modified Substructure[2, 5]	Shall satisfy ***Either Specification*** (future wearing surface excluded)	
New Substructure[2, 5]	***Specification Required*** and shall not control the Load Rating	Prohibited

Notes:

1. New members of a widened and/or rehabilitated superstructure shall not control the load rating of the superstructure.
2. For widened and/or rehabilitated superstructures requiring additional substructure (additional substructure width, height, or both), any additional substructure that is structurally connected to the existing substructure shall be considered 'Modified Substructure'. When the additional substructure is not structurally connected to the existing substructure, it shall be considered 'New Substructure'.
3. ***Specification Required*** indicates that the component shall meet the design specification.
4. When only a ***Rating Factor*** is provided, the component shall satisfy the ***Rating Factor*** requirement indicated but does not need to meet the design specification.
5. Steel substructure elements must have a rating factor equal to or greater than the rating factor required for the superstructure.
6. All bracing members (diaphragms, cross-frames, bottom laterals, etc.) and their connections shall not control the design or load rating.

The requirement to perform a seismic analysis is waived for all widened and rehabilitated superstructures and substructures. All other seismic provisions, including seismic detailing, shall apply to new and/or modified portions of existing substructures. If necessary, existing substructures shall be modified to meet the minimum support length requirements of the NYSDOT LRFD Bridge Design Specifications or restrainers shall be installed.

There is no requirement to perform a fatigue analysis or fatigue retrofits on existing spans.

All stages of construction must be analyzed and shown to be safe for legal loads as defined in EI 20-026. Load restrictions are not permitted.

All buried concrete frame and arch culverts (three-sided) shall be designed for both pin-pin and pin-roller support conditions.

14.3.1 Components

The use of any details that deviate from the NYSDOT Bridge Detail (BD) Sheets or NYSDOT Standard Sheets require an approved ATC or RDE.

A) Barriers, Railings and Pedestrian Fencing: Temporary traffic barriers shall meet, as a minimum, the testing requirements of TL-3. Permanent traffic barriers shall meet, as a minimum, the testing requirements of TL-5 or as specified in the Directive Notes. The testing requirements specified shall apply to all permanent traffic barriers that are mounted on bridge decks, approach slabs, moment slabs, wingwalls, and retaining walls.

Permanent concrete barriers and steel bridge railings shall not be mounted directly onto U-wingwalls or retaining walls. When concrete barriers and steel bridge railings are needed above a U-wingwall or retaining wall, they shall be mounted on approach slabs in accordance with the "Single Slope Barrier on Approach Slab at U-Wingwall Details" provided in Part 7, Engineering Data or mounted on moment slabs.

All permanent concrete traffic barriers shall use internal curing concrete.

All permanent barriers shall be protectively sealed.

Refer to Section 14.3.2 for aesthetic requirements related to bridge parapet walls, bridge railing, and fencing, if any.

B) Decks: Decks shall be full depth precast panel and/or cast-in-place unless otherwise noted. Cast-in-place and precast decks shall use High Performance – Internally Curing (HPIC) Concrete or Lightweight, High Performance Concrete (refer to NYSDOT Special Specification 557.01040018). The NYSDOT Bridge Manual amended as follows: (1) Table 5-1 Deck Requirements, 1st row named “Monolithic Slab”, 4th column named “Concrete”, text box revised as follows “Class HPIC for single and multi-spans” (2) Section 5.1.2.3 Internal Curing Concrete (HPIC), the first paragraph revised to “High Performance - Internal Curing (HPIC) concrete shall be used for all simple and continuous span configurations.”

Two-course decks with asphalt overlays, as defined in the NYSDOT Bridge Manual, are not permitted. Filled steel grating decks, unfilled steel grating decks, and orthotropic steel decks are not permitted.

Bridge decks shall be made fully composite with the underlying primary member system.

For new and replacement superstructures, the girder haunch depth shall not exceed 8 in. For existing superstructures, the girder haunch depth shall not exceed the width of the top flange to which it is cast upon.

All existing shear studs shall be removed and replaced.

All decks, approach slabs, sleeper slabs and moment slabs shall be protectively sealed.

All new decks and approach slabs shall have their entire top surface diamond ground. An additional 1/2 in. of slab thickness over the top mat reinforcement shall be provided to accommodate diamond grinding of up to 1/2 in.

All concrete reinforcement that will become part of the final deck shall be of equal or higher corrosion resistance as the deck (i.e. barrier reinforcement embedded in the deck).

All approach slab, sleeper slab, and moment slab reinforcement shall match the type of corrosion protection used for the adjacent concrete bridge deck.

Reinforcement in all sidewalks, concrete barriers, and noise barriers shall match the type of corrosion protection used in the bridge component to which they are attached.

Scupper corrosion protection shall follow Bridge Detail Sheet requirements.

Any individual deck span must utilize either an isotropic reinforcement scheme or a traditional reinforcement scheme. Variation of reinforcement scheme across the cross-section or along the length of any individual deck span is not permitted. Continuous decks may use an isotropic reinforcement scheme for one span and traditional reinforcement for another span provided that all the negative moment reinforcement in the negative moment area over the pier(s) meet(s) the more stringent of the two requirements.

If a precast deck is set, followed by placement of an adjacent cast-in-place deck, a closure pour is required between the deck systems if the precast deck is under live load during the placement.

When pouring cast-in-place decks and for the first 72 hours of curing, the section of the superstructure receiving the new deck shall be isolated from all sections of the superstructure that are carrying live load. This shall include disconnecting of diaphragms and isolating formwork and reinforcement at the stage line.

A third placement (closure placement) between longitudinal construction stages is required. Closure placements shall not be placed adjacent to cast-in-place deck pours for a minimum of 72 hours. The Closure placements shall use Ultra-High Performance Concrete in conformance with NYSDOT Special Specification Item 557.66010116 and the “Longitudinal UHPC Closure Pour Details” provided in Part 7.

Pinning of temporary barrier to new decks will be permitted with the following stipulations: Holes in new decks are made by either casting in a sleeve or coring. If coring, reinforcement shall be mapped out and coring will be performed to minimize the potential to cut through any reinforcement. Drilling holes in new decks is prohibited. After temporary barrier is removed all holes in the deck shall be repaired with Ultra-High Performance Concrete in conformance with NYSDOT Special Specification Item 557.66010116.

C) Precast bridge deck panels: If precast deck panels are used, field cast joints between panels shall be made with Ultra-High-Performance Concrete (UHPC) in accordance with NYSDOT Special Specification Item 557.66010116. An integral precast concrete barrier may be used provided it is in accordance with NYSDOT Special Specification Item 557.11010003.

If all NYSDOT Bridge Manual conditions for use of isotropic reinforcement and Part 3 Section 14.3.1.B are met, isotropic deck reinforcement may be used in precast concrete deck panels.

The provisions of the NYSDOT PCCM Article 6.2.3 shall apply except that any precast surface that is to be diamond ground and/or longitudinally grooved after installation shall have penetrating sealer applied after grinding and/or grooving operations in lieu of the requirement to coat all surfaces at the fabrication plant.

D) Deck Joints: Deck joints are not permitted unless stated otherwise in the Directive Notes.

Refer to Part 5, SP-11 for requirements on the use of link slabs. Ultra-High Performance Concrete used for UHPC link slabs shall be per NYSDOT Special Specifications Item 557.66010116.

Longitudinal deck joints are not permitted unless shown in Part 6 – Directive Plans. Section 5.5.2 Longitudinal Joints of the NYSDOT Bridge Manual, requiring a longitudinal joint when the bridge width exceeds 90 ft., is waived.

E) Superstructure:

Fracture-critical members are prohibited.

For straight steel I-girder bridges that have a skew greater than 20°, a refined analysis method is required. The type of refined analysis method shall be determined by the skew (θ) and the skew index (Is). The skew index is defined in NYSDOT Load and Resistance Factor Design (LRFD) Bridge Design Specifications Equation 4.6.3.3.2-2 and shall be determined for each span of the bridge. Additionally, the use of discontinuous diaphragm layouts would require a submission of a Request for Design Exception.

- If $20° < \theta \leq 45°$ and $Is \leq 0.3$ then a 2D grid or 3D finite element model shall be used for the design of the girders, diaphragms, and connections.
- If $\theta > 45°$ or $Is > 0.3$ then a 3D finite element model shall be used for the design of the girders, diaphragms, and connections.

Refer to Part 6, Directive Notes for color requirements related to painted steel superstructure elements, if any.

F) Bearings: With the exception of fully integral abutments and/or fully integral pier caps, all beam/girder supports shall utilize bearings that conform with Section 12 of the NYSDOT Bridge Manual. Design and location of bearings shall provide for easy maintenance and accessibility and future bearing replacement. Bearing replacement shall be easily accomplished via jacking points off the top of the substructure with no additional strengthening of members required. Jacking points with sufficient capacity (full dead load and live load) to allow the superstructure to be lifted for future bearing replacement under live load shall be provided. The plans shall include the location of the jacking points and the jacking loads.

The use of tie-down devices, or any other type of bearing uplift restraints, is prohibited.

G) Substructures: All concrete repair areas with exposed reinforcing bars greater than 1 sq. ft. shall utilize passive galvanic protection anodes in conformance with Item 582.99000016 - Embedment of Galvanic Anodes in Concrete. These anodes shall be of the type and spacing as shown in the Directive Plans.

All concrete substructure repairs shall have a finish surface that is true to the existing unprepared concrete surfaces. The new repaired areas shall not be recessed nor protruding.

The structural capacity of any existing substructure or foundation that is permitted to be incorporated into the Design-Builder's proposed design, and is not visible pre-construction, shall be determined based on the as-built plans. In the event that such a substructure or foundation element is found to be deteriorated, as determined by the Department, any

repairs needed to return the substructure element to a satisfactory condition will be paid for by the Department under the Extra Work Item.

All new and existing concrete substructures shall be coated with penetrating type protective sealer.

The vertical distance from the top of bridge seat to the bottom of superstructure shall not exceed 2'-6" on new or modified spans.

Abutments: The tops of all new and existing bridge seats, all bearing pedestal surfaces, and the backwall tops and face below expansion joints shall be coated with penetrating type protective sealers. When an expansion joint is located at an abutment, stainless steel reinforcement shall be used in the backwall, pedestals, bridge seat, and top 2 ft. of the front face of the stem. Reinforcing bars that extend from the abutment stem into the backwall below expansion joints shall be stainless steel.

For discrepancies that exist between the NYSDOT Bridge Manual Section 11.2.1, Integral Abutments, and the NYSDOT BD Sheets, the NYSDOT Bridge Manual shall govern. Additionally, the NYSDOT BD Sheets on integral abutments are amended as follows:

1) Pre-excavating holes at pile locations and backfilling with cushion sand is not required.
2) A horizontal construction joint between the backwall and deck is prohibited. If necessary, a vertical construction joint may be located 9 ft. into the span as shown on BD-ID4E.
3) Where it is appropriate to be used, the "Temporary Steel Girder Support" shown on BD-ID2E shall be designed for all applicable loading, and the plate and bolt dimensions shall not be less than those shown.

Piers: New concrete pier footing to column, and column to cap, connections shall provide full moment continuity. The use of bearings or hinges below the bridge seat elevation is prohibited.

Pier Caps Below Expansion Joints: All bearing pedestal and pier cap surfaces shall be coated with penetrating type protective sealers. All reinforcement completely contained within the pedestals and pier cap shall be stainless steel reinforcement. Reinforcement that extends into the cap beam shall not be plain steel.

Solid Wall-Type Piers Below Expansion Joints: All bearing pedestal surfaces, the top of the pier bridge seat, and the vertical surfaces extending 10'-0" down from the pier bridge seat shall be coated with penetrating type protective sealer. All reinforcement that is completely contained within or extends into the pedestals shall be stainless steel reinforcement. All reinforcement completely contained within the top 5'-0" of the pier, measured from the top of the pier bridge seat, shall be stainless steel reinforcement. Reinforcement that extends into the top 5'-0" of the pier shall not be plain steel.

H) Earth Retaining Structures: The Design-Builder shall determine the location(s) and types of earth retaining structures and shall design them in accordance with all applicable Project Requirements. Wingwalls shall be considered as part of the abutment for a distance, measured along the wingwall from the intersection of the centerline of bearings and fascia, equal to the height of the abutment stem (as measured from top of footing to the average bridge seat elevation). Gabion and crib walls are not permitted. New earth retaining

structures shall not rely on existing structures to derive support nor reduce loading on the new earth retaining structures.

I) Foundations: The Design-Builder shall calculate short-term and long-term settlement of new foundations for the different geotechnical conditions along the bridge. Long-term settlements for bridge foundations shall not exceed one (1) inch over a 50-year timeframe. Allowable vertical clearance shall be based upon the final long-term settlement calculated.

For all new and replacement bridges, one type of foundation (i.e. deep or shallow) must be utilized for the entire bridge except that a shallow foundation may be used in conjunction with deep foundation(s) when that shallow foundation is bearing on competent bedrock.

For existing substructures with deep foundations that require widening, a deep foundation shall be used for the widening. For existing substructures with shallow foundations that require widening, a deep foundation is acceptable for the widening. For existing substructures with shallow foundations that require widening, a shallow foundation is acceptable for the widening provided that the expected settlement of the new portion of the foundation matches the expected remaining settlement of the existing shallow foundation.

J) Mass Concrete: Mass Concrete Placements shall be in accordance with the NYSDOT Bridge Manual. All reinforcement located in the mass placement(s), except for footings, shall be epoxy coated reinforcement unless otherwise noted or specified in other sections of the RFP. The combination of reinforcement and concrete mixture permeability shall meet any defined service life requirements of the RFP.

K) Drainage: Drainage requirements are outlined in Section 21 of these Project Requirements.

L) BIN Plate Sign: The Design-Builder shall furnish and install a new BIN Plate meeting the requirements set forth in this section.

The material requirements for the BIN Plate are:

- Panel with reflective background: The aluminum panel shall conform to the requirements of the NYSDOT Standard Specifications. The background material shall be green reflective sheeting conforming to the requirements of the NYSDOT Standard Specifications for Class A Sheeting. The size of the panels shall be 1/8 inch thick by 3 inches by 12 inches. A thin rubber or plastic gasket or sheeting matching the plate size shall be placed behind the plate prior to installation.

- Numbers: The numbers shall be reflective sheeting conforming to the requirements of the NYSDOT Standard Specifications for Class A Sheeting, except that the adhesive shall be pressure-sensitive such that the numbers can be applied to the background in the field. The numbers shall be 2 inches high and silver-white in color conforming to FHWA series C dimensions.

Prior to placing the numbers on the panel, the reflective background shall be clean and free of dirt and oil which may adversely affect proper adhesion. The numbers shall be placed on the reflective background, perpendicular to the longitudinal axis of the panel and vertically centered. The reflective background and numbers shall be coated and/or edge sealed in accordance with the recommendations of the sheeting manufacturer.

The BIN plate shall be attached to the beginning abutment, right side of the bridge using expansion anchors. The plate shall be placed high on the abutment, near the fascia of the bridge so that it cannot be painted over via a spray paint can or easily removed or damaged.

M) Live Load Lifting Operations: The Design Builder is permitted to design and execute a lifting operation to facilitate the construction of the new pedestals and bearing installation under active live loads prior to placement of the new superstructure deck. The new pedestals and bearings shall be directly receiving all superstructure loads prior to the placement of the new concrete deck. Refer to CSX requirements for lifting operations in the vicinity of any CSX railroad tracks.

N) Bird Repellant System: Any bridge mounted item that is located above a sidewalk and any bridge component or portion thereof that is located above a sidewalk area shall receive a bird repellant system conforming to NYSDOT Specification 613.70070011, Bird Repellant System, Sliders. This shall include, but is not limited to, all horizontal or nearly horizontal surfaces of bridge seats, pedestals, bottom flanges of girders, diaphragms, conduits, pipes, and electrical fixtures.

14.3.2 Concrete Inspection and Crack Repair

All surfaces of newly placed concrete components shall be inspected by the Design-Builder's Construction Quality Control Engineer after completion of curing and before any other construction operation obscures the surface. This shall include, but is not limited to, concrete bridge decks, substructures, retaining walls, noise walls, and barriers. All cast-in-place and precast components that are visible shall be reinspected immediately prior to substantial completion of the project.

A report shall be generated based on the findings of the post-curing conditions no later than 30 days prior to the opening of any bridge components to traffic. All cracks exceeding the crack widths identified below shall be documented in the report. This report shall be submitted to the CQAE and shall include repair limits and procedures as detailed below. All cracks shall be repaired within 90 days of the report submission.

14.3.2.1 Concrete Bridge Decks

A report shall be generated and submitted to the Department's CQAE identifying all cracks with a width equal to or greater than 0.02 in.

Crack widths equal to or greater than 0.02 in. and less than 0.06 in. shall be repaired with high molecular weight methyl methacrylate (HMWM) using NYSDOT Special Specification 557.25000016 or 557.26000016. Cracks with a width equal to or greater than 0.06 in. shall be repaired by epoxy injection as per NYSDOT Special Specification Item 555.80020001, Crack Repair by Epoxy Injection (Restoration). This work shall be completed prior to any grinding and grooving and only when the concrete moisture content is at an acceptable level; no greater than 5% using a moisture detector meter, or no visible moisture after performing ASTM D4263 test method for a minimum of 4 hours. Penetrating sealer shall then be applied in accordance with the NYSDOT Bridge Manual.

When a crack width exceeds 0.10 in. or when the crack density, as defined by the equation given below, exceeds 1.5 cu. in. the portion of the deck that is not in conformance shall be replaced to the satisfaction of the Department. A replacement procedure and details shall be submitted to the

Department for approval or rejection. The shortest side of the rectangle used to determine the 25 sq. ft. area shall be the minimum width of the pour or 5 ft., whichever is less.

$$\text{Crack Density} = \sum_{n=1}^{TC}\left(W_n{}^2 \times L_n\right)$$

Where:

TC = Total number of cracks ≥ 0.02 in. wide within a rectangular 25 sq. ft. area

W_n = Width of crack *n* (in.)

L_n = Length of crack *n* (in.)

14.3.2.2 Other Concrete Components

A report shall be generated and submitted to the Department's CQAE identifying all cracks with a width equal to or greater than 0.04 in.

Crack widths equal to or greater than 0.04 in. shall be repaired by epoxy injection as per NYSDOT Special Specification Item 555.80020001, Crack Repair by Epoxy Injection (Restoration). This work shall be completed when the concrete moisture content is at an acceptable level; no greater than 5% using a moisture detector meter, or no visible moisture after performing ASTM D4263 test method for a minimum of 4 hours. If required, concrete protective sealer shall then be applied in accordance with the NYSDOT Bridge Manual.

When a crack width exceeds 0.125 in. or when the crack density, as defined by the equation given below, exceeds 1.5 cu. in. the portion of the component that is not in conformance shall be replaced to the satisfaction of the Department. A replacement procedure and details shall be submitted to the Department for approval or rejection. The shortest side of the rectangle used to determine the 25 sq. ft. area shall be the minimum width of the pour or 5 ft., whichever is less.

$$\text{Crack Density} = \sum_{n=1}^{TC}\left(W_n{}^2 \times L_n\right)$$

Where:

TC = Total number of cracks ≥ 0.04 in. wide within a rectangular 25 sq. ft. area

W_n = Width of crack *n* (in.)

L_n = Length of crack *n* (in.)

14.3.3 Aesthetics

Section not used.

14.4 DEMOLITION REQUIREMENTS

14.4.1 Scope

For all bridges scheduled to be removed and/or replaced as described in Section 14.1, the Design-Builder shall demolish and remove the existing superstructure, piers, abutments, foundations, retaining walls, and pavement within the Project Limits in a safe and environmentally acceptable manner.

The demolition of the existing bridges shall include all existing superstructure elements and all substructure elements as per NYSDOT Standards and BD Sheets and/or in accordance with environmental permitting. Unless noted otherwise in the Directive Notes, remove existing substructures as follows:

1) Completely remove the portion of the existing substructure within a lateral limit of 3'-0" of the new substructure.
2) Remove the portion of the existing substructure that is outside of this lateral limit as follows:
    a. Existing substructure located under roadway remove to 2'-0" below subgrade surface.
    b. Existing substructure at all other locations remove to 2'-0" below finished grade.

The Design-Builder shall test for the presence of Hazardous Materials in all structures to be disturbed to ensure the handling, removal and disposal is done in accordance with all applicable laws and standards.

The abatement of all Hazardous Materials shall be completed to the greatest extent possible prior to any demolition taking place unless a legal variation from related laws, rules and regulations can be obtained. If the Hazardous Material has been identified through the Hazardous or Asbestos Screening document and/or the record plans, the Design-Builder is responsible for all costs. Should Hazardous Material or Asbestos be found and information related to its presence was not previously available to the Design-Builder, all costs associated with abatement, containment, removal, and disposal shall be covered under the Fixed Extra Work item.

The Design-Builder shall perform all work with care so that any materials that are to remain in place, or that are to remain the property of the Department shall not be damaged. If the Design-Builder damages any materials that are to remain in place or which are to become or to remain the property of the Department, the damaged materials shall be repaired or replaced in a manner satisfactory to the Department at no cost to the Department.

The Design-Builder shall ensure that no aspects of the demolition works have a detrimental effect on public safety or the environment.

The Design-Builder shall assume responsibility for safety and maintenance of all existing structures within the Project Limits, identified for removal in accordance with DB §105-22.

Utility connections shall be discontinued and capped in accordance with the requirements of the utility companies or the Department prior to demolition works.

14.5 CONSTRUCTION REQUIREMENTS

The Design-Builder shall develop erection procedures for the bridge that include complete detailed erection sequence drawings; erection stresses in permanent and temporary members; bent and falsework reactions determined for each construction stage.

All unanticipated structural steel repairs, such as those necessary to correct fabrication errors, accidental damage, bolt hole misalignments, unforeseen field conditions, etc., shall be submitted to the Department for review and DCES approval.

14.5.1 Construction Vehicles on Bridge

The Design-Builder is prohibited from running equipment that does not operate on rubber tires (milling machines, rollers, etc.) across bridge decks unless proper precautions (mats, etc.) are provided to prevent damage to the deck. The methods used to move equipment across bridge decks shall be subject to approval by the Construction Inspection Professional Engineering Firm with comments from the CQAE.

14.6 LOAD RATING SUBMISSION REQUIREMENTS

The Design-Builder shall submit draft Load Rating Summaries of all ratable elements of all Bridges to the Design Quality Assurance Engineer for review with the Release for Construction submission for any bridge design unit. The draft Load Rating Summary shall be accompanied by backup calculations (Level 1) and one (1) electronic copy of the input files.

Prior to any bridge, including temporary bridges, in this Project being opened to traffic, the Design-Builder shall prepare a Level I Load Rating for each bridge as described in *NYSDOT Engineering Instruction 20-026 Load Rating/Posting Guidelines for State-Owned Highway Bridges.* The Level I Load Rating shall include both LFR and LRFR ratings as defined in the current version of *AASHTO's The Manual for Bridge Evaluation* and as noted in the current version of the *NYSDOT Bridge Manual.*

The Design-Builder shall prepare a Level I Load Rating of all bridges in this Project using AASHTOWare Bridge Rating (BrR) software for review and acceptance by the Design Quality Assurance Engineer. If the BrR software is not capable of analyzing one of the bridge's structural rating units (e.g. cable stayed, suspension, segmental, etc.) the Design-Builder shall create a Level I Load Rating model for those structural rating units using one of the software applications listed in the Bridge Manual. Any software used other than AASHTOWare BrR shall be approved by the Department prior to starting analysis. Any post-processing that is required shall be done using either Mathcad or Excel. Level I Load Ratings for the remainder of the structural rating unit(s) shall be created using BrR.

The final stamped and signed Level I Load Rating package shall be submitted to the Design Quality Assurance Engineer, in electronic Adobe Acrobat file format (PDF), no later than 30 calendar days prior to the scheduled opening of the structure to traffic. The Design-Builder shall also submit one electronic copy of the input and/or post-processing files of all software applications used to generate the structural analysis along with a summary sheet listing the file name, software program, and version of the program used to produce the Level I Load Rating.

14.7 TEMPORARY STRUCTURES AND STRUCTURAL LIFTING OPERATIONS

The Design-Builder shall submit Lifting Plans and Temporary Structure Plans to the DQAE. Plans shall include Load Ratings, Project site activity start date and expected completion date. DQAE conducts review and provides comments back to Design-Builder. Once Plans are approved by the Design-Builder and accepted by DQAE, the DQAE shall notify the Office of Structures Construction Unit and Permit Group of Structural Lifting Operations and temporary Structures use & details. Copies of approved plans and load ratings shall be provided to the Office of Structures Construction Unit and Permit Group for their records.

The Design-Builder shall submit Lifting Plans and Temporary Structure Plans to the Department for review, comment, and acceptance before commencing the Construction Work.

14.8 MINIMUM DETAILING AND DOCUMENTATION REQUIREMENTS FOR REHABILITATED/REPAIRED STRUCTURES

For any structural repairs or rehabilitation to be performed, the Design-Builder shall include plans in the appropriate Design Unit for this work. Plans shall indicate the location and type of each repair to be performed and shall be signed and sealed by the Responsible Engineer. A Working Plan shall also be submitted to ensure the structural capacity of the component being repaired and demonstrate the limits of repairs permissible without temporary shoring. Construction Quality Control shall verify the repairs against the RFC document and provide markup on additional areas which shall be incorporated into the as-builts. Limits of all repairs shall be verified by the Construction Quality Assurance Engineer.

14.9 INVENTORY REQUIREMENTS

Forty-five (45) days prior to a bridge being opened to traffic, the Design-Builder shall submit two (2) copies of the following:

(1) Inventory Updates or new bridge Inventory per the current NYSDOT Bridge Inventory Manual, reflecting the physical condition and/or changes resulting from the construction and

(2) Element quantities, on a span basis and for the entire bridge, per the current NYSDOT Bridge Inspection Manual and AASHTO Manual for Bridge Element Inspection.

Blank inventory forms will be provided to the Design-Builder upon request to the Department's Project Manager.

14.10 DELIVERABLES

Deliverables shall be as stated elsewhere in the RFP documents.

SECTION 15 LANDSCAPE ARCHITECTURE

15.1 SCOPE

The Design-Builder shall perform the landscape architectural activities as described in this Section 15.

15.2 STANDARDS

The Design-Builder shall perform site work in accordance with the Contract Requirements and the applicable Standards, Design Codes and Manuals cited in Section 1.6, unless otherwise stipulated in this Project Requirement or otherwise applicable to the Project.

15.3 GENERAL LANDSCAPE DEVELOPMENT

15.3.1 Existing Vegetation

Existing vegetation removal and disturbance should be minimized to the cut/fill limits and any removals, whether within the cut/fill limits or beyond those areas, shall be replaced in kind with native species appropriate for USDA NY Plant Hardiness Planting Zone 5b, as described in Section 15.3.2.

Prior to the removal of any trees or shrubs, an inventory of existing trees and shrubs proposed to be removed shall be prepared by the Design-Builder and a copy provided to the CQAE. The inventory shall include major deciduous trees over 6 inches in diameter at breast height (DBH), coniferous trees over 6 feet in height, and deciduous or evergreen shrubs between 3 feet and 6 feet in height. The inventory shall include the size, location and species of each tree or shrub. Only living trees and shrubs shall be included in the existing tree inventory.

Vegetation outside the limits of disturbance shall be protected with temporary plastic barrier fence along the limit of disturbance line.

Disturbed areas shall receive topsoil and turf establishment. The type of topsoil and turf establishment, either roadside or lawn, will vary based on location.

15.3.2 Tree Replacement Factors

A) Every live, deciduous tree greater than six inches diameter at breast height (“DBH”) which is removed must be replaced with a total quantity of deciduous trees a minimum of 2 inch caliper (size measured 6 inches above the base of the tree) equal to the total DBH size of the tree removed. For example, a 10 inch DBH tree removed could be replaced with (5) two inch caliper trees or (2) three inch and (1) four inch caliper trees; however the replacement quantity will go down if larger caliper trees are used for replacement.

B) Every live, coniferous tree removed must be replaced with a total quantity of coniferous trees equal to the height and width of the tree removed. For example, a 20 ft high x 10 ft wide coniferous tree could be replaced by two (2) 10 ft high x 5 ft wide coniferous trees.

C) Every live shrub, between 3 foot height and 6 foot height, removed must be replaced with a total quantity of shrubs equal to the quantity of shrubs removed.

D) Each replacement tree should be the same genus and species of the tree removed, unless the tree being removed was identified by the Design-Builder as an invasive plant species.

E) The minimum replacement sizes shall be as follows: 2-inch caliper for major deciduous trees, 1.5-inch caliper for minor deciduous trees, 6-foot height for coniferous trees, 3-foot height for deciduous shrubs, and 2-foot height for evergreen shrubs.

15.3.3 Replacement Locations

In addition to plantings shown in Part 6 – Directive Plans, replacement planting shall be included in a Landscape Restoration plan developed by the Design-Builder. Plantings may be located in the available right-of-way near the original locations of the trees that were removed.

Replacement planting may also be done near the right-of-way line or on private property. Planting on private property may only be done if private property owners provide written permission to the Design-Builder and agree to take over the long term care and maintenance of the plant material, and the appropriate release is obtained by the Design-Builder and in consultation with the adjoining property owner in accordance with NYSDOT EI 11-010.

15.3.4 Proposed Planting

The Design-Builder shall not use invasive plant species for any of the proposed planting as required by the New York State 2012 Invasive Species Prevention Act, or a monoculture of plant species, to reduce the potential for disease or invasive insect species to eradicate the proposed planting. Planting shall be located in a manner that does not interfere with the safe use of travel ways. Planting should be designed in a manner that provides a mix of plant material species to create seasonal interest for the traveling public.

Post planting care and replacement plantings shall be as per the requirements of Special Specification 611.190X0024, Post Planting Care with Replacement.

15.3.5 Living Snow Fence

The Design-Builder shall install passive snow control measures in the form of plantings, also known as “living snow fences” or “shelterbelts”. The design of such living snow fences shall follow the guidance in HDM 5.7.15.2 – “Shelterbelts”. At maturity, these plantings shall reduce blowing and drifting snow by at least 60% and snow shall not be deposited on any roadway due to a living snow fence. The analysis methods may include numerical modeling, temporary snow fence during the winter, or other methods at the Design-Builder’s discretion.

The passive snow control shall reduce blowing and drifting snow in the prevailing wind direction (November through April) in the following areas:

1. I481 SB to Brighton Ave exit ramp (Exit 1) north side – 1200’
2. I481 NB to Brighton Ave/Rock Cut Road exit ramp (Exit 1) west side – 250’
3. Rock Cut Road entrance ramp (Exit 1) to I481 NB, west side 400’

15.3.6 Landscaping Requirements

Additional landscape requirements are provided in the Part 6 – Directive Plans. Requirements will relate to the planting and establishment of additional native trees and shrubs. Plantings specified in Part 6 – Directive Plans count towards replacement plantings as noted in 15.3.2.

SECTION 16 SIGNAGE, PAVEMENT MARKINGS, AND TRAFFIC SIGNALS

16.1 SCOPE OF WORK

The Design-Builder shall provide all permanent fixed signing, permanent pavement markings, and traffic signal work required for the Project.

The Design-Builder shall be responsible for identifying, designing, detailing, fabricating, delivering and installing all signing (including reference markers and enhanced reference location signs), pavement marking materials and traffic signal equipment and shall install all components necessary for a complete and functional system which, in addition to meeting the design and construction criteria specified above, meets the following requirements:

A) Provides for the orderly and predictable movement of all traffic;

B) Provides such regulation, guidance, warnings and advisories as are needed to ensure safe and informed operation;

C) Is fully and seamlessly integrated into the existing signing elements beyond the Project limits; and

D) Is integrated into the existing intelligent transportation system (ITS) components, if applicable.

16.2 STANDARDS

The Design-Builder shall perform the design and construction of the signage, pavement marking, and traffic signals activities in accordance with Contract Requirements and the applicable Standards, Design Codes, and Manuals cited in Section 1.6, unless otherwise stipulated in this Project Requirement or otherwise applicable to the Project.

16.3 REQUIREMENTS

16.3.1 Design Requirements

The Design-Builder shall develop signing plans, pavement marking plans, and traffic signal plans for the Project that shall:

A) Provide for all components as called for in this Section 16;

B) Encompass the replacement of all existing signs within the following limits:

1. I-81 NB and SB - 2.5 miles south of the I-81/BL 81 interchange to just north of the existing bridges over Kirkville Road.
2. BL 81 NB and SB - from the I-81/BL 81 interchange to just north of the bridge over Calthrop Avenue.
3. Calthrop Ave. - from the Calthrop Ave./S. Salina St. intersection to the northbound ramp intersection.
4. Rt 5/92 - from 350 feet west and north of the Erie Blvd. East/East Genesee Street intersection to 1,600 feet east of the Rt5/92 (Lyndon Corners) intersection
5. I-690 NB and SB - from Bridge Street to new I-81 (former I-481).

6. Kirkville Road - from 250 feet west and north of the Fly Rd./Kirkville Rd intersection to 200 feet east of the Roberts St./Kirkville Rd. intersection.

C) Provide signing, traffic signals and pavement markings for bicycle and pedestrian facilities within the Project Limits, where applicable;

D) Locate signs in accordance with the National MUTCD and the NYS supplement to the National MUTCD. Design overhead sign structures in accordance with the NYSDOT Overhead Sign Structures Design Manual;

E) As applicable, and within the limits noted above, all existing I-81 shields shall be replaced with BL 81 shields, all I-481 shields shall be replaced with I-81 shields;

F) All exit numbers on existing signs, within the limited notes above, will provide the new mileage based exit number as well as the former exit number as indicated in the Part 6 – Directive Plans;

G) Design-Builder shall maintain the I-81 and I-481 shields so they are visible until the Department directs they can be changed, which will occur when the routes are officially designated and de-designated. At that time, the route panels with the new designations may be visible;

H) All reference markers along the highway segments noted above shall be replaced in accordance with the NYSDOT Reference Marker Manual. Reference markers shall have a 7 ft mounting height;

I) Provide signs with high reflectivity with Type IX sheeting such as to not warrant sign lighting;

J) Design-Builder shall replace all interstate shields for I-81 and I-481 with BL 81 and (new) I-81 within 1 mile of interchanges; and

K) Provide municipal boundary signs along existing I-481 corridor; and

L) New guide signs shall not reference “Shoppingtown” or “Shoppingtown Mall” as a destination.

16.3.2 Construction Requirements

16.3.2.1 Signs

The Design-Builder shall not reuse any existing NYSDOT sign materials as part of the permanent signing installation and shall be responsible for the disposal of all signing materials and structures that are removed from the Project. Standard signs owned by municipalities other than NYSDOT, and non-standard signs owned by private entities but placed within NYSDOT right-of-way, with the acceptance of the Department, shall be removed, stored and reinstalled as required.

The Design-Builder shall be responsible for the provision of all signs, posts, frames and other structural components required for the installation and support of the sign panels.

16.3.2.2 Pavement Markings

Cross hatching pavement markings shall be installed in accordance with the Department’s Specifications for Epoxy Reflectorized Pavement Markings. All special markings (Letters &

Symbols) shall be installed in accordance with the Department's Specifications. Any striping required on local roads shall receive "paint" markings.

All linear roadway markings installed on BL-81 and I-81 shall be installed in accordance with special specification 685.1X010004 Epoxy Paint with wet-night reflective elements, 20mils (grooved pavement method).

16.3.2.3 Milled In Audible Roadway Delineators (MIARD)

The Design-Builder is responsible for replacing all MIARDs that are removed or impacted due to the work noted elsewhere in this RFP and installed as section 649 of standard specifications.

16.3.2.4 Traffic Signals

There are signalized intersections within the limits of the Project that include traffic signals as well as pedestrian crossing signals, locations of which are listed below:

New Signal Locations

- I-81 SB Ramp to Genesee St (Rt 5/92, existing exit 3W Dewitt)

Replacement Signals

- Genesee St (Rt 5/92) at Lyndon Corners
- I-81 SB Ramp to Brighton Ave at Brighton Ave and relocated East Glen Ave
- Brighton Ave at Rock Cut Road (owned by City of Syracuse)

Existing Signals to be Enhanced with Non-Intrusive Vehicle Detection

- Genesee St (Rt 5/92) at Maple Drive
- Genesee St (Rt 5/92) at Wegmans Driveway

The Design-Builder shall replace the existing traffic and pedestrian crossing signals with traffic signal pole and mast arm supports meeting current standards. Audible pedestrian push button control systems meeting current ADA standards shall be installed with pedestrian signal indicators and count-down timers at the pedestrian safety walks. The Design-Builder shall design the traffic signals to be installed on far-side mast arm structures, with arms not exceeding 65' in length. If longer mast arms or the use of span wire structures are deemed necessary, the Design-Builder shall request approval from the Department. For signals being enhanced with non-intrusive detection, the Design-Builder shall remove the existing controller cabinet and its contents and install a new state-supplied cabinet (Item 680.80324515) and non-intrusive vehicle detection system. Item 680.80324515 - Install Microcomputer Cabinet contains cabinet request and delivery details.

At each intersection, the Design-Builder shall design and install new traffic signal infrastructure. The traffic signal infrastructure shall include installation of a new state-supplied cabinet and controller (Item 680.80324515), mast arm and supplemental signal span poles, signal heads including backplates with retro-reflective tape in all directions, pedestrian signal poles, pedestrian

signals and audible ped buttons, cables and conduits, vehicle detection systems, power service meter with a state- supplied disconnect/transfer switch, and relocation of any communication and/or signal preemption devices at existing signals within the project limits. The Design-Builder shall design replacement signals to closely resemble the existing signal operations. The work shall include all equipment, hardware mountings, cabling, software modifications and labor necessary to install and integrate a fully operational signalized intersection. All signal materials used in the signal installation and/or modification shall be listed in the latest NYSDOT Approved and Qualified Product Lists and shall conform with section 700 of the Standard Specifications. All signal equipment shall be placed in a location that complies with the NYS High Voltage Proximity Act. This includes, but is not limited to, keeping all signal equipment a minimum of 10 ft from primary lines, and 2 ft from secondary and all other lines.

The Design-Builder will be responsible for maintaining the existing signal until the new signal is activated. The Design-Builder shall be responsible for removal and disposal of existing traffic signal poles, mast arms, span wire, signal brackets, overhead signs, signal and pedestrian sections, wiring, pedestrian and supplemental poles, and non-LED signal modules. The Design-Builder shall be responsible for removal and delivery of all LED modules, pedestrian push buttons, the controller cabinets, and all its contents directly to the Department.

Two weeks prior to beginning any construction work on traffic signals associated with the project, the Design-Builder shall notify the regional traffic signal section to perform an inspection of the existing traffic signal equipment. After the inspection, the Design-Builder shall submit to the Department a written notification of the date they will assume responsibility for traffic signal maintenance. No construction work shall proceed until traffic signal maintenance is assumed by the Design-Builder. The existing traffic signal shall be maintained by the Design-Builder under the requirements of Section 619 of the Standard Specifications, except for the controller, programming, and timing which shall be maintained by the Department.

Traffic signal activation shall be done by NYS Traffic Signal Personnel only. The Design-Builder shall notify the NYS traffic Signal section two weeks prior to the requested date of activation.

The Design-Builder shall integrate the signals into the existing ITS system.

Refer to Reference Documents on the project website for sample signal plans and a NIVD template.

16.3.2.5 Loop Detectors

Section not used.

16.3.3 Vehicle Detection

The Design-Builder shall use non-intrusive vehicle detection systems at all NYSDOT new and replacement signals to be enhanced with this type of detection. The primary equipment used for non-intrusive detection is video detection for either at-intersection or advance vehicle detection purposes. The non-intrusive detection system installed shall meet the requirements of Special Specification 680.05010007, 680.05020007 and 680.05040004. The equipment provided for Item 680.05010007 – 360 Degree Camera Video Detection System and Item 680.05020007 – 360 Degree Camera Assembly shall not require any background masking, and software updates shall be done remotely by an automatic push to all sites. The software shall also have the ability to

classify vehicle counts into six distinct types: bicycles, cars and light vehicles, motorcycles, buses, single-unit trucks, and articulated trucks.

For at-intersection vehicle detection systems, a 360-degree video detection camera and its system shall be installed as directed by the equipment manufacturer or by their representatives. The Design-Builder shall design the detection zones to have, for each lane, one 6'x6' counter zone in front of the stop bar, one 6'x40' presence zone behind the stop bar, and one radius zone for each intersection approach. For advance detection zones, each intersection approach with a speed limit of 45 mph or above shall have 6'x6' detection zones in all through lanes of the approach. The distance of the advance detection zone to the stop bar shall be in accordance with ITE and AASHTO standards and guidelines.

The Design-Builder shall maintain existing vehicle detection with reasonable care. Unless otherwise noted, the maximum length of time that an intersection can operate without detection is two (2) weeks.

16.3.4 Conduit/Cabling Requirements

The following cables shall be utilized during the installation of new traffic and pedestrian signal heads:

A) Pedestrian/Countdown Timer and pushbutton sign: Furnish and install Signal Cable, 7-Conductor, 14 AWG for each set display; No other size conductors shall be used for pedestrian heads. Multiple 7-Conductor, 14 AWG cables may be used in the same pedestrian pole. One 7-conducter cable cannot be shared by more than one pedestrian phase, nor can it be shared by two corners of the same ped phase;

B) One-way signal heads: Furnish and install Signal Cable, 7-Conductor, 14 AWG per approach signal phase. No other size conductors shall be used for signal heads. Multiple numbers of Signal Cable, 7-Conductor, 14 AWG may be used in the same mast arm pole. Only one-way signal head assemblies shall be used.

Each and every cable entering the controller cabinet shall be permanently marked by function and phase stamped on NYSDOT approved tags. The tags shall be attached to the cables with a plastic or nylon line.

The Design-Builder shall furnish and install the following conduit as a minimum:

Conduits under roadway shall be 3" RGS.

A) Conduits between Span or Mast Arm poles or controller base and nearest pull box shall include a 2" RGS and 4" RGS.

B) Conduits between Pedestrian poles and nearest pull box shall use a 2" RGS.

All other underground conduit installations shall be 2" RGS. If any conduit cross section is expected to be more than 50% full, a second run of same size conduit shall be implemented. All signal conduits shall be bonded with a #6 bare stranded copper ground wire. All couplings and bushings shall be mechanically threaded, compression or slip type couplings, or bushings will not be allowed. Bends in conduit are not allowed. All roadway crossings shall be bored, open cuts

are not allowed unless the roadway is being newly constructed. Every conduit entrance to the traffic signal cabinet shall be sealed using non-shedding stainless steel sponges. Maximum distance of conduit runs between pullboxes shall not exceed 150 feet in distance.

16.3.5 Signal Heads/ Overhead Signs

All signal faces to be installed at NYSDOT signals as part of this Project shall be 12” LED. The number of required signal heads shall follow the MUTCD recommendation. The Design-Builder shall design all protected-permissive movement to have flashing yellow arrow operation, along with a temporary “LEFT TURN YIELD ON FLASHING YELLOW ARROW” sign to be located to the left of the signal head. Every approach lane that is not designated as a shared left/thru/right lane shall have a lane designation sign placed over the center of the lane. For the purposes of traffic signal design, all thru and right movement heads shall be aligned over the right lane line of each lane, and all left turn movement heads shall be aligned 3’ to the left of the lane designation sign. All signal heads shall have dark green polycarbonate signal sections and shall have 5” non-louvered, flat black finish back plates with 3” wide yellow reflective tape border around the outer edge. No primary traffic signal heads shall be installed less than 40’ from the stop bar or more than 180’ from the stop bar.

All signals and overhead signs in this project shall be a minimum of 16.5 feet above the high point of the roadway, with all red indications level across the intersection. No exceptions shall be made for signals mounted below 16.5 feet. For signals with back plates mounted on them, the bottom of the back plate shall be a minimum of 16.5 feet above the high point of the roadway

Supplemental signal heads for the major movement of each approach are required for interstate off ramp approaches, for approaches with 45 mph or higher speed limit and for any approach its primary signal heads are located between 120’ and 180’ from the approach’s stop bar. The placement of the supplemental signal heads shall follow the MUTCD recommendations. Supplemental heads with 4 or more sections shall be bracket mounted with all sections installed in a vertical arrangement.

All street signs name shall be installed on the arm. All street name signs shall meet the latest guidelines of the MUTCD. Overhead street signs shall have 12” letter heights but shall be kept to 10 feet or less in width. Street signs less than 7.5 feet long shall have a minimum of two mounts on the mast arm. Street signs greater than 7.5 feet long shall have a minimum of three mounts. Street signs shall be installed perpendicular to the approach, mounting equipment used shall be similar to that used for item 680.8207.

16.3.6 Pedestrian Signals

All pedestrian signals shall be 12” LED and shall consist of combination “Walking Man”/”Hand” symbols with countdown timers. Pedestrian signal installations shall also include audible signals, countdown timers and ADA compliant pedestrian pushbuttons for all marked, signalized crosswalks. Pedestrian countdown timers shall meet the requirements of Special Specification 680.81500010. Standard Specifications 680.67XX and 680.68XX are modified allowing only aluminum pedestrian signal poles, pole base shall have 9-10-inch bolt circle, no transformer base is allowed. All pedestrian push buttons shall be located parallel with the appropriate crosswalk. The design-builder shall provide the Regional Traffic Safety and Mobility Group with a list of street names to be programmed into the pedestrian signal for approval prior to ordering and shall provide the Regional Traffic Safety and Mobility Group with the audio file for all audible pedestrian signals

prior to activation. Audible pedestrian signals shall meet the requirements of Special Specification 680.81330010 and shall include programming all the following settings for an audible pedestrian signal prior to activation:

Locate Vol Min: 50; Locate Vol Max: 60; Info Msg Vol Min: 50; Std Walk Vol Min: 50; Std Walk Vol Max: 60; Ext. Walk Vol Min: 50; Ext Walk Vol Max: 60; Vol over Ambient: +5.

16.3.7 Signal Poles/ Foundations

Each arm shall extend 5' past the last attachment point on the arm. If the last attachment is a flashing yellow arrow signal head, the temporary "LEFT TURN YIELD ON FLASHING YELLOW ARROW" sign should be installed within the 5' arm extension beyond the signal head. The Design-Builder shall prepare a mast arm loading table to be included in the signal plans (deliverables) and to be provided to the pole manufacturer. It shall be the Design-Builder's responsibility, in conjunction with the pole manufacturer, to determine the ultimate mast arm pole strength and footing moment for the pole's design loading, the footing moment for the pole's ultimate design loading shall be calculated to select the proper footing code from the standard sheet 680-01. Calculated moments and footing type shall be recorded on the signal plans (deliverables) for the contract records. All signal heads shall be assumed to have a 5-section face with a 5" backplate, all overhead and street name signs need to be included in the calculations; along with two (2) additional future signs included per approach for future loading. These future signs shall have a square footage of 12 sf and 7.5 sf, for calculation purposes, the larger future sign shall be placed on the end of the mast arm and smaller future sign shall be placed mid-span on. The pole manufacturer and Design-Builder shall be responsible to design the signal pole and mast arm to meet these future needs. The Design-Builder shall calculate pole heights to accommodate the 16.5' minimum vertical clearance requirement with center of the mast arm passes between the top (red) indication and the second signal indication. For those mast arms in which fire pre-emption equipment will be mounted, the hole for the device shall only be drilled on the bottom side of the mast arm. The hole shall also be sealed after insulation is tested. At intersections where signal poles or pedestrian poles are being placed in sidewalks, the top of the foundation shall be flush with the top of the sidewalk.

16.3.8 Cabinet/ Disconnect Switch

The Design-Builder shall install one state-supplied microcomputer cabinet at each of the signalized intersections. The Design-Builder shall also install a state-supplied disconnect/ generator transfer switch with the meter channel, on the signal pole to which the cabinet has been mounted to. The electrical disconnect/generator transfer switch shall be installed underneath the meter. The cabinet and disconnect switch shall meet the requirements of Special Specifications 680.80324515 and 680.94997008, respectively. The Design-Builder shall notify the Regional Traffic Safety and Mobility Group two (2) weeks in advance of the requested date for the microcomputer cabinet and electrical disconnect/generator transfer switch for the intersection. Additionally, at the time of the request for the cabinet, the Design-Builder shall provide the design plans (deliverables) so the controller can be programmed in advance by NYSDOT for the new traffic signal(s).

The controller cabinet shall only be banded to the pole at both the top and bottom brackets. Welding shall not be allowed. For a ground mounted cabinet, the bolt diameter connecting the base to the concrete shall be ¾ inch. The mounting height for the microcomputer cabinet shall be increased to 24 inches. The Design-Builder shall request permission from the NYSDOT Traffic Signal Maintenance at (315) 428-4064 to enter any existing traffic signal controller cabinets or

perform any work on existing traffic signal controller cabinets, and two weeks before attempting to energize a signal to schedule a turn on date.

16.3.9 Pullbox

Where a fiber optic interconnect exists, a 30” square fiber optic pullbox shall be installed adjacent to the cabinet. All other pullboxes required shall be standard 26”x18” reinforced concrete pullboxes. Pullboxes shall have a two-foot minimum drainage bed of No. 2 crushed stone or gravel placed below the pullbox. No pullboxes shall be placed within the asphalt roadway.

16.3.10 Power Supply

Power shall be supplied to the microcomputer cabinet from the nearest available utility pole. An overhead electrical service shall be installed whenever possible. The power supply cable shall be a 3 conductor, 6awg cable conforming to the requirements of Special Specification 680. 95010615 with two black and one white. Colored tape is not allowed. The power supply work shall meet the requirements of Special Specification 662.60000415. The meter channel shall meet the requirements of Special Specification 680.90920103 – Electric Meter Channel, 100 Ampere, Single Phase, 240 Volt for Traffic Signal Installation. The meter channel shall be installed such that it is located away from vehicular traffic flow, and at a height that complies with the local utility company. Power service shall be in compliance with requirements of the National Electric Code. When the electrical service is installed on the signal pole, the meter channel assembly shall be attached to the pole with stainless steel banding only.

16.3.11 Traffic Signal Requirements

The Design-Builder shall develop traffic signal plans for the Project that shall:

A) Provide for all traffic signal components; and

B) Provide signing, traffic signals for bicycle and pedestrian crossings within the Project Limits, where applicable.

16.4 DELIVERABLES

Section not used.

SECTION 17 LIGHTING

17.1 SCOPE

The Design-Builder shall conduct all Work necessary to provide all required lighting components required for the Project. This includes design, fabrication and construction of all transportation related permanent and temporary roadway lighting off the bridge and roadway within the Project Limits.

The Design-Builder shall be responsible for the review and approval of all shop drawings needed for the scope of work. The review and approval process shall be in conformance with the Design-Builder's Quality Control Plan.

17.2 STANDARDS

The Design-Builder shall perform the lighting activities in accordance with the Contract Requirements and the applicable Standards, Design Codes and Manuals listed in Section 1.6, or otherwise applicable to the Project, and the following additional Standards:

17.2.1 Standards

A) ANSI/IES ANSI Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, RP-8-18

B) ANSI/IES ANSI Approved Recommended Practice for Roadway Sign Lighting, RP-19-01

C) FAA Advisory Circular 70/7460-1L, Obstruction Marking and Lighting with Change 2

D) IES Recommended Lighting for Walkways and Class 1 Bikeways, DG-5-94

E) NFPA NFPA 70 – National Electrical Code (NEC)

F) NYSDOT Policy on Highway Lighting

G) USCG 33 CFR 118 – Bridge Lighting and Other Signals

17.2.2 References

A) IES Guideline for the Application of General Illumination ("White") Light-Emitting Diode (LED) Technologies G-2-10

B) NFPA NFPA 70E Standard for Electrical Safety in the Workplace

C) NFPA NFPA 780 Standard for the Installation of Lightning Protection Systems

17.3 REQUIREMENTS

17.3.1 General Requirements

The Design-Builder shall be responsible for designing, furnishing and installing all components required for the implementation of the lighting system for the Project including new luminaires, controls, poles, mounting, wiring, conduits, and support hardware, as necessary for delivering a complete and functional lighting system. Existing lighting impacted by the Project shall be replaced to meet the Project requirements.

The Lighting System within the Project limits shall be fully maintained by the Design-Builder for the duration of the Project.

17.3.1.1 Power Supply Requirements

For reference, the lighting installation shall comply with the following:

A) Meet all requirements of NFPA 70 – National Electrical Code (NEC);

B) All outdoor electrical enclosures shall be type 316 stainless steel, rated NEMA 4X or a higher degree of protection; and

C) Meet all requirements of applicable IEEE and ANSI power engineering standards.

17.3.1.2 Removal of Existing Equipment

All disconnected luminaires, light poles, and associated equipment shall be removed and disposed of by the Design-Builder. All wiring, switches, panels, cabinets, enclosures, and other electrical equipment shall be removed and disposed of by the Design-Builder.

17.3.2 Permanent Lighting System

17.3.2.1 General

The Design-Builder shall be responsible for ensuring that the permanent lighting system meets the following requirements:

A) Provides illumination such that the road surface illumination meets or exceeds the uniformity and the illuminance and/or luminance criteria during darkness;

B) Utilizes energy efficient and long-life, low maintenance lighting technologies that are found on the Department's approved lists;

C) Can be fully and seamlessly integrated into the existing permanent lighting elements adjacent to the Project limits;

D) Utilizes a photo-control switch system that automatically activates lighting before dusk and deactivates the system past dawn;

E) Contains surge suppression devices for protection against damage by lightning strikes and complying with NFPA-780 and UL 96;

F) Provides fixtures that are water tight and intended for a marine/industrial environment;

G) Utilizes lighting components that are readily available and not proprietary equipment; and

H) Utilizes a new, or existing, locking cabinet containing manual and automatic switches and circuit breakers to control new lighting fixtures.

17.3.2.2 Construction Requirements

The Design-Builder shall use materials listed on the NYSDOT approved list of materials and consistent with the details shown on the Department's Standard Sheets.

The Design-Builder shall provide permanent lighting materials that satisfy the Project Requirements and applicable codes. In addition, the Design-Builder shall:

A) Ensure that all exposed raceways/conduits are made of PVC coated rigid galvanized steel (RGS). Short runs (no longer than **6** feet) of liquid-tight flexible metal conduit may only be used to make a final connection between the main power feeder and a light pole or fixture;

B) Ensure that all outdoor electrical enclosures and attached parts (e.g. breather drain) shall be type 316 stainless steel, rated NEMA 4X or a higher degree of protection;

C) Ensure that any new electrical enclosures shall have a key lock; and

D) Ensure all lighting shall include breakaway devices, unless protected by concrete barrier. Light poles shall feature a breakaway base, except where located behind bridge rails.

17.3.3 Temporary Lighting System

The Design-Builder shall ensure that the existing lighting levels within the Project limits are maintained at all times. A temporary lighting system shall be installed as necessary to meet this requirement. The temporary system shall be energized either separately or though connection to the existing lighting system.

17.4 DELIVERABLES

Deliverables shall be as stated elsewhere in the RFP documents.

SECTION 18 INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

18.1 SCOPE

The Design-Builder shall perform all work necessary to design, furnish, build, and install temporary and permanent replacement of all ITS communication system field devices for uninterrupted service of the regional traffic management and traffic signals.

All work items shall not interrupt the Traffic Management Center (TMC) operation. The Design-Builder shall coordinate with the engineer and the TMC prior to any work item at the TMC.

The Region 3 TMC operates 24/7 365 days per year and currently shares video information with Onondaga County 911 Center and the public via 511.ny.org or NYS Claris. In order to minimize disruptions to the Region 3 TMC operation, the following conditions shall be adhered to by the Design-Builder when removing, modifying, or replacing items under this contract unless specifically noted:

- No more than two (2) locations shall be down simultaneously
- No more than two (2) licensed frequency links shall be down simultaneously
- The Design-Builder shall make every effort to reestablish communication and video images to the TMC by the end of the day, with a maximum of 48 hours to reestablish. This includes the necessary integration of the device into the Region 3 TMC's operation via existing software.
- The TMC Shall be contacted at least 2 business days before work begins on any ITS equipment.

The ITS System work in the Project shall consist of the following:

Removal of:

- 2 permanent Variable Message Signs (VMS), 4 cameras and poles, and 1 Acoustic Detection Systems and 2 Ice Detection Systems.

Installation of:

- 2 VMS, 4 cameras and poles, and 4 Acoustic/Radar Detection Systems.

The Design-Builder shall design, furnish and install a complete, operational and tested ITS system including all required electronic devices for the System, all associated mounting hardware, all associated cabling and integrate those devices into the NYSDOT Transportation Management Center (TMC). Final integration to the NYSDOT TMC system will be coordinated with NYSDOT. The Design-Builder shall be responsible for all other work related to the ITS within the Project limits.

The Design-Builder shall maintain and protect any existing Fiber Optic trunk cables located in the NYSDOT Right of Way. Should any disruptions of the existing Fiber Optic network be required due to the Design-Builder's operations, a temporary communication system or bypass communication linked to the NYSDOT TMC shall be provided. None of the current functionality

of the existing system may be lost or negatively affected by construction activities related to this Project.

Any disruptions to the existing system caused by the Design-Builder's operations shall be repaired by the Design-Builder at no additional cost to the Department.

For the duration of this contract, the Design-Builder shall be responsible for all other work related to the ITS System within the Project limits.

18.2 STANDARDS

The Design-Builder shall perform ITS activities in accordance with the Contract Requirements, the applicable Standards, Design Codes and Manuals cited in Section 1.6, unless otherwise applicable to the Project, and the following additional Standards:

18.2.1 Standards

NFPA:

- 1101 NTCIP Simple Transportation Management Framework
- 1102 NTCIP Octet Encoding Rules (OER)
- 1201 NTCIP Global Object (GO) Definitions
- 1203 NTCIP Object Definitions for Dynamic Message Signs
- NFPA 502 Recommended Practice on Fire Protection for Limited Access Highways, Tunnels, Bridges, Elevated Roadways and Air Right Structures

NTCIP:

- Part 56 of Title 12 of the Official Compilation of Codes, Rules; and Regulations of the State (12NYCRR, Part 56)

NYCRR:

- Part 56 of Title 12 of the Official Compilation of Codes, Rules; and Regulations of the State (12NYCRR, Part 56)

18.3 REQUIREMENTS

18.3.1 Variable Message Sign (VMS)

18.3.1.1 Removal of Existing VMS

Two (2) existing permanent VMS will be removed as part of this contract. They shall be removed by qualified technicians. The removal shall include the message board, cabinets, and all electronics. The removals are located at the following locations:

- I-481 NB before Exit 2 (Jamesville Rd) near mm 1.28 – approximate coordinates 43.0040, -76.1046

- I-481 NB before Exit 4 (I-690) approximate satiation R6B 127+50, near mm 5.56, approximate coordinates, 43.0427, -76.0517

All equipment removed shall be salvaged to the Region 3 Signal Shop, 143 Sand Rd, Syracuse, NY.

Equipment damaged as a result of improper removal or handling of any of the components shall be replaced with new in-kind equipment at the Design-Builder's expense.

18.3.1.2 Installation of New VMS

The Design-Builder shall furnish and install two (2) new 3 Line-18 Character Full Matrix LED Dynamic Message Sign Assemblies (VMS) and all related installations and equipment for the operation of the sign. The VMS shall meet or exceed the requirements for the associated item number listed in the Device Requirements Table. The communications from the roadside cabinet to the sign shall be over fiber optic link.

The newly installed shall be located in the general area of the existing VMS being removed at the following locations:

- I-481 NB before Exit 2 (Jamesville Rd) near mm 1.28 – approximate coordinates 43.0040, -76.1046
- I-481 NB before Exit 4 (I-690) approximate satiation R6B 127+50, near mm 5.56, approximate coordinates, 43.0427, -76.0517

All areas shall be cleared of trees and brush and be located on a flat surface. Adequate sight distance shall also be verified in the field before determining a final location.

The Design-Builder shall confirm the final VMS and cabinet locations with the Regional ITS Maintenance Staff before installing.

Training shall be provided for all equipment, including software.

18.3.2 Cameras

18.3.2.1 Removal of Existing Camera

Four (4) existing cameras will be removed as part of this contract. They shall be removed by qualified technicians. The removal shall include the pole, lowering arm, radio equipment, cabinets, and all electronics. Regional ITS Maintenance Staff shall determine which equipment shall be returned to the Department.

The removals are located at the following locations:

- I-481 NB north of Exit 1 (Rock Cut Rd) near mm 0.24, approximate coordinates 43.0071, -76.1253
- I-481 NB north of Exit 1 (Storage Yard) near mm 1.29, approximate coordinates 43.0039, -76.1041
- I-481 NB north of Exit 3 (Lyndon) near mm 4.85, approximate coordinates 43.0337, -76.0589
- I-481 NB south of Exit 4 (Kinne) approximate satiation R6B 127+50, near mm 5.57, approximate coordinates 43.0428, -76.0514

All equipment removed shall be salvaged to the Region 3 Signal Shop, 143 Sand Rd, Syracuse, NY.

Equipment damaged as a result of improper removal or handling of any of the components shall be replaced with new in-kind equipment at the Design-Builder's expense.

18.3.2.2 Installation of New Camera and Camera Pole

The Design-Builder shall furnish and install four (4) new integrated Dome Camera assembly and all related installations and equipment for the operation of the camera, including but not limited to the camera pole, five lowering devices, equipment cabinet, IP power distribution unit, Ethernet radio, Ethernet switch, temperature monitoring system, and video encoder-decoder. The camera pole shall be 100 ft. with five lowering devices.

The installations are located at the following locations:

- I-481 NB north of Exit 1 (Rock Cut Rd) – to be installed so it is accessible for Rock Cut Rd, near mm 0.24, approximate coordinates 43.0071, -76.1253
- I-481 NB north of Exit 1 (Storage Yard) – to be installed near the base of the slope of I-481 so it is accessible from Rock Cut Rd, near mm 1.29, approximate coordinates 43.0039, -76.1041
- I-481 NB north of Exit 3 (Lyndon) – to be installed near the base of the slope of I-481 so it is accessible from NY 5/92, near mm 4.85, approximate coordinates 43.0337, -76.0589
- I-481 NB south of Exit 4 (Kinne) – to be installed so it is accessible from I-481, near mm 5.57, approximate coordinates 43.0428, -76.0514

All areas shall be cleared of trees and brush and be located on a flat surface.

The camera assembly shall meet or exceed the requirements for the associated item number listed in the Device Requirements Table, have POE injector, and be compatible with the existing ITS system. The composite cable from the equipment cabinet to the camera shall consist of two outdoor rated CAT6 cable for power over Ethernet.

The Design-Builder shall install power and communication cables supplied with the CCTV camera from the unit back to the equipment cabinet as stated in the specifications. No splices will be allowed between the camera lowering arm and the based mounted equipment cabinet.

The Design-Builder shall install the power and communication cables supplied with the Ethernet radio from the unit back to the equipment cabinet as stated in the specifications. No splices will be allowed between the radio and the base mounted equipment cabinet.

Spare lowering arms shall be wired for Ethernet. No splices will be allowed between the camera lowering arm and the base mounted equipment cabinet.

The MPEG-2/4 Video Encoder-Decoder shall be built into the IP camera.

The Ethernet radio installed shall be compatible with any other radios installed or existing.

The Ethernet Switch installed shall be compatible with existing IT system and have eight ports.

In the event that ground water is encountered during the course of construction, the cost of dewatering, pumping, bailing or draining necessary during construction to keep excavation free of water shall be included in the contract.

For pole details see Standard Sheet 680-06.

The Design-Builder shall confirm the final camera pole and cabinet locations with the Regional ITS Maintenance Staff before installing.

18.3.3 Acoustic Vehicle Detectors

18.3.3.1 Removal of Existing Acoustic Vehicle Detector

One (1) Acoustic Vehicle Detector shall be removed as part of this contract. It shall be removed by qualified technicians. The removal will include cabinets and all electronics. Regional ITS Maintenance Staff shall determine which equipment shall be returned to the Department.

The removals are located at the following locations:

- I-481 NB south of Exit 4 (Kinne), near mm 5.57, approximate coordinates 43.0428, -76.0514

18.3.3.2 Installation of New Acoustic Vehicle Detector Assembly

The Design-Builder shall furnish and install four (4) new acoustic/radar vehicle detector assemblies, and all related installation and equipment for the operation of the acoustic/radar detector. The acoustic/radar detector shall meet or exceed the requirements for the associated item number listed in the Device Requirements Table. The communications from the roadside cabinet of the acoustic/radar detector shall be over the sensor lead in the cable.

The traffic sensor and mounting bracket shall be installed on the camera pole at a manufacturer recommended height.

The field equipment cabinet interface and all other field equipment related to the acoustic/radar detector assembly shall be stored in the camera equipment cabinet.

The detector assembly shall be compatible with the existing ITS system.

The proposed acoustic/radar detector assemblies are located at:

- I-481 NB north of Exit 1 (Rock Cut Rd), near mm 0.24, approximate coordinates 43.0071, -76.1253
- I-481 NB north of Exit 1 (Storage Yard), near mm 1.29, approximate coordinates 43.0039, -76.1041
- I-481 NB north of Exit 3 (Lyndon), near mm 4.85, approximate coordinates 43.0337, -76.0589
- I-481 NB south of Exit 4 (Kinne), near mm 5.57, approximate coordinates 43.0428, -76.0514

18.3.4 Ice Detection System

18.3.4.1 Removal of Ice Detection System

The two (2) existing ice detection systems on the I481 bridges over CSX shall be removed by qualified technicians, including cabinets, signs, poles, and all electronics.

18.3.5 Pullboxes

18.3.5.1 Fiber Optic Pullboxes

Pullboxes shall have a two foot minimum drainage bed of No. 2 crushed stone or gravel placed below the pullbox.

All pullboxes required shall be standard 26 inch x 18 inch and shall be reinforced concrete only.

No pullboxes shall be placed within the asphalt roadway. On Standard Sheet 680-04, all pullboxes shall be set to ½ inch below grade with all the surrounding surfaces, except sidewalks, where they shall be flush.

Pullbox covers may be designed with or without ribs and shall be heavy duty to safely withstand the AASHTO HS-25 loading.

All pullbox cover frames shall be grounded. Electrical pullbox covers shall be bonded to the frame with a #6 AWG grounding conductor.

All conduits shall exit the pullbox from the narrow side of the box.

At a minimum, one pullbox shall be installed at the power source, one shall be installed next to each piece of equipment (camera, VMS, etc.), and one shall be installed next to the equipment cabinet for each piece of equipment. Maximum spacing between pullboxes is 150 feet.

Design-Builder shall allow for 100 foot coils in each pullbox and cabinet. If a pullbox has limited space, the Design-Builder shall leave as much linear feet of coil as possible without restricting access

At any location where conduit will be attached to a bridge, a galvanized cast iron junction box shall be installed/attached at the ends of the bridge where the conduit changes to different conduit types or materials. This junction box shall meet or exceed the requirements for the associated item number listed in the Device Requirements Table.

18.3.6 Traffic Signal Interconnection

Section Not Used.

18.3.7 Temporary Wireless Radio and Antenna

As required during construction, the existing wireless radio communication system may be relocated to maintain uninterrupted services to the NYSDOT TMC. If this is needed, the Design-Builder shall coordinate with the Region 3 NYSDOT TMC.

18.3.8 Central Computer System at TMC

All equipment installed under the contract shall be consistent with the Regional ITS Architecture and the ITS Strategic Plan for the Region, including compatibility with the Region 3 Transportation Management Center ATMS software. All relevant RITSA Service Packages shall be identified prior to design for any ITS equipment to be deployed.

The IP address assignments shall be provided to the Design-Builder by the NYSDOT TMC.

18.3.9 Electrical Work

The Design-Builder shall provide all 120/240VAC power necessary for the construction and System installation and shall include the furnishing and installation of all labor and equipment. All power, video and data circuits entering or exiting the cabinets shall be furnished with surge lightning protection. The Design-Builder shall maintain the integrity of all circuits in service that may be affected by the work.

The Design-Builder shall furnish and install cabling and conduit between the controller cabinet and the ITS equipment cabinet, the ITS cabinet and pullbox, the fiber and pulboxes, and the power source. It shall be the responsibility of the Design-Builder to verify that the cabling and its routing are sufficient for their needs.

18.3.9.1 Cabling Requirements

The minimum size cable used for power circuits and ground wires shall be #12 AWG. Alternate cable sizes that can be utilized for power and ground are #6AWG and #2AWG. Voltage Drop calculations for the electrical service drop to the ITS cabinet shall be provided.

Power cabling and wires installed outdoors and underground shall be rated for 600V, rated for wet locations and gasoline and oil resistant.

All cables provided shall be provided with terminations, connectors, and splices as needed and shall be installed within the existing or proposed conduits. All termination cables provided shall be provided with terminations, connectors and splices as needed.

All cables shall be clearly labeled with identifying label or tags clearly indicating the circuit # and/or VMS #.

All electrical enclosures and boxes provided by the Design-Builder shall be stainless steel NEMA 4X.

All conduits shall be hot-dipped Rigid Galvanized Steel (RGS). All fittings and conduit bodies shall be hot-dipped galvanized.

18.4 POWER SOURCE

The materials and work associated with the power utility connection shall be supplied and performed for the power utility company.

The Design-Builder shall coordinate manhole entry, service box location, and metering locations with the power company and Regional ITS Maintenance before starting work at a site.

The service conductor shall be a single conductor cable, No 2 gage. It shall consist of three individual conductors: two black colored conductors and one white colored conductor.

The Design-Builder shall leave enough cable coming out of the riser assembly to reach the height of the utility company's primary lines.

The meter channel assembly shall not be installed on the equipment cabinet. If the meter channel assembly can't be installed on the CCTV camera pole then it shall be installed on a wood post assembly near the equipment cabinet. If a wood post assembly is used, the Design-Builder shall submit a layout plan for mounting the equipment on the wood post.

When electrical service is installed on the CCT camera pole, the meter channel assembly shall be attached to the pole with stainless steel banding only.

The meter channel shall be installed such that it is located away from the vehicular traffic flow and at a height that complies with the local utility company.

All power services should be terminated and replaced with new services/disconnects for new equipment.

18.5 EQUIPMENT CABINET/DISCONNECT SWITCH

The Design-Builder shall install a base mounted equipment bracket, Type 332 at each camera location. The equipment cabinet shall meet or exceed the specification for the item listed in the Device Requirements Table. Equipment cabinets shall be located such that the cabinet door is on the side with the greatest distance from the roadway edge. The longest dimension shall be parallel to the roadway; the orientation of cabinet doors with respect to the adjacent roadway shall be approved at each cabinet location prior to installing the cabinet foundation or electrical conduits by the Regional ITS Maintenance Staff.

A 5 ft x 5 ft x 4 in concrete work pad shall be installed in front of the cabinet door as detailed on standard sheet 680-05.

Each and every cable entering the equipment cabinet and pullboxes shall be permanently marked by function and phase stamped on NYSDOT approved tags. The tags shall be attached to the cables with plastic or nylon line.

Each and every conduit entrance to the equipment cabinet shall be sealed using non-shedding stainless steel sponges. The steel sponges should not actually be placed inside the cabinet but inside the conduit as it passes into the cabinet.

Upon completion, all equipment cabinets shall have IP power distribution units and temperature monitoring systems installed and operational.

All equipment cabinets shall be ground mounted. Cabinets shall be mounted on an equipment cabinet signal base, which meets or exceed the specification for the associated item listed in the Device Requirements Table. Refer to Standard Sheet 680-05 for additional base mounted cabinet details.

The Design-Builder shall install an electrical disconnect/generator transfer switch at the same location where the electrical meter is located. When installed on the CCTV camera pole it shall

be located beneath the meter channel. The disconnect switch shall meet the requirements of the associated item listed in the Device Requirements Table.

18.6 SYSTEM TEST PROCEDURES

The Design-Builder's ITS System Integrator shall be responsible for testing the installed equipment to verify that it has been installed correctly, is performing as specified, and supports overall system operations. This testing will be accomplished in a sequence of procedures that begin with basic components and culminate in exercising the total system in its operational configuration.

For all tests, the Integrator is responsible for providing detailed, step-by-step procedures for the testing. These procedures shall specifically identify:

- The equipment configuration,
- The sequence of operations for the test,
- The test setup including environmental conditioning;
- The required test equipment and its configuration;
- The expected results and pass/fail criteria.

A copy of the test procedures shall be furnished to the Department for review prior to the commencement of the tests.

18.6.1 Factory Testing

For off-the-shelf equipment and components, the Integrator may establish compliance with the minimum performance established in the specifications through third party verification and a manufacturer's quality assurance plan. The manufacturer shall supply documentation to verify that the performance of the equipment has been measured against the manufacturer's equipment specification over the entire environmental range.

For equipment and components that are unique to and specifically manufactured for the project, the Integrator shall schedule an acceptance test at the factory to demonstrate compliance with the specifications. These tests shall demonstrate compliance with all aspects of the specifications over the entire range of environmental conditions. For tests that require environmental chambers of special conditions, the manufacturer may substitute documented test results in lieu of actually performing the procedure.

18.6.2 Operational Stand Alone Testing

The operational standalone testing demonstrates that the equipment has been installed correctly and is operational. These tests involve only single items of equipment or equipment assemblies. Portable laptop computers and test equipment supplied by the Design-Builder may be used to simulate control of the standalone equipment. Typical tests would include but are not limited to:

- Physical inspection of the installation;
- Continuity tests;

- Power-on tests;
- Voltage measurements;
- Cable performance tests (twisted-pair and fiber optic). For optical fibers, this would include OTDR and attenuation measurements. For twisted-pair cable, this would include checks for grounds, splits, crosses, and opens;
- Cabinet assembly-performance tests (e.g., cabinet to radar detector);
- Verification of radar detector measurements;
- Functional performance communications;
- Wireless radio measurements (output power, signal levels, etc.).

Operational standalone testing shall also include equipment setup. This includes configuring the equipment's options and setting the equipment's system identification, including its network address.

18.6.3 Group Site Verification Testing

Group site verification testing measures or demonstrates the performance of "linked" equipment and components. Typical tests include but are not limited to:

- Communications links with modems connect to optical fibers or microwave radios.
- Multiplex connections and performance between nodes such as minihubs or shelters and operations centers such as the TMC.
- Modem circuits.
- Data circuits.

18.6.4 Subsystem Integration Testing

Subsystem integration testing includes all components in the subsystem and demonstrates that the subsystem is totally functional and capable of supporting operations. Each subsystem shall be tested in its operational configuration, demonstrating complete compliance with all components between and including the operations center and the field elements.

18.6.5 System Acceptance Testing

The system acceptance test demonstrates that the installed equipment will operate as specified and support operations for a minimum of 30 days. The system acceptance test also provides a controlled burn-in period for the installed equipment. Procedures shall be provided to exercise the equipment and associated functions throughout the course of the test.

If any equipment should fail during the 30-day period, those subsystems affected by the failed equipment shall be subject to an additional 30-day test period. The Engineer of Record will

determine which equipment has been affected by the failure and subject to an additional 30-day period of testing, present the information to the Department's PM for comment and acceptance.

18.7 DOCUMENTATION REQUIREMENTS

The Design-Builder shall prepare all Documentation as required and submit to the Department for review. The Department's review of system documentation does not waive the Design-Builder's responsibility in furnishing and installing a fully operational and functional system meeting the specifications herein.

18.7.1 Shop Drawings and Test plans

Test plan submittals shall be furnished by the Design-Builder to the Department to demonstrate that the System and associated products, intended to be supplied for this Contract, have the capability to meet the functional objectives required by the Technical Parameters. System documentation submittals required shall consist of:

- Factory Acceptance Test Plan and Report
- Field Acceptance Test Plan and Report
- Operational Acceptance Test Plan and Report
- Operating Documentation

The Design-Builder shall provide the Department with the following documentation at the beginning of the project prior to starting work at any new installation site; work shall not begin until shop drawings have been approved.

- A minimum of five copies of all manufacturers' documentation for all equipment to be supplied as part of this project. This documentation shall include all operations, maintenance, software support, and protocol descriptions available from the manufacturer of each component.
- All documentation specifically requested in the individual item specifications.
- A minimum of three copies of written documentation which contains the correct hardware (dip switch settings) and software adjustable configurations for all equipment used in the project.
- A chart which details the pin-outs of all cable assemblies and actual interconnection of all system components.
- A site plan showing the location of all equipment, including the meter assembly and equipment cabinet.
- Estimate of quantities
- Copy of Regional design details and notes applicable to the ITS design.

- Shop drawings, which must be viewed and approved by R3 ITS/TMC before being used on the project.

18.8 DEVICE REQUIREMENTS

Equipment	Associated Item Number
100 ft Camera Pole with 5 Lowering Devices	683.04110003
IP Power Distribution Unit	683.96100305
5.8 GHz Point to Multipoint Ethernet Radio	683.10900010 and 683.10910010
Camera Assembly	683.10120008
MPEG-2/4 Video Encoder-Decoder	683.95010011
Ethernet Switch	683.95050010
Base-Mounted Equipment Cabinet Type 332	683.06010013
Temperature Monitoring System	683.09030008
Variable Message Sign	683.93183104
Acoustic/Radar Vehicle Detector Assembly	683.91150010
Aluminum Microcomputer Cabinet Base	680.80325010
Electrical Disconnect/Generator Transfer Switch	680.94997008

SECTION 19 WORK ZONE TRAFFIC CONTROL AND ACCESS

19.1 SCOPE

The Design-Builder shall be responsible for the planning and provision of Work Zone Traffic Control (WZTC), required to perform the Project Work until Project Completion. This Project Requirement applies to any roads, ramps, cross roads, local streets, maintenance roads, driveways, and active paths within and/or affected by the Project.

The Design-Builder shall provide WZTC for the safe and efficient movement of people, goods, and services through the Project area(s) while maintaining access and minimizing negative impacts to residents, commuters, businesses, and NYSDOT maintenance operations.

Note that, as used in this section, “Work Zone Traffic Control plan” or “WZTC plan” is the equivalent of “Maintenance and Protection of Traffic plan” or “MPT plan” as described in Chapter 16 of the Highway Design Manual (HDM).

The Design-Builder shall develop a Work Zone Traffic Control Plan per Contract requirements and shall furnish, erect, and maintain barricades, warning signs, flaggers, and pilot cars in accordance with: the National Manual on Uniform Traffic Control Devices for Streets and Highways and the New York State Supplement 17 NYCRR Chapter V (collectively, MUTCD); the traffic control plan(s), as subject to the consultation and written comment of the Department’s Project Manager; and the requirements of the Contract Documents. Flaggers shall be provided with equipment and training pursuant to requirements of the MUTCD. The equipment used by the flaggers shall be kept clean and in good repair by the Design-Builder at the Design-Builder’s expense. The Design-Builder shall take all steps necessary to either keep the existing roadway open with a minimum of inconvenience to the traveling public or provide an approved alternate route.

When requested by the Design-Builder and approved by the Department’s Project Manager, or when directed by the Department’s Project Manager, Sections of the Project may be opened to traffic prior to completion of the entire Contract. Such opening shall not constitute Final Acceptance of the Work or any part thereof, or a waiver of any provisions of the Contract.

When a Section is opened in accordance with the Design-Builder’s Work Zone Traffic Control Plan and/or as a result of the Design-Builder’s request, the Design-Builder shall remain liable until Project Completion of the entire Project, and damage to the highway occurring before that time shall be repaired by the Design-Builder at the Design-Builder’s expense, including the removal of earth or rock slides.

The Design-Builder’s equipment shall enter and leave the traveled way only in the direction of public traffic. All movements on or across the traveled way shall be performed in a manner that will not endanger the traveling public.

The Design-Builder shall maintain the pavement surface of the lanes open to traffic adjacent to the Work zone within the limits of the Project traffic control.

Refer to Part 2, § DB 105-22 for information regarding the respective responsibilities of the Department and the Design-Builder for maintenance of sections of roadway open to the traveling public.

If the Design-Builder fails to furnish warning devices, take protective measures as above provided, or complete shoulder work, drainage structures, or other features of the Work, the Department's Project Manager, or Department's Construction Quality Assurance Engineer, at his or her discretion, will notify the Design-Builder in writing of the defects along with a reasonable period of time in which the Work must be corrected or completed. If the Design-Builder fails to make a reasonable effort, in the sole opinion of the Department's Project Manager, toward correction in this period of time, the Department's Project Manager may then take such steps as the Department's Project Manager deems necessary to correct the defects, or the Department's Project Manager may terminate the Contract for default under Part 2, DB 103-06, Article 11.

The Design-Builder shall be liable and agrees to pay the Department for all costs and expenses incurred by the Department in correcting the defect(s).

19.2 STANDARDS

The Design-Builder shall perform the work zone traffic control activities in accordance with the Contract Requirements and the applicable Standards, Design Codes and Manuals listed in Section 1.6, unless otherwise stipulated in this Project Requirements, or otherwise applicable to the Project.

19.3 REQUIREMENTS

19.3.1 General Requirements

See RFP, Part 6 – Indicative Plans for Suggested Phasing Plan.

General Requirements

A. I-481, between Existing Interchange 5 and Existing Interchange 3
    a. A minimum of 2-lanes of traffic in each direction shall be maintained on I-481 except for short term single lane closures outside of the restriction periods defined in Sections 19.3.3 and 19.3.5.
    b. For crossing routes, the existing number of lanes in each direction will be maintained throughout construction except for short term closures.
B. I-81/I-481 South Interchange
    a. A minimum of 2 lanes of traffic in each direction shall be maintained on I-81, and a minimum of 2-lanes of traffic in each direction shall be maintained on I-481, except for short term single lane closures outside of the restriction periods defined in sections 19.3.3 and 19.3.5 and as follows.
    b. For crossing routes, the existing number of lanes in each direction will be maintained throughout construction except for short term closures.
C. Existing Interchange 3 (Ramps)
    a. A minimum of two (2) lanes of traffic in each direction shall be maintained on I-481, except for short term single lane closures outside of the restriction periods defined in sections 19.3.3 and 19.3.5.
    b. All ramps must remain open except for short term (night) closures for paving.

c. Pavement milling, resurfacing and widening shall be constructed during night hours.

D. Route 5/92 (E. Genesee St)

a. Between Jamesville Rd and the junction of NY5 at “Lyndon Corners” one lane of traffic must be maintained between 10PM and 7AM in the Eastbound Direction. One lane of traffic must be maintained between 9PM and 6AM in the Westbound direction. No lane closures allowed outside of these hours.

b. Between the junction of NY5 at “Lyndon Corners” and Woodchuck Hill Rd, one lane of traffic must be maintained in each direction between 10AM and 3PM and between 7PM and 9PM. No lane or shoulder closure are allowed between 6AM-10AM and between 3PM and 7PM as noted in the table below.

E. East Brighton Ave

a. Two (2) lanes of traffic in each direction shall be maintained at all times.

F. East Glen Ave

a. The existing East Glen Ae Bridge must remain open to two-way traffic at all times until the new bridge is open to traffic.

b. Full access to the Loretto facility shall be maintained at all times except for short term closures upon advance notification to the facility

19.3.2 Work Zone Traffic Control Plan

The Design-Builder shall prepare and submit a WZTC Plan for managing traffic operations and controlling access until Project Completion. A WZTC Plan must be submitted in advance of any work that restricts the roadway cross section and includes durations and traffic pattern changes that will exceed 10 hours in any 24-hour period.

The WZTC Plan shall be submitted to the Department’s Design Quality Assurance Engineer a minimum of two weeks prior to initiation of any Work requiring a lane closure or the implementation of any change in traffic patterns.

The WZTC Plan shall include:

A) Contingency plans for reasonable unforeseen interruptions;

B) Duration of each WZTC stage, including duration of lane closure(s), if any;

C) Provisions for maintaining pedestrian traffic through the Project area at all times at all locations where pedestrian access through the Project area currently exists, if applicable.

D) Use of temporary signals for WZTC staging and/or phasing shall be provided in the WZTC plans (IE: signal plan, operation, timing, phasing, detection, etc.).

E) There shall be a 1 foot minimum offset from the roadway edge line to TCB or other barriers.

F) The following restrictions shall apply during the snow and ice season, November 1 to April 15.
   a. Freeways (I-81, I-481, NY-481, BL 81): The minimum lane width shall be 11 feet. The shoulder width shall be a minimum of 6 feet or match existing condition whichever is less, at each and every point along the project. The shoulder width on structures shall be a minimum of 4 feet in width or match the existing width, whichever is less.
   b. Ramps: All ramps shall be open with the same number of turn lanes as existing. The minimum lane width shall be 11 feet. The shoulder width shall be a minimum of 6 feet or match existing condition, whichever is less, at each and every point along the project.
   c. Local Roads: All lanes shall be open. The minimum lane width shall be 10 feet. The shoulder width shall be a minimum of 6 feet or match existing condition, whichever is less, at each and every point along the project.

The Design-Builder shall notify local officials and affected police jurisdictions to facilitate safe and effective enforcement. The WZTC Plan shall recognize the need for approval of the use of local public roads, if applicable.

The Design-Builder shall be responsible for updating the WZTC Plan as necessary throughout the Contract, so that at all times the current traffic control on site is representative of the design drawings that have been accepted by NYSDOT.

19.3.3 General Restrictions

There shall be no temporary lane/shoulder closures on roadway facilities owned and/or maintained by NYSDOT on the major holidays listed below.

Construction activities that will result in temporary lane/shoulder closures shall be suspended to minimize travel delays associated with road work for major holidays as follows:

Holiday	Falls on	Temporary lane closures are NOT allowed from
New Year's Day Independence Day Christmas Day	Sunday or Monday	6:00 AM Friday before to 6:00 AM Tuesday after
	Tuesday	6:00 AM Saturday before to 6:00 AM Wednesday after (starting at 6:00 AM Friday before to 6:00 AM Wednesday after for Christmas Day)
	Wednesday	6:00 AM Tuesday before to 6:00 AM Thursday after (starting at 6:00 AM Saturday before to 6:00 AM Thursday after for Christmas Day)
	Thursday	6:00 AM Thursday to 6:00 AM Monday after (starting at 6:00 AM Wednesday before to 6:00 AM Monday after for Christmas Day)
	Friday or Saturday	6:00 AM Thursday before to 6:00 AM Monday after

Holiday	Falls on	Temporary lane closures are NOT allowed from

Memorial Day Labor Day	Monday	6:00 AM Friday before to 6:00 AM Tuesday after
Thanksgiving Day	Thursday	6:00 AM Wednesday before to 6:00 AM Monday after

Exceptions can only be made under the following conditions:

- Emergency work.
- Work within long-term stationary lane/shoulder closures.
- Safety work that does not adversely impact traffic mobility and has been authorized by the Regional Traffic Engineer.

Note: The Department reserves the right to cancel any work operations, including lane closures and/or total road closures, that would create traffic delays by unforeseen events. The Design-Builder would be notified at least seven (7) calendar days prior to the proposed work.

19.3.4 Access to Commercial Properties and Driveways

Design-Builder shall maintain access to businesses for vehicles, pedestrians, and bicyclists. If access cannot be maintained, the Design-Builder shall notify the business and provide alternative access. If alternative access cannot be provided, the Design-Builder shall conduct work when the business is not operational and shall restore access during business hours. As committed to in the FEIS, the Design-Builder shall install temporary business signs to identify entrances and direct customers to business that would be affected by detours, if applicable.

19.3.5 Closure Restrictions

Closure Restrictions

A. Daily or Temporary Lane or Shoulder closures will not be permitted as shown below:

AM PEAK PERIOD					
ROUTE	**DIR**	**LIMIT (FROM)**	**LIMIT (TO)**	**LANE CLOSURE RESTRICTION FROM**	**LANE CLOSURE RESTRICTION TO**
I-81	SB	ROUTE 31 CICERO	ADAMS ST ON RAMP	6:00AM	9:00AM
I-481	SB	I-81 N. SYRACUSE	RTE 5 & 92 EXIT	6:00AM	9:00AM
I-481	NB	ROUTES 5 & 92 EXIT	I-90	6:00AM	9:00AM
RTE 481	SB	ROUTE 31	I-81 N. SYRACUSE	6:00AM	9:00AM
ROUTE 92	EB/WB	JUNCTION WITH NY5	WOODCHUCK HILL RD	6:00AM	10:00AM

PM PEAK PERIOD					
ROUTE	**DIR**	**LIMIT (FROM)**	**LIMIT (TO)**	**LANE CLOSURE RESTRICTION FROM**	**LANE CLOSURE RESTRICTION TO**
I-481	NB	RTE 5 & 92 EXIT	I-81 N. SYRACUSE	3:00PM	6:00PM
I-481	SB	I-690	RTE 5 & 92 EXIT	3:00PM	6:00PM
RTE 481	NB	I-81 N. SYRACUSE	ROUTE 31	3:00PM	6:00PM
FREEWAY PORTION OF RTE 5	WB	ROUTE 695	RM 3308 1291 (JUNCTION W/ 174 IN CAMILLUS)	3:00PM	6:00PM
ROUTE 5/92 (E. GENESEE ST)	EB	JAMESVILLE RD	JUNCTION WITH 92	7:00AM	10:00PM
ROUTE 5/92 (E. GENESEE ST)	WB	JAMESVILLE RD	JUNCTION WITH NY92	6:00AM	9:00PM
ROUTE 92	EB/WB	JUNCTION WITH NY5	WOODCHUCK HILL RD	3:00PM	7:00PM

B. During the following events there shall be no temporary lane or shoulder closures.

Designated Roadway Facilities		
Facility	**Limits**	**Holiday/Event**
I-81	Onondaga county	New York State Fair
I-481	All	
I-81 Southbound	Central Square to Southerly terminus of I-481	Before Major Events held in the JMA Wireless Dome (From two hours prior to the scheduled start until 30 minutes after the scheduled start of the event).
I-481	South of Route 298	
I-481	South of Route 298	After Major Events held in the JMA Wireless Dome (From 30 Minutes prior to the scheduled conclusion until 1
Route 5 Westbound	W. Genesee St. to Route 695	
Route 5 Eastbound	Route 174 to Route 695	
I-690 Eastbound	I-90(exit 1) to Hiawatha Blvd (exit 9)	
I-690 Westbound	I-81 to Route 695	
Route 5 Westbound	Route 695 to Route 174	

Route 5 Eastbound	Route 695 to W. Genesee St	hour after the actual conclusion of the event.)
I-690 Eastbound	Route 695 to I-81	
I-690 Westbound	Exit 7, Solvay to I-90 (exit 1)	

C. In addition to the other restrictions described in this note, from Memorial Day weekend through Columbus Day weekend, at least two travel lanes shall remain open for through traffic on Interstate 81 as follows:

   a. Fridays from 12:00PM (noon) to 8:00 PM in the northbound direction
   b. Saturdays from 12:00 PM (noon) to 8:00 PM in both directions
   c. Sundays from 12:00 PM (noon) to 8:00 PM in the southbound direction
   d. Fridays from 12:00 PM (noon) to 8:00 PM in the southbound direction in Onondaga County from I-481 (Syracuse) to Route 11 (Nedrow)

19.3.6 Minimum Lane Widths during Construction

The Design-Builder shall maintain a minimum travel lane width of **11** feet during construction on all interstates or freeways. On any local cross road, 10 feet shall be maintained.

19.3.7 Portable Variable Message Signs

The Design-Builder shall provide, as a minimum, **8** Portable Variable Message Signs, but more should the Design-Builder's design dictate, for the duration of this Contract. The Portable Variable Message Signs shall be deployed as necessary for the various WZTC schemes developed in coordination with, and with concurrence/acceptance from, the Department's Project Manager. The portable variable message signs provided shall meet the requirements of NYSDOT Item No. 619.110512 (Portable Variable Message Sign (PVMS) STANDARD SIZE - FULL MATRIX (LED) NO OPTIONAL EQUIPMENT SPECIFIED, CELLULAR COMMUNICATIONS).

PVMS shall be placed 7 days prior to any temporary signal placement is to begin and will remain in place until all work in that phase is completed.

PVMS shall be placed when there is a change to regular traffic patterns and to advise of this upcoming change in advance.

The development of messages for the Variable Message Sign(s) shall be the responsibility of the Department's CQAE and operations staff at the NYSDOT's Transportation Management Center.

The Design-Builder shall contact the Department's CQAE at least two weeks prior to placement of any Variable Message Sign regarding their location and receive concurrence of the location.

19.3.8 Temporary and Interim Pavement Markings

The Design-Builder shall provide temporary and interim pavement markings during all construction phases conforming to the requirements of the NYSDOT Standard Specifications. The Design-Builder is responsible for the maintenance of all temporary or interim markings throughout the length of the contract and they shall remain visible and in good condition. Interim markings that are required between November 1-April 15 shall be epoxy.

19.3.9 Coordination with Regional Traffic Management Center

The Design-Builder is advised that the NYSDOT's Traffic Management Center will provide support for the Project's WZTC activities. Therefore, coordination among the Department's Construction Quality Assurance Engineer, Design-Builder, and NYSDOT's Traffic Management Center, will be required for all WZTC activities, particularly with respect to the use of Variable Message Signs (VMS) in the Project area.

The Design-Builder shall notify the Department's Project Manager of all lane and/or shoulder closures prior to implementation. The Department's Project Manager will, in turn, notify the Region 3 TMC.

The Region 3 Work Zone Notification Form (WZN) Form shall be used by the Department's Project Manager to notify the Traffic Management Center (TMC) of lane and/or shoulder closures. The WZN form is included as a Reference Document.

The Design-Builder is responsible for preparing the WZN Form and submitting it to the Department's Project Manager. The WZN Form must be submitted to the Department's Project Manager a minimum of seven (7) calendar days in advance of scheduled closures. The Department's Project Manager will respond within four (4) calendar days after receipt of the Road Work Form.

19.3.10 Emergency Response and Transportation Management Plans

The Design-Builder shall notify the Department's CQAE immediately following any impacts to motorists due to construction activities and/or unforeseen circumstances. The CQAE will be responsible for disseminating the information to the appropriate personnel/entities for appropriate response to mitigate impacts to motorists.

The Design-Builder shall prepare an Emergency Response Plan to be implemented in the event the roadway is shut down for unforeseen or unplanned circumstances. The Plan shall be implemented when the anticipated duration of closure exceeds twenty (20) minutes. The Plan shall be submitted to the Department's Project Manager for review and comment a minimum of two weeks prior to the beginning of Work. Work on this Project shall not begin until the Design-Builder receives written notification from the Department's Project Manager that the Emergency Response Plan has been reviewed by the Department and all Department comments have been resolved.

The Emergency Response Plan shall include a notification and communication plan that describes how the Design-Builder will promptly inform the appropriate personnel/entities of an unforeseen or unplanned circumstance. No later than 30 calendar days following NTP, the Department's Project Manager will provide the Design-Builder with a list of personnel and entities that need to be contacted in this section of the Emergency Response Plan.

The Design-Builder shall also provide the Department's Project Manager a Transportation Management Plan (TMP) per FHWA's Final Rule on Work Zone Safety and Mobility, 23 CFR 630 Subpart J. The intent of the TMP is to minimize impacts to the travelling public and to provide continuity of reasonably safe and efficient road user flow and highway worker safety. The Emergency Response Plan shall be a component of the TMP and shall be located in the contingency section of the TMP.

19.3.11 Lifting Operations

The Design-Builder shall be aware that under no circumstances shall lifting operations for bridge superstructure elements, overhead sign structures, or any other items, be carried out over active traffic lanes. All such operations shall at a minimum require short-duration roadway closures in accordance with the provisions of this Section 19.

SECTION 20 PAVEMENT DESIGN AND CONSTRUCTION

20.1 SCOPE

The Design-Builder shall perform all Work necessary to provide all pavement required for the Project. This includes design, furnishing of materials, fabrication and construction of all temporary and permanent pavement for roadways within the Paving Limits as shown in Part 6 – Directive Plans.

The Design-Builder shall be responsible for the review and approval of all submittals needed for the scope of work. The review and approval process shall be in conformance with the Design-Builder's Quality Control Plan.

20.2 STANDARDS

The Design-Builder shall perform the pavement activities in accordance with the Contract Requirements and the applicable Standards, Design Codes and Manuals listed in Section 1.6, unless otherwise stipulated in this Project Requirement, or otherwise applicable to the Project.

20.3 REQUIREMENTS

All pavement materials and construction methods shall be in accordance with the requirements of the NYSDOT *Standard Specifications* and the NYSDOT materials and pavement installation methods. Limestone and/or dolomite, regardless of the acid insoluble residue content, shall not be allowed for Type 1 or F1 friction aggregate requirements.

For design purposes, BL81 shall follow interstate design requirements. This shall include the BL 81 ramps connecting to I81.

For design purposes, pavement widening/reconstruction on NY Route 5 shall match existing pavement thickness.

If the existing roadway section at the limits of work varies from the standards applicable for new or resurfaced sections, the roadway features (lane & shoulder widths and cross slope) shall be transitioned to meet the existing conditions.

PG Binder, used for all roadways, shall be PG64V-22 (very heavy grade).

20.3.1 PG Binder and Mix Design Level

Requirements of this note apply to all Section 404 and 406 Asphalt items in this contract, except for shim, permeable base, temporary pavements, and miscellaneous, which may use non-modified PG binders such as PG 64S-22 and PG 64H-22.

20.3.1.1 PG BINDER

Use polymer or Terminal Blend Crumb Rubber modified PG 64V-22 (Very High) meeting the requirements of AASHTO M 332, Standard Specification for Performance Graded Asphalt Binder using Multiple Stress Creep Recovery (MSCR), for the production of hot mix asphalt mixtures for this project. In addition, the binder grade must also meet the elastomeric properties as indicated by one of the following equations for %R3.2:

1. For $J_{nr3.2} \geq 0.1$, $\%R_{3.2} > 29.371 * J_{nr3.2}^{-0.2633}$

2. For $J_{nr3.2} < 0.1$, $\%R_{3.2} > 55$

Where

$R_{3.2}$ is % recovery at 3.2 kPa

$J_{nr\ 3.2}$ is the average non-recoverable creep compliance at 3.2 kPa

When terminal blend CRM PG binder is used, the following shall apply:

- Crumb rubber particles shall be finer than #30 sieve size.
- The CRM PG binder shall be storage-stable and homogeneous.
- The Dynamic Shear Rheometer (DSR) shall be set at 2-mm gap.
- The CRM PG binder shall be 99% free of particles retained on the 600 µm sieve as tested in accordance with Section 5.4 of M 332.

Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited for mixtures under this contract. This prohibition also applies to the use of PPA as a cross-linking agent for polymer modification.

20.3.1.2 MIX DESIGN

The mixture designs must be developed in accordance with the criteria specified in the WMA items that are appropriate for the Mixture Design Level of 100 Gyrations for I-81 and BL-81 pavements. Local road pavements may use 75 Gyration Mixture Design.

Note: The PG binder for this project will be modified with polymer or CRM additives to meet the requirements stated above. Handling of the HMA/WMA shall be discussed at pre-construction and pre-paving meetings.

20.3.1.3 RAP PG BINDER CONTRIBUTION

If 10% or greater of Recycled Asphalt Pavement (RAP) is utilized in the production of hot mix asphalt (HMA) or Warm Mix Asphalt (WMA) Top Course, Binder Course, and Base Course for this contract, the following minimum asphalt content will be utilized in the final mixture design calculation for the optimum asphalt content:

WMA Mixture	Minimum Asphalt Content (%)
9.5 WMA	6.0
12.5 WMA	5.4
19.0 WMA	4.7
25.0 WMA	4.4
37.5 WMA	3.9

The mixture design will be formulated such that all the volumetric properties are within the criteria specified in the latest Material Method 5.16. The total targeted asphalt content of virgin binder

and the accepted RAP asphalt contribution shall not be less than the minimum asphalt content of the mix design during production indicated in the above table.

20.3.2 Asphalt Pavement Joint Adhesive

Asphalt Pavement Joint Adhesive shall be used at all vertical faces for all joints in the surface course such as longitudinal, transverse, curbs, or other vertical surfaces butting against the new asphalt pavement. The adhesive shall also be used on any pavement joint in the Binder course if that course is to be left open to traffic during the winter months. Longitudinal joints between lanes made by echelon paving do not require joint adhesive.

20.3.3 Shoulder Edge Wedge

The Design-Builder shall construct a shoulder edge wedge in both the binder and top course of shoulders.

20.3.4 Full Depth Reconstruction

The Design-Builder shall develop and construct pavement section(s) for full depth reconstruction, including subbase, of the Project roadways, between the approach slabs and the point at which the proposed horizontal and vertical alignments tie-in-to the existing roadway section, in conformance with the Comprehensive Pavement Design Manual, using the ESAL-based pavement design method. No permeable base is required.

1. The overall asphalt pavement thickness for I-81 and BL 81 Construction/Reconstruction shall be 10.0”
    a. 1.5” of Fiber reinforced 9.5 F2 Top Course, Item 406.09520108
    b. 2.5” of Fiber reinforced 19 F9 Binder Course, Item 406.19590108
    c. 6” of 25 F9 Base Course
        i. 12” of Subbase Course (Type 2 only). The Type 2 Stone will ensure proper uniform support and prevent difference in drainage characteristics in widening situations/areas.
2. The overall asphalt pavement thickness for NY Route 5 Construction/Reconstruction shall match the existing pavement thickness using the materials listed for I-81 Construction/Reconstruction.
3. The overall asphalt pavement thickness for or any other local road reconstruction shall be 8.5”
    a. 1.5” of 9.5 F2 Top Course
    b. 2” of 19 F9 Binder Course
    c. 5” of 25 F9 Base Course
        i. 12” of Subbase Course (Type 2 only).

For horizontal alignment changes, full depth reconstruction of the existing pavement shall be performed for a full lane width so that pavement joints are not located within a travel lane. The

remaining existing pavement shall be milled and resurfaced from curb edge to curb edge or edge of pavement to edge of pavement to provide a uniform pavement as specified in Section 20.3.2. For vertical alignment changes, up to eight inches (8”), may be made through asphalt overlays without the requirement of full depth reconstruction. Full depth reconstruction is required for vertical profile changes exceeding 8”.

There shall be one pavement design for all Interstate and Business Loop asphalt considering highest truck and passenger vehicle criteria.

If any roadway is permanently widened for the purpose of providing additional travel and/or turning lanes, new full depth pavement need only be developed and constructed for the widened section, provided that no other portion of the pavement within the widened section requires full depth reconstruction for any other purpose. All widened areas shall match the adjacent existing pavement section thickness unless that thickness is less than the new pavement section specified above. This shall be accomplished by using the above listed asphalt courses and increasing the 25 F9 Base course mixture thickness as necessary to match existing pavement thickness. To ensure proper uniform loading and adequate drainage, a crushed stone aggregate subbase is required, Type 2, 12.0” thick as indicated above. The top of the new subbase course in the widening areas shall be placed from 2” below the existing subbase up to the bottom elevation of the existing pavement to ensure adequate load capacity at the interface between the new widening and existing pavement, to provide for ease and economy of construction, and prevent a “bathtub” condition under the pavement. The existing pavement within the widened section shall be milled and resurfaced from curb to curb or edge of pavement to edge of pavement to provide a uniform pavement as specified in Section 20.3.2.

20.3.5 Milled and Resurfaced Roadways

The Design-Builder shall mill and resurface pavement areas as necessary to provide for a smooth transition between the existing and fully reconstructed pavement surfaces in accordance with the applicable Standard Sheets. The Design-Builder shall mill a minimum of 50’ beyond the limits of any full depth reconstructed pavement sections.

Within the horizontal limits of any widened or realigned pavement section, the existing pavement shall be milled and resurfaced in conjunction with the top course placement for the widened section in order to provide a uniform pavement within the widened section of roadway. At a minimum, all roadways within the paving limits, as indicated on the Part 6 - Directive Plans, shall be milled and resurfaced.

The depth of milling on I-81 and BL-81 shall be 1.5” and the asphalt placed shall be 1.5” of Fiber reinforced 9.5 F2 Top Course, Item 406.09520108. The depth of milling on NY Route 5 and any local road shall be 1.5” and the asphalt placed shall be 1.5” of fiber reinforced 9.5 F2 Top Course, Item 406.09520108.

20.3.6 Top Course Pavement

Final Top Course Pavement, except for local streets shall be placed in the last construction season before Project Completion. Base or binder course that maintains traffic more than 7 days shall have pavement termination keys.

20.3.7 Utility Trench Restoration

Outside areas of full depth reconstruction, pavements in trench restoration areas shall match the adjacent pavement section.

20.3.8 Bridge Abutment Area

Areas under new structures shall be paved with a hardscape surface meeting sidewalk design or use of precast concrete pavers.

Structures being rehabilitated shall match existing materials under the structure.

20.3.9 Guide Rail Vegetation Control Strip and Restoration

The contractor shall provide a permanent continuous vegetation control strip under all new guiderail and end treatments. The vegetation control strip shall extend from the pavement edge to the top of the embankment.

SECTION 21 DRAINAGE AND STORMWATER

21.1 SCOPE

The Design-Builder shall design and construct a stormwater drainage system in accordance with NYSDOT design standards.

The Design-Builder shall design and construct a drainage system as needed for the estimated storm runoff that provides functionality, durability, ease of maintenance, maintenance access, safety, and pleasant aesthetics.

The Design-Builder shall prepare a drainage design report and calculations with layout plans and details and obtain approval from the NYSDOT Design Quality Assurance Engineer (DQAE) prior to commencement of shop drawing preparation and construction. In addition, the Design-Builder shall conduct its quality control review in conformance with the Design-Builder's Quality Control Plan.

The stormwater management system shall be designed in coordination with Section 7, Environmental, and Section 15, Landscape Architecture, and include to the maximum extent possible, the use of Runoff Reduction (RR) Techniques for area and volume reduction, and Stormwater Management Practices (SMPs) which could include but are not limited to: Sheet flow to Filter Strips, Vegetated Swales, Infiltration Trenches, Infiltration Basins, Bioretention, Dry Swales and Wet Swales.

The Design-Builder shall be responsible for the environmental commitments related to drainage and culverts, as defined in the Water Resource Mitigation Table included in Part 7 – Engineering Data.

The proposed drainage system shall be located within the existing NYSDOT Highway Boundary, satisfy NYSDEC stormwater treatment requirements, and shall not adversely impact the existing and new stormwater drainage system. Stormwater management will be performed to comply with the NYS SPDES requirements and will be outlined in the project Stormwater Pollution Prevention Plan (SWPPP).

The Design-Builder shall be responsible for the review and approval of all shop drawings needed for the scope of work. The review and approval process shall be in conformance with the Design-Builder's Quality Control Plan.

Where drainage patterns will or must be changed from existing patterns, the Design-Builder shall be responsible for securing all necessary permits prior to construction of any drainage facilities.

Prior to Project Completion, the Design-Builder shall be responsible for cleaning all new and existing drainage facilities within the limits of pavement reconstruction, as noted in Section 22.

21.2 STANDARDS

The Design-Builder shall perform the drainage and stormwater activities, including highway, bridge and site systems, in accordance with the Contract Requirements and the applicable Standards, Design Codes and Manuals listed in Section 1.6, unless otherwise stipulated in this Project Requirement or otherwise applicable to the Project.

Stormwater shall be conveyed from point to point through the use of a single pipe. Smaller pipes in parallel shall not be permitted.

21.3 REQUIREMENTS

21.3.1 Drainage Report

The Design-Builder shall provide a Drainage Report to the Department and any other entities whose facilities will be impacted by the Project in accordance with HDM Chapter 8. The Design-Builder shall be responsible for coordination in advance with any third party to determine the necessary document submission required by the third party. At least two weeks prior to providing documents to any third party, the Design-Builder shall submit a draft Drainage Report to the Department's Design Quality Assurance Engineer for consultation and written comment.

The Drainage Report shall document the design criteria used, final design basis, and all supporting calculations and computer model output.

On the west side of I-81, between approximate Station H3 102+00 and STA 129+00, the Design-Builder shall develop a drainage plan that demonstrates that under the build condition, the amount of runoff that flows down the I-81 embankment and flows across the westernmost highway boundary will result in a minimum 5% reduction from the existing condition.

21.3.2 Southern Interchange Drainage

Temporary and permanent drainage systems shall be designed and constructed to capture all runoff and prevent ground surface infiltration in the Southern Interchange/karst areas to prevent sinkhole formation.

21.3.3 Video Inspection

The Design-Builder shall perform a video inspection on existing underground drainage facilities that are to remain within the limits of pavement reconstruction as noted in Section 22, and a post-construction video inspection of the functioning underground drainage facilities after all drainage construction work is completed. The inspection shall include all drainage facilities up to the nearest downstream structure beyond the project limits.

21.3.4 Connections to Existing Systems

The Design-Builder shall develop Design Plans and Project Specifications for any connections to existing storm systems. The Design-Builder shall be responsible for calculations performed to ensure there is sufficient capacity to accommodate any increase in flow due to changes in drainage catchment area and/or to land use. This paragraph shall not be construed to relieve the Design-Builder of the obligation to treat runoff water that requires treatment.

21.3.5 Spill Management

Spill prevention and response measures shall be described in the SWPPP.

21.4 DELIVERABLES

Deliverables shall be as stated elsewhere in the RFP documents.

SECTION 22 HIGHWAY DESIGN

22.1 SCOPE

The Design-Builder shall be responsible for the design, construction and reconstruction of the permanent roadway(s) to be constructed within the Project Limits, and any other roads damaged by construction operations, or necessary for permanent operations, all in accordance with the design requirements stated herein. Highway design, construction and reconstruction shall be understood to include the design, furnishing materials, and construction of all road appurtenances, protections, and safety devices not specifically cited in other Project Requirements.

22.2 STANDARDS

The Design-Builder shall perform the Work in accordance with the Contract Documents and the Applicable Standards, Design Codes and Manuals listed in Section 1.6, unless otherwise stipulated in this Project Requirement or otherwise applicable to the Project.

22.3 REQUIREMENTS

22.3.1 General

The Design-Builder shall be responsible for performing the detailed highway design and construction within the Project Limits in accordance with the Project Requirements set forth herein. The Design-Builder shall not design highway geometrics to, or near, minimum design values unless justified for reasons other than cost or schedule.

22.3.2 Design Requirements

Design Criteria (Critical Design Elements), Non-Standard Feature Justifications and Non-Conforming Features to be Retained are provided in Part 7, Engineering Data.

Other design requirements shall be as stipulated in the NYSDOT Highway Design Manual.

22.3.3 Guide Railing, Barrier Systems and Impact Attenuators

The Design-Builder shall remove and dispose of all existing guide railing, barrier systems and/or impact attenuators, and replace with new guide railing, barrier systems and/or impact attenuators to current NYSDOT Standards within the following limits:

A) Adjacent to roadway areas requiring widening, reconstruction ,or resurfacing.

B) Adjacent to roadway areas where noise barriers are constructed.

The Design-Builder shall install guiderail at sign locations which require guiderail in accordance with Department standards.

Any guide railing and barrier systems removed due to the MPT scheme shall be replaced with a new system and new materials.

The limits of work for new roadside and new median barrier shall be the lesser of the following:

1) The point where barrier is no longer warranted; or
2) A point where the proposed barrier can be transitioned to an existing barrier system which conforms to current standards.

All existing guide railing, barrier systems and/or impact attenuators that are removed shall become property of the Design-Builder.

Median Barriers shall be installed on existing I-481 and existing I-81 (future I-81 and BL-81) for any traversable median less than 72 feet. The new barriers shall be located adjacent to the shoulder

As noted in the Non-Standard Feature Justification, I81SB (existing) to I81 (former I481) shall have guiderail that will not cause sight line restrictions, as well as meet all other requirements as noted in other parts of this RFP.

22.3.4 Clear zone

The Design–Builder shall clearly show the “clear zone” on the final record plans. The clear zone shall comply with NYSDOT Highway Design Manual (HDM).

22.4 DESIGN EXCEPTIONS AND NON-STANDARD FEATURES

It is the responsibility of the Design-Builder, in coordination with the Department, to obtain approval of any non-standard features included in the final design. Non-standard features that have previously been approved in the Design Approval Document, and are included in Part 7 Engineering Data, do not need to be submitted for approval. The approved non-standard value shall be adhered to.

SECTION 23 STANDARDS

23.1 GENERAL REQUIREMENTS

The Design-Builder shall identify the specific version of each Standard it uses. It is the Design-Builder's responsibility to obtain clarification of any apparent error, omission, ambiguity or conflict regarding any Standard in accordance with *DB §102-02*.

23.2 SPECIFIC REQUIREMENTS

The Design-Builder shall assume that all provisions of the Standards, including the figures and tables, are mandatory and guidelines contained therein shall be assumed to be requirements. All words such as "should," "may," "must," "might," "could," and "can" shall mean "shall" unless the context requires otherwise, as determined in the sole discretion of the Department. It shall be in the Department's sole discretion to determine when the context does not require a provision to be mandatory.

Except as expressly otherwise provided in the Contract Documents, any reference to NYSDOT under a Standard shall mean the Department.

When a Standard refers to an action being necessary, needed, or recommended, the Design-Builder shall construe the action as required unless the context requires otherwise, as determined in the sole discretion of the Department.

Where reference is made in the Standards to items that are indicated in the plans or special provisions or required in the plans or special provisions, the plans or special provisions shall mean the Design-Builder's Plans or the Special Provisions.

References in the Standards to approved products or materials shall mean approved by the Department.

All references in the Standards to the inspector, the field inspector, the project engineer, the engineer, the materials engineer, the district materials engineer, the survey crew, the project supervisor, the agency certified technician, the certified plant technician, and the representative of the Office of Materials shall mean the Design-Builder, except as otherwise expressly provided in the Contract Documents or otherwise directed by the Department.

When a Standard refers to an approval of any correction or repair that deviates from the Contract requirements, the Acceptance must be by the Department.

When a Standard refers to items that will be performed or provided by NYSDOT or by a division or employee of NYSDOT, the Design-Builder shall construe the requirements as applying to the Design-Builder unless otherwise specified in the Contract Documents, or unless the context requires otherwise. It shall be in the Department's sole discretion to determine when the context requires otherwise.

SECTION 24 SECURITY

Section not used.

SECTION 25 CIVIL INTEGRATED MANAGEMENT (CIM) 3D/4D/5D MODELING

Section not used.

SECTION 26 NOISE BARRIERS

26.1 GENERAL

The Design-Builder shall design and construct Noise Barriers at the locations and limits shown in Part 6 – Directive Plans and in accordance with Project Requirements. Noise Barriers shall be installed at-grade or on top of new retaining walls. Refer to Noise Barrier and Retaining Wall Elevations in Part 6 – Directive Plans for additional information.

26.2 DESIGN REQUIREMENTS

All Noise Barriers shall be precast concrete noise barrier panels. Precast concrete Noise Barrier sections shall be in accordance with Item 643.99010004 – Precast Concrete Noise Barrier System.

Concrete Noise Barriers shall be designed in accordance with the NYSDOT LRFD Bridge Design Specifications in lieu of the design requirements specified in NYSDOT Special Specification Item 643.99010004. Base plates shall be hot dipped galvanized steel (4 mils). Anchor bolts, nuts, and washers shall be stainless steel. In addition, every anchor bolt shall have a leveling nut under the base plate and tensioning and lock nuts above, resulting in a total of three nuts per anchor bolt. The gap underneath the base plate shall be filled with a Department approved non-shrink grout. The presence of grout, or any other approved material, used to fill the gap underneath the base plate shall be ignored for the design of the anchor bolts. Any gaps or cracks in the installed noise barrier system shall be filled with an acceptable filler material or flashing so that no light can be seen through any part of the noise barrier system except through the transparent panels. Filler material or flashing shall be detailed and installed in a manner that does not trap water inside the wall components or near the base and foundation of the wall.

For locations where proposed Noise Barriers must be installed over utilities refer to the sample utility grade beam detail included in RFP Part 6 – Indicative Plans as well as additional requirements for clearances in Part 4 – Utility Requirements.

The Design-Builder shall make every effort possible to have the horizontal members of the frames supporting the Noise Barriers line up uniformly, including at locations where it may become necessary to step the precast portion of the Noise Barrier due to changes in grade and/or stepping of barriers due to changes in elevation.

Design of the Noise Barriers and foundations shall include applicable loads from the NYSDOT LRFD Bride Design Specifications including, at a minimum, wind, seismic, and lateral loading from unbalanced soil loads. The design of the connection of the post to the shaft foundation shall include loads due to prying effect.

The Design-Builder shall design shaft foundations for the Noise Barrier posts in accordance with the NYSDOT LRFD Bridge Design Specifications and Project Requirements. The top elevation of the shaft foundation shall be set such that the base plate and anchor bolts are located above the finished ground line. The minimum shaft diameter shall satisfy the following requirements:

1. Minimum distance from edge of baseplate to edge of shaft foundation concrete shall be 3”.
2. Minimum distance from centerline of anchor bolt to edge of shaft foundation concrete shall be 8”.
3. Anchor bolts shall be located inside of the shaft reinforcement cage.

Horizontal wall joints beyond those shown in Part 6 – Directive Plans are acceptable for typical noise barriers taller than 20'-0.

Existing Noise Barriers shall be removed as noted in Part 6 – Directive Plans.

26.2.1 Noise Analysis

The Design-Builder shall be responsible for complying with the following requirements for the Final Traffic Noise Analysis.

All proposers must provide the following with their technical proposal:

The Proposer must provide a noise abatement justification memo with their bid. The noise abatement justification memo shall include:

1. A statement indicating any significant proposed Design-Builder changes to Recommended Noise Barriers, and any significant proposed Design-Builder changes to the preferred alternative roadways. Significant proposed changes are defined as:

    a. Changes in the plan location of Recommended Noise Barriers that differ by more than 10 feet from the Part 6 – Directive Plans at any point along their plan alignment.

    b. Changes to the existing ground elevations along the Noise Barrier alignments by more than 6 inches.

    c. Changes in horizontal roadway alignments of up to 10 feet from the Directive drawings at any point along the alignment.

    d. Changes in vertical roadway alignments of up to 6 inches from the Indicative drawings at any point along the alignment.

2. A statement that median or edge of shoulder concrete barriers, if added to the project, will not be included as noise abatement measures.

3. A statement regarding the likelihood that the Design-Builder's proposed design would create new traffic noise impacts to receptors previously determined from the preliminary Noise Analysis to be not impacted, and thus require a NEPA reevaluation.

Post award, the Design-Builder is required to:

1. Use TNM 2.5 to prepare a Final Noise Barrier analysis using the preliminary noise barrier analysis resulting in updated TNM 2.5 acoustical models (one each for Recommended Noise Barrier) provided to prospective bidders, whether or not changes are made to any roadways or to any noise barriers identified on the directive drawings. The Design-Builder shall adjust, run, and debug the Optimized Noise Barrier analyses to accurately represent the Design-Builder's proposed design. If a NEPA reevaluation is not

required, the Design-Builder's Optimized Noise Barrier analyses TNM 2.5 model shall include:

a. Traffic volumes; vehicle speeds; vehicle mixes; atmospheric conditions; ground cover elements; shielding; and receptor locations, receptor ground elevations and receptor heights used in the preliminary noise barrier analysis resulting in updated TNM 2.5 acoustical models.

b. No additional roadways than those that were included in the preliminary noise analysis resulting in updated TNM 2.5 acoustical models.

c. No changes to the plan location, ground elevation, or top elevation of Recommended Noise Barriers. The Department will verify that Proposed Noise Barriers were constructed to horizontal alignments and top elevations that substantially conform to the Part 6 – Directive Plans.

d. Geometry of the existing and build condition roadway segments to the same model limits as were used in the preliminary TNM 2.5 models and using the same or greater number of roadway points to define each roadway.

e. No additional acoustical features (ground areas, top of cut, reflective surfaces, etc.) than those included in the preliminary TNM resulting in updated TNM 2.5 acoustical models.

f. Proposed Noise Barriers shall be designed in TNM using the same or greater number of barrier points to define each barrier, with a top of noise barrier profile that transitions at a rate that complies with any requirements provided on the directive detailed drawings regarding step height, where step height is the vertical change in the top of the noise barrier profile, usually occurring at posts. Ground elevations at Proposed Noise Barriers will be as depicted in the preliminary noise barrier optimized process resulting in updated TNM 2.5 acoustical models if the noise barrier plan location is not changed by the Design-Builder's proposal. If the location of Recommended Noise Barriers is changed by the Design-Builder's design, the Design-Builder shall provide new x, y, and z coordinates for the locations where the noise barrier plan location will be changed.

2. Provide a table comparing the preliminary and final noise levels for with and without Proposed Noise Barriers. Noise levels from TNM 2.5 shall be truncated to the whole decibel. Thus, decimal values of X.1 to X.9 shall be truncated down to X.

TNM Receiver	Preliminary TNM 2.5 Design Year without Noise Barrier Noise Level (dBA) [Provided by the Department]	FINAL TNM 2.5 Design Year without Noise Barrier Noise Level (dBA) [Provided by the Design-Builder]	Preliminary Optimized TNM 2.5 Design Year with Noise Barrier Noise Level (dBA) [Provided by the Department]	FINAL Optimized TNM 2.5 Design Year with Noise Barrier Noise Level (dBA) [Provided by the Design-Builder]

3. Perform noise abatement analyses in accordance with 23 CFR 772 and NYSDOT TEM 4.4.18.

4. Verify that the Design-Builder's proposed design does not create any new traffic noise impacts to receptors previously determined from the Traffic Noise Analysis to not be impacted.

5. Perform any NEPA reevaluations required by any changes in the numbers or locations of noise impacted receptors in the preliminary Noise Study Analysis. If as a result of the Reevaluation, a Supplemental EIS is required, the Design-Builder will be responsible for preparing all aspects of the Supplemental EIS required to satisfy NYSDOT and FHWA.

6. Provide a Final Design Noise Study Report summarizing the preliminary noise abatement design analysis and the proposed changes (if any) to the analysis, roadways, and to any of the alignments and profiles of Recommended Noise Barriers in connection with the Design-Builder's proposal. The Final Design Noise Study shall cover the following topics:

    a. Summary of the preliminary noise abatement design developed in the technical noise analysis.

    b. Description of Design-Builder's design including changes (if any) in roadways, and Recommended Noise Barriers.

c. Clearly identify any new noise impacts that were not identified previously, and clearly identify any areas where noise impacts have been eliminated as a result of the Design- Builder's design.

d. Comparison of FINAL Optimized TNM 2.5 design year without noise barrier noise levels for Proposed Noise Barriers associated with the Design Builder's design to the Preliminary Optimized TNM 2.5 design year without noise barrier noise levels provided by the Department, as shown in the table above. The Department will use this information in combination with other information provided by the Design Builder regarding his design, to assess whether the Design Builder's design will require a NEPA reevaluation.

e. Comparison of FINAL Optimized TNM 2.5 design year with noise barrier noise levels associated with the Design Builder's design to the Preliminary Optimized TNM 2.5 design year with noise barrier noise levels provided by the Department, as shown in the table above for Proposed Noise Barriers.

f. Noise abatement TNM 2.5 analyses for Proposed Noise Barriers in support of the information presented in the table, provided in electronic format.

g. In cases where there are new traffic noise impacts due to changes in the roadway design, the Design-Builder will identify those additional impacted receptors in the information submitted to the Department. The Design-Builder will evaluate the feasibility and reasonableness of noise abatement for the newly impacted receptors. Additional surface area of noise barrier that is found to be feasible and reasonable for newly impacted receptors will be clearly identified and reported to the Department. The Department will use this information to determine whether there is a need for a NEPA reevaluation.

h. In cases where changes to the roadway design reduce or eliminate noise impacts identified in the preliminary noise study report, and fewer square feet of noise barrier are necessary, the Design-Builder will clearly identify the previously impacted receptors that would no longer be impacted and, if applicable the barrier surface area that would no longer be needed in the information submitted to the Department.

26.2.2 Height Requirements

Height requirements for the Noise Barrier sections are as follows:

- Minimum top of wall elevations shall be as shown on the Directive Noise Barrier Profile drawings and Noise Barrier Detail drawings in Part 6 – Directive Plans.

The bottom of the concrete Noise Barrier panels shall be a minimum of 6 inches below the finished grade. Where isolated low points are present on the existing ground, fill material may be used to reduce the post and panel height if approved by the Department's Design Quality Assurance

Engineer (DQAE). Where Noise Barriers are mounted on flat grades, the Design-Builder shall grade finished ground to drain away from Noise Barrier on both sides of the barrier. All disturbed areas shall be restored in accordance with Project Requirements.

All precast noise barrier sections less than 20 feet in height shall be a single panel. Barriers which exceed 20 feet may consist of two panels. For two panel sections, the joint shall be located a consistent distance from the top of the Noise Barrier.

The Design-Builder shall take the proper precautions to avoid any man-made obstacles. In the event the edge of a Noise Barrier foundation is less than the required horizontal clearance to an existing or proposed utility, the Design-Builder may use a grade beam to cross the utilities such that the distance between the utility and edge of foundation meets the required clearance. Refer to RFP Part 4 – Utility Requirements for additional information.

26.2.3 Geometric Requirements

The begin and end stations for the Noise Barriers, as shown on the Part 6 - Directive Plans, shall represent the minimum length of the barriers. The elevations of the top of the Noise Barriers are shown in Part 6 – Directive Plans. The Design-Builder shall be responsible for confirming and refining barrier heights based on the Design-Builder's final noise model. Wall heights shall not be reduced.

The top of the Noise Barriers shall be perpendicular to the posts. Top of Noise Barrier elevations shall be in accordance with Part 6 – Directive Plans. The elevations on these drawings shall be considered minimum values.

Noise Barriers with grade differences between the north and south ends shall be gradually stepped such that the top elevation of the Noise Barrier is constant for the greatest extent possible. The top of the Noise Barrier shall step up or down a maximum of 2'-0" per step. The Design-Builder shall ensure that the Noise Barriers do not restrict the horizontal stopping sign distance for vehicular traffic. Design speeds utilized to determine the horizontal stopping sign distances may vary along the length of the Noise Barriers based on the existing and/or proposed mainline, service road, and/or ramp geometry and anticipated acceleration and/or deceleration speeds traversing the ramps.

The Design-Builder shall consider horizontal sight distance for all Noise Barriers and shall include diagrams and calculations in the appropriate Design Unit.

All Noise Barriers within the clear zone shall be protected by roadside barrier. Noise Barriers shall be offset so that it is beyond the roadside barrier deflection limit.

Existing and/or proposed overhead sign structures shall not span over or mount directly to the proposed Noise Barriers. The Design-Builder shall design the Noise Barriers such that they traverse behind existing and/or proposed overhead sign structures.

26.2.4 Survey and Test Pit

The Design-Builder shall perform additional survey necessary to identify all existing features along the proposed Noise Barrier alignments, including but not limited to, boundaries, utilities, ITS facilities, drainage systems, ditches, trees, fences, and ground elevations. Test pits shall be completed in accordance with Department standards prior to design and/or construction of Noise

Barriers to avoid conflicts with and/or to span over all underground utilities. Prior to performing test pits, the Design-Builder shall review the location with the Construction Quality Assurance Engineer (CQAE).

26.2.5 Drainage and Stormwater Requirements

The Design-Builder shall evaluate the impacts that the proposed Noise Barriers, including any construction access, may have on the existing drainage and stormwater systems. The Design-Builder shall design and construct all necessary temporary and/or permanent drainage and stormwater improvements in accordance with Department standards to accommodate the Noise Barriers.

26.2.6 Right-of-Way Fencing and Fence Gate Requirements

Right-of-Way (ROW) fencing adjacent to the proposed noise barriers may remain if not impacted by construction. Any ROW fencing that has been damaged or removed by the Design-Builder to construct or gain access to the Noise Barriers shall be replaced by the Design-Builder with new ROW fencing meeting current Department standards.

There shall be a distance of 12’-0” minimum provided between the ROW fence and the center of the Noise Barrier where there is adequate ROW available.

26.2.7 Aesthetic Requirements

The Design-Builder shall incorporate form-liner treatments on the faces of Noise Barrier panels as identified and located in Part 6 - Directive Plans. Three (3) Wall Mural Treatment designs have been developed titled ‘Native Ecology’, ‘Coming and Going’, and ‘Canal to Trail’. Each design spans multiple Noise Barrier panels as shown and includes a range of surfaces textures, recesses, and projections.

The Design-Builder shall develop and finalize the design of each Wall Mural Treatment design, indicating all details and surfaces. The Design-Builder shall verify the Noise Barrier exposed heights and adapt the provided designs where necessary to fill the Noise Barrier panels. Draft designs shall be submitted to NYSDOT for review and approval prior to fabrication of sample mock ups. The Design-Builder shall provide sample mock ups for review and approval. Mock ups shall demonstrate the full range of textures and aesthetic treatments to be utilized on the aesthetic Noise Barriers. Concrete used for the mock up shall include the selected integral color and finishes and the selected hand applied stain, where appropriate.

Custom form liners shall be urethane backed by plywood.

The top of wall elevation shall remain constant at each Wall Mural Treatment location.

There shall be no horizontal joints in the locations where Noise Barriers are to receive Wall Mural Treatments.

A hand applied concrete stain shall be applied to some portions of the Wall Mural Treatments, as shown in Part 6 – Directive Plans. Permanent, exterior, low VOC concrete stain shall be used. Refer to Section 26.2.9 for mock up requirements and color intent.

As determined by NYSDOT, if existing vegetation obscures visibility of Wall Mural Treatment locations, the Design-Builder shall prune or remove existing vegetation as directed by NYSDOT.

26.2.8 Noise Barrier Color

The Design-Builder shall provide integral precast concrete color sample mock ups for NYSDOT final color confirmation after contract award. Each color sample mock up shall include the full range of textures and aesthetic treatments to be utilized on the noise barrier panels. Minimum size of prepared sample mock up (s) shall be 2' x 2'. The color shall match the precast concrete Noise Barrier panels fabricated for the Phase 1, Contract 1 Project (PIN 3501.90, Contract D900054) so that at a viewing distance of 6'-0", the panels from the two projects appear identical. The Design-Builder shall provide hand-applied mural concrete stain color sample mock ups for NYSDOT final color confirmation after contract award. Color sample mock ups shall be applied over the selected integral precast concrete color with a Medium Sand or Medium Sandblast Form Liner Treatment and include at least one (1) un-stained edge condition at a typical recess. Minimum size of prepared sample mock up (s) shall be 2' x 2'. Provide four (4) sample color mock ups for NYSDOT consideration, chosen by the Design-Builder from the stain manufacturer's range of colors that best approximate the following Federal Standard Colors:
Federal Standard Color: 24201
Federal Standard Color: 16405
Federal Standard Color: 33440
Federal Standard Color: 16307
The concrete posts and caps shall not be colored or stained.

26.3 DELIVERABLES

Deliverables shall be as stated elsewhere in the RFP documents.

SECTION 27 VISUAL BARRIER

27.1 GENERAL

The Design-Builder shall design and construct a visual barrier at the locations and limits shown in Part 6 – Directive Plans and in accordance with Project Requirements. Refer to Visual Barrier profile in Part 6 – Directive Plans for additional information.

The visual barriers shall consist of precast concrete sections. This visual barrier shall be constructed prior to any adjacent highway construction work, including work along BL81, I-81, and East Glen Ave.

Horizontal wall joints beyond those shown by the Part 6 - Directive Plans are acceptable for visual barrier sections taller than 20’-0”.

27.2 DESIGN REQUIREMENTS

The Visual Barrier shall be precast concrete and shall be in accordance with Item 643.99010004 – Precast Concrete Noise Barrier System.

The Visual Barrier shall be designed in accordance with the NYSDOT LRFD Bridge Design Specifications in lieu of the design requirements specified in NYSDOT Special Specification Item 643.99010004. Base plates shall be hot dipped galvanized steel (4 mils). Anchor bolts, nuts, and washers shall be stainless steel. In addition, every anchor bolt shall have a leveling nut under the base plate and tensioning and lock nuts above, resulting in a total of three nuts per anchor bolt. The gap underneath the base plate shall be filled with a Department approved non-shrink grout. The presence of grout, or any other approved material, used to fill the gap underneath the base plate shall be ignored for the design of the anchor bolts. Any gaps or cracks in the installed barrier system shall be filled with an acceptable filler material or flashing so that no light can be seen through any part of the barrier system. Filler material or flashing shall be detailed and installed in a manner that does not trap water inside the wall components or near the base and foundation of the wall.

For locations where the proposed Visual Barrier must be installed over utilities refer to the sample utility grade beam detail included in RFP Part 6 – Indicative Plans as well as additional requirements for clearances in Part 4 – Utility Requirements.

The design of the barriers and foundations shall include the applicable loads from the NYSDOT LRFD Bride Design Specifications including, at a minimum, wind, seismic, and lateral loading from unbalanced soil loads. The design of the connection of the post to the shaft foundation shall include loads due to prying effect.

The Design-Builder shall design shaft foundations for the barrier posts in accordance with the NYSDOT LRFD Bridge Design Specifications and Project Requirements. The top elevation of the shaft foundation shall be set such that the base plate and anchor bolts are located above the finished ground line. The minimum shaft diameter shall satisfy the following requirements:

1. Minimum distance from edge of baseplate to edge of shaft foundation concrete shall be 3”.
2. Minimum distance from centerline of anchor bolt to edge of shaft foundation concrete shall be 8”.

3. Anchor bolts shall be located inside of the shaft reinforcement cage.

27.2.1 Geometric Requirements

The begin and end stations for the barriers, as shown on Part 6 - Directive Plans, shall represent the minimum length of the walls. The elevations of the top of the Visual Barriers shall be in accordance with Part 6 – Directive Plans and shall be perpendicular to the posts.

The Visual Barrier shall be gradually stepped such that the top elevation of the Visual Barrier is constant for the greatest extent possible. The top of the Visual Barrier shall step up or down a maximum of 2'-0" per step. The Design-Builder shall ensure that the Visual Barriers does not restrict the horizontal stopping sign distance for vehicular traffic. Design speeds utilized to determine the horizontal stopping sign distances may vary along the length of the Visual Barrier based on the existing and/or proposed mainline, service road, and/or ramp geometry and anticipated acceleration and/or deceleration speeds traversing the ramps.

The Design-Builder shall submit for review and approval horizontal sight distance diagrams and calculations for the Visual Barrier to ensure they will not obstruct the horizontal sight distance for vehicular traffic.

Visual Barrier within the clear zone shall be protected by roadside barrier and it shall be offset so that it is beyond the roadside barrier deflection limit.

27.2.2 Survey and Test Pit

The Design-Builder shall perform additional survey necessary to identify all existing features along the proposed Visual Barrier alignment, including but not limited to, boundaries, utilities, ITS facilities, drainage systems, ditches, trees, fences, and ground elevations. Test pits shall be completed in accordance with Department standards prior to design and/or construction of Visual Barrier to avoid conflicts with and/or to span over all underground utilities. Prior to performing test pits, the Design-Builder shall review the location with the Construction Quality Assurance Engineer (CQAE).

27.2.3 Drainage and Stormwater Requirements

The Design-Builder shall evaluate the impacts that the proposed Visual Barrier, including construction access, may have on the existing drainage and stormwater systems. The Design-Builder shall design and construct all necessary temporary and/or permanent drainage and stormwater improvements in accordance with Department standards to accommodate the Visual Barriers.

27.2.4 Right-of-Way Fencing and Fence Gate Requirements

Right-of-Way (ROW) fencing adjacent to the proposed Visual Barrier may remain if not impacted by construction. Any ROW fencing that has been damaged or removed by the Design-Builder to construct or gain access to the Visual Barrier shall be replaced by the Design-Builder with new ROW fencing meeting current Department standards.

There shall be a distance of 12’-0” minimum provided between the ROW fence and the center of the Visual Barrier where there is adequate ROW available.

27.2.5 Aesthetic Form-Liner Treatment Requirements

The Design-Builder shall incorporate form-liner treatment on both sides of all precast Visual Barrier panels. The form-liner pattern shall be in accordance with the detail provided in the RFP Part 6 - Directive Plans. All post and panel caps associated with the Visual Barrier installation shall be precast concrete with a smooth finish.

27.2.6 Visual Barrier Color

The Design-Builder shall provide integral precast concrete color sample mock ups for NYSDOT final color confirmation after contract award. Each color sample mock up shall include the full range of textures and aesthetic treatments to be utilized on the Visual Barrier panels. Minimum size of prepared sample mock up (s) shall be 2’ x 2’. The color shall match the precast concrete Noise Barrier panels fabricated for Phase 1, Contract 1 Project (PIN 3501.90, Contract D900054) so that at a viewing distance of 6’-0”, the panels from the two projects appear identical.

27.3 DELIVERABLES

Deliverables shall be as stated elsewhere in the RFP documents.

SECTION 28 RAILROAD DESIGN

28.1 STANDARDS

28.1.1 CSX Rail Yard

CSXT current design and construction standards, clearance requirements, insurance requirements, and sample Preliminary Engineering and Construction Agreements are in the CSXT Public Project Information for Construction and Improvement Projects That May Involve the Railroad. The document can be downloaded at the following URL: https://www.csx.com/index.cfm/library/files/about-us/property/public-projectmanual/

28.1.2 CSX Intermodal Rail Yard

Criteria as outlined in *Standard Specifications of the Design and Construction of Private Sidetracks* as published by CSX.

28.2 REQUIREMENTS

28.2.1 Railroad Right of Way – Right of Entry

The Design-Builder shall adhere to CSXT requirements for design and construction including:

A. CSXT Public Project Manual – The Design-Builder should be aware the Appendix sections on Construction Submission Criteria, Drainage Criteria, and various safety requirements are all requirements during construction of this project.

B. CSXT Design and Construction Standard Specifications for Pipeline Occupancies – This document is referenced in the CSXT Drainage Criteria in the CSXT Public Project Manual and includes design requirements for pipe materials for any proposed under track drainage.

C. CSXT Standard Clearance Matrix and CSXT Clearance Diagram – This document includes clearance considerations for the temporary platform and any other proposed temporary features.

D. Specification Section 34 11 26.13 – Ballast - Ballast used for track owned or operated by CSXT shall be provided from an approved CSXT ballast supplier and meet CSXT ballast material requirements.

The Coordination requirements for working with CSXT are as follows:

A. The Design-Builder shall prepare site-specific work plans for review and approval by CSXT before commencing work when any part of the equipment used in conducting the work is within 25 feet of the live tracks.

B. The Design-Builder shall submit site-specific work plans covering all work that is within 25 feet of any track or work that has the potential to foul the track. The potential to foul is any work having the possibility of impacting CSXT property or operations; defined as one or more of the following:

1. Any activity where access onto CSXT property is required.

2. Any activity where work is being performed on CSXT ROW.

3. Any excavation work adjacent to tracks or facilities, within the Theoretical Railroad Live Load Influence Zone, or where the active earth pressure zone extends within the railroad operational right of way.

4. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within 25'-0" of the nearest track centerline. This is based upon the proposed location of the equipment during use and may be a function of the equipment boom length. Hoisting equipment with the potential to foul the track must satisfy the 150% factor of safety requirement for lifting capacities.

5. Any work where the scatter of debris, or other materials has the potential to encroach within 25'-0" of the nearest track centerline.

6. Any work where significant vibration forces may be induced upon the track structure or existing structures located under, over, or adjacent to the track structure.

7. Any other work which poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact the railroad operational right of way, as determined by CSXT.

C. The cost for Railroad Flagging provided by CSXT has been included in a separate agreement between CSXT and the Department.

The Design-Builder shall obtain Right of Entry Permit with CSXT. The Access Requirements for CSXT Property are below:

A. The Design-Builder shall adhere to the railroad property access requirements while working on property under the control of CSXT. A Potential Rail Yard Access Plan is located in Part 7 of this document, this plan has tentatively been agreed to by CSXT.

B. CSXT Railroad is responsible for all flagging operations and separate coordination by the Design-Builder with CSXT is required.

C. All field personnel must attend CSXT Contractor safety/security training. Contractor safety information is publicly available on CSX's website:

   https://www.csx.com/index.cfm/customers/value-added-services/property-real-estate/permitting-utility-wireless-infrastructure-installations-and-rights-of-entry/utility-permits/safety-requirements/

D. The Design-Builder must enter into a separate Private Crossing agreement with CSXT should they need to cross the CSX tracks.

I-81 VIADUCT PROJECT - PHASE 1, CONTRACT 2

PIN 3501.91, Contract D900056

DB CONTRACT DOCUMENTS

PART 3
APPENDIX A

CONSTRUCTION QUALITY CONTROL INSPECTION

Final November 4, 2022

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The Design-Builder shall use Table 1 as a guide for development of a Quality Control Plan, as a minimum level of Quality Control (QC) activities, as defined in Section 6. The Quality Control Plan shall provide for materials quality control and construction Inspection (CI) practices oversight. In general, the Design-Builder shall employ an independent Construction Inspection Professional Engineering Firm and a Materials and Testing Firm or Laboratory that will be responsible to assure compliance of materials and construction inspection activities to all Department standards.

The frequency of QC activities shall be at least equal to current Department practices as established in the Specifications, Materials Methods and Procedures, Granular Control Procedures, and other Department standards. The Quality Control Plan shall specifically and clearly define all QC activities to be performed by the Design-Builder, documentation and records to be managed, including forms that will be used, and frequencies of sampling and testing.

The Design-Builder shall provide in the Quality Control Plan all the various materials planned for use and the specific certifications and/or sampling and testing to be progressed for QC purposes to assure durability of the material. For development of the Quality Control Plan, the Design-Builder should be aware of the following materials considerations:

- All domestic off-site materials sampling and testing for QC/QA operations will be performed by the Department. This includes but is not limited to earthwork and gravel borrow sources, Hot Mix Asphalt materials and production, Concrete materials and concrete production, steel, precast products, masonry, structural steel paints – shop applied, bridge railing, guiderail, traffic control materials, sign structures, frames and grates, and any other materials deemed necessary to assure product quality. The Design-Builder shall perform QC of off-site manufactured/fabricated materials as deemed appropriate by the Design-Builder.
- Bearing production: The Design-Builder shall be responsible for hiring an independent testing firm or laboratory to perform all bearing testing. The Design-Builder shall receive from the independent lab a certification that all bearings are in conformance with specification requirements. The Department will perform sampling and testing for verification purposes.

Use of Approved List materials is expected for commonly available products. Use of materials that are not on the Approved List, but for which an Approved List category exists, shall require the Design-Builder to provide appropriate evaluation and test results, conforming to current NYSDOT procedures for product evaluation, to prove durability of the material for the planned use, to the satisfaction of the Department. Such product evaluation shall typically consist of lab testing per AASHTO, ASTM, or Department requirements, performed by an independent certified laboratory. Upon verification of product acceptability by the Department, the product(s) will be included on the Approved List of Materials. Products that have not been accepted by the Department will not be included on the Department's Approved List of Materials. Products previously approved by the Department's New Product Evaluation Committee may be used; however, the Design-Builder may be required to provide sampling and testing results.

Use of materials for which there is not an Approved List category shall require, in the Quality Control Plan, those tests and evaluations to be performed to prove the durability of those materials before use in the Project. In many cases, physical testing should be performed by an independent laboratory. The frequency of sampling and testing, commensurate with the level of risk of the product proposed for use, shall be provided in the Quality Control Plan.

The forms listed in the column “Documentation Form(s)” are those that the Department presently uses. The Design-Builder may use their own forms, provided that their forms record the same information documented by the Department’s forms.

The Department will use Random Independent materials sampling and testing for both acceptance and/or verification of QC sampling and test data. In addition, the Department will verify compliance to the policies and processes of the Construction Inspection Professional Engineering Firm, the Materials Testing Firm and Material Testing Laboratories, as defined in the Construction Quality Control Plan to ensure conformance with the Contract Documents.

Quality Assurance acceptance decisions that incorporate the use of the Design-Builder’s QC data and activities will be progressed as described in Appendix D – Attachment 1. The level of risk for various items will determine the frequency at which the Department will perform Quality Assurance / verification sampling and testing. Statistical methods may be considered for use by the Department to evaluate the effectiveness of sampling and testing results from QC for use as acceptance if sufficient volume and associated QC and QA material tests are available. The QA Actions and Testing column defines those actions and the frequency thereof that the Department expects to take to provide Quality Assurance of materials and construction inspection activities.

QA of Construction Inspection operations will typically consist of accepting materials and/or verifying that the Design-Builder, Construction Inspection Professional Engineering Firm, the Materials Testing Firm and Materials Testing Laboratories are meeting Contract Requirements. The Department shall have the authority to perform sufficient inspections and/or tests of the Design-Builder’s Work to verify that the inspections and/or tests performed by the independent Construction Inspection Professional Engineering Firm and the Materials Testing Firm or Laboratory are in compliance with the Contract, the design and specifications, the Design-Builder’s approved Quality Control Plan, as well as the Department’s standards and practices.

The Department will have access to all activities and records of the Design-Builder, the Construction Inspection Professional Engineering Firm and the Materials Testing Firm or Laboratory retained by the Design-Builder for the purpose of assuring that the construction and inspection activities are being conducted in compliance with the Contract, the design and specifications, the Design-Builder’s approved Quality Control Plan, as well as the Department’s standards and practices.

All verified QC and QA verification and acceptance activities are used in the acceptance decision that will provide assurance that when Final Acceptance of the Project is requested, the Department is confident that all material incorporated into the Project and the associated workmanship conform to plans, specifications, standards and contract requirements. These acceptances and verifications of QC data will document the acceptance of the Work for payment purposes and assure all non-conformances have been satisfactorily addressed.

The Department shall have the authority to stop Work specific to Work Zone Traffic Control for all work sites and for the overall safety of the Work site to ensure that it is safe for the workers, the inspection staff and the public.

Nothing in the scope of the Department’s QA role shall be construed to relieve the Design-Builder, the Construction Inspection Professional Engineering Firm and the Materials Testing Firm or Laboratory of their responsibilities for full time construction inspection and compliance with the Contract, the design and specifications, the Design-Builder’s approved Quality Control Plan, as well as the Department’s standards and practices.

TABLE – 1: Quality Control Inspection Requirements

Specification Section	QC Inspection Requirements	Documentation Form(s)
All - General	▪ Location and type of Work ▪ Personnel and Equipment ▪ Weather and Site conditions ▪ Checks for Compliance with Design Plans and Project Specifications ▪ Extent of Work ▪ Problems encountered	MURK 1d (DB CQC), MURK 2b (DB-CQC), Design-Builder's Daily QC Project Diary
201 – Clearing and Grubbing	▪ Clearing and grubbing limits ▪ Disposal ▪ Salvage of marketable timber ▪ Protection and restoration	MURK 1d (DB CQC)
202 – Removal of Structures and Obstructions	▪ Safety ▪ Engineering survey ▪ Utilities (capping and protection) ▪ Unauthorized entry ▪ Hazardous Materials occurrence ▪ Exterminations ▪ Dust control ▪ WZTC ▪ Disposal of Materials ▪ Salvage	MURK 1d (DB CQC)
203 – Excavation and Embankment	General Requirements: Stated in the Standard Specifications, MURK Part 1B.	General: IR's GEB Manuals
	Select Materials	Forms are found in the appropriate GEB manual. Also refer to MURK-1 (DB CQC), Inspector's Daily Report
	Expanded Polystyrene Fill	Forms are found in the appropriate GEB manuals including GTP-7 and GEM-24. Also refer to MURK-1 (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
	Drilling and blasting operations	Form GE-469 (DB), Blasting Report Geotechnical Engineering Manual GEM-22 Procedures for Blasting
	Settlement measurement	Form GE-435, Settlement Report – Manometer Gage Form GE-436, Settlement Report – Rod Gage Form GE-437, Settlement Report – Pipe Gage
	Pore water pressures	Form GE-264, Pore Pressure Report/Vibrating Wire Piezometer
	Slope movements	Form GE-422, Slope Indicator Data Sheet
204 - Controlled Low Strength Material (CLSM)	▪ Materials: Flow test, Cylinder breaks ▪ Placement	MURK 1d (DB CQC)
206 - Trench, Culvert and Structure Excavation	▪ Safety ▪ Support and protective systems ▪ Test pits ▪ Trench and Culvert excavation ▪ Disposal of excavated Material	MURK 1d (DB CQC)
207 - Geosynthetics	Brand name and type	MURK-1 (DB CQC), Inspector's Daily Report MURK 14
208 – Stormwater Management Facilities	Conformance to special specification and environmental permit requirements	MURK-1 (DB CQC), Inspector's Daily Report and forms required by regulations
209 - Soil Erosion and Sediment Control	Checks, tests, and activity relating to mulching, temporary seeding, check dams, strawbales, haybales, sediment traps, turbidity curtains, silt fences, and fence removal	MURK-1 (DB CQC), Inspector's Daily Report
210 - Removal and Disposal of Asbestos-Containing Material (Buildings, Bridges, and Highways)	▪ Compliance with regulatory standards ▪ Air quality monitoring ▪ Disposal	MURK 1d (DB CQC) and forms as required by regulations

Specification Section	QC Inspection Requirements	Documentation Form(s)
211 - Internally Stabilized Cut Structures	▪ Materials ▪ Certified Mill Test Results ▪ Certified Mix Design for grout and shotcrete ▪ Jack and Pressure Gauge Calibration ▪ Geotextile Approved List ▪ Gout Cube Tests ▪ Nail Tests ▪ Shotcrete	Soil Nail Tendon Installation: GEM-21 Grouted Tieback Installation: GEM-17
212 - Rock Slope Reinforcement and Catchment Systems	▪ Materials ▪ Certified Mill Test Results ▪ Test Results demonstrating capability ▪ Approved List ▪ Grout Cube Tests ▪ Anchor Proof Tests ▪ Rock Bolt Tensioning ▪ Gradation Test for Cushion Sand	MURK 1d (DB CQC), Inspector's Daily Report
302 -, Bituminous Stabilized Course	▪ Results of stockpile sampling and testing ▪ Bituminous materials and stabilized course ▪ Pugmill calibration ▪ Additional Inspection/documentation ▪ Approved Material incorporated, including source and stockpile ▪ Weather and time of year restrictions met ▪ Placement and compaction	Form GE-454, Granular Material Documentation Form Form GEB-352b (DB), Project Inspection Report-Bituminous Stabilized Course Form BEB-423b (DB), Bituminous Pugmill Calibration Form MURK-1d (DB CQC), Inspector's Daily Report
303 – Optional Flexible Shoulder	Inspect and document the following dependent on material type: ▪ HMA items per 402 ▪ PCC items per 502	MURK 1d (DB CQC), Inspector's Daily Report Per ▪ §402 and MP 402-2 for HMA ▪ MURK 3, Concrete Pavement Daily Field Inspection Report for PCC

Specification Section	QC Inspection Requirements	Documentation Form(s)
304 - Subbase Course	▪ Information documented on MURK 1d ▪ Equipment used for compaction and number of passes ▪ Lift thickness prior to compaction ▪ Thickness of subbase Material placed ▪ Addition of water to subbase ▪ Construction of stockpiles ▪ Only Material from approved source or stockpile incorporated in Work ▪ Results of stockpile sampling and testing, in accordance with the requirements of GCP-17	MURK 1d (DB CQC), Inspector's Daily Report Form GE-454M, Granular Material Documentation Form SM-15B, Sieve Analysis Data
307 - Hydrated Lime Stabilized Subgrade	Inspect and document the following: ▪ Equipment used ▪ Moisture added ▪ Preparation of foundation ▪ Scarifying ▪ Lime application ▪ Mixing (primary and secondary) ▪ Compaction, shaping, and finishing ▪ Curing ▪ Compliance with weather limitations ▪ Safety and protection	MURK 1d (DB CQC), Inspector's Daily Report
308 - Soil Cement Course	Inspect and document the following: ▪ Material source and stockpile construction ▪ Preparation, application of cement, mixing, spreading, placement, compaction, and finishing in accordance with Project Specifications ▪ Curing and surface treatment ▪ Compliance with weather limitations ▪ Stockpile sampling and testing	MURK 1d (DB CQC), Inspector's Daily Report GE-454M, Granular Material Documentation Form

Specification Section	QC Inspection Requirements	Documentation Form(s)
401 - Plant Production	Materials ▪ HMA design ▪ Aggregates ▪ Aggregate source ▪ Mineral filler ▪ PG binder ▪ Recycled asphalt pavement ▪ ▪ Construction ▪ Determination of lots and sublots ▪ Mixing and holding time ▪ Production control ▪ Production quantities ▪ Plant and Equipment, including Inspection facilities	MURK 1d (DB CQC) Form BR-162, Bituminous Materials Certified Shipment Notice Per §401 and MP 401
402 – Hot Mix Asphalt (HMA) Pavements	Inspect and document the following: ▪ Composition of mixtures ▪ Weather and seasonal limitations ▪ Type and grade of bituminous Material ▪ Equipment, including hauling Equipment ▪ Paver and Equipment cleaning ▪ Condition of existing surface ▪ Spreading and finishing ▪ Compaction/pavement density ▪ Joints ▪ Surface and thickness tolerances	MURK 1d (DB CQC), Inspector's Daily Report Per §402 and MP 402-2
407 - Tack Coat	Inspect and document: ▪ Bituminous material ▪ Randomly sample and test 1 sample per 5000 gal, minimum once per project. ▪ Preparation of tack coat ▪ Time to paving (curing/breaking) ▪ Maintenance of traffic ▪ Application	Form BR-162c 9DB), Bituminous Material Certified Shipment Notice Form BR-170 (DB), Bitumen or Mix Sample MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
410 - Bituminous Surface Treatment - Single Course	Inspect and document: ▪ Bituminous material ▪ ▪ ▪ Aggregate compatibility with bitumen ▪ Compliance with weather and seasonal limitations ▪ Surface preparation ▪ Application ▪ Bitumen ▪ Cover aggregate ▪ Cleanup	Form BR-162c 9DB), Bituminous Material Certified Shipment Notice Form BR-170 (DB), Bitumen or Mix Sample MURK 1d (DB CQC), Inspector's Daily Report
490 - Cold Milling	Inspect and Document: ▪ Controls ▪ Equipment ▪ Cleaning ▪ Milling	MURK 1d (DB CQC), Inspector's Daily Report
501 - Portland Cement Concrete - General	Inspect and document: ▪ Plant ▪ ▪ ▪ ▪ ▪ ▪ Materials ▪ ▪ ▪ ▪ ▪ For Structural Concrete, information required on MURK 5d (DB CQC)	▪ BR 316a, Daily Concrete Batch Plant Report (on- and off-site plants) with Materials Acceptance Records ▪ Plant Inspector's Diary ▪ Copy of mix design or Form BR-329, Concrete Mix Design Sheet ▪ Cement shipment certifications or cement shipment authorization and cement sample logs ▪ BR 342, Materials certification (certified batches only) ▪ Delivery tickets ▪ MURK 5d (DB CQC), Design-Builder's Structural Concrete Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
502 - Portland Cement Concrete Pavement	Inspect and document information required on specified form, including: ▪ High & low ambient temperature during placement ▪ Mixer type ▪ Slump ▪ Air content ▪ Concrete specifications ▪ BR 316 Report number ▪ Concrete Mixing, Transporting & Discharging checks five (5) times each production day: ▪ Central Mix – Time, End of discharge ▪ Truck mix – time, begin and end of mixing, end of discharge and mixing revolutions ▪ Transit Mix – Time, begin and end of discharge and mixing revolutions ▪ Thickness Tolerance ▪ Compliance with weather and seasonal limitations ▪ Equipment ▪ Forms ▪ Preparation of subbase ▪ Placing and spreading concrete ▪ Finishing and texturing ▪ Joints ▪ Curing ▪ Removing Forms (fixed form paving) ▪ Protection of pavement ▪ Surface test ▪ Sealing joints	MURK 3, Concrete Pavement Daily Field Inspection Report
503 - Portland Cement Concrete Foundation for Pavement	Inspect and Document: ▪ Materials – See 501 ▪ Surface tolerance ▪ Texturing ▪ Curing	MURK 3, Concrete Pavement Daily Field Inspection Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
551 - Piles and Pile Driving Equipment	▪ Inspect equipment and prepare Form BD 138M, Pile and Pile Driving Equipment Data ▪ Pile material deliveries ▪ Complete Pile Driving Record ▪ ▪ Inspect and document: ▪ Storage and handling of piles ▪ Preparation of piles ▪ Shoes ▪ Splices ▪ Driving method(s) ▪ Length of piles ▪ Variation in pile alignment ▪ Cutting off piles and pile casings ▪ Painting exposed piles ▪ Reject defective piles and document reason and disposition	Form BD 138M, Pile and Pile Driving Equipment MURK 1d (DB CQC), Inspector's Daily Report Form BD-25M, Pile Driving Record Form BD-26M, Pile Driving Record Daily Summary MURK 1d (DB CQC), Inspector's Daily Report
Drilled Shafts	▪ Drilling ▪ Concreting ▪ Integrity Testing ▪ Shaft Plumbness ▪ Shaft Soil Field Log ▪ Rebar Cage (Centralizers, Access Tubes) ▪ Load Testing	Drilled Shafts: GEM-18 Static Pile Load Test: GCP-18
Micropiles	▪ Drilling ▪ Grouting ▪ Reinforcement ▪ Load Testing	Micropiles: GEM-25 Static Pile Load Test: GCP-18

Specification Section	QC Inspection Requirements	Documentation Form(s)
552 – Externally Stabilized Cut Structures	▪ Materials ▪ Safety ▪ Permanent Sheeting ▪ Temporary sheeting ▪ Interim sheeting ▪ Excavation protective systems	MURK 1d (DB CQC), Inspector's Daily Report
553 – Cofferdams and Waterway Diversion Structures	▪ Materials ▪ Cofferdams ▪ Structure ▪ Dewatering Equipment ▪ Sediment removal areas ▪ Temporary water diversion structure ▪ Removal	MURK 1d (DB CQC), Inspector's Daily Report
554 – Fill Type Retaining Walls	▪ Materials ▪ Construction ▪ Placement area ▪ Facing units ▪ Structure erection ▪ Methods & Equipment ▪ Leveling pad ▪ Backfill ▪ Reinforcing Approved List Materials Methods Foundation Area Erection Tolerances Backfill Material Reinforcing Elements Equipment Movements Subsurface Drainage System Identification Markers Coping Units Aesthetic Treatment ▪	Backfill sampling and testing is addressed under GCP-17.

Specification Section	QC Inspection Requirements	Documentation Form(s)
555 - Structural Concrete	Inspect and document: ▪ Reinforcing bars: (See also 556) ▪ Handling and storage ▪ Installation ▪ Plan clearances ▪ Forming operations ▪ Form support ▪ Joints ▪ Wall layout for waterstops ▪ Construction joints ▪ Concrete operations ▪ Prior to placing ▪ Placing sequence ▪ Adequacy of personnel and equipment ▪ Concrete supply ▪ Conveyance system ▪ Forms ▪ Curing materials ▪ Admixtures ▪ Prewetting ▪ Placing ▪ Finishing ▪ Curing ▪ Mass concrete operations – special provisions ▪ Cold weather concreting ▪ Verify permission ▪ Ambient temperature ▪ Maintaining temperature ▪ Safety/ventilation ▪ Insulation ▪ External heat and enclosures ▪ Hot weather concreting ▪ Underwater concrete placements	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
556 - Reinforcing Steel for Concrete Structures	Inspect and document: ▪ Storing and handling ▪ Placing and fastening ▪ Field bending ▪ Field repair ▪ Splices ▪ Placement in structural slabs ▪ Stud shear connectors for bridges	MURK 1d (DB CQC), Inspector's Daily Report
557 – Superstructure Slabs, Sidewalks on Bridges, and Structural Approach Slabs	Inspect and document: ▪ Compliance with specified restrictions ▪ Forming ▪ Forms ▪ Support Systems ▪ Haunch depths ▪ Permanent corrugated metal forms ▪ Joints ▪ Drainage ▪ Placing and fastening reinforcing steel ▪ Concreting Operations (see 555) ▪ Finishing Integral Wearing Surfaces	MURK 1d (DB CQC), Inspector's Daily Report
558 - Longitudinal Sawcut Grooving of Structural Slab Surface	Inspect and document: ▪ Grooving layout ▪ Grooving geometry ▪ Grooving operations	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
560 - Masonry	Inspect and document: ▪ Materials ▪ Dimension stone masonry ▪ Split face concrete masonry ▪ Stone masonry ▪ Rubble stone masonry ▪ Precast concrete coping ▪ Mortar ▪ Compliance with weather limitations ▪ Construction (See Section 560, Part IX) ▪ Dimension stone masonry ▪ Split face concrete masonry ▪ Stone masonry ▪ Rubble stone masonry ▪ Rubble stone masonry laid dry ▪ Precast concrete coping	MURK 1d (DB CQC), Inspector's Daily Report
563 – Prestressed Concrete Units (Structural)	Inspect and document: ▪ When receiving units: ▪ Inspector's stamp of approval ▪ Units against Report of Acceptance of Structural Concrete ▪ Damage during shipment ▪ Camber ▪ Dimensional tolerance ▪ Visual defects ▪ Erection ▪ Repair	MURK 1d (DB CQC), Inspector's Daily Report
564 - Structural Steel	Inspect and Document: ▪ Materials ▪ Field Fabrication ▪ Field Welding ▪ Repairs ▪ Erection ▪ Site storage & handling	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
565 - Bridge Bearings	▪ Materials ▪ Fabrication ▪ Protective coatings ▪ Bearing surface preparation ▪ Anchor bolts ▪ Pad installation ▪ Welding ▪ Grouting	MURK 1d (DB CQC), Inspector's Daily Report
566 – Modular Expansion Joint Systems	▪ Materials-System ▪ Fabrication ▪ Installation	MURK 1d (DB CQC), Inspector's Daily Report
567 – Bridge Joint Systems	▪ Materials ▪ Fabrication ▪ Cleaning ▪ Assembly ▪ Installation ▪ Preparation ▪ Handling and Storage	MURK 1d (DB CQC), Inspector's Daily Report
568 – Bridge Railing	▪ Materials ▪ Erection ▪ Cement Mortar Pads	MURK 1d (DB CQC), Inspector's Daily Report
569 – Permanent Concrete Traffic Barrier for Structures	▪ Materials ▪ Fabrication ▪ Tolerances ▪ Precast ▪ Cast-in-Place	MURK 1d (DB CQC), Inspector's Daily Report
570 – Paint Removal Operations	▪ Materials ▪ Ground Protection ▪ Waste materials ▪ Air filtering ▪ Removal and disposal of waste ▪ Waterway Protection ▪ Collections ▪ Floating waste containment & disposal	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
571 - Treatment and Disposal of Paint Removal Waste	▪ Containers ▪ Labeling ▪ Documentation Preparation ▪ Waste Composition ▪ Stabilization	MURK 1d (DB CQC), Inspector's Daily Report
572 – Structural Steel Painting: Shop Applied	▪ Materials ▪ Abrasive ▪ Paint ▪ Paint Inspection Equipment ▪ Cleaning ▪ Painting – General ▪ Painting – Application Methods ▪ Shop Painting ▪ Field Painting	MURK 1d (DB CQC), Inspector's Daily Report
576 - Bridge Drainage System	▪ Materials ▪ Fabrication ▪ Erection	MURK 1d (DB CQC), Inspector's Daily Report
578 - Bonded Concrete Overlay for Structural Slabs	▪ Materials ▪ Blast cleaning ▪ Preplacement wetting ▪ Bonding grout placement ▪ Handling and placing concrete ▪ Finishing and curing slab reconstruction concrete ▪ Finishing bonded concrete overlay ▪ Curing bonded concrete overlay	MURK 1d (DB CQC), Inspector's Daily Report *See* also documentation for Section 501

Specification Section	QC Inspection Requirements	Documentation Form(s)
579 - Structural Slab Reconstruction Preparation	▪ Materials ▪ Equipment ▪ Scarification ▪ Reinforcing Bar Exposure ▪ Full Depth Patches ▪ Hydrodemolition Equipment ▪ Water filtration and disposal ▪ Water retention ▪ Debris removal	MURK 1d (DB CQC), Inspector's Daily Report
582 - Removal and Replacement of Structural Concrete	▪ Materials ▪ Removal of Unsound Concrete ▪ Preparation of Surface ▪ Placement ▪ Form Removal ▪ Curing	MURK 1d (DB CQC), Inspector's Daily Report
583 - Shotcrete	▪ Materials ▪ Equipment ▪ Qualification Test ▪ Preparation of Surfaces ▪ Preparation of Materials ▪ Placement ▪ Weather ▪ Quality Control ▪ Test Panels ▪ Coring ▪ Finishing ▪ Curing	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
584 - Specialized Overlays for Structural Slabs	▪ Materials ▪ Manufacture of Class DP Concrete ▪ Manufacture of Microsilica Concrete ▪ Equipment ▪ Limitations of Operations ▪ Blast Cleaning ▪ Preplacement Wetting ▪ Bonding Grout Placement ▪ Handling and Placing Concrete ▪ Finishing and Curing ▪ Construction Joints ▪ Defective or Damaged Concrete	MURK 1d (DB CQC), Inspector's Daily Report *See* also documentation for Section 501
585 - Structural Lifting Operations	▪ Lifting Equipment ▪ Lifting Operations	MURK 1d (DB CQC), Inspector's Daily Report
587 - Bridge Railing Reconstruction	▪ Materials ▪ Bridge Railing Removal ▪ Bridge railing Storage ▪ Bridge Railing Installation (*see* Section 568) ▪ Trie Beam Installation ▪ Direct Attachment ▪ Separate Post Installation	MURK 1d (DB CQC), Inspector's Daily Report
589 - Removal of Existing Steel	▪ Work Plan ▪ Paint Removal ▪ Cutting ▪ Fastener Removal ▪ Disassembly of Welded Connections	MURK 1d (DB CQC), Inspector's Daily Report
590 - Adjustment of Bridge Appurtenances	▪ Materials ▪ Galvanized Parts and Repairs ▪ Welding	MURK 1d (DB CQC), Inspector's Daily Report
594 - Timber and Lumber	▪ Materials ▪ Erection ▪ Treatment after Fabrication ▪ Permits	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
596 - Open Steel Floor	▪ Materials ▪ Fabrication ▪ Shop Painting ▪ Placement ▪ Field Welding ▪ Field Painting	MURK 1d (DB CQC), Inspector's Daily Report
597 - Timber Bridge Railing and Transitions	▪ Materials ▪ Fabrication ▪ Galvanizing ▪ Railing ▪ Field Repair ▪ Installation/Erection	MURK 1d (DB CQC), Inspector's Daily Report
602 - Rehabilitation of Culvert and Storm Drain Pipe	▪ Materials ▪ Existing Pipe Preparation ▪ Handling and Installing Relining Materials ▪ Installation ▪ Curing ▪ Workmanship ▪ Lateral Connections ▪ Damaged Pipe and Repairs	MURK 1d (DB CQC), Inspector's Daily Report
603 - Culverts and Storm Drains	▪ Materials ▪ Excavation ▪ Laying Pipe ▪ Bedding and Backfill ▪ Damaged Pipe and Repairs ▪ Field Strutting of Corrugated Structural Plate ▪ Pipe ▪ Joints ▪ Concrete Paving for Corrugated Structural ▪ Plate Pipe ▪ Relaying Pipe ▪ Anchor Bolts	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
604 - Drainage Structures	▪ Materials ▪ Excavation ▪ Installation ▪ Backfill – See GCP-17	MURK 1d (DB CQC), Inspector's Daily Report
605 - Underdrains	▪ Materials ▪ Bed Preparation ▪ Placement ▪ Pipe Installation ▪ Backfill and Compaction – see GCP-17	MURK 1d (DB CQC), Inspector's Daily Report
606 - Guide Railing	▪ Materials ▪ Equipment ▪ Rail Elements ▪ Field Repair ▪ Field Welding ▪ Erection/Installation ▪ Anchor Units ▪ End Terminals and Assemblies ▪ Concrete ▪ Dimensional Tolerances ▪ Joints ▪ Concrete Placement ▪ Form Removal and Finishing ▪ Curing ▪ Reinforcement ▪ Defects ▪ Repair	MURK 1d (DB CQC), Inspector's Daily Report
607 - Fences	▪ Materials ▪ Clearing and Grubbing ▪ Grounding (where required) ▪ Post Placement and Spacing ▪ Post Foundations ▪ Installation/Erection	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
608 – Sidewalks, Driveways, Bicycle Paths, and Vegetation Control Strips	▪ Concrete (*see* 501 and 502) ▪ Wire Reinforcement ▪ Construction Joints ▪ Finishing ▪ Asphalt (*see* 402) ▪ Brick, Stone and Concrete Block ▪ Paving Pattern ▪ Installation ▪ Curing	MURK 1d (DB CQC), Inspector's Daily Report
609 - Curb and Curb & Gutter	▪ Materials ▪ Alignment and Grade ▪ Preparation of Mixture ▪ Preparation of Surface ▪ Placing ▪ Curing	MURK 1d (DB CQC), Inspector's Daily Report
610 – Ground Vegetation – Preparation, Establishment and Management	▪ Materials ▪ Application of Soil Amendments ▪ Rates ▪ Limitations ▪ Seed Inoculation ▪ Ground Preparation and Seeding ▪ Mulching ▪ Care during Construction	MURK 1d (DB CQC), Inspector's Daily Report
611 – Planting, Transplanting and Post-Planting Care	▪ Materials ▪ Location ▪ Delivery ▪ Storage ▪ Ground Preparation ▪ Setting Plants ▪ Restoration ▪ Care of Plantings	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
613 – Wildlife and Ecology	protection, preservation, restoration and management of terrestrial habitat, aquatic habitat and wetlands per special specifications. ▪ Materials ▪ Location ▪ Delivery ▪ Storage ▪ Installation ▪ Restoration	MURK 1d (DB CQC), Inspector's Daily Report and any forms required by regulations
614 – Pruning, Improving and Removing Existing Vegetation	▪ Materials ▪ Care of Trees ▪ Equipment ▪ Pruning ▪ Fertilizing ▪ Cleanup and Disposal ▪ Selective Thinning ▪ Tree Removal ▪ Procedures ▪ Disposal of Wood	MURK 1d (DB CQC), Inspector's Daily Report
615 - Landscape Appurtances	Per Special Specification requirements ▪ Materials ▪ Location ▪ Delivery ▪ Storage ▪ Installation ▪ Restoration	MURK 1d (DB CQC), Inspector's Daily Report
616 – Soil Bioengineering	Per Special Specification requirements ▪ Materials ▪ Location ▪ Procedures ▪ Care during Construction	MURK 1d (DB CQC), Inspector's Daily Report and any forms required by regulations

Specification Section	QC Inspection Requirements	Documentation Form(s)
617 - Invasive Species Management	Per Special Specification requirements ▪ Materials ▪ Location ▪ Procedures ▪ Care during Construction	MURK 1d (DB CQC), Inspector's Daily Report and any forms required by regulations
619 - Work Zone Traffic Control (WZTC)	▪ Materials ▪ Surface Condition ▪ Drainage ▪ Bus Stops ▪ Protection and maintenance of Pedestrian Traffic ▪ Intersecting Traffic ▪ Dust Control and Spillages ▪ Flaggers ▪ Repairs ▪ Snow and Ice Control ▪ Delineation and Guiding Devices ▪ Project Site Patrol ▪ Shadow and Barrier Vehicles ▪ Construction Signs, Temporary Barriers, Temporary barrier end treatments, Construction Barricades and Lighting ▪ Temporary Structures and Approaches ▪ Interim Pavement Markings ▪ Temporary Pavement markings ▪ Temporary Traffic Signals ▪ Railroad Protection ▪ Mailboxes ▪ Maintenance of Traffic Signal Equipment ▪ Flashing Arrow Board ▪ WZTC during Nighttime Operations ▪ Cleaning ▪ Dust Control	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
619 - Work Zone Traffic Control (WZTC) (Cont.)	▪ Signs and Sign Covers ▪ Existing Pavement Markings ▪ Exposed Guide Railing, Median Barriers and Rail Ends ▪ Maintain access to abutting property, business signs ▪ Portable Variable Message signs ▪ Traffic Control Supervisor	MURK 1d (DB CQC), Inspector's Daily Report
620 - Bank and Channel Protection	▪ Materials ▪ Ground Surface Preparation ▪ Bedding Material ▪ Stone Filling ▪ Riprap (Plain and Grouted) ▪ Concrete Block Paving ▪ Gabions	MURK 1d (DB CQC), Inspector's Daily Report
622 – Buildings and Miscellaneous Structures	▪ Materials ▪ Equipment ▪ Procedures ▪ certifications ▪ Compliance with local building codes ▪ Permits	MURK 1d (DB CQC), Inspector's Daily Report and any forms required by regulations, local building codes, and per OGS permit requirements
623 - Screened Gravel, Crushed Gravel, Crushed Stone, Crushed Slag	▪ Materials ▪ Placement ▪ Material is on Approved List	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
624 - Paved Gutters	▪ Materials ▪ AC Gutters ▪ Preparation of Bed ▪ Placing ▪ Sealing ▪ Conventional Formed Concrete Gutters ▪ Forming and Placement ▪ Construction Joints ▪ Curing ▪ Machine-Formed Gutter (*see* 609) ▪ Precast Gutters (*see* 609) ▪ Cobble Gutters ▪ Construction ▪ Joints	MURK 1d (DB CQC), Inspector's Daily Report
630 - Barricades	▪ Materials ▪ Excavation ▪ Erection ▪ Backfill	MURK 1d (DB CQC), Inspector's Daily Report
633 – Conditioning Existing Pavement Prior to Hot Mix Asphalt (HMA) Overlay	▪ Materials ▪ Cleaning Pavement and Shoulders ▪ Cleaning, Sealing and Filling Joints and Cracks	MURK 1d (DB CQC), Inspector's Daily Report
635 - Cleaning and Preparation of Pavement Surfaces for Pavement Markings	▪ Materials ▪ WZTC and Safety ▪ Cleaning Method ▪ Dust Control ▪ Protection of Pavements and Seals ▪ Limits of Work ▪ Cleaning Concrete Curing Compounds ▪ Cleaning Existing Pavement Markings ▪ Replacement of Pavement Markings	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
638 - White Synthetic Resin Binder Concrete	▪ Materials ▪ Weather Limitations ▪ Preparation of Mixture ▪ Preparation of Surface ▪ Paving ▪ Compaction	MURK 1d (DB CQC), Inspector's Daily Report
640 - Reflectorized Pavement Marking Paints	▪ Materials ▪ WZTC ▪ Preparation ▪ Application	MURK 1d (DB CQC), Inspector's Daily Report
643 – Noise Barrier	▪ Materials ▪ Equipment ▪ Procedures	MURK 1d (DB CQC), Inspector's Daily Report
644 – Overhead Sign Structures	▪ Materials ▪ Fabrication ▪ Transportation ▪ Excavation ▪ Foundations ▪ Erection	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
645 - Signs	▪ Materials ▪ Fabrication ▪ Sign Face Construction ▪ Work Sequence ▪ Location ▪ Erection ▪ Transportation, Handling and Storage ▪ Foundations ▪ Sign Posts ▪ Breakaway Bases and Hinge Assemblies ▪ Sign Panels and retroreflective sheeting ▪ Illumination Systems ▪ Insulation ▪ Grounding ▪ Functionality ▪ Sign Coverings	MURK 1d (DB CQC), Inspector's Daily Report
646 - Delineators, Reference Markers and Snowplowing Markers	▪ Materials ▪ Fabrication ▪ Location ▪ Erection ▪ Damage ▪ Marker Relocation	MURK 1d (DB CQC), Inspector's Daily Report
647 - Removing, Storing and Relocating Signs	▪ Materials ▪ Removal ▪ Storage of Signs ▪ Removal of Concrete Footings ▪ Relocation of Signs	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
650 – Trenchless Installation of Casing	▪ Materials ▪ Jacking Procedures subContractor Qualifications Designed Drill Path CODE 753 Clearance Ticket Equipment List Installation Method Design of Entrance and Exit Pits Thrust Block Design Monitoring Plan Method of Grouting; Certified Mix Design Spread Diameter Field Test Results Cylinder Break Test Results MSDS ▪ Steering and Tracking Equipment	MURK 1d (DB CQC), Inspector's Daily Report
652 - Furnishing and Applying Salts	▪ Materials ▪ Stabilized Gravel Surface Course ▪ Dust Control	MURK 1d (DB CQC), Inspector's Daily Report
654 – Impact Attenuators - Permanent	▪ Materials ▪ Traffic Protection ▪ Foundations ▪ Excavation ▪ Foundation Slab ▪ Pavement Restoration ▪ Anchorage ▪ Installation ▪ Removal and Disposal ▪ Removal and Storage ▪ Relocation ▪ Refurbishing	MURK 1d (DB CQC), Inspector's Daily Report
655 - Frames, Grates and Covers	▪ Materials ▪ Installation ▪ Field Repairs	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
656 - Miscellaneous Metals	▪ Materials ▪ Welding ▪ Galvanizing ▪ Painting	MURK 1d (DB CQC), Inspector's Daily Report
659 - Telecommunication Utilities	▪ Materials ▪ Installation and Testing ▪ Schedule ▪ Excavation ▪ Backfill	MURK 1d (DB CQC), Inspector's Daily Report
660 - Utilities	▪ Materials ▪ Installation and Testing ▪ Schedule ▪ Excavation ▪ Backfill	MURK 1d (DB CQC), Inspector's Daily Report
661 - Electric Utilities	▪ Materials ▪ Installation and Testing ▪ Schedule ▪ Excavation ▪ Backfill	MURK 1d (DB CQC), Inspector's Daily Report
662 - Gas, Oil & Steam Utilities	▪ Materials ▪ Installation and Testing ▪ Schedule ▪ Excavation ▪ Backfill	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
663 - Water Supply Utilities	▪ Materials ▪ Permits ▪ Notifications ▪ Removals ▪ Asbestos Containing Materials (Special Requirements) ▪ Shut Downs/Approvals ▪ Temporary Water Supplies ▪ Excavation and Backfill ▪ Thrust Restraints ▪ Pipe Installation ▪ Polyethylene Encasement Installation ▪ Valves and Valve Boxes ▪ Hydrants ▪ Fittings ▪ Water Service Connections ▪ Water Meter Pits ▪ Adjusting Valve Box Elevations ▪ Disconnect and Cut Water Mains ▪ Hydrostatic Testing ▪ Disinfection	MURK 1d (DB CQC), Inspector's Daily Report
664 - Sanitary Sewer Utilities	▪ Materials ▪ Installation and Testing ▪ Schedule ▪ Excavation ▪ Backfill	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
670 - Highway Lighting System	▪ Materials ▪ Excavation and Miscellaneous Work ▪ Foundations ▪ Grounding ▪ Light Standards, Breakaway Transformer Bases and Arms ▪ Conduit ▪ Pull Boxes ▪ Junction Boxes ▪ Luminaries ▪ Photoelectric Control ▪ Cable ▪ Ground Cable ▪ Tests ▪ Removal and Disposal or Storage of Lighting Equipment ▪ Relocation of Lighting Equipment ▪ High Mast Poles ▪ Portable Power Drives for High Mast Poles	MURK 1d (DB CQC), Inspector's Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
680 - Traffic Signals	▪ Materials ▪ Underground Facilities ▪ Test Holes ▪ Schedule ▪ Excavation ▪ Pole Excavation and Concrete Foundations ▪ Poles ▪ Grounding ▪ Conduit and Direct Burial Cable ▪ Pull Boxes ▪ Signal Control Cable & Shielded Communications Cable ▪ Cable Splices ▪ Span Wire Assemblies ▪ Messenger Assemblies ▪ Guy Assemblies ▪ Riser Assemblies ▪ Signal Heads ▪ Wiring Color Code ▪ Pedestrian Push Button and Sign ▪ Fire Pre-Emption Tell-Tale Light ▪ Flashing Beacon Sign Assembly ▪ Inductance Loop Installation ▪ Concrete Base for Controller Assembly ▪ Power Meter Base ▪ Overhead Traffic Signs ▪ Filed Galvanizing ▪ Cast Iron Junction Boxes ▪ Tests ▪ Fiber optic Pedestrian Signal Heads ▪ Pedestrian countdown timers ▪ Fiber optic Dual Indication Arrow ▪ Strobing Signal Section ▪ LED Traffic & Pedestrian Signal Modules	MURK 1d (DB CQC), Inspector’s Daily Report

Specification Section	QC Inspection Requirements	Documentation Form(s)
685 - Epoxy Reflectorized Pavement Markings	▪ Materials ▪ General Requirements ▪ Atmospheric Conditions ▪ Surface Preparation ▪ Epoxy Application Equipment ▪ Application of Pavement Markings ▪ Defective Pavement Markings	MURK 1d (DB CQC), Inspector's Daily Report
687 - Thermoplastic Reflectorized Pavement Markings	▪ Materials ▪ Equipment ▪ Application ▪ Atmospheric Conditions ▪ Materials Application Requirements ▪ Surface Cleaning and Preparation of Pavement ▪ Application of Thermoplastic Pavement Markings	MURK 1d (DB CQC), Inspector's Daily Report
688 - Preformed Reflectorized Pavement Markings	▪ Materials ▪ General Requirements ▪ Methods ▪ Weather and Seasonal Limitations ▪ Equipment ▪ Rollers ▪ Primer Requirements ▪ Surface Cleaning and Preparation of Pavement Surfaces ▪ Application of Markings	MURK 1d (DB CQC), Inspector's Daily Report

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I-81 VIADUCT PROJECT - PHASE 1, CONTRACT 2

PIN 3501.91, CONTRACT D900056

DB CONTRACT DOCUMENTS

PART 3
APPENDIX B

CONSTRUCTION QUALITY CONTROL MATERIAL TESTING

Final November 4, 2022

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The Design-Builder (DB) shall use this Part 3, Appendix B as a guide for development of a Quality Control Plan as defined in Part 3, Section 4. The Quality Control Plan shall provide for materials Quality Control (QC) and Construction Inspection (CI) practices oversight. In general, the DB shall employ an independent Construction Inspection Professional Engineering Firm and a Materials Testing Firm or Laboratory that will be responsible to assure compliance of materials and construction inspection activities to all Department standards.

The DB shall provide in the Quality Control Plan all the various materials planned for use and the specific certifications and/or sampling and testing to be progressed for QC purposes to assure durability of the material. For development of the Quality Control Plan, the DB should be aware that the fundamental principle behind the approach is to assign the appropriate level of resources to monitor and evaluate each analysis category based on NYSDOT's residual risk after the DB has completed construction. In general, the higher the residual risk for the performance of the material the higher the level of monitoring and verification. The stronger the relationship between the material property being tested and the material's performance, the higher the level of monitoring and verification required.

The Construction Inspection Professional Engineering Firm's QC operations shall be in conformance with Department practices as established in Specifications, Materials Methods, Materials Procedures, Materials Test Methods, Granular Control Procedures, and other Department documents, which can be found at the following websites:

Standard Specifications and Standard Sheets:

https://www.dot.ny.gov/main/business-center/engineering/specifications/busi-e-standards-usc

Materials Bureau Forms/Manuals:

https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals

Guidance, Manuals, & Computer Applications:

https://www.dot.ny.gov/main/business-center/contractors/construction-division/forms-manuals-computer-applications-general-information

Steel Construction Manual:

https://www.dot.ny.gov/divisions/engineering/structures/manuals/scm

Prestressed Concrete Construction Manual:

https://www.dot.ny.gov/divisions/engineering/structures/manuals/pccm

Geotechnical Engineering Bureau Forms and Manuals:

https://www.dot.ny.gov/divisions/engineering/technical-services/geotechnical-engineering-bureau/manuals

The Documents found at the above website in effect on the proposal due date (as shown in the RFP Instructions to Proposers, Appendix A, Section A5.1) shall be applicable to the Project.

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I-81 VIADUCT PROJECT - PHASE 1, CONTRACT 2

PIN 3501.91, Contract D900056

DB CONTRACT DOCUMENTS

PART 3
APPENDIX C

DESIGN AND CONSTRUCTION QUALITY CONTROL PLAN TEMPLATE

Final November 4, 2022

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Design and Construction Quality Control Plan Template

NYSDOT Design-Build Program

This document provides an outline of the format, minimum expectations and content of the quality plan expected from the design-build contractor. Each contractor shall update and modify this manual on each project. The contractor shall update any standards, procedures, and processes within this template to reflect the most recent NYSDOT standards and provisions outlined in the RFP.

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QP 100: **Quality Control Plan Overview**

Rev , Date

100.1 GENERAL

This section shall summarize the overall purpose of the Plan.

It is intended that this Plan is a supplement to the Quality System requirements in DB Section 100 of the Contract Documents.

The Quality Control Plan shall describe in detail the Design Builder's approach to achieving high quality work, their specific Quality Control Plan for this project and how the Design-Builder will engage the Department's Design Quality Assurance Engineer and the Construction Quality Assurance Engineer in all activities described in the Quality Control Plan.

100.2 RESPONSIBILITIES

This section shall describe what entities (firms) and individuals are responsible for performing the various specific Quality Control and Quality Assurance tasks.

(Note: The following sections are to be included in the Plan. Specific detailed requirements are listed in the respective chapters of this Template. The overview section (QP 100) shall only provide a brief summary).

100.3 DESIGN

100.3.1 Design and Development Inputs

This section shall describe in general terms how design data is obtained and is managed and controlled so that all disciplines have the necessary current and correct data. It shall also list and describe all software that is intended to be used.

100.3.2 Design and Development Outputs

This section shall describe in general terms how intermediate submittals are scheduled and processed. It shall also describe how Release for Construction documents are developed from the concept designs and how they are handled in the QC/QA process.

100.3.3 Design and Development Review

The design and review process shall be presented in this section in graphical form in the form of a flowchart. Time duration for reviews shall be included in the flowchart.

Detailed Checking

This section shall list all documents that will be checked in detail. This list shall include as a minimum:

- Checking of calculations
- Checking of computer program input
- Checking of plans
- Checking of specifications and/or special provisions

- Checking of structural design plans and calculations
- Review of studies, reports, other design documents

Design Reviews

This section shall describe in general terms the ongoing checking and review process and procedures as the design progresses. To the extent possible individuals or titles of those persons responsible for the reviews shall be identified.

This section shall also describe the following procedures:

Discipline Coordination Reviews (DCR):

This section shall list the anticipated disciplines involved and shall describe in general terms how the design is coordinated between disciplines.

Independent Technical Reviews (ITR):

This section shall describe in general terms when and how independent reviews are to be performed. The level of design completion when reviews are to be completed, the number of ITR's and the expected durations shall be described.

Constructability Reviews (CR):

This section shall describe in general terms how constructability reviews are to be performed. The level of design completion at the CR shall be described. The comment resolution process shall be described in detail as well as the documentation of the resolution of comments.

Department Reviews

This section shall describe in general terms how the DB team will obtain, manage and address Department review comments during the design process.

Quality Assurance Audits

This section shall describe in general terms the frequency and the method in which audits are performed by the Design Builder.

Other Stakeholder Reviews

This section shall describe in general terms how the DB team will manage and address stakeholder review comments during the design process and how the documentation of the review process will be maintained.

Comment Resolution Meetings

This section shall describe in general terms the nature and frequency of comment resolution meetings between the Department and designers. The documentation of the meetings and the comments shall be described.

100.3.4 Design and Development Verification

This section shall describe in general terms the procedures to ensure that the design packages have incorporated all applicable requirements and have satisfied all design standards.

100.3.5 Control of Design and Development Changes

This section shall describe in general terms how design changes over the course of the Project are coordinated, documented and processed in reference to QA/QC.

100.4 CONSTRUCTION

100.4.1 Introduction

The following topics shall be included and discussed in this section in sufficient detail to introduce Construction Quality aspects of the Plan.

a. Identification of work that will be subject to QC.
b. Description of the procedures and methods of performing construction quality activities
c. Description of the general role of the Quality Manager
d. Include a listing of what Construction and Inspection Quality activities are included in the Plan and what activities (if any) are not included.
e. The means and methods of communicating between the design group and the construction group to ensure a coordinated and consistent quality in the finished product.

All Testing, Quality Control, Inspection and approval procedures must meet current NYSDOT Standards.

100.5 DEFINITIONS

Include the definition of all key terms that are used in the Quality Control Plan.

QP 101: Key Project Roles and Disciplines

Rev , Date

101.1 SCOPE

This section shall identify key staffing positions, their responsibilities and the major and minor disciplines and support services required to complete this project.

101.2 RESPONSIBILITIES – DESIGN AND CONTRUCTION

Project specific and functional titles (with specific names of individuals and their affiliation) for key staff and their specific function on the project shall be presented in this section. Every discipline shall be represented in the staffing. An organizational chart that shows the relationships to each other and reporting responsibilities shall also be included.

101.3 RELATIONSHIP BETWEEN FIRMS

This section shall explain the relationship between the members of the DB team.

It shall include the following statements that explain the contractual arrangements of the firms involved:

- Include a statement that the construction QC personnel (Construction Inspectors) may be employed directly by the QC Professional Engineering firm, or be employees of firms acting as sub-consultants to the QC Professional Engineering firm.
- Include a statement that the QC Professional Engineering firm and any firm acting as a sub-consultant to the QC Professional Engineering firm shall not be owned by or be an Affiliate of the Design-Builder, any Principal Participant or construction subcontractor.
- Include a statement that the QC Professional Engineering firm is distinct and separate from the design and construction production organization(s).

All QC Professional Engineering firm personnel shall be knowledgeable of the Project Quality Control Plan including construction QC requirements applicable to their work.

This section shall include the protocol for reporting deviations from approved procedures to the Design-Builder and the Department. It shall also include the means that the DB team will ensure that all personnel are knowledgeable of the Plan.

101.4 KEY PERSONNEL – DESIGN AND CONSTRUCTION

It is expected that the number of key personnel performing QA and QC reviews shall be commensurate with the size and type of project.

101.4.1 Quality Manager

Include in this section the name of the individual assigned to be the Quality Manager.

Include a <u>detailed</u> description of the specific role of the Quality Manager in implementing and ensuring compliance with the Quality Control Plan (QCP) for both design and construction and for coordination with the Department's QA staff.

Include a listing of what activities the Quality Manager is responsible for and what activities (if any) are not included. As a minimum, the list of activities performed by the Quality Manager shall include the following:

- Conducting internal quality checks to verify conformance and compliance
- Reviewing and approving internal quality control audit reports
- Ensuring that project quality control records and documentation are reviewed, approved and maintained appropriately
- Attending Review, Progress and Comment Resolution Meetings as appropriate
- Implementing corrective and preventive action procedures to reduce or eliminate non-conforming work
- Providing a monthly QM Report that will be delivered to the Department's Project Manager which will include but not limited to the following Project Management, Design Management and Construction Management topics:
    - Status of all required project plans
    - Status of on-time project delivery
    - Status of on-budget project delivery
    - Status of NCR process and any recommended process improvements
    - Design related issues in general
    - Design Unit submission, review and approval status
    - Status of Utility Deliverables, as obtained from the Utility Coordination Manager
    - Recommended supplements and changes to the Design Quality Management Plan
    - Status log of all NCRs
    - Constructability Review section prior to RFCs issued
    - Status log of Shop Drawings
    - Status of environmental commitments
    - Summary of CI staffing needs & limitation as depicted in the P6 schedule
    - Special inspection requirements or concerns resulting in the need for specialty inspection or training
    - Status of detailed review of all project quality control records for compliance with RFP and MURK
    - Status, concerns or issues with fabrication, materials, concrete/HMA plant or on-site construction quality
    - Status of Site-Manager utilization, including Item quantities, materials received certs and payments

101.4.2 Design Quality Control Engineer

Include in this section the name of the individual assigned to be the Design Quality Control Engineer.

Include a <u>detailed</u> description of the specific role of the Design QC Engineer in implementing and ensuring compliance with the Quality Control Plan and NYSDOT Standards.

Include a listing of what QC activities the Design QC Engineer is responsible for and what activities (if any) are not included. As a minimum, the list of QC activities shall include the following:

- Coordination and management of the QC activities and direct implementation of the QC Plan for design;
- Determining the staffing requirements for performing the required management and administrative duties for the design QC Engineers;
- Identifying project activities that require QC procedures and work with the QC Engineer to define the scope and content of each QC Procedure;
- Overseeing QC document management activities to ensure quality records are appropriately maintained and conform to NYSDOT Standards;
- Ensuring QC quality records are reviewed and approved by authorized personnel;
- Promoting awareness of QC requirements to QC Engineer personnel;
- Assuring QC activities are performed by properly qualified personnel;
- Attending Review Meetings as appropriate;
- Reviewing, approving and distributing Implementing QC Procedures;
- Reviewing and approving internal quality audit reports;
- Conducting internal quality spot-checks to verify conformance;
- Coordinating QC activities with the Department's QA activities;
- Addressing programmatic issues within the QC Engineer's organization.

101.4.3 Construction Quality Control Engineer

Include in this section the name of the individual assigned to be the Construction QC Engineer.

Include a detailed description of the specific role of the Construction QC Engineer in implementing and ensuring compliance with the Quality Control Plan and NYSDOT Standards.

Include a listing of what QC activities the Construction QC Engineers are responsible for and what activities (if any) are not included. As a minimum, the list of QC activities shall include the following:

- Coordination and management of the QC activities and direct implementation of the Construction QC Plan for construction
- Determining the staffing requirements for performing the required management and administrative duties for the construction QC Engineers
- Identifying project activities that require QC procedures and work with the QC Engineer to define the scope and content of each QC Procedure
- Overseeing QC document management activities to ensure quality records are appropriately maintained and conform to NYSDOT Standards
- Ensuring QC quality records are reviewed and approved by authorized personnel
- Promoting awareness of QC requirements to QC Engineer personnel

- Assuring QC activities are performed by properly qualified personnel or testing firms
- Reviewing and approving Inspection and Testing Plans for specific construction work elements
- Attending Review Meetings as appropriate
- Reviewing, approving and distributing Implementing QC Procedures
- Reviewing and approving internal quality audit reports
- Conducting internal quality spot-checks to verify conformance
- Performing statistical analysis of construction QC test data to identify adverse trends
- Coordinating QC activities with the Department's QA activities
- Ensuring that the CI firm is inspecting work to match RFC quality field reviews
- Issuing nonconformance reports (NCRs) and validating NCRs issued by other QC staff when work is found to be nonconforming
- Monitoring the resolution of project NCRs, and responding to NC's issued
- Developing, reviewing, approving and implementing corrective action plans to address NCR's
- Addressing programmatic issues within the QC Engineer's organization

101.4.4 QC Engineer's Support Staff

Describe in this section the anticipated number and composition of the QC Engineer's support staff that will perform QC activities.

101.4.5 CQC Inspectors/Technicians

This section shall include a listing of the required certifications for Inspectors and Technicians as well a listing of their respective responsibilities.

101.4.6 QC Administrative Personnel

The roles and responsibilities of administrative personnel shall be identified in this section.

101.4.7 Quality Control Staffing Levels

This section shall describe how the staff size and composition will be managed during the course of the design review and construction inspection. An estimate of the maximum and minimum staff required during the course of the project shall be indicated.

101.4.8 Construction QC Testing Laboratories

This section shall describe how testing laboratories will be contracted, how their certifications will be checked and how the labs' QC procedures are verified and audited by the Design Builder.

QP 200: **Communication Protocols**

Rev , Date

200.1 PURPOSE

This section shall define the formal communication protocol and responsibilities between the Contractor, the Designer, the Construction Inspector and the Department.

200.2 SCOPE

This section shall cover in detail the method for managing and documenting written, verbal, telephone, e-mail and all other formal communication between all parties in the project.

200.3 RESPONSIBILITIES

The roles and responsibilities of specific individuals for maintaining and ensuring that communications are documented and performed appropriately shall be described in this section.

200.4 PROCEDURE

The protocol for maintaining and tracking written or verbal communication and Document Distribution shall be explained in this section.

QP 300: **Discipline Coordination Reviews**

Rev , Date

300.1 PURPOSE

This section shall define in specific terms how a Discipline Coordination Review (DCR) is completed to formally obtain input from each discipline into each deliverable and to take advantage of opportunities identified as well as avoid conflicts between disciplines. A list of disciplines shall be provided.

300.2 SCOPE

This section shall define the procedure to review the items that are specific to Discipline Coordination Reviews associated with deliverable packages.

A listing of the disciplines involved in the design that will be included in the review shall be presented.

300.3 RESPONSIBILITIES

The responsibilities of the key staff in distributing the review packages, recording receipt of review comments and distributing the comments to respective staff shall be described. Time durations for the reviews shall be indicated.

300.4 PROCEDURE

The detailed procedure for performing Discipline coordination reviews shall be presented in this section. The manner in which the Department's QA Engineer will be integrated into the process shall be described.

QP 301: Independent Technical Reviews

Rev , Date

301.1 PURPOSE

This section is applicable only if Independent Technical Reviews (ITRs) are required in the RFP or are proposed by the Design-Builder.

This section shall define in specific terms how an Independent Technical Review is completed to formally obtain input from a senior level engineer or technical expert who has familiarized himself with the project requirements but is independent of the preparation of the deliverable and is not otherwise involved in the project itself.

301.2 SCOPE

This section shall define in detail the procedures that will be used to perform independent technical reviews.

301.3 RESPONSIBILITIES

The responsibilities of key staff in the performance of Independent Technical Reviews shall be described in this section.

301.4 PROCEDURE

The procedure shall include the frequency, organization and determination of the items that are candidates for independent technical reviews. A detailed description of how the reviews will be performed shall be included. The Department's QA Engineer's involvement in the process shall be described.

QP 302: Constructability Reviews

302.1 PURPOSE

The section shall explain how, when and by whom Constructability Reviews (CR) are completed to formally obtain input from the construction team associated with the project into each deliverable.

302.2 SCOPE

This section shall define in detail the items that are subject to Constructability Reviews associated with deliverable packages.

302.3 RESPONSIBILITIES

The responsibilities of the key staff in the performance of Constructability Reviews shall be described in this section.

302.4 PROCEDURE

The procedure shall include the method, frequency, organization and determination of the items that are candidates for constructability reviews. A detailed description of how the reviews will be performed shall be included. The Department's QA Engineer's involvement in the process shall be described.

QP 303: Design Review Comment Procedure

Rev , Date

303.1 PURPOSE

This section shall explain in detail the technical review processes that will be used to ensure that all comments are tracked until they are incorporated or otherwise resolved and to ensure that all comments, responses and verification of resolution are documented.

303.2 SCOPE

This section shall describe comment resolution and tracking processes implemented in the development of the design. It shall explain how Constructability Reviews (CR), Discipline Coordination Reviews (DCR), Independent Technical Reviews (ITR), Department reviews and other reviews are documented and how comments are addressed.

303.3 RESPONSIBILITIES

The responsibilities of the key staff in the performance of this task shall be described in this section.

303.4 PROCEDURE

The procedure that will be used to process review comments shall be described in detail in this section and shall include the method, frequency and organization that will be used to ensure that comments are tracked and addressed. It shall also include the procedure for control of design development and inclusion of comments

QP 304: Material Acceptance Procedure

Rev , Date

304.1 PURPOSE

This section shall explain the material acceptance protocol. Construction materials shall not be incorporated into the project unless they have been accepted by the Quality Manager prior to incorporation. Reference and use of the Department's Material Acceptance Procedure and Documentation requirements shall be made.

304.2 RESPONSIBILITIES

The responsibilities of the key staff in the performance of this task shall be described in this section.

304.3 PROCEDURE

304.3.1 Material Acceptance

304.3.1.1Source of Supply Approval

This section shall describe how the source of supply is reviewed and approved by the Construction Quality Control Engineer.

304.3.1.2Material Certification

This section shall describe in detail the process by which materials are accepted for use and incorporation into the project. It shall also describe how the certification records are maintained and how information is relayed to the construction site.

304.3.1.3Offsite Inspection, Sampling and Testing for Material Acceptance

This section shall describe how offsite testing is performed, at what frequency and how documentation is maintained.

304.3.1.4Material Receiving Inspection

This section shall describe how inspection for material received at the jobsite is performed and the process for acceptance/rejection is done.

304.3.1.5Material Acceptance Identification

This section will describe how materials found to be in non-conformance with project requirements are processed at the job site. It shall describe in detail tagging procedures and how the materials are tracked until the non-conformance is resolved.

QP 400: **Detailed Checking of Calculations**

Rev , Date

400.1 PURPOSE

This section shall define the process for preparation and checking of engineering calculations generated as a part of the Released for Construction (RFC) drawings as well as final designs.

400.2 INTRODUCTION

The method that will be used to prepare, check, document and archive design calculations shall be described in detail.

400.3 SCOPE

The checking method shall be applicable to and shall cover all calculations that are the basis for all study, design, construction, maintenance and procurement documents.

400.4 RESPONSIBILITIES

The responsibilities of the key staff in the performance and checking of calculations and performing QA/QC shall be described in this section.

400.5 PROCEDURE

A detailed step-by-step procedure for performing, reviewing, checking, documenting calculations for the design of the project shall be defined in this section.

QP 401: Detailed Checking of Plans

Rev , Date

401.1 PURPOSE

This section shall describe the process that will be used to provide a uniform, orderly, and efficient method for checking drawings.

401.2 SCOPE

This section shall discuss the timing and methodology that will be used in the performance of detailed checks of in each phase of design.

401.3 RESPONSIBILITIES

The responsibilities of the key staff in the performance of detailed checking of plans and performing QA/QC functions shall be described in this section.

401.4 PROCEDURE

A detailed step-by-step procedure for checking plans shall be defined in this section.

The descriptions shall include:

1. Initiating the Checking Process
2. Checking
3. Correcting the Drawings
4. Verifying the Corrected Check Set
5. Drawing Change Management

QP 402: Detailed Checking – Specifications and Special Provisions

Rev , Date

402.1 PURPOSE

This section shall define the requirements for the checking of Specifications and Special Provisions.

402.2 SCOPE

This procedure shall apply to all final specifications and special provisions prepared for construction or procurement.

402.3 BACKGROUND

Some individual Release for Construction packages may include specifications or special provisions unique to that particular package. These special provisions shall be checked as indicated in the Procedure presented in this section.

402.4 RESPONSIBILITIES

The responsibilities of the key staff in the performance of detailed checking of specifications and performing QA/QC functions shall be described in this section.

402.5 PROCEDURE

A detailed procedure for checking specifications shall be defined in this section.

QP 403: Review of Studies, Reports, Other Design Documents

Rev , Date

403.1 PURPOSE

This section shall describe the guidelines for review of documents other than engineering drawings and calculations.

403.2 SCOPE

This section shall cover the review procedure that will be applied for the review of all studies, technical reports, technical memoranda, or procedures contractually required to be provided to the Department.

403.3 RESPONSIBILITIES

The responsibilities of the key staff in the performance of detailed review of studies, reports, other design documents and performing QA/QC functions shall be described in this section.

403.4 PROCEDURE

A detailed procedure for checking of all studies, technical reports and technical memoranda shall be presented in this section.

QP 404: Detailed Checking – Structural Design Plans and Calculations

Rev , Date

404.1 PURPOSE

This section shall describe the standards and procedures for an independent analysis (if required in the RFP or proposed by the DB) and for checking of bridge design calculations and for performing a design check of structural drawings.

404.2 SCOPE

This section shall explain in detail how the review of the structural design of major structures prepared by the Design Manager for Structures will be performed.

404.3 RESPONSIBILITIES

The responsibilities of the key staff in the performance of detailed review and checking of structural design plans and calculations shall be described in this section.

404.4 PROCEDURE

A detailed step-by-step procedure for checking structural design plans and calculations shall be defined in this section.

QP 405: Detailed Checking of Computer Program Input

Rev , Date

405.1 PURPOSE

To provide for systematic checking of computerized design calculations to minimize the possibility of input errors.

405.2 SCOPE

This section shall explain the scope of the procedure to be used for checking input to software programs.

405.3 RESPONSIBILITIES

The responsibilities of the key staff in the performance of detailed checking of computer program input shall be described in this section.

405.4 PROCEDURE

A detailed step-by-step procedure for checking computer program input shall be defined in this section.

QP 406: Review of Shop Drawings

Rev , Date

406.1 PURPOSE

This section shall describe the scope, responsibilities, and procedures for processing shop drawings, submittals for review and approval.

406.2 RESPONSIBILITIES

The responsibilities of the key staff in the performance of shop drawing review shall be described in this section.

406.3 PROCEDURES

A detailed step-by-step procedure for checking shop drawings shall be described in this section.

QP 407: Inspection and Testing

Rev , Date

407.1 PURPOSE

This section will describe how inspection of the work and testing of materials is performed on site. It will also describe record keeping procedures and how document version control is managed.

407.2 PLANNING AND EXECUTION

This section shall describe the procedures for inspection and testing efforts. A flowchart indicating the various steps in this process shall be included. The process shall describe and include personnel certification requirements, specification and procedural references and indicate the standard forms associated with the anticipated construction QC inspection, sampling and testing activities for the project.

407.3 INSPECTION AND TESTING RECORDS

This section shall include a description of how documents are archived, disseminated and maintained by the DB Team. Department forms and procedures for Inspection and Testing shall be used.

QP 500: **Requests for Information**

Rev , Date

500.1 PURPOSE

This section shall describe the process that will be used to address Requests for Information (RFIs) or clarifications to Released for Construction documents requested by the Contractor or the Department.

500.2 SCOPE

This section shall define the interaction between the Department, Contractor, and Designer when a request for information or clarification to RFC documents is required.

500.3 RESPONSIBILITIES

The responsibilities of the key staff in responding to RFI's shall be described in this section.

500.4 PROCEDURE

A detailed procedure for responding to RFI's shall be described in this section.

QP 501: Notice of Design Change

Rev , Date

501.1 PURPOSE

This section shall describe the procedure for revising plan sheets which were previously issued as 'Released for Construction (RFC)'. This procedure applies to design changes that are identified by the Designer only.

501.2 SCOPE

During the course of construction, it may become necessary to revise RFC plans due to changes in design progress, a conflict between design elements, or discovery of a design error. This section shall describe how these changes are executed.

501.3 RESPONSIBILITIES

The responsibilities of the key staff in processing NDC's shall be described in this section.

501.4 PROCEDURE

A detailed procedure for processing NDC's shall be described in this section. This section shall also describe how RFC drawings are revised, how revisions are tracked and how the changes are relayed to the field.

QP 502: Quality Control Oversight

Rev , Date

502.1 PURPOSE

This section shall indicate how the DB team will perform Quality Control oversight during design and construction. The Design-Builder shall explain in this section how the QC Oversight will ensure that the QC methods being used on the project are effectively providing a high standard of quality in the design and the construction.

This section will also describe how the Audits are documented, tracked, archived and sent to the Department. Measures to eliminate deficiencies are to be included in the documentation as well as follow-up to ensure that deficiencies have been corrected.

502.2 RESPONSIBILITIES

The responsibilities of the Quality Manager assigned to perform Oversight of the QC functions to ensure that the QC Plan is being adhered to shall be described in this section. This section shall describe the method, frequency and documentation of QC Audits. It shall also describe the process for tracking and resolving non-conformances of the QC Plan and process.

502.3 INDEPENDENT SAMPLING AND TESTING ASSURANCE

This section shall describe the method, frequency and documentation of Oversight sampling and testing. It shall also describe the process for tracking and resolving non-conformances of the QC Plan and process.

502.4 QUALITY CHECK POINTS

Quality check points shall be identified in this section. A description of documentation associated with QCPs shall be included.

502.5 SCHEDULING AND NOTICES TO THE DB TEAM

This section describes the manner and timing of notifications to the Quality Manager of upcoming construction work so that the QC work is properly coordinated.

QP 503: Non-Conformance Reports

Rev , Date

503.1 PURPOSE

This section shall indicate how the DB team will ensure that Non-Conformance Reports (NCR's) will be addressed properly, who is the responsible key staff for the disposition of NCR's and how the QC Plan will be revised and updated as needed to prevent re-occurrences of non-conformances.

This section shall also describe how NCR's are documented, tracked, archived and sent to the Department. Measures to eliminate non-conformances are to be included in the documentation as well as follow-up indicating the disposition of each occurrence.

503.2 RESPONSIBILITIES

The responsibilities of the Quality Manager assigned to addressing NCR's shall be described in this section. It shall also describe the process for tracking and resolving non-conformances in the design and in construction.

503.3 CORRECTIVE AND PREVENTIVE ACTION

This section shall describe the procedure that the Design-Builder will implement to document, address and track corrective and preventive actions. A determination of the cause for the non-conformance shall be documented.

NCR's may be the result on internal (design-builder) or external (Department) audits, inspections or reviews. Once the cause of the NCR has been determined, specific corrective and preventive actions shall be listed. This section shall explain how the DB team will determine the cause and the degree of corrective/preventive action to be used for every issue. It shall also explain the manner in which the proposed action is reviewed and approved by the Quality Manager.

I-81 VIADUCT PROJECT - PHASE 1, CONTRACT 2

PIN 3501.91, Contract D900056

DB CONTRACT DOCUMENTS

PART 3
APPENDIX D

QUALITY ASSURANCE PLAN PROGRAM GUIDE

Final November 4, 2022

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Quality Assurance Plan Program Guide
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SECTION 1 OVERVIEW

The primary objectives of this guide are to:

- Provide consistency and practical guidance in the Design-Build Quality Assurance Program implementation processes on NYSDOT Design-Build projects;
- Outline the processes for reviewing and accepting the Design-Builder's Quality Control Plan for control of design and construction activities; and
- Define expected Department oversight staffing and resources needs as well as define the specific roles, responsibilities and procedures for design and construction oversight; inclusive of Design Reviews, Construction Inspection, Material Acceptance that incorporates Department QA actions, verification sampling and testing, dispute resolution, and Independent Assurance Sampling and Testing requirements progressed during construction to aid in the final acceptance process of the project.

This Quality Assurance Plan Program Guide is intended to outline the Departments roles and responsibilities to provide stewardship and Design/Construction oversight for all sizes and types of Design-Build Projects. This Guide, is meant to dovetail with the Design-Builder's Quality Control Plan (ref. Part 3, Section 4). Taken together, they form the Quality Control/Assurance Program for the Project. Once the Design-Builder's QC Plan is approved the Department may develop a more tailored Project Specific Quality Assurance Plan; thereby, clearly assigning appropriate levels of Department Oversight.

In conforming to these minimum requirements, the Design-Builder shall satisfy both State and Federal design and construction quality requirements (Ref. 23CFR637).

This Guide's primary purpose is to define the Department's Project level oversight for design and construction. The Guide should provide further insight into the Department's Oversight and Verification activities that will aid the Design-Builder in the preparation of an acceptable QC Plan (reference: Part 3, Sections 4, 5, and 6). The Design Builder's Quality Control Plan should define a series of business processes that articulate the Design-Builder's approach to design and construction quality management, quality procedures, records keeping and document management and control that the Design-Builder shall adhere to throughout the duration of the Project. The QC Plan should describe the reporting and documentation processes and should outline appropriate responsibilities of the Design-Builder's organization that will implement the QC Plan. The QC Plan should integrate Design QC and Construction QC procedures and processes.

1.1 BACKGROUND

On traditional NYSDOT Design-Bid-Build (DBB) projects, the acceptance decision strictly utilizes the Departments (QA)sampling and testing results based upon various specification requirements, Material Methods, Material Procedures, the Material Inspection Manual (MIM), Control of Granular Materials Procedures, the Construction Inspection Manual (CIM), Manual of Uniform Record Keeping (MURK), and other Department requirements. This method of acceptance encompasses all of NYSDOT's traditional DBB projects; whereby, the Department, or its agents, performs QA sampling and testing to form the final material acceptance. Since all the data that went into the acceptance decision was solely the Departments (QA) data, and did

not incorporate Contractor's QC data, there was no need for verification sampling and testing of the QC data. On Design-Build Projects, however, where sufficient volumes of material and the frequency of both QC and QA testing allows, NYSDOT has chosen to incorporate the Design-Builders Quality Control (QC) sampling and testing data into the acceptance decision; thereby, transferring more responsibility onto the Design Builders QC program. Since the Design-Builder's QC sampling and testing is used as part of the acceptance decision, the Code of Federal Regulations (CFR) requires verification of the Design-Builder's sampling and testing results by the Department, or its agents. The use of Design-Builder test results as part of the acceptance decision should be carefully evaluated for each project because a significant Department owner verification program is instrumental to the project's success. Should, due to the size and complexity of the project, volumes of material and respective frequencies of QC and QA testing prohibit the use of a verification program (i.e., the inability to run statistical validation for Risk Factor 1 materials), then material acceptance will be based upon NYSDOT's QA test results under Risk Factor 1 – Low Volume, RF-1 (LV).

1.2 FHWA REQUIREMENTS

FHWA's sampling and testing regulation titled "Quality Assurance Procedures for Construction" was published on June 29, 1995 as Title 23, Code of Federal Regulations, Part 637, (henceforth referred to as the CFR). This regulation permits the use of Design-Builder test results in the acceptance decision, "provided that adequate checks and balances are in place to protect the public investment." The purpose of the CFR is, "to prescribe policies, procedures, and guidelines to ensure the quality of materials and construction in all federally-aided highway projects on the National Highway System." FHWA provided guidance and recommendations for the use and validation of Design-Build test results in the acceptance decision, recommended quality measures, and identified Design-Builder / Department risks in FHWA Technical Advisory T 6120.3, issued on August 9, 2004. FHWA later issued a non-regulatory supplement, NS 23 CFR 637B, on July 19, 2006 to provide additional guidance. Lastly, FHWA issues Technical Advisory HRT-12-039, in April of 2012, to further explain QC and QA requirements.

The four documents cited above are available at the following links:

- 23 CFR 637B: http://www.access.gpo.gov/nara/cfr/waisidx_03/23cfr637_03.html ;
- TA T 6120.3: http://www.fhwa.dot.gov/construction/t61203.cfm ;
- NS 23 CFR 637B: http://www.fhwa.dot.gov/legsregs/directives/fapg/0637bsup.htm ; and
- HRT-12-039: http://www.fhwa.dot.gov/publications/research/infrastructure/12039/12039.pdf

The following are key points from the CFR, technical advisory, and non-regulatory supplement as it pertains to the use of Design-Builder test results in the acceptance decision.

1. Quality Assurance Program. Each State Highway Agency (SHA) must develop a quality assurance program that will assure materials and workmanship incorporated into each federally-aided highway construction project on the national highway system is in conformity with the requirements of the approved plans and specifications, including approved changes. The program must meet the criteria in 23 CFR 637.207 and be approved by FHWA. Each SHA's quality assurance program shall provide for an acceptance program and an independent assurance (IA) program.

2. Independent Assurance Program. The Design-Builder's QC Material Testing Technicians and the owner verification sampling and testing Material Testing Inspectors are evaluated by an independent assurance (IA) program. The program is focused on evaluating Material Acceptance Technicians/Inspectors sampling and testing procedural techniques and proper use and calibration of testing equipment to insure that it complies with accepted test methods. The program is administered by the Department, with a goal of conducting one IA inspection per material acceptance inspection technician per year. The IA inspection may cover a variety of test methods used in the acceptance decision.

3. Acceptance Program. The Design Builders' Quality Control sampling and testing results may be used as part of the acceptance decision provided that:

- The sampling and testing has been performed by qualified laboratories, using qualified sampling and testing personnel.
- The quality of the material has been validated by verification of the testing and sampling. The verification sampling will be performed on samples taken independently of the quality acceptance samples.
- An IA program will evaluate the quality control sampling and testing.

4. Verification Sampling and Testing. The verification sampling and testing are to be performed using random independent test samples taken by qualified testing personnel employed by the SHA or its designated agent, excluding the Design-Builder and vendor.

5. Dispute Resolution System. If the results from the quality control (QC) sampling and testing are used in the acceptance program, the SHA must establish a dispute resolution system. The dispute resolution system provides a process to resolve discrepancies occurring between the Departments QA verification sampling and testing and the Design Builders quality control acceptance sampling and testing. The dispute resolution system may be administered entirely within the SHA, or by a third party.

6. Random Samples. All results used for Acceptance (QA and QC when verification is required), sampling, and testing must be obtained from random sample points.

Information contained in FHWA Technical Advisory T 6120.3 (link shown above) supersedes earlier FHWA direction and stands as the most current guidance on this subject matter. The advisory discusses the use of Design-Builder tests results for acceptance purposes, the requirements for verification sampling and testing, and statistical validation procedures on random-independent samples. In the discussion on validation procedures performed on independent samples, the Technical Advisory recommends the use of the statistical tools such as the F-test and t-test because, "they have more power to detect actual differences." More information on statistical procedures can be found in course material for National Highway Institute (NHI) Course No. 134042, other FHWA publications, or regular statistics textbooks or handbooks. A review of current state construction Design-Build QA programs can be found in NCHRP Synthesis 346.

1.3 GENERAL APPROACH TO QUALITY

In accordance with Part 3, Section 4, the Design-Builder must develop and submit a Quality Control Plan for Department approval within 30 days of Notice to Proceed. This Plan

encompasses QC activities and procedures for both design and construction operations. Included in the Quality Control Plan are all the personnel, management, organizational functions and responsibilities, documentation control, and records that will be used to control and ensure the appropriate project quality. This plan further addresses the specific design QC and construction QC oversight as required in Part 3, Section 5 and 6 respectively. Tied to the QC operations established by the Design-Builder and approved by the Department, are the design and construction oversight actions of this Guide that define the Department's roles, responsibilities and procedures.

Under Design-Build, the Contract places the responsibility and liability for the design and construction of the Project with the Design-Builder. The Design-Builder must follow the terms of the Contract documents and fulfil its responsibilities as outlined therein for the design and construction of the Project. The Department does not need – and is not obligated – to review all Project documents or construction operations to ensure that the Design-Builder is meeting its contractual obligations because the Design-Builder is responsible for following the terms of the Contract, conducting QC, monitoring and inspecting all the Work, and producing the agreed-upon deliverables according to the schedule and cost outlined in the executed Contract. The Design-Build approach is very different from traditional design-bid-build (DBB) method of project delivery, whereby a Department pays a contractor to build an asset, and the owner retains a significant role in controlling and approving the means, methods and materials used by the DBB contractor, approving design changes, inspecting the project during construction, performing QC and QA, and accepting the work at the end of construction. For a Design-Build Project, it is important that the Department's staff are aware of the Design-Builder's and the Department's respective roles and responsibilities. This Guide is intended to assist them in this regard.

The spirit of a Design-Build methodology is that the Department provides the Design-Builder flexibility to determine the best means and methods by which to comply with the requirements of the Contract Documents. The Departments responsibility in formulating acceptance decisions, is to conduct audits and inspections, as necessary, to determine whether the Design-Builder is following the processes defined, whether the Contract requirements have been met or not, and to communicate to the Design-Builder instances of non-compliance. The Department, however, is not obliged to suggest – and should refrain from suggesting – to the Design-Builder any approach to achieve compliance with the requirements of the Contract Documents.

It is important for the Department to follow the established Contract processes when providing oversight and to perform oversight without prescribing the means and methods by which the Design-Builder is to produce the deliverables. Department staff should refrain from directing the Design-Builders operations, unless it is a matter of safety, or providing an "acceptance or rejection" and simply audit the Work and offer comments. If necessary the Department should issue Non-conformance Reports.

The Quality Assurance Program (QAP) for Design-Build projects consists of the use of Qualified/Certified Inspection Technicians, Qualified Material Testing Laboratories, the Design-Builders Quality Control (QC) program, the Department's Acceptance (QA program) that is based upon either random independent sampling and testing and/or the incorporation of QC sampling and test data once verified, and the Independent Assurance Sampling and Testing Program (IA).

The purpose of this guide is to provide statewide consistency and a programmatic approach to Design and Construction Oversight for Design-Build projects. It addresses Design Review procedures as well as materials and construction procedures for QA oversight including when

and where the Design-Builder's test results are used in the acceptance decision, regardless of how the project is funded. It clarifies federal requirements relating to QA and verification procedures related to owner verification. Any modification to the QAPPG requires review and approval by NYSDOT and FHWA.

For Construction Material Acceptance, when the Design Builder's QC test data is used in the acceptance decision, as inspected per the recommended frequency established Part 3, Appendix D – Attachment 1, NYSDOT is required to perform verification testing to verify and sometimes statistically validate the test data used by the Design-Builder. When the Design Builder's QC test data is not used in the acceptance decision, NYSDOT will follow the prescribed recommended minimum testing frequencies as defined for RF-1 (LV), RF-2, and RF-3 materials.

To avoid the appearance of a conflict of interest, any (non-State DOT) qualified laboratory will perform only one of the following types of testing on the same project:

- QC testing,
- QA testing,
- Verification testing for the owner,
- IA testing, or
- Referee testing.

SECTION 2 QUALITY SYSTEM / QUALITY CONTROL PLAN REQUIREMENTS

The Design-Builder is required to develop a Quality Control Plan for the Project and submit it to the Department for approval in accordance with Part 3, Section 4. The Design-Builder's Quality Control Plan is required to describe in detail the Quality System to be implemented by the Design-Builder's organization at all levels, and describe all QC processes and procedures. Essentially, the Quality Control Plan will cover all aspects of all services rendered by the Design-Builder, materials supplied, design and construction activities, environmental compliance, health and safety, and all other works performed, including temporary works and materials which might influence the quality of the permanent works.

The Contract requirements stipulate that the Design-Builder is required to employ an independent Professional Engineering Firm to undertake QC Construction Inspection of the Design-Builder's construction of the project (see Part 3, Section 5).

The Design-Builder is required, in accordance with Part 3, Section 4.1, to submit its Quality Control Plan to the Department for approval within 30 days of Notice-To-Proceed. The Design-Builder's Quality Control Plan shall be developed in accordance with the requirements of Part 3, Section 4 and shall describe the Quality System to be implemented at all levels of the Design-Builder's organization, (including design and construction Subcontractors), and shall describe all QC processes and procedures. The Department's required format for the Quality Control Plan, describing various sections / heading and descriptions of details for each section will be provided to the Design-Builder so that every Quality Control Plan is consistent and easier for Department staff to review and understand.

As per the requirements of Part 3, Section 4.1, the Quality Control Plan is required to be developed to reflect a minimum level of inspection and documentation consistent with sampling and testing frequencies found in NYSDOT Manuals (*Contract Administration Manual, Materials Inspection Manual and Construction Inspection Manual*).

The Department will review, and approve the Design-Builder's Quality Control Plan. Thereafter, the Department will audit the procedures outlined in the Quality Control Plan and conduct oversight activities to ensure the Design-Builder's design and construction work and/ or other activities are in compliance with the defined Quality Control Plan procedures and the Contract Requirements.

The Department's Project Manager will direct a member or members of the Department's staff to be responsible for reviewing the Design-Builder's Quality Control Plan and all revisions to same as the work progresses. The review may require consultation with multiple disciplines within the Department to insure that proper procedures and processes are being proposed. The responsible reviewer should make a recommendation to the Department's Project Manager to approve the DB Quality Control Plan as is, or provide recommended improvements. The Department's Project Manager will formally relay the approval/comments back to the Design-Builder in a timely fashion. Unless otherwise stated in the contract documents, the maximum turnaround time for this review is 28 calendar days from the date of receipt of the Quality Control Plan.

On receipt of the Design-Builder's Quality Control Plan, the Department's responsible person(s) appointed by the Department's Project Manager shall review the Quality Control Plan to ensure that:

- It is developed from, and consistent with, the Initial Quality Control Plan that was submitted as part of the Design-Builder's Technical Proposal at RFP stage.

- The Quality Control Plan follows a prescribed Department outline.

- The Quality Control Plan clearly articulates the processes and procedures the Design-Builder's staff will follow in executing an activity.

- The Quality Control Plan for the Design and Construction Phase is consistent with the Initial Quality Control Plan and expanded accordingly in accordance with the Contract Requirements, and in particular the requirements as outlined in Part 3, Section 4.

- The Quality Control procedures for Design and Construction are coordinated and compatible with each other.

- It adheres to the requirements as outlined in Part 3, Section 4.

The Design-Builder is required to update the Quality Control Plan throughout the Project duration to reflect current or changed conditions as the Works progress. Each such revision is required to be submitted to the Department's Project Manager for approval within 30 days of the identification of a need for a revision (Part 3, Section 4.2.3.2). Each revision of the Quality Control Plan may be similarly reviewed by the Department. The responsible people performing reviews will preferably include staff with Design and Construction experience.

SECTION 3 DESIGN MANAGEMENT AND DESIGN QUALITY ASSURANCE

The Department's representative, the Design Quality Assurance Engineer (DQAE), will provide continuous design oversight throughout the Project. See Sections 3.1 through 3.6 for a discussion of the Department's design oversight activities.

Design will not be considered complete until all As-built Plans have been reviewed and approved by the Department.

The Department and the Design-Builder will meet and mutually agree on the schedule of Design Reviews. The initial schedule will be verified and modified by mutual consent during the course of the Contract. The Design-Builder is required to give the DQAE at least one week's notice prior to any Design Review.

3.1 GENERAL

The contractual requirements for design management and Design QC are the primary responsibility of the Design-Builder rather than the Department and are presented in Part 3, Section 5. The following sections, based on Part 3, Section 5, highlight the Department's Design QA activities.

The Design-Builder is required to identify Design Units, those components of the Project that will be produced as an integral, but independent, component of the Project. A Design Unit will have a single "responsible engineer" who will direct and sign off on the final design of that component. Within 30 days of NTP, the Design Builder shall provide a written report identifying each Design Unit. The report shall include the Design Unit description and the planned review stages and dates, including specific information to be reviewed. (Ref. Part 3, Section 5.2 Design Units)

For example, a Design Unit may be any of the following:

- A bridge;
- A section of roadway;
- A retaining structure;
- Certain Utility Relocations; or
- Work Zone Traffic Control.

The identification of Design Units is intended to facilitate scheduling of Department participation in the design and Design Review processes.

The stages of design development are designated as follows:

- Definitive Design - The stage of design development where design concepts and parameters are established that will be followed through to completion of the Project;
- Release for Construction - The stage of design development after Final Design where the

Design Plans and Project Specifications for a Design Unit or a component thereof are 100% complete and satisfy the requirements of Part 3, Section 5;

- Interim design - The stage of design development after Definitive Design where the Design Plans and Project Specifications for a Design Unit are at the 60% to 80% stage of completion;

- Final design - The stage of design development, after Interim Design, at which time the Design Plans and Project Specifications for a Design Unit are 100% complete;

- Working Plans, which includes working drawings, shop drawings, fabrication drawings, and similar documents that provide more specific construction detail; and

- As-built design, the plans and specifications that actually represent the as-constructed project.

Typically "Design Acceptance" by the Department will not take place until the As-built Plans have been reviewed and approved; however, the Department has a responsibility to review and comment on the proposed design.

During the course of the Department's participation in design reviews, Department representatives will be careful about offering, suggesting, or ordering solutions to design problems. The Department may offer or suggest possible solutions to the Design-Builder with the express provision that the Design-Builder is not bound to accept the suggestion. Department comments during the review process should focus on whether or not the proposed solution or process meets the contract requirements as specified.

3.2 DESIGN WORKSHOP

As noted in Section Part 3, Section 5.11.1, within 10 days of NTP, the Design-Builder will arrange a design workshop to familiarize the Designer's personnel and the Department (and Stakeholders, if invited by the Department) review personnel with the design concepts, issues, status, and review procedures.

The Department and Design-Builder will jointly develop the agenda of the workshop and how it will be organized (i.e., by Design Unit and engineering discipline). The intent of the workshop is to make the subsequent Design Reviews more effective and efficient for all parties. The workshop will focus on a review of the critical design elements and criteria and on how the Designer plans to organize its design and conduct the reviews.

The Design-Builder is responsible for scheduling and conducting Design Reviews with the Department to meet design and/or construction needs of the Baseline Project Schedule. The Design Review process and frequency, duration, and intensity of Design Reviews will vary with the complexity of the individual Design Units and the associated construction activities. The Design-Builder shall include the agreed Design Review schedule for all Design Units as part of the Baseline Project Schedule. The agenda will include developing agreements regarding time for design reviews (see Part 3, Section 5.9). The duration of Design Reviews will be discussed and mutually agreed between the Department and Design-Builder during the Design Workshop and verified and modified by mutual agreement during the course of the Project. The Design-Builder will give written notice of scheduled Design-Reviews to the DQAE at least one week

prior to any review.

Department participation in design task force or discipline meetings should be discussed to facilitate the "over-the-shoulder" (Oversight) Design Review process. The roles and relationships of the Designer and Department staffs should be discussed and documented, including desired lines of communication (Reference Part 3, Section 5).

The interaction between Designer and Department staff will be continuous throughout the design process through the "over-the shoulder" reviews that typically would consist of activities, such as:

- Participating in design meetings;
- Responding to design requests for information or clarification; and/or
- Auditing the design QC process and records.

Designer/Department contact will not be limited to Design Review periods as success of the DB project may be jeopardized.

Design Plan and Project Specification reviews and reviews of other Design documents will take place as scheduled by the Design-Builder to meet its design and construction schedule.

All agreements and understandings reached during the design workshop will be documented in writing and agreed to by the Design-Builder's Project Manager and the Department's Project Manager.

3.3 DEPARTMENT'S ROLE AND DESIGN QUALITY ASSURANCE

The Department's project staff oversight role during design and Design Review will consist of monitoring and auditing design progress, interpreting contract requirements, and verifying design compliance with Contract requirements.

The Department's oversight roles and activities relating to design will include, but not be limited to, the following:

- Assisting in providing interpretation and answers regarding Contract requirements on a "real time" basis, often on a daily basis (such involvement is often referred to as "over-the-shoulder" review). By having continuous contact during the design process, the Department staff should face no "surprises" during the Design Reviews. Department staff should know how the design is progressing and be fully informed of the issues;
- Providing input and participation in the review process as agreed during the design workshop;
- Verifying that the design meets the overall Contract requirements, inclusive of any environmental mitigation commitments as defined during the NEPA process and included in the overall Contract requirements. The Department's participation in Design Reviews will not usually involve detailed checks of plans and calculations, except in special cases;
- Verifying through audits of design QC process and associated records that the Design-

Builder's Design Quality Control Engineer (DQCE) is fulfilling his/her responsibilities and that the design quality procedures contained in the Quality Control Plan are being followed. An audit may include detailed checks of plans and calculations in some cases;

- Verifying Design-Builder's progress for payment purposes; and
- Providing consultation and written comment at the successful completion of each Design Review.

The DQAE and other participants in design reviews will record their comments on Form DR (Design Review Comments).

The DQAE should record daily activities and observations on Form MURK 2b (DB-DQAE) (Exhibit V – Forms for Department Use).

During the design process, the Departments' Oversight consists of two distinct elements:

- Auditing the Design-Builder's Quality Control Plan Processes and Procedures; and
- Participation in the Design Review Process.

Categorization of Levels of Review

The level of review undertaken by the Department personnel will be tailored to the complexity, importance and level of risk of the Design Unit in question and will therefore be based on the Design Builder's Design Unit Schedule as submitted with his proposal and finalized within 30 days of NTP.

Appropriate levels of review will be determined by the DQAE after a review of the Design-Builder's Design Unit Listing.

In addition to the design "over the shoulder" review the following oversight approach will be followed:

Level 1 Review. Design packages of particular importance/complexity and risk – (Work Zone Traffic Control, Bridge Foundations, etc) shall be subject to a Level 1 Review. Initially, a minimum of 10% sample rate frequency of important and/or complex design packages submitted shall be applied potentially reducing to a 5 % sample rate when satisfactory compliance has been demonstrated. Conversely, should compliance not be demonstrated satisfactorily, the sample rate will be increased. A 20% sample rate is proposed for a number of design elements.

For Level 1 Reviews:

- Check all items as required under a Level 3 review; and
- Also conduct a full detailed review (inclusive of independent calculations, assumptions, etc) of the design to be carried out to examine full compliance with the Contract.

Level 2 Review. These reviews involve design submissions that involve aspects that could involve public safety or public perception significance (e.g. bridge main span, rail interface,

general road alignment, junction layouts, etc.) will be subject to a Level 2 review.

For Level 2 Reviews:

- Check all items as required under Level 3 review, and:
- Provide a focused review on just those identified limited number of critical public safety/public perception design elements

Level 3 Review. All design submission shall be subject to Level 3 Review.

For Level 3 Reviews:

- Check that all documents are provided;
- Check all certificates have been signed;
- Check the concepts appear correct and is consistent with the Definitive Design
- On a page/drawing turn basis, check if the design appears to comply with the Contract Requirements; and
- Check for obvious deficiencies.

On completing a review of Design documents, the Department may respond using one of two forms: Form DR (for comments) or Form NC-D (for non-conformances). The Design Builder is obligated to address these comments in consultation with the Department (Part 3, Section 5.8.5). The resolution of all comments and NC-D is tracked through the Design Builder's Quality System.

3.4 DESIGN REVIEWS

Design Reviews will be conducted at each of the following stages of design development:

- Working Plans
- Definitive Design
- Interim Design
- Final Design
- Release for Construction
- Design Changes
- As-built Plans

The Design-Builder's DQCE is responsible for conducting the Design Reviews with Department and Stakeholder participation, except for the As-built reviews. The review of As-built Plans will be performed by the Department with Design-Builder participation. FHWA participation can be

expected in all Federal Aid funded projects “as-built” design reviews. Design Reviews are also required for all design changes that occur during design and/or construction.

Design Reviews are normally conducted in the offices of the Designer or Design-Builder. Design Reviews do not consist of packaging formal submittal documents and sending them off to Department offices for formal written reviews. If assistance from other Regions, the Department’s main office, or Stakeholder staff is required for a review, the Department project staff will invite them to participate in the review.

The Department may wish to participate in the review of Working Plans, but will not actually review and approve them.

The Department’s DQAE may provide Consultation and Written Comment on the design product before the design is released for construction. This Consultation and Written Comment does not constitute approval of the design. Design acceptance will not be given until the end of the Project after all As-built Plans have been reviewed and accepted.

3.5 NEGOTIATION OF ORDERS-ON-CONTRACT THAT INCLUDE DESIGN

The Department’s DQAE will be involved in the negotiation of Orders-on-Contract that include design work. Design costs must be negotiated separately.

3.6 DESIGN FORCE ACCOUNT WORK

The DQAE will be responsible for verifying the work involved in design Force Account Work and for signing-off on the Design-Builder’s design Force Account records on a daily basis. The actual mechanics of how this will be done will be covered in the initial design workshop or as part of the negotiation for extra work. Force Account records for design will be kept separate from construction Force Account records because different criteria apply.

SECTION 4 CONSTRUCTION MANAGEMENT AND CONSTRUCTION QUALITY ASSURANCE

4.1 GENERAL

As described above, Quality Assurance consists of those actions performed by the Department to verify the Design-Builder's Quality Control Plan is being adhered to, that the Contract requirements are met and that all Department standards are met. On Design-Build projects the Department representatives are conducting two functions; one is to ensure that the Design-Builder is following the QC Plan procedures, and the second is to verify workmanship and when applicable the Design Builder's QC material testing data.

The Design-Builder is responsible through the Construction Quality Control Engineer to determine acceptability of materials for use and that proper construction practices are employed. Typically, adherence to Department approved materials requirements with appropriate sampling and testing methods and frequencies following Department procedures is expected. The Construction QC Engineer should also perform inspection of construction operations and progress documentation following MURK procedures, unless defined otherwise in the Quality Control Plan.

The Department's QA process confirms both the Design-Builders adherence to the Quality Control Plan and bases material acceptance through either verification of QC data or QA acceptance, so that when the project is complete, final acceptance can be made with reasonable assurance that materials are acceptable and that construction procedures were progressed in a manner to assure the long term durability and performance of the project.

The following listing of activities is an overview of the Department's Construction Quality Assurance Engineer's oversight roles and activities relating to construction Quality Assurance of the Project. Refer to Part 3 Sections 5 and 6 and Part 3 Appendix D – Attachment 1 for more details regarding the Department's role in Construction Quality Assurance.

- Verifying that current stamped and signed Design Plans and Project Specifications are on-site;

- Confirming that the Design-Builder's Construction QC staff:

  1) have the specified qualifications, licenses, and/or certifications;

  2) are present to observe and control the work;

  3) are performing their duties in accordance with contract requirements, specifically those specified in Part 3, Section 6; and

  4) are conducting sampling and testing of materials at the proper frequencies.

- Confirming if differing site conditions and/or significant changes in the character of the work occur;

- Verifying progress, reviewing and approving payment requests. At a minimum a report comparing all QC and QA material tests to acceptable contract tolerances, with sign-off from CQAE will be attached to each payment DWR. Test results and certifications (Status B

report) in D contract will be acceptable prior to payment;

- Auditing the Design-Builder's construction QC records to verify that the Design-Builder is maintaining quality and is performing its QC responsibilities, and , if necessary, issuing Non-Conformance Reports for the Design-Builder to conform to the Quality Control Plan and to make corrections and preventive actions;

- Verifying records of Force Account Work. The Design-Builder will be responsible for maintaining the Force Account records, but the Department's staff will spot-check the labor, equipment, and materials being used;

- Spot-checking measurements of any work paid on the basis of quantities and Unit Prices;

- Auditing safety and security records and checking of the qualifications of safety and security personnel;

- Spot-checking for compliance with Design Plans and Project Specifications, conducting either verification (QA) sampling and testing and comparing Department's CQAE records with the Design-Builder's construction QC Inspection results, or QA acceptance sampling and testing;

- Reviewing and spot-checking Design-Builder's Work Zone Traffic Control activities and installations;

- Participating in release for construction Design Reviews and reviews of Work Plans;

- Participating in the reviews of As-built Plans;

- Ensuring the Design-Builder is complying with the QC plan processes and procedures;

- Assisting the Design-Builder in coordinating with appropriate State or federal agencies should unknown, unidentified Hazardous Materials be encountered;

- Spot-checking the Design-Builder's QC Inspectors' records for the remediation of Hazardous Materials;

- Performing Construction QA and testing of materials to either verify the Design-Builder's QC materials test data or accept materials based on QA test data. All QA tests will be assigned to work items in the SiteManager Q contract;

- Coordinate with NYSDOT Regional IAST Staff to ensure that appropriate project staff get IA inspected;

- Monitoring Design-Builder's Utility Relocations and installations; and

- Verifying qualifications of Design-Builder's environmental staff, spot-checking of Design-Builder's compliance with environmental requirements; and, auditing of Design-Builder's environmental monitoring records.

The level of effort of verification by the Department both for materials and construction practices

is dependent on risk. Risk is informally evaluated for impacts to long-term performance, impacts to operational and maintenance cost over the service life of the project, and public safety and perception regarding premature distresses and/or failures of the construction materials in question. The Design-Builder assumes the risk and progresses work accordingly. This risk can be managed by utilizing Department Approved materials and sources lists, and appropriate QC testing methods. It is the Department's role to verify materials acceptability and test results when applicable, assure compliance with construction procedure requirements and resultant workmanship, and perform IAST to assure testing is performed correctly.

On Design-Build projects the Department is still responsible for the acceptance; however, when material volumes and test frequencies warrant, the risk is shifted towards the Design-Builder as the Department incorporates verified QC data and processes into the acceptance decision. Verification is the process of assuring specific products incorporated into this Project and procedures used are acceptable. Material acceptance that incorporates the Design-Builder's QC data requires a higher frequency of QC testing and an abbreviated frequency of QA verification testing than traditional Design-Bid-Build Projects. The frequency of Verification (QA) testing is categorized by the Department into one of three risk factors that is dependent upon the long-term performance risk associated with the material and its use.

The fundamental principle behind using a three-tiered approach is to assign the appropriate level of resources to monitor and evaluate each item of work based on the Department's risk. In general, the higher the risk associated with the long-term performance of the material and the higher usage on a project the greater frequency level of inspection and verification used in the acceptance decision.

Detailed descriptions of each risk factor level are defined in Part 3, Appendix D and specific details for each item's QA practices are provided.

4.2 MATERIAL SAMPLING, VERIFICATION TESTING & INSPECTION:

The recommended risk factor verification levels, specific test criteria, and frequency of testing are defined in Part 3, Appendix D – Attachment 1. These are default values for Standard Specification items. For other materials, or where quantities may be significant, the CQAE should assign or revise the appropriate risk factor verification level during the development of the Project Specific Quality Assurance Plan to provide an accurate level of verification.

4.3 VERIFICATION SAMPLING & TESTING

When there is sufficient quantity of QC and QA test data for a given RF-1 material, the Department shall use a statistically sound process to compare the Design-Builder's QC test results with those obtained by the Department, and then decide whether the results are statistically valid. The specific verification procedures will vary by material but the following is an abbreviated step by step procedure to familiarize the reader with the process:

1. The Design Builder shall submit a list of RF-1 items and estimated quantities to the Departments PM, with its Quality Control Plan within 30 Days of NTP to facilitate the decision making regarding the items of work that provide an opportunity for statistical verification & testing of materials by the CQAE engineer and its QA team. The objective of the verification testing process is to validate and confirm if the Design Builder's QC data came from the same population as the Departments Verification test data. The statistical process can help to identify discrepancies in the overall material, process,

sampling, and testing processes. Verification testing should be conducted using random independent samples.

2. Verification testing will be undertaken using sampling and testing equipment that was not used for QC testing.

3. It is anticipated that the results of the verification testing will be made available to the Design Builder.

4. The results of the Design Builder's QC test results and the Departments QA verification tests are compared. A statistical hypothesis test is carried out to analyze whether the Design Builder's test and the Department's tests are from the same population; i.e. the means of the two data sets are equal and the variances are also equal. The F-test provides a method for comparing the variances (standard deviation squared) of two sets of data. The calculated F-value is then compared to the critical value (Fcrit) obtained from a table of F-values at a chosen level of significance (α).

5. The t-test provides a method for comparing the means of two independent data sets and is used to assess the degree of differences in the means. If it is determined that the variances are assumed equal (F=Fcrit), then the t-test is conducted based on the two sample sets using a pooled estimate for the variance and pooled degrees of freedom. If the sample variances are determined to be different (either F≠Fcrit), then the t-test is conducted using the individual sample variances, the individual sample sizes, and the effective degrees of freedom. The calculated t-value is compared to the critical value (tcrit) obtained from a table of t-values at a specified level of significance.

6. If the t-test does not indicate similarity, a continuous analysis is relied upon. The p-values (from F- and t-tests) are reported for each analysis and tracked over time. This approach enables the efficient monitoring of the validation status on a daily basis and allows for more timely action to address non-validation. When using F and t-test for validation, the objective is to maximize verification sample size so as to have a sufficiently powerful analysis, while capping the maximum verification sample size so as to limit the detection of materially insignificant statistical differences. In the continuous analysis approach, the verification sample population increases as additional QC and QA verification test results are reported, up to a recommended maximum of 25 QA verification test or a maximum time period of 90 days. This approach allows the trending of whether F and test p-values verify the quality control test results at the specified level of significance. Thus the verification team can identify whether there is a positive validation trend (increasing confidence in validation) or a negative validation trend (decreasing confidence in validation).

7. It is highly encouraged, prior to starting production, that material testing laboratory test method specific correlation be conducted, as well as technician sampling and testing procedures be compared and correlated. Statistical Validation will identify, through investigations, subtle and allowable within the limits of the recognize test methods. For example, sulfur capping of concrete cylinders versus the use of neoprene rubber capping, both acceptable test method procedures used to prepare concrete cylinders for determining concrete compressive strength, yet if one method is employed by the QC laboratory and another is employed by the QA laboratory, assuming all data is within specification limits, the statistical analysis will probably not validate due to the subtle

differences in test procedures.

4.4 MATERIALS OVERSIGHT

Materials shall conform to the Contract requirements. The Department will perform sampling and testing of materials to assure that the Design-Builder's QC actions are effective. Use of Approved List materials is expected for commonly available products. The Design-Builder will provide the required evidence of acceptability / manufacturers certifications as required by specifications. Other items will require QC evaluation prior to use as defined in Part 3, Appendix A.

Products and materials will have appropriate identification provided by the Design-Builder, from receipt and storage through installation. When materials arrive at the project site, receiving personnel will document receipt of the material in accordance with the appropriate procedure. The CQCE will check material for conformance to Project requirements. Any damage or deficiency will be noted. The materials will be used or stored as appropriate for the material.

The CQAE will verify and document products and materials conformance to specifications of the project. Packing slips, mill certificates, or other documents from the Design-Builder showing conformance to requirements should be randomly reviewed by the CQAE and retained in project files by the Design-Builder.

Products or materials not immediately used will be stored in accordance with manufacturer's directions and verified as such by the CQAE. Some products and materials will require special measures to protect them from degradation. The manufacturers or supplier's requirements will be followed in providing the proper environment for the products and materials. The CQAE will provide QA of the Design-Builder's management of stored materials under proper conditions.

In general, the role of the Department's CQAE is to monitor, in a timely manner, the performance of materials sampling and testing commitments of the Design-Builder's CQCE. The CQAE will perform sampling and testing of materials at frequencies defined in Part 3, Appendix D – Attachment 1, consistent with the levels of risk and respective levels of verification testing for each specific item. All sampling and testing practices will conform to Department procedures and verification will be to show compliance with Department specifications or specific project requirements. The CQAE will document all sampling and testing performed, results, and retain samples as necessary.

Examples of materials sampling and testing might consist of:

- Sampling and testing of concrete for RF-1 conformance to specifications. Analysis of contractor test data using F- and T- statistical analysis as compared to Department test results would be performed

- Independent sample testing of tack coat for RF-2 conformance to specifications to verify that the tack coat properties are within specification limits.

- Review of project records for materials certifications for soil and erosion control materials under RF-3, for products appearing on the Department's Approved List of Materials. Cross check certifications to materials on site.

When sampling and testing are in compliance with Contract requirements, results should be

reported in a timely manner to the Design-Builder. No further action is typically required.

If materials sampling or testing results do not meet the Contract requirements, the CQAE will prepare a non-conformance report in a timely manner. It is the Design-Builder's responsibility to review the findings of the QA sampling and testing, and take appropriate actions. Non-conformance findings will be reported and corrective action taken as appropriate for the work at hand. Actions could consist of but are not limited to remove and replace, remediate in place, remain in place without remediation, and/or consideration of price adjustments.

Unless stated differently in the Contract or the RFP the Department will perform quality assurance tests and inspections during the production of the materials produced off-site such as at PCC Plants, Asphalt Plants, Precast Concrete Plants, etc. On -site QA tests and inspections will be performed by the Department after QC sampling and testing has confirmed acceptability of materials, and the frequency of any such testing will be as defined in Part 3, Appendix D – Attachment 1.

4.4.1 Standard off-site manufactured materials / Approved List items

Because certain material production and/or locations are not conducive to QC by the Design-Builder, the Department will perform sampling and testing of various items for inclusion into the Department's Approved List of Materials, adhering to standard evaluation requirements for materials. The requirements and procedures for Approved List testing can be found at https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau.

4.4.2 Off-site manufactured / fabricated materials

All domestic off-site materials sampling and testing for QC/QA operations will be performed by the Department in a manner similar to what is done for traditional Design-Bid-Build projects, and in accordance with NYSDOT Specifications. Depending on sampling and testing procedures and the applicable risk factor, statistical evaluations may be performed. The Design-Builder shall perform QC of off-site manufactured/fabricated materials as deemed appropriate by the Design-Builder and shall hold the Department harmless for liabilities associated with schedule delays and/or impacts to contracted supplier-subcontractor business relationships.

Off-site manufactured items subject to Department QA materials acceptance procedures include:

- Prestressed Concrete Structural Elements (beams, girders (AASHTO and bulb-T), and piles
- Metal Traffic Signal and Light Poles and Arms
- Structural Steel Elements (beams and girders)
- Precast Concrete Materials Elements
- Pipe (concrete, steel, aluminum and high density polyethylene) for culverts, storm drains and underdrains
- Hot Mix Asphalt Concrete production – QC/QA program
- Portland Cement Concrete production
- Aggregate CMA QA program District Materials Section

- Masonry
- Structural Steel Paints
- Bridge Railing and Guide Rail
- Traffic Control Materials
- Sign Structures
- Frames and Grates

Note: Where shop drawings are required for material production, the Department's QA responsibility is to verify production in conformance with specific shop drawings. Shop drawing reviews, when appropriate, should be addressed following Design QA requirements.

Refer to Part 5 – Special Provisions for Design-Builder Quality Assurance Requirements related to Bridge Bearings. The Department will perform QA of bearings at a frequency established in Part 3, section D – Attachment 1.

4.4.3 On-site fabricated materials / project produced materials

The Department will perform sampling and testing of on-site fabricated materials for use of proper raw materials, handling, placement, and /or storage until time of use. Various materials tests will be used dependent upon the material under evaluation. The type and amount of testing will be defined in Part 3, Appendix D – Attachment 1. Critical items will require sampling and testing at greater frequencies, typically considered RF-1 as described earlier. Other items will be evaluated as RF-2 or RF-3 as appropriate. All sampling and testing performed by the Department will be after the Design-Builder's QC has progressed.

4.5 CONSTRUCTION QA - GENERAL

Construction practices used by the Design-Builder shall be as defined in the Contract documents. During construction operations, the CQAE will check various operations and compared them to the requirements set forth in Project documents and standard specifications. These checks will be performed following the appropriate procedure and documented by the CQAE. The Department shall have the right to audit, monitor, inspect and test the work as it progresses and the Design-Builder shall accommodate this process. Routine review of the records produced by the Design-Builder's QC staff should be performed to verify accurate recording of work activities, testing results, etc… are being progressed by the Design-Builder. Part 3, Appendix D – Attachment 1 defines the construction QA oversight of items used in the Work. Department Construction Quality Assurance Engineers will document audits of construction operations on a daily work report or similar type record. The CQAE will maintain a daily Diary of the construction operations.

When construction operations are in compliance with Contract requirements, results should be reported in a timely manner to the Design-Builder. No further action is typically required.

If construction operations are not performed to the Contract requirements, the CQAE will prepare a non-conformance report in a timely manner. It is the Design-Builder's responsibility to review the findings of the QA observations, and take appropriate actions to maintain quality. Non-conformance findings will be reported and corrective action taken as appropriate for the work at hand. Actions could consist of but are not limited to remove and replace, remediate in

place, remain in place without remediation, and/or consideration of price adjustments.

Depending on the size of the project, there may be multiple categories of Department Inspectors, or a Department Inspector may be required to fulfill more than one role. The intent is not to duplicate inspection of the work provided by QC team but to verify QC data and documentation of the QC inspections.

Additionally, the Department will perform Independent Assurance Sampling and Testing (IAST), observations and oversight to assure adherence to the QC Plan developed for the project. All Design-Builder staff performing QC and the CQCE's staff whose test data is used in the acceptance decision will be subject to IAST inspections by the Department.

4.6 WITNESS AND HOLD POINTS

Witness and Hold Points shall be established where notification of the Department and/or the Design-Builder's design team (for elements of a project that require design team members certification prior to continuation of Work), where applicable, is required for observing or visually examining a specific work operation or test. Witness Points are points identified within the Construction QC Plan and CPM schedule which require notification of the Department and/or design team, where applicable. Work may proceed beyond a Witness Point with or without participation by the Department provided proper notification has been given. However,

Work shall not proceed until certification from the required design team member is obtained.
Hold Points are mandatory verification points identified within the Construction QC Plan and CPM schedule beyond which work cannot proceed until mandatory verification is performed. Witness and Hold Points shall be identified in the Construction QC Plan, and/or the CPM schedule where critical characteristics are to be measured and maintained, and at points where it is nearly impossible to determine the adequacy of either materials or workmanship once work proceeds past this point.

For Witness and Hold points where the Department's involvement is required, the Department's CQAE will handle responses to the Design-Builder with written reports or releases. The time necessary to respond to the notification for inspection at Witness and Hold Points shall be stated in the Construction QC Plan, mutually agreed to by the Design-Builder and the Department and incorporated in the Design-Builder's CPM schedule.

The Department shall have the right to stop work if the Design-Builder does not adhere to witness or hold points.

4.7 LABORATORIES FOR QUALITY ASSURANCE

All sampling and testing shall be performed by a laboratory that is accredited in the applicable AASHTO procedures by the AASHTO Accreditation Program (AAP). For test methods not accredited by AAP, the laboratory must comply with AASHTO R18 (most current Edition) and must be approved by the Department at its sole discretion. NYSDOT test methods will be provided when deemed appropriate.

All equipment used, whether at an established laboratory or satellite (field) laboratory, has to be calibrated/verified. The labs have uniform policies and procedures per AASHTO R-18 to ensure that they are providing testing services in compliance with applicable test methods. The policies and procedures address inspection and calibration of testing equipment, as well as a

correlation-testing program between the laboratory and portable or satellite facilities.

The Department QA laboratories (Regional Laboratories or Central Office Laboratory) will not under any circumstances perform QC testing whatsoever.

4.8 VERIFICATION

Verification sampling, testing, observations, or other procedures will be performed by qualified sampling and testing personnel employed by the Department or its designated agent, reporting to the CQAE.

The Department shall hold final authority for determining the acceptable quality of materials and workmanship incorporated into the Project. QA decisions will consider:

- Results of Design-Builder QC sampling and testing at specified frequencies and locations;
- The Department's QA and Verification sampling and testing results;
- The Department's Independent Assurance Sampling and Testing (IAST) at specified frequencies and locations;
- Inspection by the Department of the attributes and processes that may affect the quality of the finished product; and
- Any dispute resolution procedures to resolve non-validation discrepancies between the Department's Verification Sampling and Testing and the Design-Builder's Sampling and Testing.

Individual materials and/or construction operations will not be accepted or rejected specifically except as noted for off-site locations. Materials and procedures that are in conformance with project requirements will be noted as such and reported to the Design-Builder. Materials, testing, or construction operations that are not in conformance to project requirements will be noted as non-conformances, reported to the Design-Builder, and actions taken as necessary by the Design-Builder to address the NCR's.

Verification frequencies shall follow the requirements of Part 3, Appendix D – Attachment 1 for standard materials and methods adhering to Department specifications. The verification methods and frequencies for unique products shall be as determined by the Department on a project by project basis.

4.9 NON-CONFORMANCE

The Design-Builder's QC staff and QC Engineer are responsible for identifying non-conforming Work. The Department may also identify non-conforming Work to the Design-Builder for corrective action. Any completed work not meeting the plans, specifications and Contract requirements is to be deemed non-conforming. A Non-Conformance Report (NCR) must detail the area of problem and cite from plans or specifications, how or why the work does not conform. The NCR will be submitted to the CQCE in writing within 24 hours of identification. Outstanding reports will be discussed in a review of the NCR log at weekly meetings. The Department will verify that all NCR's are addressed in a timely manner per the QC Plan. The

resolution of a NCR may potentially include removal and replacement, reworking, or repair.

The Department's CQAE can raise a NCR when he/she identifies material, or a finished product in which the material is used, is not in conformity with the Contract Requirements. With respect to Verification Sampling and Testing NCR's, in accordance with Part 3, Section 6.3, the Design-Builder's QC Engineer, is required to evaluate and assess the material in question and provide the Department with a written explanation why the non-conformance occurred, what corrective action is being put in place to avoid future non-conformances, and information regarding a clearly defendable plan for disposition (using good engineering judgment) of the existing non-conforming material which may potentially include removal and replacement, reworking or repair. Where reasonably acceptable work has been produced, the Department's Project Manager can make a determination if the work may remain in place, and in such an event is required to document the basis of his/her determination. As such any determination should only be made where the Design-Builder's written explanation documents sufficient engineering judgment to support the case for the work to remain in place.

It is important that both the Design-Builder and the Department's staff fully appreciate the reasons for raising a NCR. Often there is reluctance on the Design-Builder's part, perhaps as a result of normal human reluctance to admit error, or previous experience on other contracts where a misinformed or negative managerial attitude was taken towards NCRs. The Department's Project Manager should actively encourage the issue of NCRs and point out, to the Design-Builder's team the benefits, from a cost and time point of view, of reacting openly to non-conformance reporting in accordance with the process outlined above, in order to minimize the need to remove and replace works .

4.9.1 Non-Conformance Log

The Design Builder shall maintain a log for reported non-conformance materials or procedures according to the requirements of Part 3, Section 5.4.2 and Section 6.2.1.

4.9.2 Engineering Judgment

Material test results or workmanship that are in reasonable conformance with specifications and project requirements, but do not meet the specification requirements specifically, may be adequate for their intended use. As such, where, based on sound engineering judgment, reasonably acceptable work has been produced, the Design-Builder may choose to leave the work in place as is. Such determination must provide for the material or work to perform as originally intended. The Department's Project Manager can make a determination if the work may remain in place, and in such an event is required to document the basis of his/her determination. Each such occurrence must be properly documented and a project log of engineering judgments maintained by the Project Manager. Documentation shall include the location, specification requirement, recorded test results or observed procedures non-conformance, and the engineering judgment applied to deem the situation suitable for incorporation into the project.

4.10 INDEPENDENT ASSURANCE SAMPLING AND TESTING

The Independent Assurance Sampling and Testing (IAST) program as implemented by NYSDOT, or its designee, to evaluate all sampling and testing procedures, personnel, equipment, and laboratories that will be used as part of the acceptance decision. This program provides uniform procedures to verify that tests are performed by qualified personnel and that

laboratory facilities and equipment are adequate to perform the required sampling and testing methods.

With most Design-Build projects, the pace of construction is extremely quick. Manpower curves are normally established to bring construction inspectors and testing technicians to the project at optimal periods based on the volume of anticipated work. Careful administration of the IAST program is essential to the success of the overall project so that unnecessary delays are not encountered and testing technicians and laboratories are evaluated in a timely manner.

Implementation of the IAST Program is performed by Regional NYSDOT personnel; however, NYSDOT has the option of designating an independent laboratory to administer the IAST program on its behalf. When this option is utilized, personnel from the independent laboratory must be qualified to meet NYSDOT requirements.

SECTION 5 DISPUTE RESOLUTION

Non-conformance of observed practices are usually easily discernible, such as the size and spacing of reinforcing steel. Through the life of a project, there may be differences in material test results or statistical sample populations between the Design-Builder's QC and the Department.

In an effort to be as efficient and timely as possible, it is recommended that the Design-Builder, QC Engineer, Department's Project Manager and CQAE develop a plan to resolve disputes as near to the operational level as possible. Time limits can be established for how long an agreement can be worked out at a particular level before it should be addressed at the next level. Time critical disputes may, however, ascend to the highest level within a day.

If a discrepancy in the test results occurs, a cooperative effort by the Department and the Design-Builder to identify the cause of the non-specification material or the discrepancy in the test results will include the following actions:

- Check of test data, calculations and results;
- Observation of the Design-Builder's sampling and testing by the Department's Project Manager; and
- Check of test equipment by the CQAE.

Since most QA sampling and testing will be progressed using Regional laboratories, the first level of sample testing for dispute resolution will be performed at the Department's Central Laboratory, or utilizing an independent laboratory when specific test capabilities do not exist within the Department. If resolution cannot be made at this level then a referee laboratory will be used as specified in Part 3, Section 6.4.

5.1 NON-VALIDATION AND STATUS OF MATERIALS

It is important for the reader to understand that for RF-1 verification process to have a positive outcome, the material test results must first be within specification limits, and secondly the statistical comparison of QC and QA test results must validate. For discrepancies where evaluation uses RF-1 with statistical verification methods, dispute resolution needs to consider if the material actually fails to meet contract specification limits or if the statistical comparison does not validate. When QA verification test do not statistically validate the Design Builder's QC test results, the Department and the Design-Builder's CQCE shall jointly investigate the source of non-validation (i.e., adjust sampling and testing processes to correct any sampling and testing deficiencies, align testing procedures using split sampling methods, calibrate equipment, and reduce testing bias as identified during the joint investigation). The Department may increase the QA sampling frequency to provide additional QA data for potential continuing non-validation analyses. If the non-validation persists over five consecutive RF-1 F- and t-test analyses, a Non-Conformance Report shall be issued to formally document and seek resolution to the non-validation. In addition to the need to investigate the non-validation, the material in question has to be immediately evaluated to determine if it can be left in place or has to be removed, reworked, or repaired. If material is to remain incorporated into the Project, the material in question will be evaluated using the process described in this section. The appropriate party (CQAE or CQCE) may exercise Engineering Judgment to determine that the

material will perform its intended purpose.

For RF-1 defined materials requiring statistical verification, the Department will perform continuous F- and t-test analysis with the testing frequency as defined in Part 3, Appendix D – Attachment 1. The continuous analysis will be run daily with new verification test results being added to the sample population as older verification test results are removed (up to 25 day maximum limit). The analysis will be performed against the corresponding QC sample population.

The level of significance (α) used for statistical analysis will be as provided below unless otherwise approved by the Department.

Material	***Level Of Significance (α)***
Earthwork: compaction	0.01
Concrete, structural: air content, 28 day compressive strength	0.025
Concrete, non structural 28 day compressive strength	0.01
Hot Mix Asphalt items	Per existing QC/QA program
Other materials (TBD)	0.01

There are four possible combinations of passing and failing results between the QC and QA (verification) test results.

1. Both the QC and QA test results pass specification limits: Although statistical validation has not occurred, both the QC and QA test results are passing the established specification limits; thus, material quality in question is considered acceptable.

2. QC test results fail and QA test results pass specification limits: Material may be left in place if the Engineer of Record and QC Engineer determines that engineering judgment may be used to accept the material or if the material is accepted through the non-conformance resolution process.

3. Both the QC and QA test results fail the specification limits: Material may be left in place if the Engineer of Record and QC Engineer determines that engineering judgment may be used to accept the material or if the material is accepted through the non-conformance resolution process. The acceptance of material is subject to one of the two scenarios below.

    a. QA test result indicates reasonable conformance with specification requirements, and NYSDOT exercises engineering judgment to concur with acceptance of material based on the Engineer of Record and QC Engineer's judgment or through the non-conformance resolution process.

    b. QA test result does not indicate reasonable conformance with specification requirement, and the QC Engineer must perform an additional fixed test at the QA failed test location. Based on the results of QC Engineer test result and subsequent investigation discussions between the Department and the Design-Builder's Engineer of Record, a determination is made and documented on whether the material may be left in place.

4. <u>QC test results pass but QA test results fail specification limits</u>: Material may be left in

place if the Engineer of Record and QC Engineer determines that engineering judgment may be used to accept the material or if the material is accepted through the non-conformance resolution process. This is subject to the Department's response in the two scenarios below.

a. QA test result indicates reasonable conformance with specification requirements, and the Department exercises engineering judgment to concur with acceptance of material based on the Engineer of Record and QC Engineer's judgment or through the non-conformance resolution process.

b. QA test result does not indicate reasonable conformance with specification requirement, and the QC Engineer must perform an additional fixed test at the QA failed test location. Based on the results of QC Engineer test result and subsequent investigation discussions between the Department and the Design-Builder's Engineer of Record, a determination is made and documented on whether the material may be left in place.

5.2 SPLIT SAMPLE DISCREPANCIES

For dispute resolution where non-statistical methods are being used, a split sample shall be obtained and tested. Since most QA sampling and testing will be facilitated at the Regional level, sample testing for dispute resolution will be performed at the Department's Central Laboratory or utilizing an independent laboratory. A comparison of tolerances which will trigger the referee and disputes processes is summarized in the table below. Comparison tolerance for testing shall be:

Split Samples may be used outside of the statistical analysis for owner verification of contractor-performed QC testing under the Departments Owner Verification Program. A comparison process for performing and analyzing split samples between QC and QA is necessary during initial implementation of this statistical verification program. The Department will analyze these samples and discuss the results with the QC testing firm to assure laboratory and technician test results compare favorably. When the acceptable tolerance limit in the table below are exceeded, corrective action for either or both parties will be identified, and corrective actions will be incorporated as appropriate. The process will help provide initial alignment of the Departments QA and the QC Material Testing Firm laboratories and testing procedures.
Split samples may also be performed throughout the life of the project as necessary to investigate non-validating material categories and to verify or realign testing equipment and personnel.

QAand QC will determine random sample locations using ASTM D3665 or similar auditable methods.
The Department's Project Manager will determine allowable actions to address discrepancies or failures as determined below, following the non-conformance resolution process. Actions could consist of but are not limited to remove and replace, remediate in place, remain in place without remediation, and/or consideration of price adjustments.

Test	***Comparison Tolerance***	***Source***
Soil/ Aggregate Wet Density using Nuclear gauge in Direct Transmission[1]	Soil – 2.1 pcf Aggregate Base – 3.0 pcf	Values adjusted from AASHTO T-310
Soil/Aggregate Density using Sand Cone[1]	2.0 pcf	Values adjusted from ASTM D1556
Soil/Aggregate Moisture using Nuclear gauge (backscatter) [1]	Soil – 2.1 pcf	Values adjusted from AASHTO T-310
Soil/Aggregate Moisture determined by oven dry	14% difference[2]	ASTM D2216
One Point Proctor – density Lab Proctor – density	5.0 pcf	AASHTO T-99
One Point Proctor – moisture	15% difference[2]	AASHTO T-99
Gradation	> No. 4 sieve: ± 5% ≤ No. 4 sieve: ± 3%	AASHTO T27 / T/11
Concrete Air	± 1%	ASTM C231 ASTM C173
Concrete Strength	15 % difference on the average of 2 cylinders	Values adjusted from ASTM C39
Asphalt Bulk Specific Gravity Identical plug/core Plug/core –split sample (close proximity)	Less than 0.015 Less than 0.030	Values adjusted from AASHTO T-166

[1] Referee testing in the field using a third party
[2] Percent difference calculation shall be % diff ≤ ({absolute value[W1-W2]} / ((1/2) * (W1+W2)))*100

SECTION 6 PROJECT SPECIFIC QUALITY ASSURANCE PLAN

As mentioned in the introduction of this Guide, the contents of this Program Guide are generic in nature and should be applicable to all types and sizes of Design-Build Projects. It is the Project Manager and the CQAE and DQAE responsibility to apply this program guidance at the Project Level.

I-81 VIADUCT PROJECT - PHASE 1, CONTRACT 2

PIN 3501.91, CONTRACT D900056

DB CONTRACT DOCUMENTS

PART 3
APPENDIX D

APPENDIX D - ATTACHMENT 1
SCHEDULE OF CONSTRUCTION QUALITY ASSURANCE AND VERIFICATION INSPECTION

Final November 4, 2022

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The Design Builder (DB) shall use this Appendix D – Attachment 1 to aid in development of a Quality Control (QC) Plan as defined in Part 3, Section 4. The Department will perform Quality Assurance (QA) for materials acceptance to verify that the Design and Construction QC Plan is controlling DB operations in conformance with Department standards. This Appendix D – Attachment 1 describes the expected testing procedures and frequencies to assure product and process quality, and verification of the DB QC Plan.

Quality Assurance on the Design Builder's QC process may be progressed according to values defined in the "QA Actions and Testing" column of the following table. The Risk Factor for various items will determine the frequency at which the Department will conduct quality assurance / verification sampling and testing. Statistical methods may be considered for use by the Department to evaluate the effectiveness of sampling and testing results from QC for use as acceptance. The QA Actions and Testing column defines those actions and the frequency thereof that the Department expects to minimally take to provide quality assurance of materials and construction inspection activities. Final determination of these actions and frequencies will be developed specific to the QC plan provided by the DB.

The level of effort of verification by the Department both for materials and construction practices is dependent on risk. The Design-Builder assumes most of the risk and progresses work accordingly. This risk is managed by providing appropriate QC to limit failures of materials or non-conformance to acceptable construction procedures. Therefore, the Department's role when applicable, is to verify materials acceptability and testing results, assure compliance with construction procedure requirements, and perform IAST to assure testing is performed correctly.

The Department's QA considers the material application and construction procedures to determine the overall risk associated with using a particular material or process. The risk is then defined as one of three Risk Factor levels, each addressing the expected QA needs. Detailed description of each Risk Factor level is defined in the table below and specific details for each item's QA practices are provided. The three Risk Factor levels are described in general below.

Risk Factor 1 (RF-1)

RF-1 provides continuous analysis using statistically based (F & t-testing) for those categories of materials and associated test methods that are strong indicators of long-term performance. These are typically considered high-risk, high-volume type materials incorporated into a Design-Build project. Examples include compressive strength for hydraulic or Portland Cement Concrete, percent soil compaction for embankment, and percent asphalt content for Hot Mix Asphalt Concrete.

Subsequent to the Design Builder's submission of its Quality Control Plan, which includes a tabulation of all anticipated RF-1 items and estimated quantities, the Department may then make a determination as to when sufficient quantities are used on a project such that the Design-Builders data can be used for acceptance purposes. The Design-Builder's QC testing frequency shall be in compliance with various Department documents. The Design Builder, in coordination with the Department shall develop and implement the statistical methodology for data collection, analysis and determination to conclude when sufficient data has been collected to conclude that a F & T approach is acceptable. Upon such conclusion, the Department's Verification sampling and testing frequencies should be a minimum of 25% of the QC testing frequency. Acceptance is based upon both validation of statistical analysis of complimentary QC test data population and QA verification test data populations and both test results meeting

acceptable material acceptance limits as defined in the contract documents.

Repeat failing test results should trigger a higher frequency of Verification testing and for those materials/test methods that have demonstrated high levels of repeated successful validation/specification compliance should be considered for reduced frequency of inspection not to go below 10% of QC testing frequency.

Risk Factor 1 – Low Volume (RF-1(LV))

RF-1(LV) provides for acceptance when smaller quantities of high risk type materials are used and statistical comparison and/or validation methods are not appropriate. The Design-Builder shall continue to perform QC and when materials are deemed ready for Department inspection, random sampling and testing will be performed by the Department. The Department's QA frequency of sampling and testing will be in compliance with all materials testing requirements and standards. That is, QA testing frequency will be the same as DBB. In these cases, QA testing will form the acceptance decision.

The Design-Builder's data for RF-1 may be used for acceptance only after sufficient tests have been performed to provide for a statistically valid analysis, at which time QA will revert to the requirements of Risk Factor 1.

Risk Factor 2 (RF-2)

In addition to checking that all QC test results are within specification limits, RF-2 verification provides independent verification of those materials and associated test methods that are secondary indicators of material performance. Verification testing, in the form of independent verification sampling or split sampling with the QC test, that the test results fall within specification limits is typically appropriate. These materials/material tests are considered a reduced risk from RF-1. An example is the slump test for concrete. Approved list products that require more than manufacturer's certification of compliance to assure quality are covered under this level of verification. Acceptance is based upon Standard Specifications and other contract requirements and the frequency of sampling and testing required. That is, QA testing frequency will be the same as DBB. QA testing will form the acceptance decision. No statistical validation is required.

Risk Factor 3 (RF-3)

RF-3 provides observation verification for those materials that only require very few QA tests for compliance with various Department documents or where materials are accepted based on the inclusion in the Departments Approved List of materials. For these materials, risk of failure does not affect the long-term performance of the facility produced approved products are used. The Design-Builder should still perform QC testing as required. Under RF-3 approach, the Department oversight does not perform any tests but observes any QC test performance for equipment and procedural compliance for a product, and/or perform an audit of project procurement records to verify compliance with Departments Approved List, Certification of Compliance on record, Buy America, etc. The frequency of this testing is a minimum of once per calendar year per test method and/or product, or random frequency as determined by the Department's Project Manager.

Some domestic off-site materials sampling and testing for QA operations may be performed by the Department as indicated elsewhere in the RFP. When Department QA is used for acceptance / rejection of materials, the Risk Factors are not applicable since no Design-Builder data is used for acceptance. The Design-Builder may perform QC as deemed appropriate or

desired at off site locations and should include any such oversight in the QC Plan. If Design-Builder sampling and testing is desired for acceptance, this should be outlined in the QC Plan and Risk Factors will apply.

Use of materials for which there is not an Approved List category will require, in the Design-Build Quality Control Plan, those tests and evaluations to prove the durability of unique materials before use in the project. In many cases, physical testing should be performed by an independent laboratory. A planned frequency of sampling and testing, commensurate with the level of risk of the product proposed for use, must be provided in the DB Quality Control Plan for acceptance by the Department's Project Manager.

Department QA of Construction Inspection operations will typically consist of verifying the CQCE is performing and assuring all construction operations adhere to Department Specifications and Standards and/or the DB Quality Control Plan. The Department shall have the authority to perform sufficient inspections and/or tests of the DBs work to verify that the inspections and /or tests performed by the CQCE are in compliance with the contract, the design and specifications, the Design-Builder's approved Quality Control Plan, as well as the Department's standards and practices. The frequency of construction inspection will depend on the critical nature of the construction operation.

Certain critical items of work will require witness or hold points to assure acceptability and/or verification testing prior to progression of work. The DB should include in the QC Plan specific hold points as desired by the DB or as required by the Department.

Witness and Hold Points shall be established where notification of the Department and/or Design-Builder's design team (for elements of a project that require design team members certification prior to continuation of Work), where applicable, is required for observing or visually examining a specific work operation or test. Witness Points are points identified within the Construction QC Plan which require notification of the Department and/or design team, where applicable. Work may proceed beyond a Witness Point with or without participation by the Department provided proper notification has been given. However, work shall not proceed until certification from the required design team member is obtained. Hold Points are mandatory verification points identified within the Construction QC Plan beyond which work cannot proceed until mandatory verification is performed. Witness and Hold Points shall be identified in the Construction QC Plan where critical characteristics are to be measured and maintained, and at points where it is nearly impossible to determine the adequacy of either materials or workmanship once work proceeds past this point.

The CQAE shall designate a primary point of contact for notifications for inspection at Hold Points and Witness Points. An alternate individual may be designated to function in this capacity in his/her absence. For Witness and Hold points where the Department's involvement is required, the Department's CQAE will be designated to handle responses to the Concessionaire/Design-Builder with written reports or releases. The time necessary to respond to the notification for inspection at Witness and Hold Points shall be stated in the Construction QC Plan, mutually agreed to by both the Design-Builder and the Department.

The Department will have access to all activities and records of the DB, CQCM, and materials testing firm/laboratory retained by the DB for the purpose of assuring that the construction and inspection activities are being conducted in compliance with the contract, the design and specifications, the DB's approved Quality Control Plan, as well as the Department's standards and practices.

All QA activities of the Department will provide assurance that materials and methods are such that, when final acceptance of the project is requested, the Department is confident that all materials and work conforms to plans, specifications, and standards. These verifications will document the acceptance of the work for payment purposes and assure all non-conformances have been satisfactorily addressed.

The Department shall have the authority to stop work specific to Work Zone Traffic Control non-conformance issues that impact safety of the traveling public. The DB shall ensure the overall safety for the workers, the inspection staff and the public at all times.

Nothing in the scope of the Department's QA role shall be construed to relieve the DB and their CI and QC firms of their responsibilities for full time construction inspection and compliance with the contract, the design and specifications, the Design-Builder's approved Quality Control Plan, as well as the Department's standards and practices.

Tolerances for Statistical and Comparison evaluations shall be per the below tables to be deemed valid or acceptable. Any discrepancies shall be handled according to the Appendix D, Quality Assurance Plan Program Guide, Section 5.

The level of significance (α) used for statistical analysis will be as provided below unless otherwise approved by the Department.

Material	Level- Of Significance (α)
Earthwork: compaction	0.01
Concrete, structural: air content, 28 day compressive strength	0.025
Concrete, non structural: 28 day compressive strength	0.01
Hot Mix Asphalt items	Per existing QC/QA program
Other materials (TBD)	0.01

Comparison tolerance for testing shall be:

Split Sample Comparison Tolerances

Test	Comparison Tolerance	Source
Soil/ Aggregate Wet Density using Nuclear gauge in Direct Transmission	Soil – 2.1 pcf Subbase – 3.0 pcf Aggregate Base – 3.0 pcf	Values adjusted from AASHTO T-310
Soil/Aggregate Density using Sand Cone	2.0 pcf	Values adjusted from ASTM D1556
Soil/Aggregate Moisture using Nuclear gauge (backscatter)	Soil – 2.1 pcf Subbase – 3.0 pcf	Values adjusted from AASHTO T-310
Soil/Aggregate Moisture determined by oven dry	14% difference*	ASTM D2216
One Point Proctor – density Lab Proctor – density	4.5 pcf 4.5 pcf	AASHTO T-99
One Point Proctor - moisture	15% difference*	AASHTO T-99

Concrete Air	+/- 1%	ASTM C231 ASTM C173
Concrete Strength	15 % difference on the average of 2 cylinders	Values adjusted from ASTM C39
Asphalt Bulk Specific Gravity Identical plug/core Plug/core –split sample (close proximity)	Less than 0.015 Less than 0.030	Values adjusted from AASHTO T-166
Percent difference calculation shall be % diff ≤ ({absolute value[W1-W2]} / ((1/2) * (W1+W2)))*100		

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
All - General	▪ RF as described per item. ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site locations.	• Materials QA: as described per item. CI QA: as described per item.
201 – Clearing and Grubbing	▪ RF-3 – all work	• Materials QA: N/A • CI QA: random verification of QC records for work documented as progressed, verify adherence to work limits, and compliance with planned / required protection / restoration.
202 – Removal of Structures and Obstructions	▪ RF-3 – all work	• Materials QA: N/A • CI QA: random verification of QC records for work progressed, adherence to safety requirements, and adherence to WZTC per 619 requirements as appropriate.
203 – Excavation and Embankment	▪ Select Material- RF-2 ▪ Embankment Material where structural elements will be constructed- RF-2 ▪ Embankment Material all other areas- RF-3 ▪ Unclassified excavation- RF-3 ▪ Hold point for stockpile evaluation where required	• Materials QA: Verify initial source of proposed material and that GEB Manual requirements are being met. Random verification of subsequent sources. Observe sampling of initial stockpile and 100% of subsequent stockpiles. Sample and test material as defined in specifications and GCP-17 at a frequency of 100% of that required by QC plan. • Statistical analysis not required for gradation testing. CI QA: Perform side by side compaction testing at 100% of tests required by QC plan. Random visual observation of construction operations for compliance with specifications.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
	▪ Expanded Polystyrene Fill: RF-2	• Material QA: Random review of material certification and third party test results for specification compliance. • CI QA: Sample and test for specification compliance 100% of the blocks required for testing by the QC plan per GTP-7. Random visual observation of construction for compliance with specifications.
	▪ Drilling and blasting operations- RF-3 ▪ Hold point to review blasting plan prior to start of any work.	• Materials QA: N/A • CI QA: Participate in the pre-blast meeting. Verify that the QC consultant completed all the steps needed for blasting, including reviewing the blast plan, and conducting the pre-blast meeting. Refer to GEM-22 for guidance.
	▪ Settlement measurement- RF-3 ▪ Measurements taken of actively moving landslides or structures. Hold point for implementation of solution. Measurements taken for fills/structures undergoing waiting periods. Witness point for removal of surcharge/termination of waiting period. ▪ Routine monitoring.	• Materials QA: Check the documentation required by specification and the QC plan to verify that the proposed equipment has been calibrated as required. • CI QA: Observe the first installation of each type of monitoring device, and 25% of any subsequent installations. Take side by side readings at 10% of those taken by DB. See GCP-15
	▪ Pore water pressures- RF-3 ▪ Measurements taken of actively moving landslides or structures	• Materials QA: Check the documentation required by specification and the QC plan to verify that the proposed equipment has been calibrated as required. • CI QA: Observe the first installation of each type of monitoring device, and 25% of any subsequent installations. Take side by side readings at 10% of those taken by DB. See GEB Manual requirements

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
	▪ Slope movements- RF-3 ▪ Measurements taken of actively moving landslides or structures. Hold point for implementation of solution.	• Materials QA: Check the documentation required by specification and the QC plan to verify that the proposed equipment has been calibrated as required. • CI QA: Observe the first installation of each type of monitoring device, and 25% of any subsequent installations. Take side by side readings at 10% of those taken by DB. See GEB Manual requirements
204, Controlled Low Strength Material (CLSM)	▪ RF-2 – all load bearing applications ▪ RF-3 – non-load bearing applications (i.e. filling an empty vault).	• Materials QA: Review each mix design to verify compliance with the specification and use of approved materials. • CI QA: Observe flow tests for 100% of the flow tests required by QC plan following ASTM D6103. Observe placement operations for 100% of the volume placed. • Perform cylinder breaks on 100% of the number required in the QC plan for load bearing applications only, using cylinders cast per MM9.2 and meeting requirements of 733-01.
206 - Trench, Culvert and Structure Excavation	▪ RF-3 ▪ Witness point to verify sheeting or lag wall design.	• Materials QA: N/A • CI QA: Check the design completed for temporary sheeting or lag wall to verify that the method and parameters are appropriate. Backfill to meet QA requirements for Section 203.
207, Geotextile	RF-3	• Materials QA: Verify that material is on Approved List, for each material to be used. • CI QA: Verify that the QC inspector check that the material used on the project is the same as that shown to be used on the plans. Random observation for specification compliance.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
208 – Stormwater Management Facilities	▪ RF-2 ▪ Witness point for laboratory testing when required.	• Materials QA: Check documentation required by specifications and environmental permits to verify compliance. Certified copies of laboratory test results supplied by DB • CI QA: Verification of materials acceptability. Observe the first installation of each type of facility, and 20% of any subsequent installations. For precast verify that QC review of drawings performed properly and certifications provided. Assure field testing performed per specification.
209, Soil Erosion and Sediment Control	▪ RF-3 ▪ Hold point for compliance with environmental permit requirements	• Materials QA: Verify products on Approved List or materials meet the appropriate 700 requirements and that certifications are provided when required. Verify compliance with environmental permit requirements. • CI QA: Perform random check of 10% of the areas that have been inspected to determine they meet the criteria called for in the specifications
210 - Removal and Disposal of Asbestos-Containing Material (Buildings, Bridges, and Highways)	▪ RF-3 ▪ Witness point for safety of operation, verify license	• Materials QA: N/A • CI QA: Verify asbestos handling license. Review daily logs provided per 210-3. Review certification for disposal.
211 - Internally Stabilized Cut Structures	▪ RF-1 for permanent walls ▪ RF-2 for temporary walls	• Materials QA: Review material documentation. Verify strength of grout and shotcrete for various designs. • CI QA: Observe 25% (100% for RF-2) of the soil nail/grouted tieback testing required in the QC plan. See GEM-21 and GEM-17. • Perform grout cube testing on 25% (100% for RF-2) of testing required in QC plan per 701-19E. • Perform shotcrete testing on 25% (100% for RF-2) of testing required in QC plan per 583.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
212 - Rock Slope Reinforcement and Catchment Systems	▪ RF-2 ▪ Witness point of proof load testing	• Materials QA: Review material documentation. • CI QA: Observe 100% of the anchor proof tests/rock bolt tensioning required in the QC plan per GEB Manual requirements. • Perform grout cube testing on 100% of testing required in QC plan per 701-19E.
302 - Bituminous Stabilized Course	▪ RF-3	• Materials QA: Verify proposed materials meet specification requirements. • CI QA: Random observation for specification compliance.
303 – Optional Flexible Shoulder	▪ RF-3	• Materials QA: Verify proposed materials meet specification requirements. • CI QA: Random observation for specification compliance.
304 - Subbase Course	▪ RF-2 – all subbase for permanent roadway facilities ▪ RF-2 – subbase for permanent parking lots, sidewalks, bike and pedestrian trails	• Materials QA: Verify initial source of proposed material and that GCP-17 requirements are met. Random verification of subsequent sources. • CI QA: Observe stockpile sampling procedures for the first stockpile, and for 25% (100% for RF-2) of the subsequent stockpiles. • Perform stockpile sampling and testing per the specification on the first and on 25% (100% for RF-2) of the subsequent stockpiles. Statistical Analysis not required for gradation testing. • Visually inspect 25% (100% for RF-2) of the stockpiles. • Random observation for specification compliance.
307 - Hydrated Lime Stabilized Subgrade	▪ RF-3	• Materials QA: Verify materials are on the Approved List and manufacturer certifications received / on file as appropriate. • CI QA: Random observation for specification compliance of proper depth of mixing, mixing operations, and compaction.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
308 - Soil Cement Course	▪ RF-3	• Materials QA: Verify materials are on the Approved List and manufacturer certifications received / on file as appropriate. • CI QA: Random observation for specification compliance of proper depth of mixing, mixing operations, and compaction.
401, Plant Production	▪ RF-2 when DB is responsible for plant operations ▪ DOT anticipates having staff in HMA plants and providing materials inspection during production. If the DB will provide plant responsibility equal to or greater than DOT QC/QA procedures, it shall be defined in the QC plan and QA will be modified accordingly.	• Materials QA: Maintain current QC/QA practices per 401 and MP 401 except for incentive payments. • CI QA: See appropriate specification item
402 – Hot Mix Asphalt (HMA) Pavements	▪ RF-2	• Materials QA: See 401, Plant Production. • CI QA: Observation and document review per 402 and MP 402. For each days placement cores are taken, one core and the plant QA mixture maximum theoretical density will be used for verification. 50 Series placements accepted per MP 98-01.
407 - Tack Coat	▪ RF-2	• Materials QA: Verify suppliers for emulsions on Approved List and certification received / on file. Sample and lab testing per 702. • CI QA: observation, documentation review and random checks to verify quantity and ensure requirements are being followed and met. Observe calibration of bituminous spray equipment

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
410 - Bituminous Surface Treatment - Single Course	▪ RF-2	• Materials QA: Verify suppliers for aggregate and emulsions on Approved List and certification received / on file. Sample and lab testing per 702 of emulsion, aggregate sampling and testing per 410. • CI QA: observation, documentation review and random checks to verify quantity and ensure requirements are being followed and met. Observe calibration of bituminous distributor and aggregate spreader equipment.
490 - Cold Milling	▪ RF-3	• Materials QA: Not applicable • CI QA: Verify removal limits are being properly met.
501 - Portland Cement Concrete - General	▪ RF-2 when DB is responsible for plant operations ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes.	• Materials QA: Inspection per MM9.1. • For quantities less than 50 cy, materials acceptance may be via certification. • For projects producing large quantities for a given placement or where there is a project specific batch plant, the DB may be required to perform plant sampling and testing. Such sampling and testing may be used for acceptance purposes following RF-2, per MM 9.1, verified quarterly by IAST testing. DOT to perform testing per MM 9.1 at 25% frequency to verify fine aggregate gradation of minus 200 material and moisture content for production. • Additional testing may be required dependent upon Design-Builders QC plan requirements and any special testing outlined to assure durability (i.e. corrosion protection, permeability, f/t, scaling, etc…) • CI QA: NA

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
502 - Portland Cement Concrete Pavement	▪ For cumulative project quantities over 1000 CY. ▪ RF-1 for entrained air content ▪ RF-2 for temperature and unit weight ▪ For cumulative project quantities 1000 CY or less. ▪ RF-1(LV) for entrained air content, slump, temperature and unit weight	• Materials QA: Plant inspection per requirements of 501 for concrete production. • CI QA: Observe DB concrete sampling and testing of concrete for entrained air content, temperature and unit weight at frequencies per MM9.2. Department to perform air content and unit weight testing, frequency dependent on volume used on the project.
503 - Portland Cement Concrete Foundation for Pavement	▪ For cumulative project quantities over 1000 CY. ▪ RF-1 for entrained air content ▪ RF-2 for temperature and unit weight ▪ For cumulative project quantities 1000 CY or less. ▪ RF-1(LV) for entrained air content, slump, temperature and unit weight	• Materials QA: Plant inspection per requirements of 501 for concrete production. • CI QA: Observe DB concrete sampling and testing of concrete for entrained air content, temperature and unit weight at frequencies per MM9.2. Department to perform air content and unit weight testing, frequency dependent on volume used on the project.
551 - Piles and Pile Driving Equipment	▪ RF-1/ RF-1(LV) for concrete ▪ RF-2 for all other materials / operations	• Materials QA: Review material documentation, verify compliance per 551 requirements. Plant inspection per requirements of 501 for concrete production. Perform 28 day compressive strength per MM9.2, per concrete mixture for 25% of QC frequency when larger volumes permit RF-1. • CI QA: Review construction practices per GEM-26 or as defined in Design-Builders QC plan. Review pile plumbness on 25% of the number required in the QC plan. Review 25% of the pile driving logs. • Observe 25% of the load testing required in the QC plan per GCP-18.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
Drilled Shafts	▪ RF-1 RF-1(LV) for concrete ▪ RF-2 for all other materials / operations	• Materials QA: Review material documentation. Plant inspection per requirements of 501 for concrete production. Verification for 28 day compressive strength per MM9.2, per concrete mixture when larger volumes permit RF-1. • CI QA: Review construction practices per GEM-18 or as defined in Design-Builders QC plan. Review pile plumbness on 25% of the number required in the QC plan. Review 25% of the pile driving logs. • Observe 25% of the load testing required in the QC plan per GCP-18.
Micropiles	▪ RF-1 for concrete and grout ▪ RF-2 for all other materials / operations	• Materials QA: Review material documentation. Plant inspection per requirements of 501 for concrete or grout production. Grout testing per 701-19E for 100% of placements, testing for grout setting time, expansion/contraction, compressive strength, bleed water, fluidity, chloride and sulfate content and permeability. • CI QA: Verify construction practices and Design-Builder QC per GEM-25 or as defined in Design-Builders QC plan. Review grouting pressure on 25% of the number required in the QA plan. Observe 25% of the load testing required in the QA plan per GCP-18.
552 – Externally Stabilized Cut Structures	▪ RF-2 ▪ Hold point for design review	• Materials QA: Review material documentation prior to use. Plant inspection per requirements of 501 for concrete production. Perform 28 day compressive strength per MM9.2, per concrete mixture at 100% of QC frequency. • CI QA: Review structural and geotechnical design. See GDP-11
553 – Cofferdams and Waterway Diversion Structures	▪ RF-3 ▪ Hold point for design review	• Materials QA: Verify material requirements of 553-2 • CI QA: Verify review of submittal documents by QC.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
554 – Fill Type Retaining Walls	▪ RF- 2	• Materials QA: Verify that wall units are from the Approved List. Perform materials testing per the specification on the first stockpile and on 100% of the subsequent stockpiles. Statistical analysis not required for gradation testing. Backfill sampling per GCP-20. • • CI QA: Observe random sampling on backfill from behind the wall, on 100% of the random samples taken. Perform random sampling and testing on material from behind the wall on 100% of the required samples. Statistical analysis not required for gradation testing. • Perform compaction testing at 100% of frequency required by QC plan. See inspection requirements of GEM-16. •

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
555, Structural Concrete	▪ For cumulative project quantities over 1000 CY ○ RF-1 for air content and strength ○ RF-2 for slump, unit weight and temperature ▪ For cumulative project quantities 1000 CY or less. ○ RF-1(LV) for strength, air content, slump, unit weight and temperature ○ RF-3 for various appurtenances and raw materials. Witness points for all structural applications prior to concrete placement, to verify cover, rebar quantity and spacing, and verify proper placement of appurtenances as necessary. ▪ Hold point for concrete placement until materials certifications received.	• Materials QA: Plant inspection per requirements of 501 for concrete production. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Perform plastic air content and 28 day compressive strength, slump, unit weight, and temperature per MM9.2, per concrete mixture at frequency dependent on volume used on the project as follows: • For cumulative project quantities over 1000 CY: • RF-1: 25% of QC testing frequency • RF-2: 100% of QC testing frequency • For cumulative project quantities 1000 CY or less: • RF-1(LV) • CI QA: Observe QC Inspection progressing per standard specifications or QC Plan. Observe DB concrete sampling and testing of concrete for air and slump at frequencies per MM9.2. Review materials certifications for various supplied items. Observe QC checks performed such that design is met for characteristics such as thickness, reinforcing spacing, cover, and grade. Verify acceptable curing materials on hand prior to placement. • Additional testing may be required dependent upon Design-Builders QC plan requirements and any special testing outlined to assure durability (i.e. corrosion protection, permeability, f/t, scaling, etc…)

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
556, Reinforcing Steel for Concrete Structures	▪ RF-2 for Stainless Steel products ▪ RF-3 for all other reinforcing materials	• Materials QA: Verify all manufacturers on Approved List and\or material certification received / on file per the following: • Black bar: mill must appear on Approved List. • Epoxy Bar: mill, fabricator, and powder must all appear on Approved Lists. • Galvanized Bar: Approved list for mill, certification for the galvanizing. • Stainless Steel Bar reinforcement per 709-13 and Stainless Clad bar Reinforcement per Special Specification: Acceptance testing per each bar size and heat for tensile strength, chemistry, nominal weight, and deformation height. • CI QA: Verify proper handling of reinforcing per specification 556

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
557 – Superstructure Slabs, Sidewalks on Bridges, and Structural Approach Slabs	▪ For cumulative project quantities over 1000 CY ○ RF-1 for air content and strength ○ RF-2 for slump, unit weight and temperature ▪ For cumulative project quantities 1000 CY or less. ○ RF-1(LV) for strength, air content, slump, unit weight and temperature ○ RF-3 for various appurtenances and raw materials. Witness points for all structural applications prior to concrete placement, to verify cover, rebar quantity and spacing, and verify proper placement of appurtenances as necessary. ▪ Hold point for concrete placement until materials certifications received.	• Materials QA: Plant inspection per requirements of 501 for concrete production. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Perform plastic air content and 28 day compressive strength, slump, unit weight, and temperature per MM9.2, per concrete mixture at frequency dependent on volume used on the project as follows: • For cumulative project quantities over 1000 CY: • RF-1: 25% of QC testing frequency • RF-2: 100% of QC testing frequency • For cumulative project quantities 1000 CY or less: • RF-1(LV) • CI QA: Observe QC Inspection progressing per standard specifications or QC Plan. Observe DB concrete sampling and testing of concrete for air and slump at frequencies per MM9.2. Review materials certifications for various supplied items. Observe QC checks performed such that design is met for characteristics such as thickness, reinforcing spacing, cover, and grade. Verify acceptable curing materials on hand prior to placement. • Additional testing may be required dependent upon Design-Builders QC plan requirements and any special testing outlined to assure durability (i.e. corrosion protection, permeability, f/t, scaling, etc…)
558 - Longitudinal Sawcut Grooving of Structural Slab Surface	▪ RF-3	• Materials QA: N/A • CI QA: Verify grooving dimensions per specification for each day of work. Measure groove spacing.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
560 - Masonry	▪ RF-3	• Materials QA: plant QC/QA program per Materials Procedure 09-03 for block items. Verify masonry cement type is correct, and approved • CI QA: Random verification of adherence to all specification construction requirements. Verify dovetail anchor locations / spacing for every 1000 sf wall placed.
563 – Prestressed Concrete Units (Structural)	▪ RF-2 when DB is responsible for plant operations. ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites.	• Materials QA: Precast production off-site per the PCCM. The Design-Builder will progress any necessary shop drawings and perform QC and QA as defined in the PCCM. The Department will perform the requirements of the PCCM at 25% of the defined QA requirements to verify conformance with specifications. • CI QA: Verify erection per PCCM.
564, Structural Steel	▪ RF-2 when DB is responsible for plant operations. ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites.	• Materials QA: Steel fabrication off-site per the SCM. The Design-Builder will progress any necessary shop drawings and perform QC as defined in the SCM. The Department will perform the requirements of the SCM at 25% of the defined QC requirements to verify conformance with specifications. Other materials conformance per various 700 section requirements. • CI QA: Verify erection per SCM. Observe field repairs to paint damaged during erection performed according to Section 572.
565, Bridge Bearings	RF-2 ▪ Hold point: Installation shall only progress after receipt of BR-195.	• Materials QA: Verify Bearing manufacturer on Approved List. Department review of manufacturers sampling and testing data. 10% of the produced lots will be sampled and tested by the Department for verification per sections 716-06, 716-07, 716-11, 716-12 or Special Specification requirements. • CI QA: Verify BR-195 and inspection stamps inspected at jobsite.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
566 – Modular Expansion Joint Systems	▪ RF-3 ▪ Hold point: Installation shall only progress after receipt of manufacturer's certification.	• Materials QA: Verify use of systems on the Department's Approved List and receipt of manufacturers certifications received / on file. • CI QA: Assure shop drawing reviewed by DB and receipt of manufacturer's certification report prior to installation. Verify adherence to manufacturer's installation requirements. Observe watertight integrity test.
567 – Bridge Joint Systems	▪ RF-3 ▪ Hold point: Installation shall only progress after receipt of manufacturer's certification.	• Materials QA: Verify use of systems on the Department's Approved List and receipt of manufacturers certifications received / on file. • CI QA: Assure any shop drawing reviewed by DB and receipt of manufacturer's certification report prior to installation. Verify adherence to manufacturer's installation requirements. Observe watertight integrity test.
568 – Bridge Railing	▪ RF-3 for projects where Design Builder performs oversight of production ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites.	• Materials QA: Verify manufacturer's certification with test results received / on file. Drop Weight Tear Test each heat of bridge rail as outlined in NYSDOT specification 710-23. • CI QA: Verify installation progressed per 568-3. Random testing of connections requiring tightening to specified torque.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
569 – Permanent Concrete Traffic Barrier for Structures	▪ RF-1(LV) / RF-2	• Materials QA: Plant inspection per requirements of 501 for concrete production for cast-in-place (CIP) construction. Verify precast products provided from approved Precaster listed on the Dept Approved List and produced under QC/QA program. Perform all sampling and testing of concrete per MM9.2. Samples taken at a frequency once for every 200 cy of concrete placed. Acceptance based on compressive strength and air content. For precast verify that QC review of drawings performed properly and certifications provided. • CI QA: for CIP verify all field items per QC Inspection requirements prior to concrete placement. Review materials certifications for reinforcing. Observe QC checks performed such that design is met for items such as thickness, reinforcing spacing, and grade and cross slope as determined by dry run. Verify acceptable curing materials on hand prior to placement.
570 – Paint Removal Operations	▪ RF-3	• Materials QA: Verify HEPA filters meet specification requirements. • CI QA: Performance of the containment system during paint removal operations shall be in accordance with the relevant parts of 570.
571 - Treatment and Disposal of Paint Removal Waste	▪ RF-3	• Materials QA: NA • CI QA: Verify waste disposal progressed in accordance with 571.
572 – Structural Steel Painting: Shop Applied	▪ RF-3 ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes.	• Materials QA: Paints must appear on Approved List for Class 1 Paints. Abrasive must meet requirements set forth by 572, inspected in the field. Paint systems on A.L. sampled annually at random sites for chemical relevance to NTPEP tests on same system according to Materials Method 6. • CI QA: Verify paint has been applied in accordance with 572.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
576, Bridge Drainage System	▪ RF-3	• Materials QA: Verify materials conform to 576-2 through review of certifications. • CI QA: Verify DB receipt of appropriate certifications. Installation per plans or shop drawings. Adherence to Steel Construction Manual for any metallic product installation. Assure field testing performed per specification.
578 - Bonded Concrete Overlay for Structural Slabs	▪ RF-1(LV) / RF-2 ▪ Witness point prior to placement of bonded overlay for surface preparation, reinforcing condition, and formwork.	• Materials QA: Plant inspection per requirements of 501 for concrete production. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Perform plastic air content and 28 day compressive strength per MM9.2, per concrete mixture under RF-1(LV) or at 10% of QC frequency when larger volumes of concrete allow RF-2. • CI QA: Observe QC Inspection progressing per standard specifications or QC Plan. Observe DB concrete sampling and testing of concrete for air and slump at frequencies per MM9.2. Review materials certifications for various supplied items. Observe QC checks performed such that design is met for characteristics such as thickness, reinforcing spacing, cover, and grade. Verify acceptable curing materials on hand prior to placement.
579 - Structural Slab Reconstruction Preparation	▪ RF-3	• Materials QA: Concrete, if required, per 501. Verify acceptability of QC tests for plastic air content and 28 day compressive strength per MM9.2, per concrete mixture. • • CI QA: Verify removal limits and surfaces prepared properly per specification requirements. Verify concrete repairs progressed per 555. •

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
582 - Removal and Replacement of Structural Concrete	▪ RF-1(LV) / RF-2 ▪ Witness point for all structural applications prior to concrete placement, to verify cover, rebar quantity and spacing, and verify proper placement of appurtenances as necessary.	• Materials QA: Plant inspection per requirements of 501 for concrete production. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Perform plastic air content and 28 day compressive strength per MM9.2, per concrete mixture under RF-1(LV) or at 100% of QC frequency when larger volumes of concrete allow RF-2. • CI QA: Observe QC Inspection progressing per standard specifications or QC Plan. Observe DB concrete sampling and testing of concrete for air and slump at frequencies per MM9.2. Review materials certifications for various supplied items. Observe QC checks performed such that design is met for characteristics such as thickness, reinforcing spacing, cover, and grade. Verify acceptable curing materials on hand prior to placement.
583 - Shotcrete	▪ RF-2 ▪ Witness point for qualification panel ▪ Witness point for all structural applications prior to concrete placement, to verify cover, rebar quantity and spacing, and verify proper placement of appurtenances as necessary.	• Materials QA: Qualification panels should be observed by Department staff, verification using test panels taken every 1000 sf for compressive strength. • CI QA: OV review documentation of all materials components from AL. All cores for reinforcement encasement be retained for OV evaluation

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
584 - Specialized Overlays for Structural Slabs	▪ RF-1(LV) / RF-2 ▪ Witness point for all structural applications prior to concrete placement, to verify cover, rebar quantity and spacing, and verify proper placement of appurtenances as necessary	• Materials QA: Plant inspection per requirements of 501 for concrete production. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Perform plastic air content and 28 day compressive strength per MM9.2, per concrete mixture under RF-1(LV) or at 100% of QC frequency when larger volumes of concrete allow RF-2. • CI QA: Observe QC Inspection progressing per standard specifications or QC Plan. Observe DB concrete sampling and testing of concrete for air and slump at frequencies per MM9.2. Review materials certifications for various supplied items. Observe QC checks performed such that design is met for characteristics such as thickness, reinforcing spacing, cover, and grade. Verify acceptable curing materials on hand prior to placement.
585 - Structural Lifting Operations	▪ RF-3 ▪ Witness point for DCES review of working drawings	• Materials QA: N/A • CI QA: Verify lifting progressed via working drawings developed by DB.
587 - Bridge Railing Reconstruction	▪ RF-3	• Materials QA: Verify manufacturer's certification with test results received / on file. Drop Weight Tear Test each heat of bridge rail as outlined in NYSDOT specification 710-23 for any new materials. • CI QA: verify construction progressed per specifications
589 - Removal of Existing Steel	▪ RF-3	• Materials QA: N/A • CI QA: Verify work progressed per SCM and QC plan
590 - Adjustment of Bridge Appurtenances	▪ RF-3	• Materials QA: Verify materials meet specification requirements, approved list as appropriate, and certifications received / on file. • CI QA: verify construction progressed per specifications

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
594 - Timber and Lumber	▪ RF-3	• Materials QA: Verify materials meet specification requirements, Approved List as appropriate, and certifications received / on file. • CI QA: perform random check of 10% of the areas that have been inspected to determine they meet the criteria called for in the contract documents.
596 - Open Steel Floor	▪ RF-2 when DB is responsible for plant operations. ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites.	• Materials QA: Steel fabrication off-site per the SCM. The Design-Builder will progress any necessary shop drawings and perform QC and QA as defined in the SCM. The Department will perform the requirements of the SCM at 100% of the defined QA requirements to verify conformance with specifications. • CI QA: Verify erection per SCM. Observe field repairs to paint damaged during erection performed according to Section 572.
597 - Timber Bridge Railing and Transitions	▪ RF-3	• Materials QA: Verify materials meet specification requirements, Approved List as appropriate, and certifications received / on file. The Design-Builder will progress any necessary shop drawings and perform QC and QA as defined in the SCM. • CI QA: perform random check of 10% of the areas that have been inspected to determine they meet the criteria called for in the contract documents. Assure any shop drawing reviewed by DB.
602, Rehabilitation of Culvert and Storm Drain Pipe	▪ RF-3	• Materials QA: Materials acceptance based on appearing on the NYSDOT Approved List as per 602 requirements and manufacturer's cert that the material conforms to requirements of the 602 spec. • CI QA: Verification of materials acceptability. Observe conformance with manufacturers QC / Installation Plan on file with Director, Materials Bureau.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
603, Culverts and Storm Drains	▪ RF-3.	• Materials QA: Verify manufacturer on Approved List and certifications received / on file. Verify earthwork materials per 203. • CI QA: Observe materials installation per 603. Observe earthwork compaction testing per 203.
604, Drainage Structures	▪ RF-1(LV) / RF-2 - cast-in-place products ▪ RF-3 - precast products produced per Materials QC/QA program requirements from approved list manufacturer.	• Materials QA: Plant inspection per requirements of 501 for concrete production for cast-in-place (CIP) construction. Perform plastic air content and 28 day compressive strength per MM9.2, per concrete mixture under RF-1(LV) or at 100% frequency of QC when larger volumes of concrete allow RF-2. Verify precast products provided from approved Precaster listed on the Dept Approved List. Verify earthwork materials per 203. • CI QA: for CIP, verify all field items per QC Inspection requirements prior to concrete placement. Review materials certifications for reinforcing. Observe QC checks performed such that design is met for items such as thickness, reinforcing spacing, cover, etc… Verify acceptable curing materials on hand prior to placement. Perform all sampling and testing of concrete per MM9.2. For precast verify that QC review of drawings performed properly and certifications provided. Observe earthwork compaction testing per 203
605, Underdrains	▪ RF-3	• Materials QA: Verify Approved List materials and certifications received / on file per appropriate 700 sections • • CI QA: Observe installation to proper depth and use of acceptable filter material. •

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
606, Guide Railing	▪ RF-1(LV) / RF-2 for concrete ▪ RF-3 for all other materials ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites.	• Materials QA: Verify Box Beam Guide Rail producers on Approved List. Verify manufacturer's certification with test results received / on file. NYSDOT to perform Drop Weight Tear Test each heat of box beam guide rail as outlined in 710-21 and Materials Method 14. • • CIP concrete barrier and end assemblies – Verify plant inspection per requirements of 501 for concrete production. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Perform plastic air content and 28 day compressive strength per MM9.2, per concrete mixture under RF-1(LV) or at 100% frequency of QC when larger volumes of concrete allow RF-2. • • Precast concrete barrier – Verify material production per 704-03 and precast manufacturers certification received / on file. • • Corrugated Guide Rail and Cable Guide Rail – Verify material certification received / on file. • • CI QA: Verify specific guiderail type installation per appropriate 606. Observe QC concrete inspection per MM9.2 •
607, Fences	▪ RF-3	• Materials QA: Verify materials certifications received / on file. • CI QA: Assure any shop drawing reviewed by DB. Perform random check of 10% of the areas that have been inspected to determine they meet the criteria called for in the contract documents.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
608 – Sidewalks, Driveways, Bicycle Paths, and Vegetation Control Strips	▪ RF-2 for concrete ▪ RF-3 for other materials	• Materials QA: Sample WWF, Brick and Pavers as per Materials Procedure 05-02. See 401, Plant Production for HMA. Plant inspection per requirements of 501 for concrete production. Perform plastic air content per MM9.2, per concrete mixture at 100% of QC. Miscellaneous materials conformance per various 700 section requirements. • CI QA: observation, documentation review random checks to verify quantity and ensure requirements are being followed and met. Observe QC concrete inspection per MM 9.2.
609, Curb and Curb & Gutter	▪ RF-3	• Materials QA: Approved List for 714-01 Stone and Granite curb. For HMA, review documentation with random observation of HMA production. MP 401 allows producer to certify HMA used for 609 items with allowable QA testing, if desired. Plant inspection per requirements of 501 for concrete production. Observe plastic air content per MM9.2, per concrete mixture. Verify miscellaneous materials conformance per various 700 section requirements. • CI QA: observation, documentation review and random checks to verify quantity and ensure requirements are being followed and met. Observe QC concrete inspection per MM 9.2.
610 - Ground Vegetation – Preparation, Establishment and Management	▪ RF-3 ▪ Hold point for topsoil placement until material testing results are received. ▪ Hold point for compost with biosolids until material certification received.	• Materials QA: Check documentation required by specifications to verify compliance • CI QA: perform random check of 10% of the areas that have been inspected to determine they meet the criteria called for in the specifications. Verify appropriately licensed applicator for chemical weed control methods.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
611 – Planting, Transplanting and Post-Planting Care	▪ RF-3 ▪ Hold point on installation of Specimen plants until material approval. ▪ Witness point on first instance of transplanting operation. ▪ Witness point on inspection of first delivery of each plant type.	• Materials QA: Observe the inspection of the first delivery of each plant material type (e.g.: deciduous tree, coniferous shrub). Verify certifications required by specification. Verify that the material used on the project is the same as that specified in the contract documents, at a rate of 10% of the QA frequency. • CI QA: perform random check of areas that have been inspected, to determine they meet the criteria, including placement locations, called for in the contract documents as follows: • 10% of roadside, • 15% of streetscape and • 20% of planting for environmental permit requirements
613 – Wildlife and Ecology	▪ RF-2 for any materials or performance testing required by environmental permit ▪ RF-3 for all other non-environmental permit work ▪ Witness point the start of any permit-related ecological treatment (e.g.: stream restoration).	• Materials QA: Review documentation required by specifications and environmental permits to verify material or testing compliance. Perform any required testing at 100% of QC requirements or per direct environmental requirements • CI QA: perform random check of 100% of the areas that have been inspected to determine they meet the criteria called for in the specifications. Assure any field testing is performed per specification.
614 – Pruning, Improving and Removing Existing Vegetation	▪ RF-3 ▪ Witness point for verification of trees to be pruned or removed prior to work start in streetscape or areas subject to permit	• Materials QA: Check documentation required by specifications to verify compliance. • CI QA: perform random check of the areas that have been inspected to determine they meet the criteria called for in the contract documents as follows: • 10% of roadside • 15% of streetscape • 20% of areas subject to permit (e.g.: NYC parks, forest preserves)

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
615 – Landscape Appurtenances	▪ RF-3 ▪ Witness point for verification that approved equal meets the ▪ Hold point for field layout of one-of-a-kind site design (e.g. play equipment, art installation)	• Materials QA: Check documentation required by specifications to verify compliance • CI QA: Assure any shop drawing reviewed by DB. Observe the first installation of each type of appurtenance, and 20% of any subsequent installation, including placement location.
616 – Soil Bioengineering	▪ RF-3 ▪ Witness point on inspection of first delivery of each plant type. ▪ Witness point for location of any material in streambed.	• Materials QA: Check documentation required by specifications and environmental permits to verify compliance. Certified copies of laboratory test results supplied by DB. • CI QA: Verification of materials acceptability. Observe the first installation of each type of facility, and 20% of any subsequent installations. Secure placement of materials to provide protection from erosion.
617 - Invasive Species Management	▪ RF-3 ▪ Witness point on layout of proposed treatment area. ▪ Witness point for location and operation of equipment washing station.	• Materials QA: Check documentation required by specifications and environmental permits to verify compliance. • CI QA: perform random check of 10% of the areas that have been inspected to determine they meet the criteria called for in the specifications. Verify appropriately licensed applicator for chemical weed control methods.
619, Work Zone Traffic Control (WZTC)	▪ RF-3 for materials. No physical testing expected but requires verification of adherence to specifications and standards of application on daily basis. ▪ Witness point of all traffic control / safety operations.	• Materials QA: verify products on Approved List or conforms to requirements of 619-2 references as appropriate. • CI QA: Assure DB personnel competency for safety oversight of WZTC and that all operations are compliant with 619, safety plan, and MUTCD requirements.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
620, Bank and Channel Protection	▪ RF-2 only if soundness testing deemed necessary and performed by Design Builder. ▪ RF-3 for any Department accepted stockpiles / materials	• Materials QA: Stockpile material, soundness testing if necessary, based on geologic source report data. Visual examination of materials for size and gradation. Block pavers per certification and Approved List of 704-04. Gabions per 712-15 • CI QA: random visual inspection of materials used and practices followed for installation. Secure placement of stone materials to provide protection from erosion. See GCP 14.
622 – Buildings and Miscellaneous Structures	▪ RF-1 for new building erections and structural alterations where materials testing can be performed by Design-Builder and verification testing possible (i.e. concrete, earthwork items, etc…). ▪ RF-2 for non structural alterations ▪ RF-3 for non-testable products or materials accepted on Approved List. ▪ Hold point for OGS Construction permit ▪ Hold point for foundation strength ▪ Additional Witness and Hold point per applicable Material Sections referenced in contract documents.	• Materials QA: Check documentation required by specifications to verify compliance. Certified copies of laboratory test results supplied by DB. Review "Commissioning" and any testing of systems (i.e. ITS, fire suppression, elevators, etc…) for compliance with building design. • CI QA: Review of CPM schedule by DB. DB informs Department of achievement/adjustment of project milestones. Assure any shop drawing reviewed by DB. Verify building trade inspections completed. Perform random check of 20% of the areas that have been inspected to determine they meet the criteria called for in the specifications.
623 - Screened Gravel, Crushed Gravel, Crushed Stone, Crushed Slag	▪ RF-3	• Materials QA: verify materials meet 703-02 • CI QA: Review calculations for quantities used if in-place measure. Verify quantities if measured by weight.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
624 - Paved Gutters	▪ RF-3.	• Materials QA: See 401 for HMA production requirements. Small quantities accepted based on certification per 401. See 501 for concrete production. Quantities less than 50 CY accepted on certification. Observe concrete air content QC testing per MM9.2. • CI QA: observation, documentation review and random checks to verify quantity and ensure placement requirements are being followed.
630 - Barricades	▪ RF-3	• Materials QA: Corrugated Guide Rail – Verify material certifications received / on file. Verify materials on Approved List as appropriate • CI QA: Verify completed installation per plans.
633 – Conditioning Existing Pavement Prior to Hot Mix Asphalt (HMA) Overlay	▪ RF-3	• Materials QA: See 401 for HMA production requirements. Small quantities accepted based on certification per 401 • CI QA: Observation, documentation review and random checks to verify quantity to ensure placement requirements are being followed and met.
635 - Cleaning and Preparation of Pavement Surfaces for Pavement Markings	▪ RF-3	• Materials QA: N/A • CI QA: Verify cleaning operations do not damage pavements to remain in place and are progressed in a safe manner to protect traffic. Timely replacement of pavement markings per Dept requirements for safety.
638 - White Synthetic Resin Binder Concrete	▪ RF-2	• Materials QA: See 401 for HMA production requirements. Small quantities accepted based on certification per 401 • CI QA: Observation, documentation review and random checks to verify quantity and ensure requirements are being followed and met.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
640, Reflective Pavement Marking Paints	▪ RF-3	• Materials QA: Verify product appears on the Approved List. • CI QA: Random verification of placement in conformance with the MUTCD.
643 – Noise Barriers	▪ RF-3 ▪ Hold point for foundation strength	• Materials QA: verify materials used meet requirements for the type of barrier installed. Certifications for testing as appropriate. See 501 for concrete production. Quantities less than 50 CY accepted on certification. Verify DB test results for foundation concrete compressive strength meets barrier design requirements. Observe concrete air content testing per MM9.2. • CI QA: Verify completed installation per plans.
644 – Overhead Sign Structures	▪ RF-1(LV) / RF-2 for CIP concrete sampling and testing ▪ RF-3 for other components and precast concrete ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites. ▪ Hold point for foundation strength prior to setting any overhead structures or poles. ▪ Witness point for pole installation and any bolt tightening.	• Materials QA: Item 644 may require the use of stainless steel hardware. SS hardware stock lot sampled, tested and approved according to 715-16 prior to use. Exception is grade B8 bolts less than 3/8” in diameter, which are accepted based on chemistry only. Plant inspection per requirements of 501 for concrete production. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Perform plastic air content and 28 day compressive strength per MM9.2, per concrete mixture under RF-1(LV) or at 100% of QC frequency when larger volumes of concrete allow RF-2. Verify materials on Approved List as appropriate. Refer to Special Specification Item# 645.03XXXX11 for sheeting. • • CI QA: Verify excavation per 206, select structural fill per 203. Verify concrete installation per 555. •

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
645, Signs	▪ RF-3 ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites. ▪ Hold point for foundation strength prior to setting structures or poles. ▪ Witness point for pole installation and any bolt tightening.	• Materials QA: Verify SS hardware stock lot sampled, tested and approved according to 715-16 prior to use (exception is grade B8 bolts less than 3/8" in diameter, which are approved based on chemistry only). See 501 for concrete production. Quantities less than 50 CY accepted on certification. Observe concrete air content testing per MM9.2. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements. Verify materials on Approved List as appropriate. Verify sign panel compliance with 730. Refer to Special Specification Item# 645.03XXXX11 for sheeting. • CI QA: Verify conformance with plans, Standard sheets, Materials Detail sheets and Approved Lists. Verify placement locations, erection conforming to standard sheets, and visual applicability for safety.
646 - Delineators, Reference Markers and Snowplowing Markers	▪ RF-3	• Materials QA: Verify conformance with Standard Sheets and product appearing on the Approved List • CI QA: verify placement locations, erection conforming to standard sheets, and visual applicability for safety.
647 - Removing, Storing and Relocating Signs	▪ RF-3	• Materials QA: Verify new / replacement materials conform to 645. • CI QA: Verify conformance with plans, Standard sheets, Materials Detail sheets, and Approved Lists. Verify placement locations, erection conforming to standard sheets, and visual applicability for safety.
650 – Trenchless Installation of Casing	▪ RF-2	• Materials QA: Review material documentation. • Perform grout cube breaks on 100% of the number required in the QA plan. • CI QA: Observe steering and tracking procedures for the first installation, and 100% of the subsequent installations. Observe monitoring plan for the first installation, and for 100% of the subsequent installations

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
652 - Furnishing and Applying Salts	▪ RF-3	• Materials QA: verify materials meet 712-02 or 712-03 • CI QA: review documents that application rates are adhered to and that treatments are effective
654 – Impact Attenuators - Permanent	▪ RF-1(LV) / RF-2 for concrete or grout compressive strength ▪ RF-3 for other components ▪ Hold point for foundation strength prior to setting attenuators	• Materials QA: See 501 for concrete production. Quantities less than 50 CY accepted on certification. Perform plastic air content and 28 day compressive strength per MM9.2, per concrete mixture RF-1(LV) or at 100% of QC frequency when larger volumes of concrete allow RF-2. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements and certifications as appropriate. Verify materials on Approved List as appropriate. • CI QA: Verify conformance with manufacturer's drawings, plans, Standard sheets, Materials Detail sheets, and Approved Lists.
655, Frames, Grates and Covers	▪ RF-3 ▪ RF does not apply when DOT performs materials sampling and testing for acceptance purposes at off-site fabrication sites.	• Materials QA: review certification stating that castings (frames, grates and covers) meet the NYS Standard Sheets for castings, meet Buy America clause. Verify iron castings with "Proof Loaded" designs appear on Approved List for Proof Loaded Castings. • CI QA: verify placement true to line and grade and proper bearing on underlying surface.
656, Miscellaneous Metals	▪ RF-3	• Materials QA: verify materials requirements of 715 and 725 as appropriate. Galvanizing performed per 719-01. Review certifications as appropriate. Random sampling when deemed necessary. • CI QA: Verify work progresses per the Steel Construction Manual.
659 - Telecommunication Utilities	▪ RF-3	• Materials QA: Verify compliance with special provisions of local municipality and/or respective utility company • CI QA: Verify earthwork progressed per section 206 requirements as appropriate. Verify DB coordination with local utility

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
660, Utilities	▪ RF-3	• Materials QA: Verify compliance with special provisions of local municipality and/or respective utility company • CI QA: Verify earthwork progressed per section 206 requirements.
661, Electric Utilities	▪ RF-3	• Materials QA: Verify compliance with special provisions of local municipality and/or respective utility company • CI QA: Verify earthwork progressed per section 206 requirements as appropriate. Verify DB coordination with local utility
662, Gas, Oil and Steam Utilities	▪ RF-3	• Materials QA: Verify compliance with special provisions of local municipality and/or respective utility company • CI QA: Verify earthwork progressed per section 206 requirements as appropriate. Verify DB coordination with local utility
663, Water Supply Utilities	▪ RF-3	• Materials QA: Verify compliance with special provisions of local municipality and/or respective utility company. Materials compliance per 663-2. Concrete production per 501, with exceptions as noted in 663. Review / verify DB test results for concrete compressive strength meets design requirements. Observe concrete air content testing per MM9.2. at 10% of QC frequency • CI QA: Verify earthwork progressed per section 206 requirements as appropriate. Verify DB coordination with local utility.
664, Sanitary Sewer Utilities	▪ RF-3	• Materials QA: Compliance with special provisions of local municipality and/or respective utility company • CI QA: Verify earthwork progressed per section 206 requirements as appropriate. Verify DB coordination with local utility

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
670 - Highway Lighting System	▪ RF-3 ▪ Hold point for foundation strength prior to setting structures or poles. ▪ Witness point for pole installation and any bolt tightening. ▪ Hold point for all testing of systems prior to placing into service.	• Materials QA: See 501 for concrete mixture requirements. Concrete production accepted on certification. Observe plastic air content performed per MM9.2 procedures and frequency. Rebar acceptance per 556. Miscellaneous materials conformance per various 700 section requirements and certifications as appropriate. Verify materials on Approved List as appropriate. • CI QA: Verify shop drawing reviews completed by DB prior to material delivery. Random review of installation per standard specifications. Test of system prior to service
680, Traffic Signals	▪ RF-1(LV) / RF-2 for concrete ▪ RF-3 for all other materials ▪ Hold point for achieving concrete strength prior to loading / installing poles. ▪ Hold point for all testing of systems prior to placing into service.	• Materials QA: See 501 for concrete mixture requirements. Concrete production accepted on certification. Perform plastic air content and 28 day compressive strength per specification following MM9.2, under RF-1(LV) or at 100% of QC frequency when larger volumes of concrete allow RF-2. Rebar acceptance per 556. Verify precast components conform to 723-45. Miscellaneous materials conformance per various 700 section requirements and certifications as appropriate. Verify materials on Approved List as appropriate. Verify certification from manufacturer for compliance with 724 requirements. • CI QA: Verify excavation per 206, select structural fill per 203. Verify concrete strengths achieved prior to any loading. Pole erection per standard sheets and compliance with any MUTCD requirements. Verify appropriate testing of signal systems are completed prior to placement into service. Verify coordination with utilities and agency maintaining the signals as appropriate.

Specification Section	Risk Factor, applications, and hold points	• Quality Assurance Actions and Testing
685, Epoxy Reflectorized Pavement Markings	▪ RF-3	• Materials QA: Verify product appears on the Approved List • CI QA: Verify placement per plans, Standard sheets and MUTCD on clean / prepared surfaces, under acceptable atmospheric conditions, and using proper WZTC. Verify retro-reflectivity
687, Thermoplastic Reflectorized Pavement Markings	▪ RF-3	• Materials QA: Verify product appears on the Approved List • CI QA: Verify placement per plans, Standard sheets and MUTCD on clean / prepared surfaces, under acceptable atmospheric conditions, and using proper WZTC. Verify retro-reflectivity
688, Preformed Reflectorized Pavement Markings	▪ RF-3	• Materials QA: Verify product appears on the Approved List • CI QA: Verify placement per plans and MUTCD on clean / prepared surfaces, under acceptable atmospheric conditions, and using proper WZTC.

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