NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

REQUEST FOR PROPOSAL (RFP)

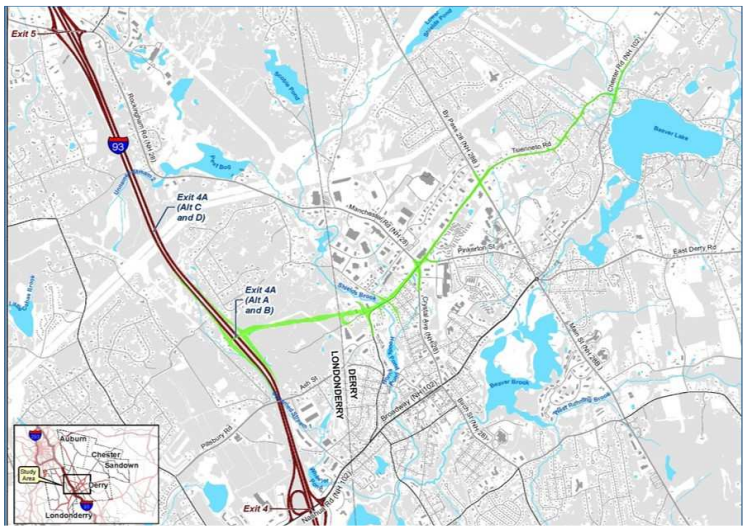
DESIGN-BUILD SERVICES FOR

Interstate 93 Exit 4A Project

DERRY-LONDONDERRY, NH –
NHDOT Project Number: 13065
Federal Project Number IM-0931(201)

Volume II – Book 2

Technical Provisions



NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

7 Hazen Drive
Concord, NH 03302
Mailing Address: P.O. Box 483
Concord, NH 03302-0483

July 20, 2020

ADDENDUM #3

Table of Contents

Table of Contents i
1. GENERAL REQUIREMENTS 1
1.1. Project Scope 1
1.2. I-93 Interchange 4A 2
1.3. Bridges 3
1.4. Roadway 3
1.5. Other Items 4
2. PROJECT MANAGEMENT PLAN AND ADMINISTRATION 5
2.1. General Project Management 5
2.1.1. Document Management 6
2.1.2. NHDOT-Design-Builder Communications Plan 8
2.1.3. Partnering 8
2.1.4. Deliverables 9
2.1.5. Coordination with Other Projects 9
2.2. Coordination with Stakeholders 10
2.3. Risk Management 10
2.4. Schedule and Cost Control Management 11
2.4.1. Project Schedule 11
2.4.2. NHDOT Submittal Review Timeframes 14
2.5. Public Information and Communications 14
2.6. ROW Management and Coordination 15
2.7. Environmental Management 15
2.8. Design Management 15
2.9. Construction Management during Construction 16

2.10. Traffic Management during Construction 16

2.11. Requirements for NHDOT Offices, Equipment and Vehicles 16

2.11.1. General Description 16

2.11.2. NHDOT Project Office Space 17

2.11.3. Project Office Equipment 20

2.11.4. Field Laboratory 26

3. QUALITY MANAGEMENT PLAN 27

3.1. Project Quality Assurance 27

3.1.1. Design QA Program 27

3.1.2. Construction QA Program 27

3.2. QA Program Responsibilities 27

3.2.1. Design-Builder Responsibilities 27

3.2.2. NHDOT Responsibilities 28

3.3. QMP General Requirements 28

3.4. Quality Terminology 29

3.5. Quality Control Inspection and Testing 29

3.5.1. NHDOT Construction Notices 30

3.5.2. Quality Control Laboratory Requirements 30

3.5.3. Supply Source and Material Quality 30

3.6. Responsibility and Authority of Design-Builder Staff 30

3.7. QMP Format and Contents 30

3.7.1. QMP Section 1 – Introduction 31

3.7.2. QMP Section 2 – Quality Control Organization 31

3.7.3. QMP Section 3 – Document Management Procedures 33

3.7.4. QMP Section 4 – Design Quality Control Procedures 34

3.7.5. QMP Section 5 – Construction Quality Control Procedures 41

3.8. Construction Quality Control Plans 46

3.9. Non-Conformance Reports (NCRs) 47

3.10. Materials & Workmanship Quality Certificate 48

4. SAFETY PLAN 49

4.1. Project Specific Emergency Planning 49

4.2. Joint Duty Regarding Safety 50

5. PUBLIC INFORMATION AND COMMUNICATIONS 51

5.1. General Requirements 51

5.1.1. NHDOT's Role 51

5.1.2. Design-Builder's Role 52

5.2. Administrative Requirements 53

5.2.1. Public Information and Communications Plan 53

5.2.2. Public Information Coordinator 55

5.2.3. Public Information Office 55

5.2.4. Customer Groups 56

5.2.5. Public Meetings 56

5.2.6. Meeting Minutes 57

5.2.7. Emergency Event Communications 57

5.2.8. Disseminating Public Information 58

5.3. Deliverables 59

5.3.1. PICP 59

5.3.2. Meeting Minutes 59

6. ENVIRONMENTAL 60

6.1. General Requirements 60

6.2. Environmental Approvals 61

6.2.1. Permits and Limitations 61

6.2.2. New Environmental Approvals and Amended NHDOT-Provided Approvals 62

6.2.3. Responsibilities Regarding Environmental Studies 63

6.2.4. NHDOT Review and Approval of Design-Builder Submissions 65

6.3. Comprehensive Environmental Protection Program (CEPP) 65

6.3.1. Environmental Management System (EMS) 66

6.3.2. Environmental Compliance and Mitigation Plan (ECMP) 66

6.3.3. Environmental Protection Training Plan (EPTP) 70

6.3.4. Contaminated/Hazardous Materials Management Plan (HMMP) 72

6.3.5. Communication Plan (CP) 74

6.3.6. Construction Monitoring Plan (CMP) 74

6.3.7. Recycling Plan 74

6.3.8. Stormwater Management Plan (SMP) for Construction Period and Post-construction Operation 74

6.4. Environmental Personnel 74

6.4.1. Environmental Compliance Manager (ECM) 77

6.4.2. Environmental Training Staff 77

6.4.3. Environmental Compliance Inspectors (ECI) 77

6.4.4. Cultural Resource Management Personnel 78

6.4.5. Water Quality Specialist 78

6.4.6. Hazardous Materials Manager 78

6.5. Summary of Environmental Commitments 79

6.5.1. General 79

6.5.2. Noise 79

6.5.3. Socioeconomics 80

6.5.4. Geology, Minerals, and Soils 80

6.5.5. Contaminated Properties and Hazardous Materials 80

6.5.6. Surface Waters and Water Quality 84

6.5.7. Surface Waters, Wetlands and Vernal Pools Mitigation 84

6.5.8. Groundwater 85

6.5.9. Aquatic Life and Fish Habitat 86

6.5.10. Floodplains 87

6.5.11. Plant Communities and Wildlife 87

6.5.12. Threatened and Endangered Species 87

6.5.13. Cultural Resources 89

6.5.14. Construction Impacts 91

6.6. Contaminated Materials Allowance 94

7. DESIGN CRITERIA 95

7.1. General 95

7.2. Utilities 95

7.2.1. General Requirements 97

7.2.2. Design 100

7.2.3. Construction 102

7.2.4. Deliverables 105

7.3. Right-of-Way 107

7.3.1. General Requirements 107

7.3.2. Administrative Requirements 108

7.3.3. Project Survey Requirements for ROW Purposes (See Section 7.5 for general project Survey Requirements) 121

7.3.4. ROW Acquisition Activities 125

7.4. Geotechnical 133

7.4.1. General Requirements 133

7.4.2. Design Requirements 133

7.4.3. Instrumentation Programs 141

7.5. Survey 142

7.5.1. Base Technical Concept Survey 142

7.5.2. General Requirements 143

7.5.3. Right-of-Entry 143

7.5.4. Survey Services 143

7.5.5. Administrative Requirements 144

7.5.6. Design Requirements 144

7.5.7. Construction Requirements 146

7.5.8. Survey Records and Reports 147

7.5.9. Electronic Deliverables 147

7.5.10. Permanent Survey Control Network 148

7.6. Roadway, Bicycle, and Pedestrians 148

7.6.1. General Requirements 148

7.6.2. Roadway Design Requirements 148

7.6.3. Bicycle Facilities 151

7.6.4. Pedestrian Facilities 152

7.6.5. Construction 152

7.7. Drainage 153

7.7.1. General Requirements 153

7.7.2. Administrative Requirements 155

7.7.3. Design Requirements 156

7.7.4. Construction Requirements 162

7.7.5. Deliverables 162

7.8. Structures 163

7.8.1. Interchange 4A over I-93 NB & SB Bridge 163

7.8.2. Pedestrian/Bike Path under the Connector Road 165

7.8.3. Connector Road over Shields Brook Bridge 167

7.8.4. Tsienneto Road over Tributary E Bridge 168

7.8.5. Retaining Walls (Non-Bridge Structures) 169

7.8.6. Overhead Sign Structure Foundations 170

7.8.7. Signal Mast Arm Foundations 170

7.8.8. Closed Circuit Television Pole Foundations 170

7.8.9. Soundwalls 170

7.9. Aesthetics and Landscaping 171

7.9.1. Administrative Requirements 171

7.9.2. Design Requirements 171

7.9.3. Construction Requirements 173

7.9.4. Deliverables 173

7.10. Traffic 173

7.10.1. General Requirements 173

7.10.2. Design Requirements 173

7.10.3. Construction Requirements 177

7.10.4. Deliverables 178

7.11. Intelligent Transportation Systems (ITS) 180

7.11.1. General Requirements 180

7.11.2. Administrative Requirements 181

7.11.3. Design Requirements 181

7.11.4. Construction Requirements 181

7.11.5. Deliverables 181

7.12. Traffic Control 182

7.12.1. General Requirements 182

7.12.2. Administrative Requirements 183

7.12.3. Design Requirements 185

7.12.4. Construction Requirements 188

7.12.5. Deliverables 189

7.13. Roadway Lighting 189

7.13.1. Design 190

7.13.2. Agreements 191

7.13.3. Construction 191

7.13.4. Deliverables 192

8. MAINTENANCE 193

8.1. General Requirements 193

8.2. General Maintenance Obligations 193

8.3. Design-Builder's Obligation to Remedy and Repair 194

8.4. NHDOT Obligation to Remedy and Repair 194

8.5. Winter Maintenance Season 194

1. GENERAL REQUIREMENTS

1.1. Project Scope

The overall scope of the Project includes design and construction services for the New Hampshire Department of Transportation's (NHDOT) I-93 Exit 4A Project. The Project consists of a new diamond interchange on I-93 in the Town of Londonderry, approximately one mile north of Exit 4. The new diamond interchange will only provide access to the east side of I-93. A 1-mile connector roadway will be built on a new alignment from Interchange 4A to Folsom Road, near the intersection of North High Street and Madden Road, in the Town of Derry. Folsom Road, and subsequently Tsienneto Road, will be upgraded, and intersections within the project limits will be improved. In total, the Proposed Project corridor from I-93 to the intersection of Tsienneto Road and NH Route 102/Chester Road will be approximately 3.2 miles. Refer to Figure 1-1 for the Project Location Map.

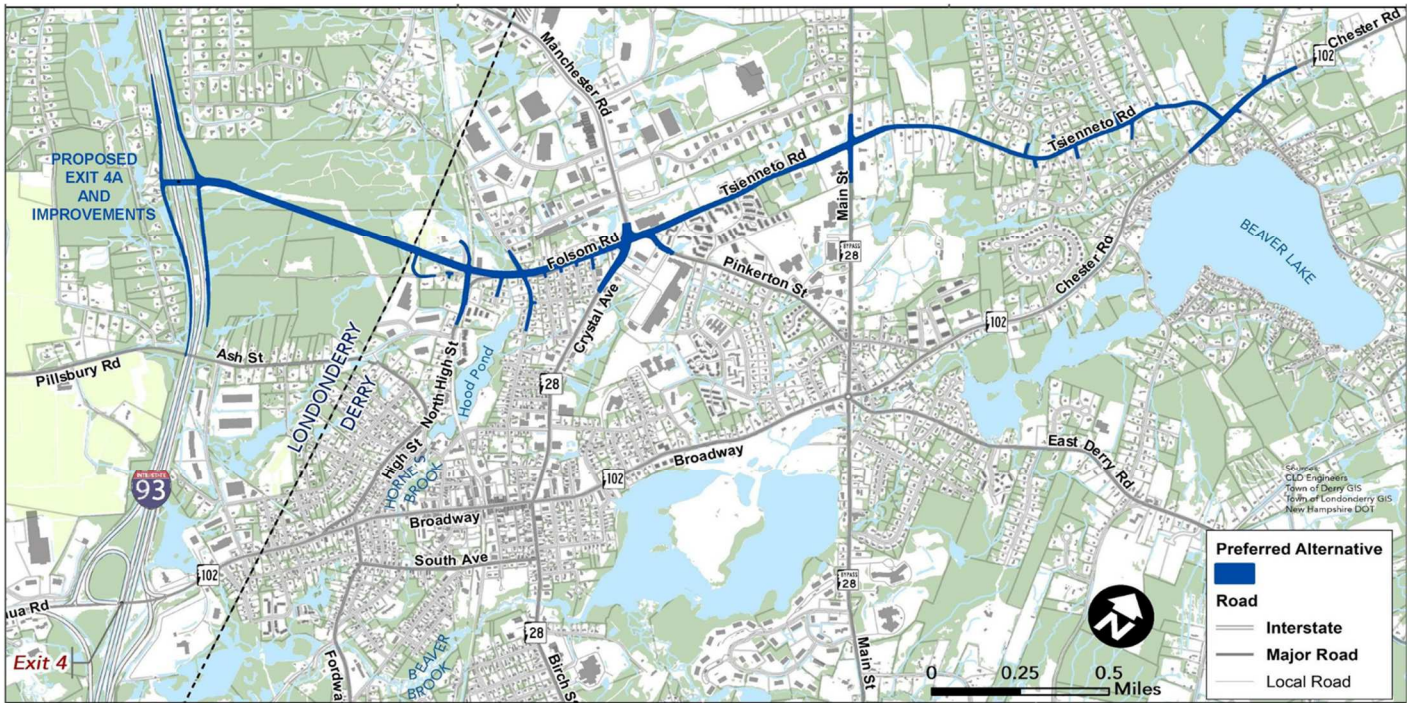


Figure 1-1: Project Location Map

A Design-Build team, which will be selected by NHDOT with input from the Towns of Derry and Londonderry, will complete this work. In advance of the request for proposal, permitting work has been initiated as well as public meetings to determine the project constraints.

The scope of work includes the following primary elements:

A. A new highway interchange on I-93, including a new bridge over I-93. The interchange shall be designed to accommodate an ultimate 8-lane roadway cross section and a future rail facility on I-93. Widening I-93 to an 8-lane cross section will be done by a separate project.

B. Soundwalls along both sides of I-93 in the interchange area.

C. New 5 or 6-lane Connector Roadway on new location from the interchange to Folsom Road. Approximately 1 mile in length.

D. Underpass bridge on Connector Road to not preclude for a future rail-trail corridor by others near the North High Street intersection.

E. Widening and reconstruction of Folsom Road on a shifted alignment to a 6 or 7-lane cross section between Franklin Street and NH 28 (Crystal Avenue/Manchester Road). Approximately 0.3 miles in length.

F. Widening and reconstruction of Tsienneto Road on existing alignment to a 3-lane or 5-lane cross section between NH 28 (Crystal Avenue/Manchester Road) and NH 28 Bypass (North Main Street). Approximately 0.7 miles in length.

G. Widening and reconstruction of Tsienneto Road to a 2-lane or 5-lane cross section from NH 28 Bypass (North Main Street) to NH 102 (Chester Road). Approximately 1.1 miles in length with minimal changes in alignment and profile.

H. Widening and reconstruction of NH 102 (Chester Road) to a 3 or 4-lane cross section near the Tsienneto Road intersection. Approximately 0.4 miles in length.

I. New bridges at Connector Road over Shields Brook and Tsienneto Road over Tributary E.

J. New traffic signals at 7 intersections. Traffic signal upgrades at 2 existing signalized intersections with interconnected communications and traffic coordination.

K. Stormwater treatment measures throughout the project area to meet MS4 requirements.

L. Identification and relocation of all impacted utilities, including an electric transmission line in the interchange area.

M. Design and construction of Intelligent Transportation Systems (ITS) infrastructure;

N. Acquire necessary ROW and easements for all non-full acquisition parcels. Full acquisitions will be acquired by the NHDOT.

A major objective of the project is to minimize environmental impacts while providing the required roadway improvements.

The design of the new bridges shall be in conformance with the design criteria included within the project specifications. No additional permanent ROW other than as described in this Contract is required for the project as described herein.

1.2. **I-93 Interchange 4A**

The new Interchange 4A includes but is not limited to the following items:

A. Construction of a new bridge over I-93. The superstructure depth in the BTC has been minimized to provide the required minimum vertical clearance below while minimizing grades

of the approach roadway and interchange ramp roadways.

B. Provides structure span lengths sufficient for the proposed roadway width beneath, including specified minimum number and widths of lanes and shoulders, required horizontal clearances and sufficient width for future light rail facilities.

C. Grading and landscaping of new earthen structures.

D. Paving and striping of new roadway surfaces.

E. Maintenance and Protection of Traffic during Construction.

F. Roadway lighting.

G. Preparation of as built plans.

1.3. Bridges

The overall scope of work for the bridges required includes but is not limited to the following items:

A. Construction of a new bridge carrying Interchange 4A over I-93 NB & SB as noted above.

B. Construction of a new bridge carrying the Connector Road over a potential future rail-trail corridor near the North High Street intersection, adjacent to the former Manchester and Lawrence Railroad corridor.

C. Replacement of the current culvert carrying Folsom Road over Shields Brook with a new bridge.

D. Replacement of the current structure carrying Tsienneto Road over Tributary E with a new bridge.

1.4. Roadway

The overall scope of work for the roadway improvements includes but is not limited to the following items:

A. Removal of existing structures in conflict with the proposed work.

B. Construction of a new connector roadway connecting Interchange 4A with the Town of Derry.

C. Improvements to the existing Folsom Road and adjacent roadways as shown in the BTC.

D. Paving and striping of new roadway surfaces.

E. Maintenance and Protection of traffic during construction.

F. Roadway Lighting.

G. Preparation of as built plans.

The work will include vibration monitoring during construction for the preservation of adjacent historic structures.

Maintenance of access to properties adjacent to the project, including businesses and residential properties.

1.5. **Other Items**

Other work in the project scope of work includes but is not limited to the following items:

A. Right-of- Way Acquisitions, relocations, and demolishing of buildings

B. Utility Relocations as required

C. Stonewall reconstruction as required

2. PROJECT MANAGEMENT PLAN AND ADMINISTRATION

Design-Builder shall establish and maintain an organization and processes to effectively manage all Elements of the Work. This Project management effort shall be defined by and follow the Project Management Plan (PMP), which addresses several discrete Elements of the Work. The Project Management Plan is an umbrella document that describes Design-Builder's managerial approach, strategy, and procedures to design and build the Project and achieve all requirements of the Design-Build Documents.

The structure of the Project Management Plan is outlined in Table 2-1A.

Table 2-1A: Elements of the Project Management Plan

PMP Chapter	Chapter Title
1	**General Project Management**
2	**Coordination with Stakeholders**
3	**Risk Management**
4	**Schedule and Cost Control Management**
5	**Public Information and Communications Plan**
6	**ROW Management and Coordination**
7	**Environmental Management**
8	**Design Management**
9	**Construction and Traffic Management During Construction**

2.1. General Project Management

The Project Management Plan shall describe Design-Builder's overall Project management plan and approach to the work (including design, and construction), including at least the following:

A. A description of the methods to be used to assure necessary communication and documentation within Design-Builder's team, including communication among the sub-organizations and management personnel.

B. A description of how Design-Builder intends to: (i) provide the experienced personnel, facilities and equipment, and to integrate such resources, to complete each aspect of the Project; (ii) control and coordinate the various Subcontractors; (iii) interface with NHDOT, its consultants and relevant federal, State and local agencies; (iv) interface with applicable Utility Owners; (v) control Project schedules and minimize Project costs; and (vi) comply with applicable Laws.

C. A description of the plan to manage permitting and third-party coordination and approvals.

D. An organization chart outlining the basic structure of Design-Builder's Project organization (including the design and construction sub-organizations) and a description of the roles, responsibilities, interrelation and work to be accomplished by each member of the management team and each sub-organization, including identified Subcontractors and Suppliers (at all tiers).

E. Information describing how each of the Key Personnel will fit into the organization, including a description of each key person's function and responsibility relative to the Project, and indicating the percent of time that the person will devote to the Project during their activity.

F. A detailed description of how the team members will work together to provide a unified design, construction, and quality approach to all elements of the Work.

G. A description of the team decision making process, how internal disputes between team members will be resolved and how Design-Builder will avoid adverse impacts to the Project (cost, schedule or quality) in the event of such disputes.

H. The Document Management Plan in accordance with Section 2.1.1, including the Communications Plan and Partnering Approach.

2.1.1. Document Management

All electronic information submitted to NHDOT shall be searchable and legible.

2.1.1.1. *Project Management Plan Requirements*

Design-Builder shall describe procedures and processes in the PMP for the storage and retrieval of documents, including the following:

A. Methods by which all documents issued and received by Design-Builder will be uniquely coded and retrievable.

B. The routing, filing, control, back-up and retrieval methods for all documents.

C. Methods to facilitate sharing of data including procedures and software for accessing all documents.

2.1.1.2. *Electronic Document Management System (EDMS)*

NHDOT will ~~Design-Builder shall~~ develop and implement an Electronic Document Management System (EDMS), and provide the Design-Builder appropriate levels of access to the EDMS~~.~~. ~~Additionally,~~The Design-Builder shall:

A. Furnish the services of one administrative employee, entitled the Document Control Specialist, who will ensure that the Design-Builder will prepare, status, electronically file and send all project correspondence and drawings utilizing the EDMS as established and maintained by the NHDOT. The Document Control Specialist shall be designated by name, in writing with a resume of their qualifications, within five (5) calendar days of the award of the Contract and shall not be changed without prior written notice to the Department.

B. Produce and transmit all correspondence for the project using the EDMS, including, but not

limited to: transmittals, meeting minutes, requests for information (RFI's), requests for change (RFC's), submittals, field memos, notices, letters, and punch lists. Submittals, including shop drawings, working drawings, catalog cuts, material certifications, and all documentation required by Contract, shall be submitted electronically via the EDMS. Original hardcopy documents may still be required in addition to the electronically submitted copies as determined by the NHDOT. The Design-Builder is responsible to coordinate the overall creation and submission of all project documentation to meet the requirements of the project schedule and specifications.

C. NHDOT will provide training for and access to the EDMS for up to fifteen (15) named Design-Builder personnel who will be designated the Design-Builder's authorized users. The Design-Bui~~iu~~lder's authorized users shall complete EDMS training provided by NHDOT prior to use of the EDMS.

D. The Design-Builder is responsible for ensuring the Design-Builder's authorized users have access to the public internet from a computer system running any currently supported Microsoft Windows Operating System and Microsoft Internet Web Browser. The Design-Builder shall be responsible for furnishing a compliant computer system required for use by any of the Design-Builder's authorized users.

E. Input and update Right Of Way parcel acquisition status in a web-based geographic tracking system that is accessible by NHDOT or its designees, for display on the EDMS.

NHDOT will:

A. Provide licensed use of an EDMS, the required user accounts, and managed hosting of the EDMS, either by NHDOT or by a firm retained by NHDOT knowledgeable in the use and management of the EDMS.

B. Provide the Design-Builder and it's authorized users direct access the EDMS via the internet.

C. Develop~~Use~~ data systems, standards and procedures for the EDMS and it's use.

~~A. compatible with those employed by NHDOT and implement any new operating practices required as a result of NHDOT's amendments to any such systems, standards and procedures.~~

~~B. Employ appropriate standards and procedures, and t~~Provide training to the Design-Builder's authorized users~~personnel~~ to operate the EDMS~~any NHDOT data management system which NHDOT may require~~ in connection with this~~e~~ Project.

~~C. Provide a mechanism for the electronic transfer of meta data along with the associated document file format images for uploading into an electronic document management system (EDMS) employed by NHDOT.~~

D. ~~Provide NHDOT with procedures and software for accessing all documents generated under the Design-Build Documents.~~

~~Design-Builder shall provide NHDOT at Design-Builder's expense, sufficient access to Design-Builder's document control database as deemed necessary by NHDOT.~~

2.1.2. NHDOT-Design-Builder Communications Plan

Design-Builder shall develop, implement, and maintain a NHDOT–Design-Builder Communications Plan (Communications Plan) that is consistent with and expands upon the preliminary communications plan submitted with the Proposal. Design-Builder shall maintain and update the Communications Plan throughout the Term.

The Communications Plan shall describe the procedures for communication of Project information between Design-Builder's organization and NHDOT.

The Communications Plan shall describe how Design-Builder's organization will respond to unexpected requests for information, communicate changes or revisions to necessary Design-Builder personnel, and notify affected stakeholders before and after changes are made to the Design-Build Documents.

2.1.3. Partnering

Partnering is a process of voluntary structured communication between the Department, the Design-Builder, its principal Subcontractors and suppliers, and other Project stakeholders for the purpose of improving efficiency and minimizing Disputes. Partnering, including the establishment of a partnership charter, does not in any way waive, alter, or otherwise affect any provision of the Contract.

Participation in Partnering is mandatory. The associated costs of Partnering will be agreed to mutually and shared equally.

Representatives from both the Design-Builder and the Department will arrange a facilitated initial Partnering Workshop, which shall be held before the start of on-site construction. The Department Project Manager and/or the Resident and the Project Manager will determine Workshop attendees, the facilitator, agenda, duration, and location. Key Project level supervisory personnel, corporate/State level management personnel, and key Project personnel of the Design-Builder's principal Subcontractors and suppliers shall attend. Project design Engineers, FHWA, local government representatives, environmental regulators, emergency service personnel, Utility Companies, impacted business and/or landowners, and other stakeholders may also be invited to attend. The product of the initial Partnering Workshop will be a partnership charter. This charter will include mutually agreed upon Project goals and communication escalation procedures.

The Design-Builder and the Department may agree to hold follow-up Partnering Workshops in advance of significant milestones in the construction schedule, not expected to exceed two additional workshops.

Partnering, including the establishment of a partnership charter, does not in any way waive, alter, or otherwise affect any provision of the Contract including those requiring notice and all other provisions governing the resolution of Issues or Disputes.

2.1.4. Deliverables

2.1.4.1. *Project Management Plan*

Design-Builder shall submit a Project Management Plan to NHDOT for approval in accordance with the requirements of Section 2.

2.1.5. Coordination with Other Projects

In addition to the requirements found in the Contract, during the construction phase of the Project the Design-Builder shall be required to coordinate its efforts with local and government agencies including NHDOT, the municipalities of the Town of Derry and the Town of Londonderry, community groups, adjacent land owners, utility companies and other planned Town and NHDOT projects that may be under design or construction during the construction phase of the Project. The coordination will include, but is not limited to, providing sufficient notice of roadway closures and/or other significant operations prior to their occurrence. The Design-Builder shall review design plans and shall coordinate and monitor the work of any entity performing or proposing work adjacent to the Project. The Design-Builder must anticipate allocating responsible personnel to this aspect of the Project.

2.1.5.1. *NHDOT Projects*

Known adjacent NHDOT projects that may require coordination include, but are not limited to, the following:

Project	**Target for Advertising**	**Anticipated Completion**	**Description**
Salem-Manchester 14633D	Under Construction	Fall 2020	Exit 4 interchange, I-93 NB and SB mainline and NH 102 approach work.
Salem-Manchester 13933A	Under Construction	Fall 2020	I-93 mainline widening south of Exit 1
Salem-Manchester 14633J	Fall 2019	Fall 2020	I-93 mainline construction of 4th lane between Exit 1 and Exit 5
Chester 41848	Spring 2022	Fall 2023	NH 102 and NH 121 intersection safety improvements
Londonderry 41715	Spring 2021	Fall 2021	NH 28 and Stonehenge Road intersections improvements
Manchester 42635	Fall 2020	Fall 2021	NH 28 Bypass Tier 2 Pavement Preservation

2.1.5.2. *Town of Derry Projects*

Known adjacent Town of Derry projects that may require coordination include, but are not limited to, the following:

Project	Target for Advertising	Anticipated Completion	Description
Water Main Improvements	2020	TBD	Route 28 south from Windham Town line to Ryans Hill
Water Main Extension	2020	TBD	Old Manchester Road to Londonderry town line
Culvert Replacement	2020	TBD	North Shore Road (Island Pond)
Hood Pond Dam/Rail Trail Extension	2021	TBD	This project will intersect with the future culvert under connector road at North High Street intersection
Water Main Upgrade	2021	TBD	Ferland Drive
Sunset Avenue Culvert Replacement	2022	TBD	Sunset Avenue culvert replacement
Possible Water Main Upgrades	2023	TBD	Manchester Road – Phase II of regional water project
Town Pavement Management Program	Yearly	Yearly	The specific streets are determined each year based on pavement condition. The town would coordinate these projects with the D-B team should there be any potential conflict to an adjacent street, recognizing resurfacing work is a fairly short window.

2.2. Coordination with Stakeholders

The Project Management Plan shall describe Design-Builder's overall plan and approach to coordinating with Stakeholders, including at least the following:

A. A description of the methods to be used to assure communication, cooperation and coordination with Project Stakeholders, including emergency services, Town of Derry, Town of Londonderry and other Stakeholders.

B. A description of the approach to communication and cooperation with businesses, residents and public facilities.

2.3. Risk Management

The Project Management Plan shall describe the approach to identification, management, mitigation, and allocation of Project-specific risks, including a risk matrix which shall identify the following at a minimum:

A. Significant risk categories during the design and construction of the Project.

B. The potential consequences of the identified risks.

C. The probability/likelihood of risks.

D. Proposed procedures and tools to conduct a risk sensitivity analysis.

E. Risk-mitigation strategies to eliminate or reduce specific risks.

The Risk Management Plan shall be updated throughout the project as risks are retired or as additional risks are realized.

The Design-Builder shall conduct an initial Risk Management Workshop at the project start to identify risks and to populate the risk matrix. The Workshop shall include members of the Design-Builder, Subcontractors, Designers, NHDOT and project stakeholders.

2.4. Schedule and Cost Control Management

The Project Management Plan shall provide a description of Design-Builder's plan and management approach for schedule and cost control on the Project, including at least the following:

A. Describe Design-Builder's document, cost control and schedule management system to be used to control and coordinate the cost and schedule of the work during the term of the Contract, including during design and construction.

B. Describe the proposed Project schedule methodology and cost control approach and include at least the following:

   I. A description of the system used for preparing and updating the Project schedule.

   II. A description of the system used for preparing and updating the schedule of values.

   III. A description of the proposed plan to integrate Subcontractor activities into Design-Builder's scheduling and reporting system.

   IV. A description of the proposed approach for calculating progress performance on a monthly basis and preparing payment requests.

   V. A description of how Design-Builder will approach re-scheduling of its work to achieve schedule recovery objectives and how these objectives will be enforced with its work force and Subcontractors.

   VI. The number of full-time equivalent personnel who will perform scheduling, reporting, invoicing and other Project controls functions for the Project.

2.4.1. Project Schedule

The Project Schedule shall define the timeframe for completion of the Project and achievement of milestones, and be used to monitor progress and denote changes that occur during design and construction. The Project Schedule shall include an intermediate completion date for clearing and demolition of structures associated with relocating the transmission line north of the area of the new Exit

4A Interchange as early as practical in the construction schedule. The planning, design, construction, and completion of the Work shall be undertaken and completed in accordance with the most recent Project Schedule approved by NHDOT.

2.4.1.1. *General Requirements*

Design-Builder shall be responsible for the adequacy of the Project Schedule and managing resources to meet the requirements of the Design-Build Documents and the PMP, including NHDOT reporting and invoicing requirements.

2.4.1.2. *Required Submittals*

Design-Builder shall develop, update, and submit the following schedule submittals in accordance with the applicable provisions of the Agreement. The submittals shall include both hard copies and electronic files, in PDF format and the native version file.

2.4.1.2.1. Baseline Schedule

Design-Builder shall use the preliminary schedule submitted with the Proposal as a foundation to prepare a Project Baseline Schedule. Design-Builder shall be responsible for updating scheduling software to maintain compatibility with current NHDOT-supported scheduling software, which is currently Microsoft Project.

The Project Baseline Schedule shall include a separate narrative report that describes, in general fashion, Design-Builder's proposed methods of operation for designing and constructing the major portions of the Work required by the Design-Build Documents. The schedule narrative shall describe the general sequence of design and construction, the proposed Critical Path of the Project, and all Project Schedule milestones.

The Project Baseline Schedule shall include all Work activities required under the Design-Build Documents, in sufficient detail to monitor and evaluate design and construction progress, from commencement of the Work to Final Acceptance of the Work. The Project Baseline Schedule shall also include activities for property acquisition, Utility Adjustments, permit acquisitions, and interfaces with other projects, localities, municipalities and other Governmental Entities. For each activity, Design-Builder shall indicate the duration (in Days) required to perform the activity and the anticipated beginning and completion date of each activity. In addition, the Project Baseline Schedule shall indicate the sequence of performing each major activity and the logical dependencies and inter-relationships among the activities.

The Project Baseline Schedule shall include a listing of all submittals as called out in the Design-Build Documents. Submittal activity durations shall include specific durations for NHDOT review and/or approval of Design-Builder's submittals as called out elsewhere in the Design-Build Documents.

With the exception of activities relating to Environmental Approvals by Governmental Entities, each activity depicting Design-Builder's operations shall have duration of not more than 20 Days, and not less than one Day, except as otherwise approved by NHDOT. All activities shown in the

schedule, with the exception of the first and last activities, shall have a minimum of one predecessor and a minimum of one successor activity.

Float shall not be considered as time for the exclusive use of or benefit of either NHDOT or Design-Builder but shall be considered as a jointly owned, expiring resource available to the Project and shall not be used to the financial detriment of either party. Any method utilized to sequester Float calculations will be prohibited without prior approval of NHDOT. Any schedule, including the Project Baseline Schedule and all updates thereto, showing an early completion date shall show the time between the scheduled completion date and the applicable Milestone Schedule Deadline as "Project Float."

Design-Builder shall allocate the total contract price and quantities throughout the Project activities in the Project Schedule. Such allocation shall accurately reflect Design-Builder's cost for each Project activity and shall not artificially inflate, imbalance, or front-load line items. The price of each Project activity shall be all-inclusive and shall include all direct and indirect costs, overhead, risks, and profit. Note that cost information will be suppressed on the Proposal submission, but shall be included with Design-Builder's first monthly Project Schedule Update(s) and submitted with Design-Builder's first Draw Request.

Percent complete shall be used to show activity progress as of the status date. The definition of percent complete for activities shall be made in consultation with NHDOT prior to beginning of scheduled Work. It should only be altered with NHDOT's consent. Design-Builder shall establish a Work Based Schedule (WBS) with clearly identifiable linkage between the Price Proposal and Design-Builder-designated Project activities, and phases represented in the Project Schedule. The WBS for each Work element shall indicate the duration, timing, and logical relationship to other Work Elements, including relationships to Project activities other than the parent Project activity of the particular Work Element. The WBS for each Project activity shall be defined in terms of Work Elements reflecting the types of Work.). Project activities shall be broken down at a minimum to Work Elements (e.g., bridges may be broken down into foundations, substructure, superstructure, and decks). All Work shall be broken down to similar manageable Work Elements. For Utility Adjustment Work, if Work is not shown as a Project activity itself, such Work shall be shown as a Work Element, where applicable. For mobilization, Design-Builder shall provide a list of Work items that are included in each Project activity or Work Element.

2.4.1.2.2. Project Status Schedule Updates

Design-Builder shall update, on a monthly basis, the approved Project Schedule to reflect the current status of the Project, including approved Change Orders. Design-Builder shall provide such schedule and status updates as such to satisfy NHDOT reporting requirements.

Each Project Status Schedule Update shall accurately reflect actual start and actual finish dates of Work, percentage complete, and Days remaining for Work in progress as of the effective date of the updated Project Baseline Schedule. Each Project Status Schedule Update shall indicate the overall completion percentage of the Project.

No changes in activity durations, calendar assignments, logic ties, or constraints will be allowed in the Project Status Schedule Update without the written approval of NHDOT in accordance with the Section titled Project Schedule Revisions below. The monthly Project Status Schedule Update shall include a schedule narrative report which describes the status of the Project in detail, including progress made that period, plans for the forthcoming period, all potential delays and problems, their estimated effect on the Project Schedule and on overall completion, and whether on, ahead of, or behind schedule.

2.4.1.2.3. Project Schedule Revisions

Until NHDOT approves a revision, all Project Schedule submittals shall be tracked against the previously approved Project Schedule. Accepted revisions shall be incorporated into the Project Schedule at the next monthly schedule update.

2.4.2. NHDOT Submittal Review Timeframes

The Project Schedule shall allow 21 Calendar Days for NHDOT to review all submittals as noted in Volume II – Book 1, Design-Build Contract Section 3.2.2 and Appendix 2 item 104.15.2 of the Design-Build Contract or as otherwise noted in this document. Review times other than 21 days noted within the Technical Provisions shall govern as superseding Section 3.2 of the Design-Build Contract. NHDOT will try to accommodate any request from the Design-Builder to expedite this review period where requested. Submittals uploaded after noon are to be considered as having been received the following working day.

2.5. **Public Information and Communications**

The Project Management Plan shall provide a description of Design-Builder's plan and management approach for public information and communication, including at least the following:

A. Design-Builder's approach to positively implement and manage community relations and liaison with Stakeholders during the design and construction stages of the Project, including consideration of all outreach activities, impacts on commuter travel and the adjacent community, and other specific aspects, such as noise impacts, fugitive light, construction traffic, Project marketing and advertising. Design-Builder shall describe its approach to public information activities, including identification of personnel for such effort and how Design-Builder will manage interaction with NHDOT, elected officials, public agencies, the communities, and other Stakeholders. Design-Builder shall address all elements of the proposed public information and communications plan as required in Technical Provisions. Describe the Design-Builder's approach to maintain NHDOT's "Vision" and anticipated benefits.

B. Design-Builder's approach to public comments and mitigation of business, residents and the public's concerns.

C. Design-Builder's preliminary public information and communications plan, which shall specifically address the following:

   I. Qualifications and experience of proposed key staff members who will be engaged for purposes of community outreach.

II. Adjustments to construction activities in response to community and Stakeholder concerns.

III. Proposed communications strategies, such as, a newsletter, websites, and hotlines.

IV. The proposed methodology for capturing and resolving complaints, concerns or questions from the public.

V. The proposed methodology for dealing with the news media.

2.6. ROW Management and Coordination

The Project Management Plan shall provide a description of the Proposers plan for identifying and completing all full and partial acquisitions on the project. The information shall include at least the following:

A. Approach to ensuring conformance with all applicable laws, rules and regulations.

B. Approach to minimizing impacts to private property to reduce or eliminate full or partial acquisitions where possible.

C. Approach to managing the Design-Builders responsibilities for completing all acquisitions necessary for construction of the project.

D. Approach to coordinating with NHDOT, the Towns and FHWA throughout the ROW process.

2.7. Environmental Management

The Project Management Plan shall provide a description of Design-Builder's plan and management approach to environmental compliance, soil and groundwater management and permitting, including at least the following:

A. Applicable laws, rules and regulations.

B. The method Design-Builder will use to ensure planning commitments, Section 106 Memorandum of Agreement and environmental permit conditions are integrated into design, construction and maintenance of the Project.

~~B.~~C. Soil and Groundwater Management Plans including worker Health and Safety Plan, for both the Design and Construction phases of the project.

2.8. Design Management

The Project Management Plan shall provide a description of Design-Builder's plan and management approach for performing design on the Project, including at least the following:

A. A description of how Design-Builder intends to manage the development and coordination of design, including issues such as design of connecting projects, ROW, survey, environmental permitting, utilities, community relations and safety issues.

B. A description of the proposed approach for delivering the design for the Project, including where the designers will be located, how designs are to be developed by different firms, how offices will be integrated and work coordinated to ensure consistency and quality.

C. A description of how the design personnel will interface with the construction personnel to achieve a quality constructed Project that minimizes long-term maintenance.

2.9. Construction Management during Construction

The Project Management Plan shall provide a description of Design-Builder's plan and approach for performing construction on the Project, including at least the following:

A. A narrative description of how Design-Builder intends to schedule and sequence the construction to minimize impacts on the environment, communities and traveling public while still providing acceptable construction performance.

B. A description of the intended laydown, recycling, staging, disposal and maintenance locations (with approximate areas) to be used during construction.

C. A description of how the ROW and adjacent roads and properties will be maintained and protected, including the intended measures to be used to mitigate and minimize noise, vibration, light, dust, erosion/run-off and local road damage.

D. A description of how Design-Builder will coordinate its construction work with other projects that are expected to be under construction during the work.

2.10. Traffic Management during Construction

The Project Management Plan shall provide a description of Design-Builder's plan and approach for traffic management on the Project, including at least the following:

A. A narrative description of how Design-Builder will manage and control traffic during construction.

2.11. Requirements for NHDOT Offices, Equipment and Vehicles

2.11.1. General Description

Except where noted elsewhere in the Agreement, at a minimum the Design-Builder's Key Personnel and major task managers, and NHDOT construction support staff shall co-locate for the Term of the Agreement to facilitate project coordination and daily communication. The definition of co-locate for this Agreement is office space meeting the conditions of this Technical Provision that are within close proximity to each other along or adjacent to the Project within one mile of the Project ROW. The location, condition, and amenities of the office space for NHDOT are subject to NHDOT's prior written approval.

Design-Builder shall provide NHDOT office space and conference room facilities (i.e. available for occupancy) within 21 days of issuance of NTP1 and shall remain in use and service for an additional 90 days after the Project has been completed and accepted by NHDOT.

Design-Builder shall, as part of the project:

A. Provide and pay for all office space, facilities, equipment, and services necessary for NHDOT to oversee the Work.

B. Maintain the Project office space for the period specified or until otherwise agreed to by NHDOT in writing.

C. After the Term of the Agreement, provide disposal or removal of all facilities and any site restoration needed for the Project.

The office space and equipment provided by the Design-Builder for NHDOT shall be in good and serviceable condition, at least of the same quality as those of Design-Builder's Project office, at all times. Design-Builder and NHDOT shall participate in a Project condition survey prior to and at the completion of occupancy.

Access to the NHDOT Project Office and Conference Room shall be ADA compliant.

2.11.2. NHDOT Project Office Space

Design-Builder shall provide and maintain a NHDOT Project Office, which meets the space requirements identified in the Section titled *NHDOT Project Office Space Requirements* below, and provide equipment for the duration of the Project for the exclusive use of NHDOT and its consultants, FHWA, and other third parties as directed by the NHDOT.

Design-Builder shall provide a NHDOT Project Office and equipment that shall meet the requirements of a Type A field office specified under Section 698 of the 2016 NHDOT *Standard Specifications for Road and Bridge Construction* except as modified by this Section 2.10.

2.11.2.1. *NHDOT Project Office Space Requirements*

Design-Builder shall provide housing for an NHDOT Project Office and lavatories that shall be buildings or trailers which meet the following minimum requirements and the ancillary requirements of subsection 2.1.1 of Section 698 of the 2016 NHDOT *Standard Specifications for Road and Bridge Construction*:

A. Office space for six (6) NHDOT employees or its representatives for the duration of the design and construction phases of the Project. Personal office areas shall be at least 120 square feet.

B. One enclosed conference room at least 12 ft. X 30 ft. This conference room shall be dedicated for NHDOT use and not part of a common area shared with the Design-Builder.

C. Closet: In addition, one enclosed lockable space shall be for storage/filing, storage of equipment, and computer/phone/network equipment; minimum size shall be 120 square feet.

D. Electrical: Adequate overhead lighting and two power outlets at each work area. One exterior outlet and light near entrance.

E. Air Conditioner(s): Central air conditioning or a sufficient number of individual units to maintain a maximum temperature of 78°F (26°C).

F. Lavatory: The lavatory shall be built-in, containing toilet facilities and working sink with hot and cold water. Toilet paper, paper towels and hand soap shall be provided as needed.

G. Heat: Thermostatically controlled to maintain a minimum temperature of 68°F (20°C).

H. Weatherproofing: Roof, sides, and floor shall be maintained weatherproof at all times.

I. Communications/Data: The Design-Builder shall provide and install the complete voice/data communications cabling system, which includes but is not limited to the EMT conduit, bridle rings, pill boxes, Category 5e UTP cable, Category 5e "RJ-45" UTP receptacles, Category 3 "RJ-11" UTP receptacles, receptacle boxes, cover plates, and multimode fiber optic cable. All cable shall be routed, terminated, labeled and tested. Voice and date circuits shall be installed in conjunction with NHDOT Bureau of Construction staff in Concord, NH.

   - Design-Builder shall certify and state supplied components as functional before installation and shall bear all responsibility for replacement of parts at work commencement.
   - Design-Builder shall prepare test plan and submit before installation, test installed system and supply test results, and will conform to all industry standard testing procedures.
   - Design-Builder shall terminate all Category 5e UTP cable in 66M150 punch down blocks for voice cabling and shall terminate all Category 5e UTP data cable in date patch panels within the wiring closet.
   - Each drop will contain two data ports with RJ45 connectors and two voice ports with RJ11 connectors.

J. Design-Builder will provide all materials, as needed and required, to complete the installation of the cable plant which shall include all cable, connectors, patch panels, equipment rack(s), patch cables, face plates, punch down blocks, fiber optic cable and other equipment during the Project duration, Design-Builder shall (at its own expense, except as noted herein) repair it, replace it, and/or otherwise restore it to its original condition within five Business Days after the occurrence of such damage or loss.

K. A combination break and lunch room area at least 400 sf. The break/lunch room may be common with the Design-Builder's office space.

All space requirements are approximate in nature. Facilities that reasonably comply with these requirements will be acceptable.

2.11.2.2. *Large Conference Room*

The Design-Builder shall also provide a large conference room for conferences and meetings. This room may be separate from the NHDOT Project Office, but must be adjacent or within a short walking distance. The conference room shall be for the primary use of NHDOT and its consultants for the Project, as well as for FHWA, and other third parties as directed by the NHDOT.

Requirements for the large conference room are as follows:

A. The conference room shall be large enough to comfortably fit 25 to 30 people around a table.

B. The conference room shall also be equipped with video conferencing and teleconferencing equipment and subscription to a video conferencing service so that long-distance meetings can be held from here.

C. Two large white boards with markers and erasers;

D. Includes a projector and screen that can be used for PowerPoint or video conferencing viewing;

E. Includes a table big enough to seat 25 people around; 20 desk chairs; and 10 folding chairs. These chairs are independent of any chairs provided at office desks.

2.11.2.3. *Field Office and Large Conference Room Site Requirements*

Design-Builder shall, as part of the Project:

A. Secure a well-graded site that has an access road, a parking area, and building space that meets all local building code requirements.

B. Obtain all site permits.

C. Provide all utility services.

D. Provide a parking area for the intended number of occupants plus visitor spaces to reasonably accommodate stakeholders who may visit the offices for meetings. The parking area shall be reasonably level and has an all-weather surface and all-weather access.

E. Provide an outside shed of at least 150 sf at each Project for storage of small tools and equipment for the exclusive use of NHDOT.

F. Provide at least two building entrance/exits for each building, each secured with a door lock plus a dead-bolt lock.

G. Ensure that the site and office space meet all access requirements of the Americans with Disabilities Act (ADA), as amended (42 USC §§12101, et seq.).

2.11.2.4. *Maintenance, Services and Utilities*

The Design-Builder shall provide and pay for NHDOT Project Office and Large Conference Room maintenance, service, and utilities that meets the requirements of Section 698 of the 2016 NHDOT Standard Specifications for Road and Bridge Construction and as follows:

A. Potable water service;

B. Twice-a-week janitorial service, including maintenance of trash containers and trash pickup service;

C. Fuel. Adequate supply for heating and testing operations.

D. Electricity. Minimum 200A, 115-125 volt service for each field office.

E. Maintenance of the exterior areas, including the access to parking areas, that keeps them neat, clean, in good repair, and safe;

F. Exterior security lighting that is automatically activated at low light levels to maintain at least two foot-candles of lighting within the fenced office site;

G. 24-hour security patrol service or a silent watchman-type security system;

H. First Aid Kit. Shall be maintained and restocked as necessary or directed.

I. Hard-wire high-speed internet access in each personal office area, including monthly service charges; and

J. Telephone service with at least one outside line (with voice-mail service) for each personal office area assigned to the office, and one line dedicated to the fax service and one line dedicated to a separate voice grade, touch tone dialing line for the computer modem is required for the NHDOT Field Office. All necessary hardware and appurtenances for the computer modem shall be provided. Large conference room requires telephone service necessary to meet needs listed in the Section titled Large Conference Room.

2.11.3. Project Office Equipment

The Design-Builder shall provide NHDOT Project Office equipment that meets minimum requirements of subsection 2.2 of Section 698 of the 2016 NHDOT *Standard Specifications for Road and Bridge Construction* as well as the following:

A. The computer system and accessories shall be installed to be fully operational (all components and software installed) in the field by representatives of the Design-Builder, with electronic communication established with the NHDOT Bureau of Construction in Concord, NH. Unless otherwise authorized or stated within the D-B Contract, no contractual payments will be processed until the computer and associated equipment is fully operational.

B. The Design-Builder shall maintain all furnished equipment in good working condition and shall provide replacement equipment at no additional cost to the NHDOT due to breakdown, damage, or theft within two (2) working days of notice.

C. All desktop computer(s), laptop computer(s), high capacity color copier/scanner/printer(s) and phones shall be new. Used or refurbished will not be allowed.

D. Upon written request, NHDOT may require the Design-Builder to furnish miscellaneous office supplies such as field books, cross section paper, measuring tapes, loose-leaf binders, writing utensils, etc. as appropriate. The cost of these incidentals shall be included in the Design-Builder's lump sum price.

E. Upon completion of the project, all equipment and necessary components shall remain the property of the Design-Builder, with the following exceptions: flash drives, DVDs, CDs, video cards, and any miscellaneous office supplies purchased for the purpose of documentation or measurement will become the property of the NHDOT.

F. NHDOT will reimburse the Design-Builder for the actual, reasonable, and documented costs of the repair, replacement, and/or restoration prior to the Term of the Agreement, if any loss or damage has been caused as a direct result of willful misconduct of NHDOT.

2.11.3.1. *Furniture*

A. One locking desk with a minimum of three drawers or one desk with a three-drawer locking file cabinet and static guard mat for each employee office space; Desk size is approximately 60" x 30".

B. One 5 pedestal office desk chair on wheels with adjustable height, arm rests and back support for each desk provided; and

C. One straight back office guest chair for each desk provided.

2.11.3.2. *Telephones*

A. See Section 2.10.2.4 - Maintenance, Services and Utilities above.

2.11.3.3. *Copier and Fax Equipment*

A. See Table below for requirements for Copier/Scanner/Printer.

2.11.3.4. *Computer and Other Accessories*

The Design-Builder shall also provide the following equipment for use by the Engineer (indicated by the checkboxes below):

☒ Smart Phone

Quantity: ___5__

Smart Phone with the following minimum specifications:

- Memory: min. 64 MB
- RAM/256 MB (Accessible: 172 MB)
- Resolution/Screen: min. 240x320 pixels, touch screen LCD, portrait & landscape display
- Software: Microsoft® Office Word Mobile, Excel® Mobile, and PowerPoint® Mobile Adobe® Reader® LE PDF viewer, Internet Explorer Mobile, Windows Media Player, Bluetooth profile (or equivalent) enabled
- EV-DO, 1X RTT capable
- Internal flash card: min. 8 GB
- Unlimited data service
- Minimum service area shall be Maine, New Hampshire, Vermont, and Massachusetts with a minimum 90% coverage area. The service plan shall have a New Hampshire calling number, a minimum service plan of 1,000 minutes per month, and unlimited texting.
- Accessories: Wall charger, car charger, screen protector protective case, belt attachment capability, hands-free adapter and owner's manual

☐ Cellular Phone

Quantity: _____

Cellular hand set shall have a 1/3-watt nominal power output, shall have a protective case and belt attachment capability, DC adapter (cigarette lighter operation), battery charger, hands-free adapter, and owner's manual. The minimum service area shall be Maine, New Hampshire, Vermont, and Massachusetts with a minimum 90% coverage area. The service plan shall have a New Hampshire calling number, a minimum service plan of 1,000 minutes per month, and unlimited texting.

☒ Internet Access for Department Supplied Equipment:

Quantity: ___5_____

Mobile Hotspot - Coverage shall be adequate for the area required and shall be 4G compatible. Unlimited data usage and at least 128 kbps upload and 384 kbps download bandwidth. This unit shall be separate from the Smartphone.

☒ Internet Access for Desktop

Unlimited-hours Broadband Internet Access Wireless router

☒ Desktop Computer

Quantity: __2____

Processor:	Intel Core i5, Dual Core 2.4 GHz or better
Operating System:	Microsoft Windows 10
Memory:	8 GB RAM Minimum
Hard Disk Drive:	500 GB Minimum
CD-ROM:	DVD +/- RW
Monitor:	24 inches or larger 1920 x 1080 resolution or better
Video:	Internal web camera 512 MB Video memory or higher
Audio:	16 Bit Audio with Speaker and Microphone
Communication:	Wireless (802.11a/b/g/n compliant) 10/100/1000 Ethernet
Expansion Ports:	Four USB 2.0/3.0
Internet Access:	Unlimited, cable modem service. DSL only acceptable if cable unavailable.

Software:

- Microsoft Office 2010, or newer, Professional Version
- Bluebeam Revu (current version), or other approved software, that allows user to create, markup, and edit project documents; collaborate work processes with contracting parties; and offers full integration with Microsoft Office Antivirus software w/updated subscription maintained

Other Equipment:

- Keyboard
- Optical mouse, wireless or with connecting cable
- Surge Protector: 15 Amps, six outlets with circuit breaker control and spike protection
- Ten (10) rewriteable DVD-RW disks with protective covers
- Two (2) flash drives, 64 GB minimum each

☒ Monitor

Quantity*: __5___

24” Minimum Diagonal View Area

**Note: The Desktop Computer specification requires that a monitor be provided with the desktop when selected. This quantity <u>is in addition to</u> the desktop computer monitor quantity*.

- Color Flat Panel
- Minimum 16:9 aspect ratio with a 1600x900 pixel resolution
- 3ms response time or better
- Adequate graphics card that supports the monitor’s resolution; interfaces properly with the field computers and laptops; and provides high definition video display.
- Compatible connecting cable(s)

☐ Color Printer/Scanner/ Copier

- Laser Jet or Ink Jet
- Network Capable
- Wireless

- Microsoft Windows compatible
- Resolution: 1200 vertical x 1200 horizontal dpi, minimum
- Capable of scan/copy/print 8 ½ x 14 color originals
- Computer disks with software drivers and utilities
- Tray Capacity: 100 sheets, minimum
- Replacement Toner Cartridge(s) as required, with 1 spare on hand at all times
- Speed: 10 sheets per minute, minimum
- Laser Jet or Ink Jet
- Network Capable
- Paper with the following minimum specifications:
  - 8 ½" x 11" sheets – 3 reams to be maintained
  - 8 ½" x 14" cut sheets – 2 reams to be maintained

☒ High Capacity Color Copier/Scanner/ Printer

- Laser Jet
- Network Capable
- Wireless
- Microsoft Windows compatible
- Resolution: 600dpi color, 1200dpw b&w, minimum
- Capable of scan/copy/print 11 x 17 color originals
- Two dedicated printing trays: (1) 8½ x 11 and (1) 11 x 17
- Tray Capacity: 250 sheets, minimum
- Speed: 30 sheets per minute, minimum
- Duplex printing capable
- Computer disks with software drivers and utilities
- Replacement Toner Cartridge(s) as required, with 1 spare on hand at all times
- Paper with the following minimum specifications:
  - 8 ½" x 11" sheets – 3 reams to be maintained
  - 8 ½" x 14" cut sheets – 2 reams to be maintained
  - 11" x 17" cut sheets – 1 ream to be maintained

☒ Telephone Service — Landline phone service with voicemail accessibility.

☒ Telephone — A wired phone with an additional portable handset.

Quantity: 5_____

☒ Digital Camera — Digital camera with the following minimum specifications:

- Min. 8.0 Mega Pixels resolution
- Picture file storage media, compatible for uploading picture data to the computer unit and printer (min. 8 GB)

Quantity: __1___

- Supports jpeg file format
- HD Video capability

- USB interface and cable
- 12-volt DC adapter and AC adapter power supply cables
- Rechargeable with backup set of batteries and charger
- Owner's manual
- Carrying case

☒ Video Camera

Quantity: __1___

Video Camera with the following minimum specifications:

- New (or used with a recently performed service check verified by an invoice)
- 30 GB internal hard drive
- 34x optical zoom
- Low light capability
- Image stabilization
- USB interface and cable
- Extra battery with charger
- Owner's manual
- Storage case

☒ 2-Drawer File Cabinet

Quantity: ___3__

In addition to the File Cabinet quantity requirements of 698.2.2.2, provide a 2-drawer file cabinet with the following minimum specifications:
Fire resistant, legal size; inside dimension approximately 10 x 15 x 26 in, each, with lock(s) and key(s). The file shall bear an Underwriters Laboratories "C" Label - 350ºF (177° C) for one hour, inside surface.

☒ 3 Hole Punch:

Adjustable, 2 to 3 metal hole punch able to punch through a minimum of 10 sheets of standard paper at once with 9/32" holes and chip tray.

☒ Surge Protector/

Quantity**: ___2__

15 Amps, 6 outlets with circuit breaker control and spike protection Battery Backup
***Note: The Desktop Computer specification requires that a surge protector be provided with the desktop when selected. **This quantity is in addition to the desktop computer surge protector quantity.*

☒ Strobe Light

Quantity: ___2__

Magnetic mount, 20 watt, 12/24 Volt DC (Whelen model VP420M or equivalent) with Port car or equivalent DC adapter.

☒ Concrete Testing

In addition to the Concrete Testing Equipment required per section 520.3.1.3.1.2, provide a complete additional set of Concrete Testing Equipment meeting the requirements of Section 520.3.1.3.1.2

☒ Portable Turbidimeter Quantity: ___1_	Portable Turbidimeter with the following minimum specifications: • Turbidity Range: 0 to 1000 NTU • Range: .01 to 1100 NTU • Accuracy: ± 2% of reading or .01 NTU (0 to 500 NTU); ± 3% of reading • Resolution: .01 NTU < 10 NTU; .1 NTU < 100 NTU; 1NTU < 1100 NTU • Analytical Method: ISO 7027 • Rechargeable battery pack with charger • Twelve (12) sampling vials • Calibration kit •
☒ Distance Measuring Instrument:	1 portable distance measuring instrument, accuracy 1 foot per mile (minimum), automatic calibration, built-in WAAS enabled - 66-channel GPS receiver, 4 MB memory (400,000 events - including event code identifiers, distance, time and speed), 12 volt DC, able to download data to computer via USB or Serial RS-232. Must be capable of providing GPS coordinates in the WGS 1984 coordinate system.

** For each cell phone and/or Smartphone provided, the monthly service charge, including taxes, and any activation or deactivation fee for cellular phone or mobile telephone service, including toll calls up to 1000 minutes per month per each, shall be paid by the Design-Builder and shall be subsidiary. Any call time charges, used by State personnel, above the base 1000 minutes per month will be paid as extra work under Section 104.05.*

2.11.3.5. *Global Navigation Satellite System (GNSS) Equipment*

The Design-Builder shall provide Global Navigation Satellite System (GNSS) Equipment that meets minimum requirements of the Special Provision for Section 670.822, which is provide in the Reference Information for this project. The Design-Builder shall provide NHDOT with a minimum of 2 rover units per setup.

All equipment shall be replaced and updated at least once every five years. A multipurpose piece of equipment capable of meeting multiple parts of the requirements above will be considered to meet the requirements. Replacement toner cartridge(s) shall be supplied as required for each printer, fax machine or copier, with 1 spare on hand at all times. All printers, copiers, and fax machines shall be compatible with and networked wirelessly, or otherwise approved connection, to all field office supplied computers and laptops.

2.11.4. Field Laboratory

A Physical Laboratory is required and shall be provided for the Project with all the necessary spacing and equipment as specified in subsection 2.3 of Section 698 of the 2016 NHDOT *Standard Specifications for Road and Bridge Construction*.

3. QUALITY MANAGEMENT PLAN

Design-Builder shall develop, implement, and maintain a comprehensive Quality Management Plan (QMP) that is consistent with and expands upon the preliminary Quality Management Plan submitted with the Proposal. The Quality Management Plan shall be organized and comply with the requirements of Section 3. The Quality Management Plan shall be submitted and accepted by NHDOT prior to the Design-Builder submitting any Design Submissions. Design-Builder may elect to obtain formal ISO 9001 certification, but will not be required to do so.

3.1. Project Quality Assurance

To ensure that goals for project quality will be met, NHDOT has established Quality Assurance (QA) requirements for Design-Build projects. This includes a Design QA Program to address quality in the design process and a Construction QA Program to ensure the quality of construction, comprised of the elements outlined below.

3.1.1. Design QA Program

NHDOT's Design QA Program for Design-Build projects includes the following two elements:

A. Design Quality Control (QC) system by the Design-Builder

B. Design Acceptance system by NHDOT

3.1.2. Construction QA Program

The Construction QA Program for Design-Build projects includes the following six core elements:

1) Construction Quality Control (QC) system by the Design-Builder

2) Construction Acceptance/Verification system by NHDOT (or its Designated Agent)

3) Independent Assurance (IA) by NHDOT (or its Designated Agent)

4) Dispute Resolution system

5) Qualified/Accredited Laboratories (all Contractors and NHDOT)

6) Qualified/Certified Inspection & Testing Personnel (all Contractors and NHDOT)

3.2. QA Program Responsibilities

3.2.1. Design-Builder Responsibilities

The Design-Builder shall establish and implement a comprehensive Quality Control (QC) System to ensure that the performance of the Design-Builder's Work fulfills the design and construction requirements of the Contract. The QC System shall address the Design-Builder's Quality Control organization and roles, document management procedures, Design QC activities, Construction QC activities, qualified/accredited QC laboratories, and qualified/certified QC inspection & testing personnel.

The QC System shall be implemented by the Design-Builder including their Subcontractors, Producers, Fabricators and Manufacturers. The Design-Builder shall be proactive and use its QC System to control its processes and ensure that work conforms to the requirements of the contract and specifications. The Design-Builder shall not rely on NHDOT's acceptance inspection and testing results in order to keep their processes in control. It is required that the Design-Builder will complete its own separate inspection and testing.

3.2.2. NHDOT Responsibilities

NHDOT will be responsible for Design Acceptance actions and Construction Acceptance/Verification of the quality of all materials and workmanship through Acceptance inspection, sampling, and testing. An Independent Assurance (IA) system will be provided by the Department's Bureau of Materials & Research. The Department will also be responsible for implementing a Dispute Resolution system. The Design-Builder shall notify NHDOT a minimum of 15 days in advance of the start of off-site fabrication for which NHDOT has the option for performing inspection. The 15 day time period shall be in advance of the actual start of fabrication and shall be irrespective of the date of submittal or acceptance of shop or working drawings for the work.

NHDOT has an interest and a duty to perform due diligence on behalf of the public to audit the processes and selected elements of the Work. NHDOT Acceptance Inspection and Testing, monitoring of the DB Entity's Quality Control activities, and periodic IA evaluations are necessary and shall be accommodated by all members of the Design-Builder's organization and its agents.

While NHDOT will be performing Acceptance inspection and testing of the work, independent of the Design-Builder's QC System, the Design-Builder maintains the sole responsibility for quality, safety, compliance with all applicable Laws, and other components both direct and indirect to the Work.

At all points in performance of the Design-Builder's work at which specific reviews, inspections or approvals by NHDOT are required, the Design-Builder shall not proceed beyond that point until NHDOT has completed such review, inspection or approval or waived its right to review, inspect or approve has been provided.

NHDOT reserves the right to check QC laboratory testing equipment, personnel procedures and techniques for compliance with specified standards under the Independent Assurance (IA) system.

NHDOT also reserves the right to access the QC laboratory facilities, at no additional cost to NHDOT, to witness QC testing, and to verify compliance of the testing procedures, testing techniques, and test results with the requirements contained in the Design-Builder's accepted Quality Control (QC) System.

3.3. **QMP General Requirements**

Design-Builder shall develop, implement, and maintain the Quality Management Plan for the Term. The QMP shall describe the Quality Control system, policies, and procedures that ensure the Work meets the requirements of the Design-Build Documents and provides documented evidence of same.

The Quality Management Plan shall contain detailed procedures for Design-Builder's Quality Control activities. Design-Builder's Quality Control system shall incorporate planned and systematic audit activities undertaken by an independent QC Audit Team, who's member are independent of the design

and production staff. Design-Builder shall conduct all Quality Control and design overlay and coordination among design disciplines, all in accordance with the QMP and the requirements of the Design-Build Documents.

All QC inspections, reviews, and testing shall only be performed by personnel with training and qualifications, using appropriate equipment that is accurately calibrated and maintained in good operating condition at an AMRL (AASHTO R18, "Establishing and Implementing a Quality System for Construction Materials Testing Laboratories") accredited laboratory, or at a laboratory qualified through the Northeast Transportation Technician Certification Program (NETTCP) Laboratory Certification Program or comparable laboratory qualification program acceptable to NHDOT.

The complete Quality Management Plan shall incorporate the following features:

A. The QMP shall be a single comprehensive document that outlines the Design-Builder's overall Quality Control system for both Design and Construction.

B. Design-Builder shall make all QC records immediately available to NHDOT for review. Design-Builder shall provide NHDOT with a copy of any and/or all QC records when requested.

C. The QMP shall encompass all Work performed by Design-Builder and Contractors of all tiers.

D. Design-Builder shall submit to NHDOT the results of all internal audits within seven days of their completion.

E. Design-Builder shall promptly submit to NHDOT Non-Conformance Reports (NCRs) both upon issuance and resolution.

3.4. Quality Terminology

Quality terminology, unless defined or modified elsewhere in the Design-Build Documents, shall have the meaning defined in the Contract Terms and Definitions section. Terms used in ISO 9001 shall have the meanings defined below:

A. Organization: Design-Builder's organization, including any Affiliates and Contractors.

B. Customers: the Users of the roadways, NHDOT, Customer Groups, and key stakeholders that have an adjacent property interest or connecting roadway.

C. Product: the Work.

3.5. Quality Control Inspection and Testing

The Quality Management Plan shall contain detailed descriptions of the QC inspection and testing schedules, including the timing and frequency of testing, that Design-Builder will use to meet quality requirements of the Work.

Design-Builder shall revise its Quality Management Plan when its own Quality Control organization detects a systemic or fundamental non-conformance in the work performed or in the manner the Work is inspected or tested, or when NHDOT advises Design-Builder of such a problem.

3.5.1. NHDOT Construction Notices

On a weekly basis, Design-Builder shall provide NHDOT with a rolling three-week construction notice. The construction notice shall include the fabrication schedule and planned construction activities for items where NHDOT or their Designated Agent is performing Acceptance/Verification inspection and testing at the fabrication facility.

3.5.2. Quality Control Laboratory Requirements

Design-Builder shall perform QC testing in accordance with, but not limited to:

A. Random QC tests shall be conducted by the independent QC Audit Team's testing laboratory identified in the QMP that is accredited through the AASHTO Accreditation Program (AAP) or qualified through the NETTCP Laboratory Certification Program, or comparable laboratory qualification program acceptable to NHDOT for the pertinent testing. A copy of AAP accreditation certificate(s) or NETTCP certification shall be transmitted to NHDOT upon their receipt by the testing laboratory.

B. Equipment in all laboratories shall be certified prior to commencing any construction activities and shall retain the certification by AASHTO, NETTCP, or NHDOT, as applicable for the duration of the Work.

C. Use of on-site QC satellite or field laboratories is permitted if each laboratory is qualified by NETTCP or NHDOT and has written policies and procedures to ensure that the satellite laboratories performing testing activities are capable of providing testing services in compliance with applicable test methods. Procedures shall address inspection and calibration of testing equipment, as well as a correlation-testing program between the accredited or qualified primary QC laboratory and portable or satellite facilities.

3.5.3. Supply Source and Material Quality

Quality of all materials shall conform to requirements contained in the Design-Build Documents and to any requirements of affected Utility Owners. The QC Audit Team shall provide plant inspection and aggregate sampling and testing at concrete and asphalt plants. Manufacturers' test reports may supplement, but not replace, the QC inspections, sampling, testing, and certification provisions.

3.6. **Responsibility and Authority of Design-Builder Staff**

QC Audit Team personnel assigned to perform random QC inspection, testing, or monitoring of attributes inspected or quality characteristics tested shall not be those personnel performing or directly supervising the Work during production or placement.

Design-Builder's QC Administrator and Construction QC Manager shall have the authority to stop Work for quality-related issues.

3.7. **QMP Format and Contents**

Within 15 days of Notice to Proceed, the Design-Builder shall submit a complete Quality Management Plan based on the Draft QMP submitted with the Design-Builder's Technical Proposal. The Design-

Builder shall schedule a meeting with NHDOT in advance of the submission of the QMP to discuss the format and contents of the document. The QMP shall contain the following five sections:

Section 1 – Introduction

Section 2 – Quality Control Organization

Section 3 – Document Management Procedures

Section 4 – Design Quality Control Procedures

Section 5 – Construction Quality Control Procedures

The Design-Builder shall submit the QMP for review by NHDOT and FHWA, and shall obtain NHDOT's acceptance thereof, and shall at all times comply with the requirements thereof. The Design-Builder shall not revise any portion of the accepted QMP without the prior written approval of NHDOT. NHDOT will not accept any Early Start of Construction packages or shop drawing submittals until the QMP is accepted. The QMP shall address the items described in Section 3.7 and Attachment 3-1 (Quality Management Plan Requirements) to the Technical Provisions.

3.7.1. QMP Section 1 – Introduction

The Quality Management Plan shall contain a complete description of the quality policies and objectives that Design-Builder will implement throughout its organization. The policy shall demonstrate Design-Builder senior management's commitment to implement and continually improve the quality management system for the Work. This section shall also include an overview of the QMP, program requirements, roles and responsibilities and the process for approval and updates.

3.7.2. QMP Section 2 – Quality Control Organization

Design-Builder shall regularly maintain the Quality Management Plan to contain current versions of the following information:

A. The organizational chart that identifies all Quality Control personnel, their roles, authorities and line reporting relationships.

B. Description of the roles and responsibilities of all Quality Control personnel and those who have the authority to stop Work.

C. Identification of testing firms, including information on each firm's capability to provide the specific services required for the Work, certifications held, equipment and location of laboratories.

D. Resumes for all Quality Control personnel.

The persons and organizations performing Quality Control functions shall have sufficient authority and organizational freedom to identify quality problems, and to initiate, recommend, provide and verify the implementation of solutions. Persons performing Quality Control functions shall be at an organizational level that ensures that they are not influenced by the potential impact of implementation of the Quality Management Plan requirements on the Project Schedule, performance or cost.

3.7.2.1. *Quality Control Administrator*

The Quality Control (QC) Administrator is considered one of the Project's key personnel. The QC Administrator shall be responsible for overall management of the QC System as established in the Quality Management Plan. The QC Administrator shall be a Registered Professional Engineer currently licensed in the State of New Hampshire and have a minimum of 10 years' experience in transportation design or construction. The QC Administrator shall report directly to the Design-Builder's Executive Management and coordinate all Project QC issues directly with NHDOT. The specific duties of the QC Administrator shall be defined in the QMP.

The Design-Builder shall not replace the QC Administrator without prior written approval by NHDOT. Design Builder to provide resume of proposed replacement for NHDOT review. The Design-Builder's request to replace the QC Administrator shall name a proposed replacement manager who shall be available full-time within 15 Days of NHDOT approval. The replacement QC Administrator shall meet all of the same qualification requirements listed above. No work shall be performed without an active QC Administrator.

3.7.2.2. *Design Quality Control Manager*

The Design Quality Control (QC) Manager shall be responsible for implementation of all Design QC procedures and activities as established in the Quality Management Plan. The Design QC Manager shall be a Civil Engineer with, at a minimum, a B.S. in Civil Engineering, 10 years' experience in highway and/or bridge design a Registered Professional Engineer currently licensed in the State of New Hampshire and shall report directly to the Design-Builder's QC Administrator. The specific duties of the Design QC Manager shall be defined in the QMP.

3.7.2.3. *Construction Quality Control Manager*

The Construction Quality Control (QC) Manager shall be responsible for implementation of all Construction QC procedures and activities as established in the Quality Management Plan. The Construction QC Manager shall be a Civil Engineer with, at a minimum, B.S. in Civil Engineering, 10 years' experience in highway and/or bridge construction, certified as a NETTCP QA Technologist and shall report directly to the Design-Builder's QC Administrator. The specific duties of the Construction QC Manager shall be defined in the QMP.

3.7.2.4. *Project Design and Construction Personnel Role in Quality Control*

All Design and Construction "Production Personnel" (i.e. staff performing design and construction work activity) on the Project, including the Environmental Permitting Manager, Design Manager, Construction Manager, Construction Superintendent(s), and all personnel working under their direction, shall have the "up front" responsibility for ensuring the quality of their work. This staff is expected to apply QC "self-checks" or "self-inspection" throughout the process of work production in accordance with Quality Control procedures in the QMP.

All Design and Construction Production Personnel shall receive initial training on the Quality Control procedures in the Quality Management Plan under the direction of the QC Administrator and QC

Staff. All training and related proposed schedules shall be documented in the QMP. Additional periodic training will be provided as determined necessary by the QC Administrator.

3.7.2.5. *Project Design and Construction QC Audit Teams Role in Quality Control*

Formal Quality Control checks will be performed independent of Design Production Personnel by the Design QC Audit Team staff and formal QC inspection and testing will be performed independent of Construction Production Personnel by the Construction QC Audit Team staff throughout design and construction.

Members of the Design QC Audit Team shall be an independent group of senior engineers that is assembled to provide high level QC reviews for design components within their respective discipline. In general, the qualifications include senior level expertise in their given discipline and no role in the primary design of the project and the development or production of the work element they are reviewing.

Members of the Construction QC Audit Team shall work independently from the construction production personnel. These individuals shall be assigned the responsibility for QC inspection and testing of the construction Work Items and are not directly involved with the fabrication, manufacture, production or placement activities for the Work Item, segment or phase being constructed.

3.7.3. QMP Section 3 – Document Management Procedures

The Quality Control procedures for the Design-Builder's Design plans, specifications, reports, calculations and other Construction Documents shall be organized by engineering discipline (structural, civil, utilities, etc.). These procedures shall specify measures to ensure that appropriate quality requirements are specified and included in Design Documents and to control deviations from such requirements.

At a minimum, the following QC procedures shall be established and monitored by the Design QC Audit Team staff:

A. An electronic project filing system (electronic folders).

B. Standard file naming convention (for all types of documents).

C. Electronic file revisions and redline markup standards.

D. Email standards, protocols, and filing system.

Design-Builder shall develop and maintain QC inspection and testing records that include, but are not limited to:

A. Quality Control inspection reports and QC material sampling/testing results shall be submitted to NHDOT within seven (7) days following the inspection or test, except as noted in Section 3.9. Control Charts shall be available in an accessible location for review by NHDOT at any time.

B. The Construction QC Audit Team shall maintain, electronically, a daily log of all inspections performed for both Design-Builder and Subcontractor operations in a format acceptable to

NHDOT, and transmit to NHDOT daily. The daily QC inspection reports shall identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed. The responsible technician and supervisor shall sign the daily inspection reports. The results of the daily inspections shall be provided to NHDOT in an electronic format within twenty-four (24) hours after the work shift.

C. The Construction QC Audit Team shall be responsible for establishing an electronic system for recording all material test results. The responsible technician and his/her supervisor shall sign the daily test reports. The results of the daily tests shall be provided within one (1) Day of test completion.

D. The Construction QC Audit Team's inspection and materials system shall electronically deliver the laboratory and field test results to NHDOT in the database format approved by NHDOT. This electronic reporting is intended to allow the Design-Builder and NHDOT to make timely and accurate decisions on workmanship and material quality issues.

3.7.4. QMP Section 4 – Design Quality Control Procedures

Design-Builder shall prepare and submit to NHDOT for review and approval a Quality Management Plan QMP that describes its policies, procedures, and staffing to manage design Quality Control in accordance with the requirements of this Section 3.7.4.

3.7.4.1. *QMP Design Quality Control General Requirements*

The QMP shall describe and include the following general requirements:

A. Clear definition of the specific responsibilities of the internal Quality Control functions of the Design Firm and the QC review functions of the independent Design QC Audit Team shall be provided.

B. The Quality Control procedures for Professional Services products shall be organized by discipline (such as structural, electrical, mechanical, architectural, civil, utilities). These procedures shall specify measures to ensure that appropriate quality requirements are specified and included in the Professional Services product and to control deviations from such requirements.

C. Specific Quality Control and quality review procedures, including all required forms and checklists, shall be specified for preparing, verifying and checking all Professional Services products to ensure that they are independently checked and back-checked in accordance with generally accepted engineering practices in the State of New Hampshire and the requirements of the Design-Build Documents. The checking of structural design shall include a set of independent calculations, performed by the Design-Builder, for all structural elements.

D. The designer and checker shall be clearly identified on the face of all Final Design Documents. The QMP shall also include specific procedures for verifying the Professional Services product, along with any computer programs being used for such purposes. Design Documents shall be

stamped, signed and dated by the engineer in responsible charge for that item, element, or phase of the Work.

E. Procedures shall be described for coordinating Professional Services performed by different individuals, disciplines or firms working in the same area, in adjacent areas, or on related tasks to ensure that conflicts, omissions, or misalignments do not occur between drawings or between the drawings and the specifications. This shall also include the coordination of the review, approval, release, distribution, and revision of documents involving such parties.

F. Procedures shall: (1) ensure that Design-Builder personnel are familiar with all the provisions of the Design-Build Documents concerning their respective responsibilities; (2) provide for the education, training and certification, as appropriate, of personnel performing activities affecting or assessing the quality of the Work to assure that such personnel achieve and maintain reasonable proficiency; and (3) ensure that the Work is performed according to the QMP, generally accepted engineering practices in the State of New Hampshire and the Design-Build Documents.

G. Procedures shall be established for meeting documentation requirements; the filing of design criteria, reports and notes, calculations, plans, specifications, schematics and supporting materials needed during the Final Design; and the specific responsibilities of personnel to satisfy these requirements. All Design Documents shall be maintained, organized and indexed by Design-Builder and copies made available to NHDOT, upon its request.

H. Procedures and schedules for the Design QC Audit Team to perform audits of the Design Firm's Quality Control procedures under the QMP.

3.7.4.2. *Design Quality Control Personnel, Staffing and Responsibilities*

Design Quality Control Manager. For qualifications of the Design Quality Control Manager see Section 3.7.2.2. The Design QC Manager shall not be involved with direct scheduling or production activities; and shall report directly to the QC Administrator. The Design QC Manager shall see that the methods and procedures contained in the accepted QMP are implemented and followed by Design-Builder design staff in the performance of the Work. The Design QC Manager shall be a Registered Professional Engineer in the State of New Hampshire.

Personnel in Responsible Charge. Design-Builder shall designate (by name) the personnel in responsible charge for each item, element, or phase of the Work. The personnel in responsible charge shall possess the necessary registrations in the State of New Hampshire and shall be personally responsible for directly supervising the Work and who will stamp, sign and date the Professional Services product for a given item, element, or phase of the Work as applicable.

Reviewing Professional Services. The Design-Builder personnel performing the Quality Control check of the Professional Services shall not be directly involved with the original development of the item, element, or phase being checked. The Design QC Audit Team shall perform a detailed review of all Professional Services after the Design-Builder has completed the Quality Control “self-checks”.

3.7.4.3. *Professional Services Submittal Review Process*

Design-Builder shall conduct a series of working meetings with its Professional Services staff, the Design QC Audit Team's staff, and NHDOT to establish workflow processes and procedures to be utilized during the design review process that are consistent with the Design-Build Documents. The working meetings are also to develop an understanding on general design concepts such as geometrics, aesthetics, drainage, traffic control, and structures.

Design-Builder and NHDOT shall collaborate and mutually agree upon: (i) a list of proposed sections (i.e., Station x+xx to Station y+yy) for the Work; (ii) Professional Services packaging and content (such as drainage, individual structures, electrical, mechanical, architectural, roadway, traffic sequencing, and others); (iii) a list of mandatory submittals; and (iv) a proposed submittal schedule. The Professional Services reviews shall be evenly scheduled over the duration of the Professional Services phase of the Work. Sections and packages shall be logically organized into manageable pieces, and shall contain sufficient information and details to confirm Design-Builder intent and to validate conditions. Design-Builder shall obtain NHDOT's written acceptance of the sections, packages and contents, the schedule, and the methodology prior to making the first submittal to the Design QC Audit Team.

At a minimum, Design QC Audit Team shall conduct detailed mandatory submittal reviews for Professional Services elements listed in this Section 3.7.4. The Design QC Manager shall chair the submittal reviews, and Design-Builder shall maintain formal documentation of these meetings for NHDOT's audit.

The purpose of the submittal reviews is for the Design QC Audit Team to verify and document that all Professional Services products are proceeding in accordance with Project requirements, sound engineering practice, applicable Law, the Governmental Approvals and the Design-Build Documents. All submittals are subject to review and comment by the Design QC Audit Team and other persons as provided herein. The Design QC Manager shall refuse and reject any submittal that does not comply with the requirements of applicable Law, the Governmental Approvals and/or the Design-Build Documents.

If the Design-Builder and NHDOT cannot come to an agreement on the list of mandatory submittals, the following list shall be provided at a minimum:

A. For all bridges: type, size and location submittals, 50% design submittals, 80% design submittals and final design submittals. Once all review comments have been incorporated and accepted, the final design submittals will become Released for Construction work packages. A detailed design narrative shall be submitted with each submittal.

B. For all roadways segments: Slope and Drain Submission (50%), PPS & E Submission (80%) and PS&E Submission (Final). Once all review comments have been incorporated and accepted, the PS&E submittals will become Released for Construction work packages. A detailed design narrative shall be submitted with each submittal.

C. Any deliverables described in the Technical Provisions

D. Design Exceptions and Design Waiver Requests

3.7.4.4. *Final Design Submittal*

The Final Design Submittal shall be submitted to the Design QC Audit Team for review and certification of compliance. Construction packages for individual Work items, elements, or phases shall be organized such that the final document package can be assembled in a manner similar to the standard construction documentation typically provided to NHDOT for conventional project letting, as mutually agreed upon by Design-Builder and NHDOT.

When Design-Builder has completed the Final Design Submittal for an item, element, or phase and wishes to obtain NHDOT's concurrence of such design, the Design QC Manager shall certify that:

A. The design meets all applicable requirements of the Design-Build Documents, applicable Law and the Governmental Approvals.

B. The design has been checked in accordance with Design-Builder's accepted QMP and Professional Services Quality Procedures.

C. The item or element is ready for construction.

D. Design-Builder has obtained all required Final ROW, Governmental Approvals, and Utility Owner approvals.

The Final Design Submittal shall be complete Design Documents incorporating all of the design submittal review comments. All documentation, including Design QC Audit Team's written certifications, copies of NHDOT's approval of deviations from design standards and/or Design Exceptions shall be provided with the Final Design Submittal.

Prior to certifying the above items, elements, or phases, and upon review and comment of the Final Design Submittal by the Design QC Audit Team and NHDOT, Design QC Manager shall schedule a formal review with NHDOT.

3.7.4.5. *Formal Review*

The Design QC Manager will conduct a formal review presentation to NHDOT at a location acceptable to NHDOT. The formal review presentation will be held following the Design QC Audit Team’s and NHDOT’s review and comment of the mandatory submittals.

At least five (5) Business Days prior to the applicable formal review presentation dates, Design-Builder will assemble and submit drawings or other documents to NHDOT for information and review.

Draft minutes of formal review presentations shall be submitted to NHDOT by Design QC Manager within five (5) Business Days after completion of each review.

3.7.4.6. *Resubmittal Process*

Resubmittals of any design submittal may be required if deemed necessary by the Design QC Audit Team (where Design QC Audit Team approval and/or certification is required), NHDOT, or any Governmental Entities with jurisdiction over the Project. Each resubmittal must address all comments received from a prior submittal in a manner satisfactory to the commenting party.

Submittals shall be resubmitted as many times as necessary to address comments of the Design QC Audit Team, NHDOT, or any Governmental Entity.

Upon completion of the Design QC Audit Team's review, Design-Builder may forward such submittals to NHDOT and the appropriate Governmental Entities for review and comment or approval. If NHDOT had requested additional information during the final formal review, the Design QC Manager will conduct an additional formal review of the resubmitted items, elements, or phases. A copy of all correspondence relating to each submittal made to any Governmental Entity shall be concurrently provided to NHDOT.

3.7.4.7. *Certification of Compliance*

The Design QC Manager shall verify that Design-Builder has obtained approval from applicable Governmental Entities and Utility Owners prior to the issuance of a "Certification of Compliance" designation of the Design Documents by the Design QC Manager. Following issuance of a “Certification of Compliance” by the Design QC Manager, NHDOT shall review and provide written concurrence or comment for resubmittal.

After Design-Builder has incorporated the Final Design Submittal and/or the resubmittal of formal review comments into its design and all concerns and questions have been resolved to the satisfaction of NHDOT, Design-Builder shall provide Final Design package to NHDOT. Design-Builder as part of its Final Design package shall include all:

A. Design drawings

B. Design calculations

C. Design reports

D. Specifications

E. Electronic files

F. Documentation required for all Final ROW

G. Governmental Approvals

H. Utility Owner approvals

NHDOT's concurrence with the Design QC Manager’s certification of compliance will not constitute approval of the design or subsequent construction, nor relieve Design-Builder of its responsibility to meet the requirements hereof. Irrespective of whether NHDOT provides Design-Builder with the authority to begin construction on items, elements, or phases of the Work prior to completion of the design for the entire Project, Design-Builder shall bear the responsibility to assure that construction meets the requirements of the Design-Build Documents, applicable Law and the Governmental Approvals.

Construction on any item, element, or phase covered by the Design QC Manager 's certification of compliance of said item, element, or phase shall only progress to the extent covered by the Design

Documents included in that statement, except for the Work performed in accordance with Section 3.7.4.9 (Early Start of Construction). Prior to progressing further with construction of a certified package, Design-Builder shall complete the next item, element, or phase of design or complete the Final Design, and obtain NHDOT's concurrence, except for the Work performed in accordance with Section 3.7.4.9. Any items, elements, or phases of design, subsequent to the certification of compliance from Design QC Audit Team, shall be checked and certified by the Design QC Manager in the same manner as indicated above.

If NHDOT determines that the Final Design Documents do not meet the requirements of the Design-Build Documents, applicable Law and/or the Governmental Approvals, NHDOT will notify Design-Builder in writing of any specific deficiencies in the Final Design Documents. Design-Builder shall correct such deficiencies; modify the Final Design Documents; and, if necessary, modify construction upon receipt of NHDOT's comments.

If there is evidence that the QMP procedures are not adequate, as evidenced by NHDOT's oversight reviews or problems during construction, NHDOT may, at its sole discretion, withhold payment for design and construction until sufficient QMP procedures are in place. If construction is in progress, NHDOT may suspend ongoing Work represented by the deficient design and require correction of design and/or construction defects.

Design-Builder shall provide quantity estimates for Work covered by Final Design Documents. The quantity estimates shall be in units consistent with the Quality Control sampling and testing requirements in the QMP.

3.7.4.8. *Design Changes*

Design-Builder or NHDOT may initiate design changes. Design changes may occur either on items, elements, or phases undergoing construction or after Final Design. In order to process these types of changes, Design-Builder shall submit, when the problem or change occurs, a Request for Information (RFI) for NHDOT's approval.

All design changes submitted under the RFI procedure shall undergo the same QMP checks as the original design.

The designer responsible for the original design shall approve design changes during construction, or design changes to Final Design Documents in writing. If the original designer is no longer available, then after notification to the original designer, an experienced Professional Engineer Registered in NH shall provide documentation of design changes. All plans, final submittals, specifications, calculations, and reports for design changes shall be stamped, signed and dated by an experienced Registered Professional Engineer. In all cases, the Design QC Manager shall certify in writing that the design change has been:

A. Designed in accordance with the requirements of the Design-Build Documents, applicable Law and the Governmental Approvals,

B. Checked in accordance with Design-Builder’s accepted QMP, and

C. Prepared consistently with other elements of the original design.

Design-Builder shall request and schedule interim and final RFI formal design review(s) by NHDOT for all design changes made during construction or to the Final Design Plans. All changes made through the RFI process shall be documented in the As-Built drawings as specified in Section 3.7.4.11 (Record Drawings and Documentation).

3.7.4.9. *Early Start of Construction*

The following will set forth the circumstances under which certain items, elements, or phases of the Work may be packaged by Design-Builder to initiate an Early Start of Construction prior to obtaining NHDOT's concurrence of the Final Design for the item, element, or phase. The "Early Start of Construction" requirements shall apply to any Work that is performed by Design-Builder prior to receiving NHDOT's written concurrence with the Design QC Manager's certification of compliance of the Final Design Submittal for the Work. All such Work is performed at the sole risk of Design-Builder. NHDOT does not consider any items as satisfying the QMP requirements until the Design QC Manager has issued a certification of compliance and NHDOT has issued a written concurrence therewith. Compliance with permit conditions shall apply to all "Early Start of Construction" work.

Any Work constructed by Design-Builder prior to receiving NHDOT's concurrence of the Final Design Submittal for the Work, and later determined to be unacceptable by NHDOT, in its sole discretion, shall be revised, removed or otherwise reconfigured to the satisfaction of NHDOT at Design-Builder's sole cost and expense and without any consideration given to an extension of the Completion Deadline.

NHDOT and Design-Builder shall agree on procedures for Early Start of Construction, which procedures shall, among other things, include a process for distributing construction documents signed and sealed by a Registered Professional Engineer to NHDOT and Design-Builder's field staff.

In order for Design-Builder to proceed with early phases of construction of any portions of the Work, specific pertinent items of the design required to detail and construct the work in the early phase shall have been previously reviewed by the Design QC Audit Team and NHDOT and comments from both the Design QC Audit Team and NHDOT shall have been transmitted to the Design-Builder. In addition, all items within the early phase which tie into or set controlling conditions of later phases, including roadway baselines, horizontal alignments, vertical profiles, elevations, lane widths, gutter line locations, drainage systems, and subsurface work, shall be designed and reviewed as noted above, For example, Early Start of Construction may be rough grading of a specific portion of the Project, for which specific pertinent items of the design may include:

A. Horizontal and vertical alignment for the entire project length

B. Typical sections and sections at critical locations that control project design

C. Related elements of the drainage system

D. Related elements of the Traffic Control Plan specifically applicable during the term of the Early Start of Construction scope

E. Subsurface geotechnical investigations and recommendations

F. Slope stability analysis and recommendations

G. Preliminary structure general plans (if a structure is within the element or portion of the nonstructural Work)

H. Settlement monitoring program

I. Construction specifications

An Early Start of Construction shall be at the sole and complete risk of Design-Builder, and does not release Design-Builder from any of the requirements described in Section 3. (Quality Management Plan). If, as a result of the review process, construction modifications or changes to already completed Work elements performed under the Early Start of Construction are required, Design-Builder shall make any and all construction modifications to already completed construction activities at its sole cost and expense without any entitlement to time extensions or adjustment in the Price.

3.7.4.10. *Released for Construction Documents*

Not later than two Business Days after Design-Builder has completed design of any particular Released for Construction Document, Design-Builder shall submit the signed and sealed document to NHDOT.

3.7.4.11. *Record Drawings and Documentation*

The Record Drawings and Documentation shall be an organized, complete record of Plans and supporting calculations and details that accurately represent what Design-Builder constructed.

Design-Builder shall ensure that the Record Drawings reflect the actual condition of the constructed Work.

3.7.4.11.1. NHDOT

Design-Builder shall submit to NHDOT the electronic files used to prepare the Record Drawings and Documentation. Record Drawings for NHDOT roads shall include both marked up PDFs (including changes noted and clouded for easy identification) as well as corrected CADD files (clouds not required).

3.7.4.11.2. Town of Derry and Town of Londonderry

Record Drawings for Town owned roads shall be in the form of corrected CADD files (clouds not required).

3.7.5. QMP Section 5 – Construction Quality Control Procedures

Design-Builder's Quality Management Plan (QMP) shall describe its internal Quality Control policies, procedures, and personnel used by it, Suppliers, and Subcontractors during construction of the Work. The QMP shall be consistent with the applicable procedures contained in the current NHDOT Construction Manual and establish a clear distinction between QC "self-check" activities performed by

Construction Production personnel and formal QC activities performed independently by QC Audit Team personnel. At a minimum, the QMP shall specify:

A. Methods and procedures that clearly define the distinction/authority/responsibility for the administration of Design-Builder's QMP.

B. That Design-Builder, Supplier, and Subcontractors designate an individual on each crew to be responsible for performing daily field inspections of their own Work and for preparing a daily QC report to document the inspection performed.

C. The review and approval of all Portland cement concrete and hot mix asphaltic concrete mix designs by a Construction QC Audit Team Professional Engineer Registered in the State of NH.

D. Methods and procedures to be utilized by Design-Builder to obtain active participation of the work force in Quality Control operations to achieve a quality project; reporting forms to be used by the responsible Quality Control personnel shall be included.

E. A construction Quality Control organization and staffing plan. The period of time that the QC staff member will be present on the site shall be shown, resumes of the Key Personnel shall be included, and the experience/knowledge/skill levels of the Quality Control support staff shall be stated.

F. Construction QC Audit Team organizational and staffing plans. The period of time that the QC staff member will be present on the site shall be shown; resumes of key staff members shall be included; and the required minimum knowledge, technical skills, and experience level of the personnel related to the various inspection functions, such as grading, drainage, pile-driving and structures inspections, that will occur on the Work shall be stated. The administrative/clerical support staff for maintenance and management of records/documents pertinent to random QC Audit Team data for the QMP activities shall be identified.

G. Procedures for inspecting, checking, and documenting the Work. Inspection, examinations and measurements shall be performed for each operation of the Work to assure quality.

H. Procedures to ensure that all activities affecting the quality of the Work are accomplished under controlled conditions, using appropriate equipment for the task being performed.

I. Procedures to ensure that the education, training, and certification of personnel performing QMP activities are achieved and maintained and that all Work is performed in accordance with the approved designs, plans, and specifications.

J. Procedures to ensure that critical elements of the Work are not started or continued without inspection and testing by the Construction QC Audit Team personnel on site. Inspection points shall be identified and communicated to the Construction Quality Control Manager, and NHDOT. Procedures to proceed beyond inspection points shall be developed.

K. Description of specific procedures to ensure that all Work conforms to the requirements of the Design-Build Documents, Governmental Approvals and applicable Law, and the Design Documents, as well as that all materials, equipment, and elements of the Work will perform satisfactorily for the purpose intended.

L. Documents specifying that all activities undertaken by or on behalf of Design-Builder affecting the quality of the Work shall be prescribed and accomplished by documented instructions, procedures, and appropriate drawings. Such instructions, procedures and drawings shall include quantitative and qualitative criteria to be used to determine compliance.

M. Measures to ensure that purchased materials, equipment, and services conform to the Design-Build Documents, Governmental Permit Conditions and Approvals, applicable Laws, Rules, and the Design Documents. These measures shall be consistent with Good Industry Practice and shall include provisions for source evaluation and selection, objective evidence of quality furnished by Subcontractors and Suppliers, inspection at the manufacture or vendor source, and examination of products upon delivery.

N. Procedures for identification and control of materials, equipment, and elements of the Work. These procedures shall be consistent with Good Industry Practice to ensure that identification of the item is maintained by appropriate means, either on the item or on records traceable to the item, as necessary, throughout manufacture or fabrication, erection, installation and use of the item.

O. Procedures to ensure that materials, equipment or elements of the Work that do not conform to requirements of the Design-Build Documents, Governmental Permit Conditions and Approvals, applicable Law or the Design Documents are not used or installed. These procedures shall include identification, documentation, segregation, disposition and notification to NHDOT and, if appropriate, Governmental Entities and other affected third parties, as well as procedures for NHDOT to review Nonconforming Work.

P. Procedures for processing a Request for Information (RFI) to resolve discrepancies and/or questions in the plans and specifications so that all changes are documented and approved by Design-Builder's design engineers and NHDOT.

Q. Procedures to indicate, by the use of markings such as stamps, tags, labels, routing cards, or other suitable means, the status of inspections and tests performed upon individual items of the Work.

R. A program for Construction QC Audit Team inspection for each operation of all Work through examinations or measurement, and testing of materials or elements of the Work to assure quality.

S. A program for coordination of all QC inspections and testing with the Acceptance/Verification inspections and tests of Governmental Entities and Utility Owners.

T. A program to ensure performance of all QC testing required to demonstrate that all materials, equipment and elements of the Work will perform satisfactorily for the purpose intended and

meet the standards specified in the Design-Build Documents. It shall specify written test procedures which include provisions for ensuring that all prerequisites for the given test have been met and that adequate test instrumentation is available and used. The QMP shall require that QC test results be documented and evaluated to ensure that test requirements have been satisfied. The QMP shall also demonstrate how the Construction QC Audit Team will track its testing frequencies to ensure compliance with the Design-Build Documents.

U. Procedures for reviewing and approving Construction QC Audit Team test results, categorizing test results in a manner acceptable to NHDOT, transmitting random QC test results to NHDOT in a format acceptable to NHDOT for use in fulfilling its statistical validation requirements, and working collaboratively with NHDOT to resolve statistical non-validation between Construction QC Audit Team and NHDOT Acceptance/Verification test results.

V. Measures to ensure that tools, gauges, instruments, and other measuring and testing devices used in activities affecting quality are properly maintained, controlled, calibrated, certified and adjusted at specified periods to maintain accuracy within industry standards.

W. Procedures to control the handling, storage, shipping, cleaning and preservation of materials and equipment to prevent damage or deterioration.

X. Procedures to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, defective material and equipment, deviations and other Nonconforming Work are promptly identified and corrected. The procedures shall ensure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition and the corrective action taken shall be documented and reported to NHDOT in writing and to appropriate levels of Design-Builder's management to ensure corrective action is promptly taken.

Y. A comprehensive system of planned and periodic audits of Design-Builder's QMP to determine adherence to and the effectiveness of the QMP. Construction QC Audit Team personnel shall perform the audits in accordance with the written procedures or checklists. Audit results shall be documented, reviewed, and acted upon by Design-Builder. Follow-up action, including re-audit of deficient areas following corrective action, shall be taken where indicated.

Z. Measures to control the receipt and issuance of documents, such as instructions, procedures, training manuals and drawings, including changes thereto, which prescribe activities affecting quality. These measures shall ensure that approved documents, including authorized changes thereto, are reviewed for adequacy and approved for release by authorized personnel of Design-Builder and are distributed to and used at the location where the prescribed activity is performed. Changes to documents shall be reviewed and approved by the same organizations that performed the original review and approval unless NHDOT consents, in writing, to another responsible organization.

AA. The requirements and methods for controlling documents. Design-Builder's document control system shall be compatible with NHDOT's.

BB. Procedures and personnel to be used to assure that specified instrumentation is installed and monitored in accordance with applicable specifications.

CC. The form and distribution of Certificates of Compliance (COCs).

DD. Procedures for Construction QC Audit Team activities in the QMP with respect to checking and verifying the accuracy and adequacy of construction stakes, lines, and grades established by Design-Builder.

3.7.5.1. *Construction QC Personnel, Staffing and Responsibilities*

3.7.5.1.1. Construction Quality Control Manager

For qualifications of the Construction Quality Control Manager see Section 3.7.2.3. The Construction QC Manager shall not be involved with scheduling or production activities, and shall report directly to the QC Administrator. The Construction QC Manager shall see that the methods and procedures contained in the accepted QMP are implemented and followed by Design-Builder and Subcontractors in the performance of the Work.

3.7.5.1.2. Construction Production Staff QC Role

Design-Builder's and Subcontractors' construction work force (Production Personnel) are all responsible for performing "self-inspection" and "self-checks" of the quality of the Work. Production Personnel performing QC self-inspection shall ensure quality of workmanship and QC sampling/testing shall ensure that materials meet the required specifications prior to independent random QC testing performed by the Construction QC Audit Team. Personnel responsible for performing the frontline Quality Control inspection shall be knowledgeable and receive training to perform their QC duties. Production Personnel performing frontline QC sampling/testing shall be knowledgeable in the testing methods and procedures and do not need to be certified or direct employees of the Design-Builder, but cannot be employees of the Construction QC Audit Team.

3.7.5.1.3. Construction Quality Control Audit Team Staff

A Construction QC Audit Team shall be provided under the direction of the Construction QC Manager to independently perform random inspection and material sampling/testing of all Work performed and materials incorporated into the Project by any member of Design-Builder's group. If approved in writing in advance by NHDOT, qualified individuals who are employees of or retained by manufacturers, vendors or Suppliers may inspect and test certain portions of Work.

The Construction QC Audit Team staff shall be trained and qualified in the applicable inspection and material sampling and testing procedures. The Construction QC Audit staff shall be experienced in highway and bridge inspection and material testing. The training and experience of the Construction QC Audit Team staff shall be commensurate with the scope, complexity, and nature of the activity to be controlled and tested. Qualifications shall include applicable NETTCP certifications or appropriate NHDOT or State Highway Agency certification for testing and inspection, as well as nationally recognized certifications such as PCI or ACI certification in applicable inspection or testing activities. Construction QC Audit Team staff shall report to the Construction QC Manager.

The Construction QC Audit Team staff shall provide oversight and perform QC audits of the construction operations and Work.

The Construction QC Audit Team staff shall inspect attributes for equipment, environmental conditions, materials, and workmanship for all construction, installations, and operations. Construction activities requiring continuous field QC inspection or sampling and testing, in the sole discretion of NHDOT, shall proceed only in the presence of assigned Construction QC Audit Team personnel. The QMP shall identify those activities.

3.7.5.1.4. Construction Quality Control Audit Staffing Levels

The size of the Construction QC Audit Team staff shall reflect the volume of QC Audit activities necessary for the Work in progress and shall be maintained in accordance with the accepted QMP. The Construction QC Audit Team staff will perform random QC oversight, inspection, and testing services. Random QC Audit data may be included with NHDOT's Acceptance/Verification data in the acceptance determination for some Work Items.

The Construction QC Audit Team staffing requirements shall be updated as necessary throughout the Term of the Work to reflect changes in the actual construction schedule. Design-Builder shall ensure that adequate Construction QC Audit Team staff is available and that all QMP activities are undertaken in a manner consistent with the Project Schedule and in a manner that will enable Design-Builder to achieve the Project Completion and Final Acceptance deadlines.

Should NHDOT determine that Design-Builder is not complying with QMP because of lack of QC Audit Team staff, NHDOT shall have the right, without penalty or cost, including time extensions or delay damages, to restrict Work efforts until appropriate levels of staffing consistent with the QMP and satisfactory to NHDOT are obtained or NHDOT may withhold payment to Design-Builder for such services.

3.8. **Construction Quality Control Plans**

Construction Quality Control Plans (QC Plans) shall be prepared for all major construction Work Items and submitted to DOT for approval a minimum of 60 days prior to the planned start of work on the applicable Work Item. At a minimum, QC Plans to be prepared shall include, but not be limited to, the major Work Items listed below:

A. Bridge Substructures

B. Bridge Bearings & Bridge Seats

C. Bridge Fabricated Structural Members

D. Welded steel beams

E. Bridge Superstructure

F. Closure Concrete

G. Hot Mix Asphalt Pavement

It is expected that all major materials and processes needed to complete the Work of the contract will be addressed in one of the listed Quality Control Plans.

The Quality Control Plans may be developed using the NETTCP "Model Quality Control Plan" (Appendix F of the NETTCP QA Technologist course manual, December 2009) as a standard template. Where appropriate for certain Work Items, deviations from the "Model Quality Control Plan" are permissible, however, each QC Plan shall address all aspects of the work needed to complete the subject Work Item. The "Model Quality Control Plan" is available from NETTCP at www.nettcp.com.

The Quality Control Plans shall address the following requirements:

A. The sampling and testing frequencies specified in the Quality Control Plans shall be no less than the frequencies specified in the Department's Division 700 of Construction Manual.

B. Inspection Attributes shall be identified for each major Work Item. The minimum Attributes to be inspected shall be in accordance with the NHDOT Standard Specifications for Road and Bridge Construction. Lot and Sublot sizes shall be established for each Inspection Attribute, unless already specified by NHDOT.

C. Standard QC Report Forms and Record Books shall be established for inspection, sampling, and testing of all Work Items. NETTCP standard Test Report Forms (TRFs) and Inspection Report Forms (IRFs) shall be used to document all QC inspection, sampling, and testing results. Where NETTCP TRFs or IRFs do not currently exist, the Design-Builder shall develop and use their own forms to address such testing or inspection.

D. All Standard Manufactured Materials shall be delivered to the project site with a standard Certificate of Compliance (COC) and supporting manufacturer QC test results for the corresponding Lot of material and must be on the current NHDOT Qualified Products List.

E. All laboratories performing QC testing of Project Produced Materials shall be qualified through either the AASHTO Accreditation Program (AAP) or NETTCP Laboratory Certification Program.

F. All QC personnel identified in a QC Plan shall have appropriate certifications, which shall be described in the QC Plan and shall be subject to NHDOT approval. If pertinent certification is available through NETTCP, it is recommended. If not available through NETTCP, other comparable certifications may be accepted by NHDOT.

3.9. Non-Conformance Reports (NCRs)

Completed work that does not conform to the contract requirements for the quality of materials and workmanship shall be documented through a Non-Conformance Report (NCR). When an NCR is required, it shall be prepared and submitted to DOT within 24 hours after the non-conformance is identified.

The NCR shall clearly describe the element of DB Work that is non-conforming and the nature of the non-conformance. The NCR shall further address steps to be taken to ensure that the particular non-conformance is not repeated.

The Design-Builder's design engineer of record for the Work shall evaluate the effect of the non-conformance on the performance, safety and life of the Project and its elements. The proposed resolution of the non-conformance, including remedial actions if necessary, shall be fully designed and documented and shall bear the stamp of a registered professional engineer in the State as appropriate. The Design-Builder's Construction QC Manager and Quality Control Administrator shall verify, by signing the NCR, that the resolution of the non-conformance, including any remedial actions, has undergone the same level of QC as the design.

NHDOT shall retain the right to document deficiencies in the Work based on observation, sampling and testing of the DB Work. The Design-Builder is responsible for providing DOT with test results in a timely way. DOT may use the NCR form to document deficiencies and these deficiency reports shall require the same review and ultimate closure by the Design-Builder as a Design-Builder NCR.

NHDOT shall review and accept the proposed resolution of any NCR prior to the Design-Builder implementing any corrective action. Where agreement cannot be reached regarding resolution of an NCR, a dispute resolution process shall be used. NHDOT shall ultimately have the authority to call for removal of any nonconforming Work should NHDOT not agree that the remedial actions set forth by the Design-Builder are sufficient. NHDOT reserves the right to make cost adjustments for work that, although not in conformance with specifications, is nevertheless satisfactory to remain in place.

The Design-Builder shall maintain a log of all NCR's and submit this log to NHDOT and the Construction QC Manager on a bi-weekly basis, at a minimum, regardless of any status change. Each NCR shall be numbered sequentially, given a brief description, a status and an expected date for closure. NHDOT will not grant final acceptance for any portion of the DB Work that has an outstanding NCR.

3.10. Materials & Workmanship Quality Certificate

The Design-Builder shall submit with the as-built plans a "Materials & Workmanship Quality Certificate" signed by the Design-Builder's Construction QC Manager and Quality Control Administrator indicating that all materials and workmanship incorporated in the Project conform to the Contract requirements.

4. SAFETY PLAN

Design-Builder shall be responsible for the safety of its personnel and of the general public affected by the Project.

Design-Builder shall develop, implement, and maintain a comprehensive safety plan ("Safety Plan") that is consistent with and expands upon the preliminary safety plan submitted with the Proposal. The Safety Plan shall fully describe Design-Builder's policies, plans, training programs, Work Site controls, and Incident response plans to ensure the health and safety of personnel involved in the Project and the general public affected by the Project during the Term of the Agreement. Prior to award, a copy of the Design-Builder's Safety Plan must be on file with the Contracts Section of the NHDOT as a condition of Award. If such plan is revised during the Contract Time, the Design- Builder shall provide the updated plan to the NHDOT. The Design-Builder shall comply with its safety plan and this Section 4.

Design-Builder's Safety Plan shall address procedures for immediately notifying NHDOT of all Incidents arising out of or in connection with the performance of the Work, whether on or adjacent to the Project.

The Design-Builder shall be responsible for all claims or damages arising from failure to so comply and indemnifies and holds harmless the NHDOT, as well as the Towns of Derry and Londonderry, from all claims and damages arising from such non-compliance.

4.1. Project Specific Emergency Planning

Unless the Contract provides for closure of an existing facility, the Design-Builder shall ensure that essential police, fire, rescue, and ambulance services have reasonable and timely access to and through the Project Limits. The Design-Builder shall contact all emergency service providers in the area, discuss potential impacts on emergency operations (including water supply for fire suppression), and minimize any negative impacts. Fire hydrants within or adjacent to the Project Limits shall be kept accessible to fire apparatus at all times, unless the fire department agrees otherwise in writing.

If the nature of the Work involves deep trenching, confined spaces, toxic chemicals, or any other unusual hazards that could require specialized rescue, the Design-Builder shall inform and cooperate with the appropriate fire department, rescue service, or EMS.

The Design-Builder shall provide the NHDOT with and post and maintain in conspicuous places within the Project Limits, a list containing:

A. Emergency response numbers with the names and telephone numbers (including cellular phone and pager numbers, if applicable) of local ambulance, police, fire, rescue, and hospitals;

B. Emergency response numbers for hazardous Materials spills;

C. The Design-Builder's personnel with phone numbers who may be reached in case of emergency; and

D. The NHDOT's personnel with phone numbers who may be reached in case of emergency.

4.1.1. Work Completed on Impacted Sites

Environmental due diligence completed as part of preliminary design of the project identified three sites where soil and groundwater management for impacted soils will be required. Design-Builder will be responsible to develop a separate definable Health and Safety Plan (HASP) covering the regulatory requirements of OSHA Standard(s) 29 CFR 1910.120/1926.65, Hazardous Waste Operations and Emergency Response (commonly referred to as "HazWoper"), and also codified by EPA as 40 CFR Part 311 . Further information on Environmental due diligence and impacted sites is provided in Section 6.

4.2. **Joint Duty Regarding Safety**

If the Design-Builder or the NHDOT actually observes any person(s) performing Work in a manner that:

A. The observing party actually knows is not in compliance with the MUTCD, the Design-Builder's TCP, an applicable OSHA requirement, or commonly accepted safety practices; and

B. Creates a clear and immediate risk of significant bodily injury to any person, then the observing party shall immediately notify such person(s) working in an unsafe manner and the other party to the Contract.

The Design-Builder and the NHDOT agree to cooperate in eliminating all such unsafe conditions.

5. PUBLIC INFORMATION AND COMMUNICATIONS

5.1. General Requirements

It is vital to the success of the Project that NHDOT and Design-Builder gain and maintain public support. The public will better support NHDOT and Design-Builder if they are kept abreast of Project information in a timely manner, are notified in advance of potential impacts, have an opportunity to identify issues and recommend solutions, receive timely and appropriate feedback from Design-Builder, and perceive a high- quality, well executed communications plan for keeping them informed, engaged, and educated.

Communications with the public, community involvement, and minimizing impacts on businesses, residents, and traffic flow are critical components of the successful development of the Project. NHDOT staff will lead all Public Outreach, communications and engagement during the Design-Build process. However, the Design-Builder will be responsible to provide assistance to NHDOT on construction related issues involving the community. The Design-Builder will facilitate management of community issues and mitigation of construction impacts to adjacent residents, businesses, and the greater community.

NHDOT staff, and the Design-Builder must work together as a team and be prepared to:

A. Maintain a positive image for the Project;

B. Provide regular reports on the Project's progress; and

C. Mitigate construction impacts on the Project's area residents, business owners, and the traveling public

Above all, working closely with NHDOT, the Design-Builder must place a high priority on being responsive to construction related concerns of the public, neighborhoods, and business owners throughout the life of the contract.

NHDOT has worked in partnership with the local community utilizing a number of communication tools and will maintain the lead in implementing a high level of public engagement through final design and construction.

This Section 5 describes the requirements with which Design-Builder shall comply during the Term of the Agreement regarding the provision of information and communication with the Customer Groups.

5.1.1. NHDOT's Role

NHDOT will maintain the overall responsibility for public involvement and information for the Project, with Community and Government Affairs staff holding the primary responsibility for direct interface with the public. Community relations activities conducted by the Design-Builder will be limited to construction-related issues with Design-Builder working closely with NHDOT on all community issues. NHDOT retains the option to use outside assistance on all community relations and engagement issues.

NHDOT's responsibilities include:

A. Providing leadership in establishing the Project's Public Awareness and Community Relations Program;

B. Establishing clear communications policy and strategic direction;

C. Implementing an on-going public outreach program that utilizes a variety of tools for communicating with the community;

D. Providing the Design-Builder with communications guidance and protocols as they relate to construction concerns/issues, and resolution;

E. Monitoring Design-Builder's performance for compliance with established communications related to construction impacts;

F. Identifying Stakeholder representatives, and

G. Managing all communications to the public including media relations, print pieces and information hotline.

5.1.2. Design-Builder's Role

Design-Builder's primary interaction with the community will be limited to incidence response regarding concerns or issues associated with construction activities. This may come in the form of creation of special construction signage, talking with impacted property owners on-site with NHDOT, working with NHDOT to schedule construction activities that will minimize impacts, and working with NHDOT to identify solutions to problems that may arise for impacted properties (such as access or right-of-entry issues). Design-Builder's secondary responsibility will be to assist NHDOT as needed with interactions with community members at public meetings or events.

Design-Builder's responsibilities include:

A. Adhering to the NHDOT Public Awareness and Community Relations Program that directly addresses NHDOT's communications goals and objectives;

B. Working in partnership with NHDOT Inspectors on-site in addressing property owner issues to ensure a swift result and minimal impact;

C. Obtaining NHDOT approval of all information presented to the public;

D. Attending and participating in public meetings and/or events as directed by NHDOT to provide updated technical information to the public;

E. Coordinating with NHDOT staff to ensure scheduling allows proper notification of construction activities;

F. Assisting NHDOT with distribution of construction related materials to targeted property owners; and

G. Exercise absolute respectfulness and decorum at all times when communicating with the public.

H. Community relations (including website development and maintenance)

I. Develop and maintain a project website for dissemination of project public information.

5.2. Administrative Requirements

5.2.1. Public Information and Communications Plan

Design-Builder shall prepare a comprehensive Public Information and Communications Plan (PICP), based upon the preliminary communications plan submitted with Design-Builder's Proposal, which informs, educates, and engages the Customer Groups throughout every stage of the Project. In preparing this plan, Design-Builder shall identify the Customer Groups and develop specific plans to respond to their concerns and needs in all respects regarding the Project. After incorporation of comments from NHDOT on the plan, Design-Builder shall implement the various activities and initiatives contained therein. Design-Builder shall continually maintain the plan to ensure delivery of high-quality, well executed communications throughout the Term of the Agreement.

The PICP shall be flexible to capture the full magnitude of yet-to-be-determined impacts from Project activities such as design, construction, and maintenance, and the public's reaction to these and other impacts. The PICP shall also be resilient to successfully implement the outlined strategies, given the ever-changing desire for depth, breadth, and frequency of information by a variety of important Customer Groups such as the media, elected officials, and the general public.

The PICP shall include a general timeline listing public information activities for the Project over the entire Term of the Agreement.

NHDOT may audit Design-Builder's performance of the activities set forth in the PICP. Design-Builder shall make appropriate changes to the PICP as required to meet the findings of any audit or review and to suit the changing goals and needs of the Project. Design-Builder shall cooperate with NHDOT to amend the PICP as required to suit circumstances as yet unknown, including public reaction to the impacts from the Work and the depth, breadth and frequency of information necessitated by Customer Groups. Design-Builder shall document the efforts and results of the PICP in measurable terms to clearly indicate compliance.

Design-Builder shall provide sufficient qualified staffing to effectively implement the PICP.

In developing the PICP, Design-Builder shall make appropriate provisions to achieve the following:

5.2.1.1. *Public Liaison*

A. Gain and maintain public support, building on existing community partnerships and communication networks.

B. Provide the public with opportunities for input.

C. Demonstrate to the public that the Project will be developed pursuant to a well-executed program.

D. Notify the public in advance of key Project ROW acquisition, construction, and maintenance activities and communicate the potential impacts of these activities.

E. Develop, disseminate and display timely, high-quality, innovative, user-friendly, accurate and appropriate community information including exhibits showing slope grading, drainage, bridge structures, retaining walls, sound walls, and Project ROW acquisition.

F. Develop and manage a public relations campaign and communication strategy to convey key messages, branding and pertinent information about the Project.

5.2.1.2. *Customer Groups*

A. Develop a forum to coordinate on-going dialogue among Customer Groups, NHDOT, and Design-Builder.

B. Prepare and distribute Project-related materials in a user friendly format to inform Customer Groups through appropriate means such as: meetings, interviews, media kits, news releases, telephone correspondence, newsletters, brochures, e-mail, hotlines, Highway Conditions Reports (HCRs), dynamic message boards, Web alerts, public opinion polls/surveys, videos, display booths, presentations, public access information kiosks, and special events.

C. Organize and manage meetings with key elected officials, the general public, representatives of civic organizations, businesses, and special interest groups along the Project corridor (individually or in groups) for the purpose of building rapport with affected stakeholders.

5.2.1.3. *Media*

A. Build on existing NHDOT media resources and/or create and develop advertising messages, including graphics, logos, and slogans.

B. Place Project-related messages in the appropriate media.

C. Develop and distribute public service announcements, paid advertising, and news reports.

D. Manage media relations with key transportation and business reporters and prepare and distribute news releases and media kits.

E. Develop and maintain a project website

5.2.1.4. *Environmental*

The PICP shall detail the communication hierarchy for information distribution related to the compliance with the Comprehensive Environmental Protection Plan, as described in Section 6

(Environmental). The PICP shall include names and contact information, including emergency contact information, and the preferred methods of routine, and emergency communication distribution.

5.2.2. Public Information Coordinator

Design-Builder shall provide a Public Information Coordinator to lead Design-Builder's responsibility for public involvement activities on a day-to-day basis throughout the Term of the Agreement. The Public Information Coordinator shall have a minimum of four years of relevant experience on projects of similar type and scope, and the ability to competently perform the following:

A. Provide the primary point of contact between Design-Builder and the public and act as clearinghouse for the receipt and response to written or verbal complaints regarding the Project.

B. Lead the production, implementation, audit, Quality Control and update of the PICP.

C. Coordinate and supervise day-to-day activities of Design-Builder's personnel in performing the activities described in the PICP.

D. Facilitate communication among Design-Builder, NHDOT personnel (including NHDOT's Office of Public Information), and Customer Groups.

E. Interact with affected Customer Groups and represent the interests of the Project at associated public meetings and other formal and informal occasions.

F. Develop a "first-hand feel" for public concerns and reactions regarding the Project and public information program and incorporate that knowledge into improving the PICP.

G. Liaise with the person assigned to coordinate the initial response to any Incident or Emergency and any Governmental Entity that may have jurisdiction in the Emergency.

5.2.3. Public Information Office

Design-Builder will not be required to maintain a public information office for this project. The Design-Builder will be required to facilitate the exchange of information between Design-Builder and the public, provide residents and other Customer Groups information on the Project, including Project maps and Plans, alternative routes, lane closures, construction updates, community impacts, and commute options. This may be accomplished by providing these resources to the Town of Derry for their use in making this available to the public.

In addition to the services listed above, Design-Builder shall provide a 24-hour telephone hotline, manned during normal business hours with a recorded message describing Emergency procedures after hours.

5.2.4. Customer Groups

The Public Information Coordinator shall actively engage, inform, and seek appropriate support from Customer Groups for the Project throughout every stage of the Project. Customer Groups shall include the following:

A. Media

B. Governmental Entities, including regulatory and law enforcement agencies, including the following:

B.1 Town of Derry

B.2 Town of Londonderry

B.3 Manchester Water Works, and Pennichuck East Utility, not including any community groundwater wells

B.4 Beaver Lake Watershed Partnership

C. General public residing or working within the general vicinity of the Project, or traveling within or across the limits of the Project

D. Business owners within or adjacent to the Project corridor

E. Utilities, railroads, transportation authorities and providers (such as local airports, transit operators, toll authorities, and other highway concessionaires) affected by the Project.

5.2.5. Public Meetings

Design-Builder shall organize and manage public meetings with the Customer Groups during design and construction activities. This shall include the Design-Builder acquiring meeting space and making all accommodations including ADA requirements. All costs associated with the public meetings shall be the responsibility of the Design-Builder and included in the lump sum bid price.

During such meetings, Design-Builder shall inform the public of the Project's progress and discuss key issues as they emerge. Design-Builder shall provide timely and useful information regarding subjects of interest to the public, including:

A. Design and construction issues affecting adjacent residential areas, frontage roads, local streets, and utilities, including such issues as Project ROW definition, grading, drainage, and noise barriers and retaining walls

B. Street and roadway detour design and implementation

C. Scheduling and duration of Work, including hours of construction

D. Haul routes

E. Methods to minimize noise and dust

F. Environmental mitigation measures

Design-Builder shall notify NHDOT a minimum of 48 hours in advance of any meetings with the public. NHDOT reserves the right to attend any such meetings. When requested by NHDOT, Design-Builder shall participate in any meetings with the public called and conducted by NHDOT by providing necessary support. When NHDOT decides to conduct such meetings, Design-Builder shall share, in a readily disseminated form, all necessary information regarding potential Customer Groups at NHDOT's request.

For the purpose of preparing a proposal, the Design Builder shall assume they are to accommodate four (4) such public meetings being called by NHDOT.

5.2.6. Meeting Minutes

For all meetings with the public which Design-Builder conducts or directly participates in, whether called by NHDOT or the Design-Builder, the Design-Builder shall prepare meeting minutes within five (5) Business Days after the conclusion of such meetings. At a minimum, Design-Builder shall include the following items in the meeting minutes:

A. A complete list of attendees (including their affiliations, telephone numbers, and e-mail addresses)

B. Documentation of the issues discussed and any associated solutions

C. Description of remaining open issues and action items (including the person(s) responsible for follow-up and target date for resolution)

For the purpose of preparing a proposal, the Design Builder shall assume meeting minutes will be required for ten (10) meetings total with the Town of Derry, the Town of Londonderry, local town neighborhoods, and business groups. The Design-Builder shall also assume meeting minutes will be required for all monthly progress meetings held for the project duration.

5.2.7. Emergency Event Communications

For all emergency events, such as vehicle collisions, ice/snow conditions, and hazardous material spills, the Public Information Coordinator shall take timely and appropriate action to inform NHDOT's Transportation Systems Management and Operations (TSMO), Transportation Management Center (TMC), the Towns of Derry and Londonderry, as applicable, and appropriate Customer Groups of all pertinent details. The Public Information Coordinator shall provide these details through the use of appropriate tools to ensure effective communication. These tools include: dynamic message signs (DMS), NHDOT's Highway Conditions Report (HCR), email/Web alerts, telephone notification, facsimiles, and media releases/interviews, as appropriate. The Public Information Coordinator shall continue to provide updated information to the Towns of Derry and Londonderry and the TMC, as available and on a timely basis, until the Emergency no longer exists.

In the event of an unforeseen Emergency, timely notification shall mean as soon as practicable, but in no event longer than within one hour of the occurrence. If advance warning is available for an Emergency event such as ice/snow, timely notification shall mean as soon as practicable, but in no event longer than within one hour of the time the information was available. In both situations, the Public Information Coordinator shall continue to provide updated information, as available and on a timely basis, until the Emergency no longer exists.

5.2.7.1. *Lane Closures*

Design-Builder shall provide NHDOT and appropriate Customer Groups a minimum of two weeks advance notice for lane closures and/or traffic switches planned to be in effect longer than 24 hours, and a minimum of 24 hours advance notice for lane closures that are planned to be in effect less than 24 hours, using all appropriate tools as needed. The Public Information Coordinator shall notify the TSMO of all lane closures (or an event that results in lane closures). The TMC shall be notified within 10 minutes of installing the first advanced warning sign for a lane closure or lane blocking event. The TMC shall also be notified within 10 minutes of removal of the last advanced warning sign.

5.2.8. Disseminating Public Information

Design-Builder shall prepare and appropriately distribute materials regarding Project-related subjects, using all appropriate methods, including: meetings, news releases, telephone correspondence, newsletters, email, hotlines, TMC, dynamic message signs, Web alerts, maps, displays, renderings, and presentations.

Design-Builder shall provide content suitable for posting on the Design-Build Teams project website to convey Project-related information. NHDOT may also use this content on the NHDOT project website as needed including:

A. Contact information

B. Project maps

C. Frequently asked questions (FAQs)

D. Current Project activities addressing design, construction, and maintenance

E. Timing of street and bridge closures and openings, impacting property access

F. Recommended route alternatives during closures

G. Special events calendar

H. Public comment repository

I. Links to NHDOT's TMC

J. Links to other related sites as deemed appropriate by NHDOT

K. Look ahead schedules

L. Contact information for public use

The Web site shall also contain other general Project-related information that enhances the engagement or education of the general public. Design-Builder shall regularly review and update information on this public Web site throughout the Term of the Agreement to provide current and appropriate information.

All written materials produced for Customer Groups shall follow the Publications Style Guide published by the NHDOT's Public Information Office and/or other appropriate spelling/writing guidelines.

Design-Builder, working collaboratively with NHDOT, shall assess the need for multi-lingual communications and, where appropriate, furnish Project-related materials in non-English languages or other demographic adaptations.

5.3. **Deliverables**

5.3.1. PICP

Design-Builder shall submit the PICP for NHDOT's approval. Submittal shall be in both hardcopy form and electronic format compatible with NHDOT software. NHDOT approval of the PICP shall be a condition of issuing approvals for the start of construction activities.

5.3.2. Meeting Minutes

Design-Builder shall submit draft versions of all meeting minutes to NHDOT for review before distributing final versions to the meeting attendees and appropriate Customer Groups. Draft meeting minutes shall be submitted no more than 72 hours after completion of the subject meeting unless otherwise allowed by NHDOT or stated otherwise in the Contract.

6. ENVIRONMENTAL

6.1. General Requirements

The Design-Builder shall deliver the environmental commitments required by the RFP, Design-Build Documents, Environmental Laws, Governmental Entities, Governmental Approvals, and all applicable federal and state Laws and regulations. To that end, the Design-Builder shall develop, operate, and maintain a Comprehensive Environmental Protection Program (CEPP) for the Work to ensure environmental compliance with all applicable Environmental Laws and commitments. The Program shall obligate the Design-Builder to protect the Environment and document the measures taken during the performance of the Work to avoid and minimize impacts on the Environment from the design, construction, maintenance, operation, and rehabilitation activities of the Project. The Program shall effectively demonstrate in detail the Design-Builder's knowledge of all applicable project-specific Environmental Approvals, issues, and commitments and applicable Environmental Laws as set forth in Book 2, and shall describe the processes that will be followed during the course of the Work to comply with those Environmental Approvals, issues, and commitments and applicable Environmental Laws, as well as the documentation required to validate compliance. All monitoring and reporting activities shall be concise, consistent throughout the Term of the Agreement as applicable to the activities being performed, and in accordance with the requirements set forth in the Environmental Laws. The program shall also effectively describe the Quality Control measures that the Design-Builder will implement to verify the compliance of the program with all applicable Environmental Laws.

The program shall establish and implement environmental permits, waivers and conditions, issues, and commitments consistent with the Environmental Approvals. Additional specific requirements are found in the Reference Documents. The program shall establish a goal of zero environmental violations during the performance of all Work activities. However, should violations occur, the program shall set forth detailed processes for rectifying such violations in an appropriate and timely manner.

The Design-Builder's obligation regarding Governmental Approvals and Laws, including Environmental Laws and Environmental Approvals, and the Design-Builder's obligation for environmental compliance is set forth in Book 2, Section 6.1.

The Design-Builder shall cause Work to comply with Environmental Approvals and compliance requirements for any additional actions throughout the Term of the Agreement. The Design-Builder shall monitor and document Work activities so that documents providing evidence for compliance are available to NHDOT for inspection at any time.

The Design-Builder shall comply with all Federal, State, local laws, and regulations regarding impacts to the environment; and preventing the spread of prohibited invasive plants. Pollution of streams, wetlands, rivers, lakes, ponds, and reservoirs with fuels, oils, bitumens, chemicals, suspended silt, or other harmful materials and pollution of the atmosphere from particulate and gaseous matter shall be avoided to the maximum extent practicable. Detailed requirements implementing this policy are outlined in NHDOT Standard Specification Section 107. The Design-Builder shall employ all BMP's instituted by the Environmental Compliance Manager in a timely manner.

Soils located within the project limits on the former Manchester & Lawrence Rail corridor are considered to be classified as impacted soils. The NH Department of Environmental Services requires treating railroad ballast materials as impacted soils as they routinely contain non-leachable impacts just above the allowable limits to be considered "clean material."

Furthermore, environmental due diligence identified the following four sites to have impacted soils and/or groundwater:

- B1062 Storm Water Basin Along Folsom Road
- B1085 Storm Water Basin Along Tsienneto Road
- Royal T Carwash
- B208 Water Quality Swale along Crystal Avenue

Phase I Environmental Site Assessment and Phase II Environmental Site assessment are included with the Record Information Documents.

Any ~~remediation~~ activities on ~~contaminated~~ impacted sites would be required to comply with water quality standards and for the Design-Builder to obtain the necessary permitting coverage for any discharges from the ~~contaminated~~ impacted sites. These requirements would be in addition to the requirements for discharges covered under other NPDES permits including the construction general permit or MS4 general permit. The Project shall be constructed and operated in conformance with all regulatory and permitting requirements.

The Design-Builder shall prepare and submit a proposed Project Operation Plan (POP) to the NHDOT's Bureau of Environment through the Engineer at least 15 business days prior to any work in the areas identified as contaminated. The Design-Builder shall refer to the NHDOT's Special Attention/Project Operation Plan (SA/POP) Template and the Generic Soil Management Plan/Soil and Groundwater Management Plan (SMP/SGMP) to develop the POP for the Project. The Bureau of Environment will review the proposed POP for compliance with state regulatory requirements, and provide comments to the Engineer. The comments to the proposed POP must be addressed by the Design-Builder in a revised POP. When all comments have been addressed, the Bureau of Environment will approve the POP. ***No excavation and/or dewatering of contaminated material may take place until the POP has been approved by the Department.***

6.2. Environmental Approvals

6.2.1. Permits and Limitations

A Final Environmental Impact Statement/Record of Decision, with a Section 4(f) Evaluation, has been submitted and approved by FHWA under the National Environmental Policy Act (NEPA), and was issued on February 3, 2020.

The Project will require several environmental, utility, and local permits/approvals. NHDOT is responsible for obtaining the environmental permits described in the table below (unless noted otherwise). Utility permits and/or local permits will be the responsibility of the Design-Build team.

Though NHDOT may not have received final environmental permits when the RFP is issued, NHDOT expects to have permit conditions reasonably well defined by that time. NHDOT, and FHWA have completed the NEPA process and expect to have acquired all of the necessary environmental permits before the commencement of construction. However, anticipated permit issuance dates may change depending on design and other factors. As final design proceeds, the Design-Builder may be required to support the preparation of any remaining permits as needed and may be required to prepare permit amendments or modifications to reflect Design-Builder changes from the BTC, NHDOT will submit the permit applications or associated responses to more information request. Additional permits or permit amendments may affect the Project design and schedule. Table 6-1 summarizes the anticipated required permits/approvals to be acquired by NHDOT and their associated status.

If after the required permits/approvals are acquired, the Design-Builder varies from the conceptual plans to a degree that would necessitate additional permits or permit amendments, the Design-Builder will be required to prepare permit amendments or modifications to reflect Design-Builder changes. A “significant amendment” to an approved permit will require a complete new permit, to be prepared by the Design-Builder. As defined in RSA 482-A:3 Excavating and Dredging Permit: Certain Exemption, Section XIV Note (e) a “significant amendment” means an amendment which changes the proposed or previously approved acreage of the permitted fill or dredge area by 20 percent or more, includes a prime wetland, or elevates the project's impact classification. This meaning of "significant amendment" shall not apply to an application amendment that is in response to a request from the department. NHDOT will review, approve and submit the Design-Builder’s permit amendments or modifications to the Governmental Entities for the procurement of these additional permits or permit amendments. The timeframe for any permit or permit amendment requiring NHDES review will be 10 working days for submission completeness, and 50 working days for review. All other review periods for NHDES will follow the Memorandum of Agreement Between the Department of Environmental Services and the Department of Transportation Regarding Wetlands Permitting Timeframes (RSA 482-A) dated 12/17/2019 and included in the Reference Information Documents. Any delay and associated costs caused by procuring the permits, or amendments, will be the responsibility of the Design-Builder.

The Design-Builder may request a Change Order to extend the Completion Deadline for a NHDOT-Caused Delay if the environmental approvals submitted by NHDOT are not obtained by the dates noted in Table 6-1 and the delay changes the duration of the Critical Path. The Design-Builder is responsible for the schedule of obtaining environmental approvals and permits, including those requiring NHDOT to submit as the applicant, that have no commitment date in Table 6-1.

NHDOT will partner and coordinate with the Design-Builder in the effort to obtain the environmental approvals within reasonable times to not affect the schedule.

6.2.2. New Environmental Approvals and Amended NHDOT-Provided Approvals

NHDOT-Provided Approvals are based on the BTC as presented in the Environmental Approvals in Table 6-1. Such approvals may require re-evaluation, amendment, or supplement as the Work progresses or in order to accommodate actions not identified in the Environmental Approvals or covered specifically by existing resource agency coordination. Changes to the BTC or incorporation of Additional Properties into the Project may require new Environmental Approvals.

The Design-Builder will be responsible for coordination with Governmental Entities necessary to obtain new Environmental Approvals or amendments to the NHDOT-Provided Approvals except where NHDOT has agreements with Governmental Entities to perform such coordination.

The Design-Builder will be responsible for ensuring compliance with the conditions and schedules set forth in amendments to any NHDOT-provided Approvals or in new Environmental Approvals. NHDOT may, in its discretion, provide assistance in securing new Environmental Approvals or amendments to NHDOT-Provided Approvals.

6.2.3. Responsibilities Regarding Environmental Studies

The Design-Builder, with possible support from NHDOT as indicated, shall be responsible for conducting continuing environmental studies based on the Project approved NEPA document and BTC.

The Design-Builder, with the support from NHDOT, shall be responsible for conducting environmental studies and re-evaluations caused by actions not identified in the Environmental Approvals, actions not covered specifically by existing resource agency coordination, or incorporation of Additional Properties into the Project. The Design-Builder shall be responsible for all coordination of environmental studies with appropriate Governmental Entities, except where NHDOT has agreements with Governmental Entities to perform such coordination.

Table 6-1

Anticipated Permits and Approvals Needed

Agency	Permit/Approval	Status
Federal Agencies		
US Fish and Wildlife Service	Section 7 of the Endangered Species Act	Assessment and coordination occurred for listed or proposed listings of endangered species during the NEPA process. No federal species are anticipated to be affected. An acoustical survey for Northern Long-eared bats was conducted and is valid until August 2021. In areas where construction clearing is not started by then, a new survey and coordination with USFWS will be needed. A Bridge/Structure Assessment for to determine the presence of NLEB at the Shields Brook and Tributary E culverts must be conducted by the Design-Builder prior to construction activities. Standard and special conditions identified in the federal wetland permit are to be followed.

Federal Highway Administration	Final Environmental Impact Statement/ Record of Decision and Section 4(f) Evaluation	The Final EIS/ Record of Decision by FHWA was published on February 3, 2020.
	Section 106 Historic Consultation	An MOA between FHWA, NHDOT, the Town of Derry, and NHDHR for effects on the M&L Railroad Corridor Historic District, archaeological resources and stonewalls, was signed on 10/29/2019. The design stipulations to mitigate these effects shall be carried out...
Environmental Protection Agency	National Pollutant Discharge Elimination System Construction General Permit (CGP)	The Design-Builder will be responsible to file a Notice of Intent and notify NHDOT when such Notice is filed with EPA.
	National Pollutant Discharge Elimination System NH Municipal Separate Storm Sewer System (MS4) General Permit	NHDOT, Londonderry and Derry are Authorized to Discharge from the existing and proposed MS4s. The Design-Builder is responsible to ensure compliance with the applicable MS4 General Permit conditions
U.S. Army Corps of Engineers	Section 404 Permit	The project Section 404 permit is anticipated by June 24, 2020. The Design-Builder is responsible to ensure compliance with Section 404 permit conditions.
State Agencies – NH		
New Hampshire Department of Environmental Services (NHDES)	Wetlands Bureau - Standard Dredge and Fill Wetland Permit	A Major Impact Wetland Permit Approval Letter was received on May 5, 2020. The permit is contingent on the receipt of a one-time payment to the NHDES ARM Fund prior to February 28, 2021. Standard and Special conditions of the permit apply.
	Shoreland Program - Shoreland Permit (for Beaver Lake area)	The Shoreland Permit by Notification was issued on February 19, 2020.
	Alteration of Terrain Bureau – Alteration of Terrain Permit (AoT)	No permit will be issued. However, the final design developed by the Design-Builder shall be compliant with AoT Rules and Regulations.
New Hampshire Fish and Game Department (NHFGD)	State Endangered or Threatened fish or wildlife	Coordination with NHFGD to reduce potential impacts to state listed species during construction is the responsibility of the Design-Builder.
New Hampshire Division of Forests and Lands, Natural Heritage Bureau (NHNHB)	State Endangered or Threatened plants	No state listed species are known to be present. The Design-Builder is responsible

		to abide with protection of species if encountered.
New Hampshire Department of Agriculture, Market & Food, Plant Industry Division New Hampshire Division of Environmental Services, Water Division	Invasive Plant Species	Under the statutory authority of *RSA 430:55* (NH Department of Agriculture) and RSA 487:16-a (NH Department of Environmental Services), the spread of invasive plants, listed in Agr 3800 and Env-Wq 1300, by the Design-Builder is prohibited.

6.2.4. NHDOT Review and Approval of Design-Builder Submissions

NHDOT reserves the right to review, comment on, require revisions to, and reject for resubmission documentation submitted for environmental compliance or Environmental Approvals. Documentation shall conform to current NHDOT submission standards and the requirements of all applicable Governmental Entities, laws, and regulations. NHDOT will accept documentation meeting current submission standards. NHDOT will return approved documentation to the Design-Builder for submittal to the appropriate Governmental Entity in cases where the Design-Builder performs coordination. NHDOT, acting reasonably, will approve those submissions for which NHDOT signature or other approval is required. Documentation not meeting current submission standards or requirements of Governmental Entities will be returned to the Design-Builder, and shall be revised by the Design-Builder to meet standards or requirements.

6.3. **Comprehensive Environmental Protection Program (CEPP)**

As part of the PMP, the Design-Builder shall develop and implement a Comprehensive Environmental Protection Program, applicable throughout the Term of the Agreement to establish the approach, requirements and procedures to be employed to protect the environment. All component parts shall reflect in order of priority: impact avoidance, minimization and as last resort mitigation. The CEPP shall satisfy applicable FHWA, NHDOT, and resource agency requirements, including those detailed as commitments in any Environmental Approvals.

At a minimum, the CEPP shall include the following component parts:

A. Environmental Management System (EMS),

B. Environmental Compliance and Mitigation Plan (ECMP),

C. Environmental Protection Training Plan (EPTP),

D. Contaminated/Hazardous Materials Management Plan (HMMP),

E. Communication Plan (CP),

F. Construction Monitoring Plan (CMP),

G. Recycling Plan (RP), and

H. Stormwater Management Plan (SWMP) for Construction Period and Post-Construction Operation.

I. Discharge Turbidity Monitoring and Reporting Plan

The dates by which component parts comprising the CEPP are to be submitted for NHDOT approval are set forth in this Section 6. Amendments and updates to the CEPP as necessary to address changing conditions and environmental requirements shall be in accordance with the procedures for amendments to the PMP.

6.3.1. Environmental Management System (EMS)

The EMS shall be the overarching system by which the Design-Builder shall cause environmental commitments made during the Environmental Approval and permitting processes, and other environmental requirements to be carried forward and reflected, as appropriate, in the design and implemented throughout the Work. The Design-Builder shall utilize the EMS to track on-going issues, identify environmental compliances, non-compliances and identify actions required/taken to correct any such non-compliance.

6.3.2. Environmental Compliance and Mitigation Plan (ECMP)

The ECMP shall document and fully detail compliance strategies and procedures to be employed to cause Work performance in accordance with requirements of applicable Environmental Laws and Environmental Approvals. This plan shall establish and/or document schedules, protocols, and methodologies to be used in accomplishing Work, with an emphasis on monitoring, reporting, corrective actions and adaptive management. The plan shall include a Compliance Action Plan (CAP). The CAP shall consist of a decision-making matrix which will define the triggers for initiating or re-initiating environmental compliance actions for construction and maintenance activities. For each trigger, the CAP will identify the appropriate type or level of environmental study or other compliance action necessary to ensure the ongoing validity of Project Environmental Approvals and commitments. In addition, the ECMP shall detail any mitigation required by Environmental Approvals, the Design-Builder's approach to satisfying mitigation requirements and the Design-Builder's approach to monitoring the progress of performance of environmental mitigation measures, including mitigation requirements identified after completion of the ECMP. At least 48 hours prior to start of construction, the Design-Builder shall schedule a meeting to review project environmental commitments and permit conditions. The meeting shall be attended by NHDOT, NHDES, and the Design-Builder's key construction, design and environmental staff described in Section 6.

The ECMP shall include the following components:

A. Environmental Permits, Issues, and Commitments (EPIC) Sheets

The Design-Builder shall develop and maintain EPIC construction plan sheets. Applicable permits and environmental commitments shall be identified on EPIC sheets and updated throughout the construction period to identify on-Site conditions. Section 6.5 includes a list of draft and specific environmental commitments that have been assembled as of June 8, 2020. This list of commitments may not be comprehensive, the commitments may be modified due to permit conditions or other factors, new commitments may be added or existing commitments may be deleted. The Design-Builder is responsible for maintaining up-to-date and accurate records of all project environmental commitments and ensuring that all are met.

B. State of New Hampshire Environmental Permits and Approvals

The Design-Builder shall document how they will comply with the terms and conditions for any Environmental Permits, Approvals or regulation issued by New Hampshire state agencies. These may include, but are not necessarily limited to, the following:

I. New Hampshire Standard Dredge and Fill Permit

II. New Hampshire Comprehensive Shoreland Protection Act Permit

III. New Hampshire Alteration of Terrain Regulations

IV. New Hampshire Department of Agriculture, Market & Food, Agr 3800

V. New Hampshire Division of Environmental Services, Env-Wq 1300

C. Clean Water Act - Sections 404: Discharge of dredged or fill material in Waters of the United States, including wetlands

The Design-Builder shall document how they will comply with the terms and conditions for Section 404 permit(s) issued to NHDOT by the USACE (U.S. Army Corps of Engineers):

D. Clean Water Act - Section 402: National Pollutant Discharge Elimination System (NPDES)

The Design-Builder shall document how they will comply with Section 402 of the CWA, including NHDOT, Town of Londonderry, and Town of Derry's MS4 Stormwater Management Plans found at the following links.

- https://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/water-quality.htm
- https://www.derrynh.org/environmental/pages/stormwater-pollution-prevention
- https://www.londonderrynh.org/engineering-division/pages/storms-stormwater

The documentation shall also include documentation of the Design-Builder day-to-day operational control over activities regulated by the CGP. This may include Storm Water Pollution Prevention Plans (SWPPP), CGP Notices of Intent, Monitoring Reports, Corrective Action Reports, Notices of Change and Notices of Termination.

E. State Listed Species

The Design-Builder shall develop a plan to document how they will coordinate to address state listed threatened or endangered, listed or candidate species, if any are found to occur in the project area or encountered during construction operations. The documentation shall be in agreement with any agreements which may be made with the New Hampshire Fish and Game Department (NHFGD) and the New Hampshire Natural Heritage Bureau (NHNHB), including the

requirement for coordination with NHFGD to be conducted by NHDOT. The documentation at a minimum shall include:

I. Process for communicating any commitments regarding state listed species, and

II. Procedures for complying with any commitments.

F. Endangered Species Act and Fish and Wildlife Coordination Act

The Design-Builder shall document how they shall comply with the Endangered Species Act (ESA), and the Fish and Wildlife Coordination Act (FWCA). The documentation shall reflect that coordination with U.S. Fish and Wildlife Service (USFWS) shall be conducted by NHDOT. The documentation at a minimum shall include:

I. Process for training personnel on the requirements of the ESA and FWCA,

II. Process for communicating any commitments regarding ESA and FWCA, and

III. Procedures for complying with any commitments including mitigation.

Note that acoustical monitoring for Northern Long-eared bat (NLEB) was conducted in August 2016 and found no evidence of NLEB presence within the undeveloped area of the Project. The NLEB clearance is valid for five years and re-evaluation for the presence of NLEB within the project limits must be conducted in areas where construction clearing is not initiated by August 2021. The Design-Builder must conduct an updated acoustical survey for NLEB and coordinate with NHDOT who would consult with the USFWS on a determination of the potential effects to the NLEB before clearing occurs. A Bridge/Structure Assessment Form to determine the presence of NLEB at the Shields Brook and Tributary E culverts must be conducted by the Design-Builder prior to construction activities.

G. Traffic Noise

The Design-Builder shall document how they will address traffic noise mitigation. The documentation at a minimum shall include:

I. Process for carrying out noise mitigation measures as identified and discussed in the approved NEPA document Base Technical Concept (BTC), and Noise Technical Report,

II. Process for carrying out noise mitigation measures determined throughout the life of the Project, and

III. Process to handle changes that may occur to proposed permanent noise mitigation in the approved NEPA document, the BTC and Noise Technical Report.

To fulfill the commitments of the previously mentioned NHDOT-Provided approvals the Design-Builder shall be responsible for implementing all noise mitigation measures to minimize construction and long-term impacts of the Work as prescribed in NHDOT-Provided approvals

and subsequent NHDOT-Provided approvals secured by the Design-Builder. The Design-Builder acknowledges that NHDOT-Provided approvals are based on the BTC design and BTC ROW. Analysis of the noise mitigation performance must be made by the Design-Builder based upon the final design and utilizing the model used to assess impacts and mitigation for the SDEIS/FEIS study phase. Refer to Section 7.8.9 for additional requirements for soundwalls required on this project.

H. The FHWA and NH Division on Historical Resources have prepared an Adverse Effect Memo, a copy of which is provided in the reference information.

A Memorandum of Agreement (MOA) has been executed between NHDOT, FHWA, the Town of Derry and the New Hampshire State Historic Preservation Office relative to this project. A copy of the MOA is provided in the reference information (see Appendix K of the FEIS, Volume III, and in the RFP RIDs). The Design-Builder shall comply with the stipulations in the MOA and provide for these in both the final design and in construction of the project. The Design-Builder shall, if requested by NHDOT, furnish evidence that each stipulation in the MOA has been satisfied in the final design and in construction of the project.

I. Public Involvement

The Design-Builder shall document how they will comply with all public involvement requirements, including but not limited to public involvement requirements specifically related to cultural resources. The documentation shall comply with all applicable requirements including, but not limited to, 43 TAC §2.4, Section 106 of the National Historic Preservation Act (36 CFR 800), the Civil Rights Act of 1964, and the Civil Rights Restoration Act of 1987. The documentation shall include that the developer is responsible for supporting NHDOT with all public involvement requirements for the life of the project except where NHDOT has agreements with Governmental Entities to perform public involvement requirements. The documentation at a minimum shall include:

I. Process for handling public involvements requirements,

II. Procedures for documenting public involvement, and

III. Procedures for compliance with Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220), August 7, 1998, for materials provided for digital, on-line dissemination.

6.3.3. Environmental Protection Training Plan (EPTP)

The Design-Builder shall develop and implement an Environmental Protection Training Program that shall meet the minimum requirements set forth herein. The EPTP shall include methods and procedures documented in the ECMP to:

I. Educate every worker to:

a. Recognize the overall importance of environmental issues to constructing, operating and maintaining a successful Project, and

b. Appreciate the various environmental sensitivities of the Project.

II. Train every worker to:

a. Recognize environmentally sensitive resources and federal- and state-endangered species that may be encountered during the Work,

b. Understand environmental documentation for impacted sites requiring special management of soil or groundwater.

~~a.~~c. Avoid or take appropriate action to minimize environmental impacts from the Work,

~~b.~~d. Know the required actions, practices, and procedures regarding regulated resources,

~~c.~~e. Recognize a potentially unsafe condition,

~~d.~~f. Foster the Design-Builder's management and supervisory personnel's attitude of commitment to the Project's environmental quality,

~~e.~~g. Convey to all workers, the Design-Builder's management commitment to the Project's environmental quality, and

~~f.~~h. Convey to all workers, NHDOT's and the Design-Builder's commitment to zero tolerance for violations.

6.3.3.1. *EPTP Scope and Content*

The goal of the EPTP is to educate Project personnel about the following:

A. Overall importance of environmental protection to the Project

B. Compliance responsibility and Governmental Entity authority including background and environmental issues regulatory overview.

C. Overview of the Design-Builder's environmental commitments and responsibilities at the Project level.

D. Worker responsibilities.

E. Wetlands identification.

F. Endangered species identification.

G. Invasive species identification.

H. Environmental Approvals terms and conditions including an overview of the provisions of the ESA, and Storm Water Pollution Prevention Program (SWPPP).

I. BMPs for environmental compliance, including pollution prevention, erosion, sedimentation, and dust control measures to maintain water and air quality.

J. Required mitigation measures.

K. Procedures and precautions in the event of spills of or discovery of Hazardous Materials or unknown chemicals or contamination.

L. Procedures and precautions in the event human skeletal remains or other archeological or paleontological resources are discovered.

M. Procedures regarding the relocation of historical markers (i.e. Town Markers, NH SHPO Subject Markers, NHDOT Markers).

N. Groundwater protection requirements.

O. CWA regulations and surface water protection requirements.

P. Overview of noise and residential impact reduction procedures.

Q. Air quality requirements.

R. Penalties and/or fines for violations of and noncompliance with Environmental Approvals and Environmental Laws, including termination of employment.

6.3.3.2. *EPTP Participation*

The Design-Builder shall require all employees to participate in the EPTP and shall keep accurate records documenting attendance, as well as materials presented.

6.3.3.3. *EPTP Schedule*

The Design-Builder shall include activities for implementation of the EPTP in the Project Schedule. The length of training sessions and their frequency shall be sufficient to achieve the goals set forth above. Periodic training sessions at key times (e.g., prior to construction or major maintenance in sensitive areas or construction timing restrictions to protect threatened and/or endangered species) shall be used to update workers on specific restrictions, conditions, concerns, and/or requirements.

6.3.4. Contaminated/Hazardous Materials Management Plan (HMMP)

The Design-Builder shall prepare an HMMP for the safe handling, storage, treatment and/or disposal of Hazardous Materials, whether encountered at or brought onto the Project Site by the Design-Builder, encountered or brought onto the Project site by a third party, or otherwise, during the Term of the Agreement. The Design-Builder shall submit the final HMMP to NHDOT for review and approval; approval of the Plan by NHDOT shall be a condition of commencement of site Construction Work.

The HMMP shall include procedures compliant with all applicable Environmental Laws and include, at a minimum:

A. For all chemicals to be used on the Project, the Design-Builder shall keep and update Material Safety Data Sheets (MSDS), per OSHA requirements, for the term of the Agreement.

B. Designated individuals responsible for implementation of the plan,

C. Procedures for identifying and documenting potential contaminated sites which might impact Project development,

D. Procedures for mitigation of known contaminated sites anticipated to impact construction,

E. Procedures for identifying, handling, and management of Limited Reuse Soils (LRS),

F. Procedures for mitigation of unanticipated contaminated sites encountered during construction,

G. Procedures for mitigation of contamination during the operation and maintenance of the Project,

H. Procedures for developing a detailed Spill Response Plan for the term of the Project,

I. Process for training personnel for responding to and mitigating Incidents involving contamination or waste,

J. Provisions for appropriate storage and disposal of all waste encountered or disposed of on the Project for the term of the Project,

K. Provision for a Hazardous Materials training module as an Element of the EPTP component of the CEPP,

L. Procedures for preparing an Investigative Work Plan (IWP) and Site Investigative Report (SIR) in the event that Hazardous Materials are discovered during construction, operations or maintenance activities, and

M. Identification and contact information for designated responsible individuals.

The HMMP shall include provisions for making all on-Site workers aware of the potential Hazardous Materials to which they may be exposed, limiting Contractors and other Site workers' exposure to Hazardous Materials and providing all necessary personal protection equipment to protect workers from exposure. The HMMP shall require the Design-Builder to provide any non-Design-Builder personnel who visit the Project with the appropriate personal protection equipment.

The HMMP shall require that all personnel of Design-Builder-Related Entities handling Hazardous Materials be trained and certified at least to the minimum requirements established under the current guidelines of OSHA 1910.120 (HAZWOPER Training).

Further, the HMMP shall include procedures for ensuring that all applicable certifications, licenses, authorizations and Governmental Approvals for the Design-Builder personnel handling Hazardous Materials are current and valid through the duration of the Work.

6.3.5. Communication Plan (CP)

The Design-Builder shall develop a CP, which describes in detail the communication hierarchy for information distribution related to the compliance with the CEPP. The CP will include names and contact information, including emergency contact information, and the preferred methods of routine, and emergency communication distribution.

6.3.6. Construction Monitoring Plan (CMP)

The CMP shall identify times, locations, and other conditions where monitoring of construction activities are to be performed to maintain and cause compliance with Environmental Laws, Environmental Approvals, Environmental Commitments, and the Design-Build Documents. The CMP shall establish and/or document schedules, protocols and methodologies to be used for monitoring Work with an emphasis on timely reporting, corrective actions and adaptive management. The CMP shall establish reporting procedures, identify reporting requirements and establish controls for report distribution and records retention. All Environmental Monitoring Reports shall be made available for review by NHDOT at NHDOT's request. Should any non-compliance or violation be observed that represents an imminent danger to human health or the environment, the CMP shall include procedures to cause immediate notification of NHDOT.

6.3.7. Recycling Plan

The recycling plan shall document and fully detail the Design-Builder's commitment to recycling, waste minimization and use of "green products" during all aspects of Work. The recycling plan shall document the Design-Builder's recycling initiatives as well as methods and procedures for maximizing the use of recycled materials in all aspects of the Work.

6.3.8. Storm Water Management Plan (SWMP) for Construction Period and Post-Construction Operation

The SWMP shall provide the approach to storm water management and compliance during construction, and for the transition to post-construction operational storm water management.

The SWMP documentation shall also include post-construction operational guidance to maintain and manage the storm water system to comply with MS4 standards. The Design-Builder shall provide operational maintenance and control over BMP's within the project area, until acceptance by the Department at specified in Section 8 Maintenance.

6.3.9. Discharge Turbidity Monitoring and Reporting Plan

The Discharge Turbidity Monitoring and Reporting Plan shall be included with the Storm Water Pollution Prevention Plan (SWPPP) and comply with the NPDES Construction General Permit (CGP). The plan shall include, at a minimum, the name of individuals responsible for inspecting the site and their

qualifications, provisions to measure and report precipitation, method for determining forecasted events for pre-storm inspections, inspection frequencies, locations of discharge points declared in the Notice of Intent for the CGP, locations of surface waters as defined in ENV-Wq 1702.44 of the NH surface water quality standards, turbidity meter requirements (specified below), quality control provisions and sampling protocols.

6.3.9.1. *Pre-storm BMP Inspections*

The Design-Builder shall conduct a pre-storm inspection of all erosions control and storm water BMPs in accordance with all applicable CGP and NHDES Alteration of Terrain (AoT) regulations no less than weekly and no more than 24 hours prior to the start of any forecasted precipitation event of 0.5 inches or more in a 24 hour period that is predicted to occur during the work week, or no sooner than Friday if the forecasted precipitation event is predicted to occur during the weekend when work is not occurring.

6.3.9.2. *Turbidity Monitoring Quality Assurance/Quality Control Protocols*

Portable turbidity meters shall be recalibrated daily prior to collection of the first sample with results recorded on a field data sheet. Portable turbidity meters shall meet the following specifications:

- Turbidity Range: 0.001 to 1100 NTU
- Accuracy: ±2% < 100 NTU; ±3% > 100 NTU
- Resolution: .01 NTU < 10 NTU; .1 NTU < 100 NTU; 1 NTU < 1100 NTU
- Analytical Method: ISO 7027
- Must be rechargeable and have a charger
- Contain twelve (12) sampling vials
- Contain a calibration kit
- Meter shall be provided to NHDOT for approval

At least one duplicate sample shall be taken for every 10 samples taken each day that turbidity monitoring occurs, with results and identification of the duplicate sample clearly identified and recorded on a field data sheet. (1 duplicated for between 1 and 10 samples, another duplicate for between 11 and 20 samples, etc). If the relative difference between the duplicate measurement and the original measurement exceeds 10%, recalibrate the turbidity meter and re-measure turbidity. At least one blank samples shall be taken for every 10 samples taken each day that turbidity monitoring occurs and recorded on a field data sheet. Blank samples hall be taken by filling a sample container with deionized water and measuring the turbidity immediately after. Turbidity samples shall be taken in accordance with the following protocols:

- Rinse sampling container three times with water from the waterbody
- Submerge sampling container a minimum of an arm's length upstream and allow the container to fill
- Do not collect any water immediately adjacent to legs or boots.
- Ensure that any introduced air bubbles are removed prior to analysis

- Immediately cap the sample container

6.3.9.3. *Inspection and Turbidity Monitoring of Sensitive Discharge Locations*

Where earth has been disturbed and is not yet stabilized at the "sensitive discharge locations" shown in Table 6.3-1, inspections shall be conducted at least weekly, and within 24 hours following a precipitation notice of 0.25 inches or greater. If notification occurs during non-business hours, the inspection shall occur within two hours of the start of the next regular business day.

Table 6.3-1 – Sensitive Discharge Locations

ID	Assessment Unit
003	NHRIV700061203-23 BROOK TO WHEELER POND
025	NHRIV700061203-11 BEAVER BROOK
046	NHRIV700061203-29 CAT O BROOK SOUTH
049	NHRIV700061203-08 CAT O BROOK NORTH
052	NHLAK700061203-02-01 BEAVER LAKE

The Design-Builder shall take turbidity samples of every discharge at each sensitive discharge location and include the results in the inspection report. Turbidity monitoring shall commence within two hours of a precipitation notice of 0.25 inches or greater and continue every two hours during regular business hours while discharge is occurring. Turbidity monitoring of the discharge may cease after the precipitation event ends and turbidity values in the discharge are less than or equal to 33 NTU, or after the discharge ends. If notified during non-business hours, turbidity monitoring (if discharge is still occurring) shall occur within two hours of the start of the next regular business day. This turbidity monitoring is in addition to the turbidity monitoring specified in Part 9.1.1 of the CGP.

6.3.9.4. *Reporting Requirements*

The Design-Builder shall record all turbidity measurements for each active discharge point, the results of daily checks for visible turbidity (plumes) attributed to the discharge in all receiving surface waters as defined in Env-W1 1702.44 of the NH surface water quality standards, which include "Waters of the United States", the forecasted precipitations amounts, the applicable precipitation gauge reading that triggered the inspection, and the actual precipitations amounts for each event. The Design-Builder shall identify and record an incident of non-compliance, and based on the inspection results, complete any necessary maintenance or corrective actions. If visible plumes are observed in the receiving water and/or an exceedance occurs in the discharge of the turbidity thresholds specified in Part 9.1.1.c of the CGP, the Design-Builder shall complete any necessary maintenance under Part 2.1.4 and/or corrective action up Part 5 of the CGP.

6.4. Environmental Personnel

The Design-Builder, acting through the Environmental Compliance Manager (ECM), shall designate an Environmental Team (ET), as detailed in this section, to prevent, minimize, and/or correct any violation of or noncompliance with Environmental Approvals. The ET shall include Environmental Training Staff, Environmental Compliance Inspectors (ECIs), Archeologist, Architectural Historian, Historian, Historical Architect, Water Quality Specialist, NH Certified Wetland Scientist, Fluvial Geomorphologist or hydrologist, and Contaminated/Hazardous Materials Manager. All of the ET shall be deemed other principal personnel.

In the CEPP, the Design-Builder shall set forth an approach, procedures and methods for:

A. Staffing and availability of ECM and all ET personnel, and

B. ET staff response times during the duration of the project.

6.4.1. Environmental Compliance Manager (ECM)

The Design-Builder shall designate a full-time ECM for the Work. The ECM shall report and coordinate all issues directly with NHDOT and the Design-Builder's Project Manager. In the event the ECM, in consultation with the Design-Builder's Project Manager and NHDOT, is unable to reach satisfactory resolution of environmental issues, the ECM shall provide written notification to the Design-Builder and NHDOT outlining the concerns, actions taken in attempt to correct the concerns, and provide a recommendation as to the suggested course of action.

The ECM shall direct the work of the ET and shall monitor, document, and report environmental compliance for the Work. The ECM shall report immediately to NHDOT and the Design-Builder any violation or non-compliance and shall include with any such report, the appropriate recommendations for corrective action including stoppage of Work.

The ECM shall coordinate with NHDOT, the Design-Builder, and appropriate Governmental Entities. The ECM shall submit all necessary environmental documentation and monitoring reports to the appropriate Governmental Entities and when applicable, through NHDOT, to the extent necessary to maintain compliance with applicable Environmental Approvals.

6.4.2. Environmental Training Staff

Under the direction of the ECM, the environmental training staff shall develop, schedule and conduct environmental awareness and environmental compliance training for the Design-Builder's personnel. All training shall be in accordance with the requirements set forth in Section 6.3.3.

6.4.3. Environmental Compliance Inspectors (ECI)

The ECIs shall conduct on-Site environmental monitoring, prepare documentation, and report to the ECM daily all violations, compliance, and noncompliance with Environmental Approvals.

The ECI shall report immediately to the ECM any violation or non-compliance and shall include with any such reports, the appropriate recommendations for corrective action, including stoppage of Work.

6.4.4. Cultural Resource Management Personnel

The ECM shall designate an Archeologist, Architectural Historian, Historian, and/or Historical Architect as specified in this Section to provide expertise in monitoring impacts to cultural resources during the course of the Work.

Qualifications: Cultural Resource Management Personnel shall meet qualifications as specified under 36CFR61, the Secretary of the Interior's Professional Qualification Standards for Archaeology of Architectural History, and meet NHDHR's additional qualifications.

6.4.5. Water Quality Specialist

The ECM shall designate a Water Quality Specialist to provide expertise in delineating environmental jurisdictional areas, storm water pollution prevention, and the protection of jurisdictional waters during the course of the Work.

Qualifications: The Water Quality Specialist shall be a Certified Professional Erosion and Sediment Control Specialist (CPESC) and have verifiable experience in implementing Storm Water Pollution Protection Plans and be able to demonstrate a working knowledge of permit requirements for New Hampshire as applicable to this project, and shall meet the qualifications of a "qualified person" as specified in the June 27, 2019 USEPA NPDES Construction General Permit requirements. "A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact storm water quality, and the appropriate skills and training to assess the effectiveness of any storm water controls selected and installed to meet the requirements of this permit."

6.4.6. Hazardous Materials Manager

The ECM shall designate a Hazardous Materials Manager to provide expertise in the safe handling of Contaminated/Hazardous Materials required to perform the Work and those that may be discovered/impacted during the duration of the Agreement. The Hazardous Materials Manager shall conduct appropriate activities such as the following:

A. Schedule and/or conduct training for the Design-Builder's employees.

B. Verify all employee certifications prior to and required for any handling of Contaminated/Hazardous Materials.

C. Maintain records of all incidents involving Hazardous Materials and notify the ECM, NHDOT and appropriate authorities in writing of any such incidents.

Qualifications: The Hazardous Materials Manager shall be a qualified professional with 40-hour HAZWOPER certification and at least five years' experience in similar projects in the following areas:

A. Experienced in developing IWPs, SIRs, and remedial action plans or equivalent reports necessary and acceptable in material discovery and remediation efforts of Contaminated and Hazardous Materials.

B. Experienced in the investigation and remediation of Contaminated and Hazardous Materials.

6.5. Summary of Environmental Commitments

The following sections summarize the environmental commitments found in Section 4.0 of the Record of Decision (ROD) and discussed in further detail in Section 4.0 the approved FEIS, and also as required by the project permits and NHDOT requirements. The ROD Environmental Commitments are provided as information and the FEIS/ROD is included in the project reference information. These commitments must be met during the contract. This list of commitments may not be comprehensive as they may be modified, or added to, due to permit conditions or other factors. New commitments may be added or existing conditions may be modified based on the DB Team final design.

6.5.1. General

A. During final design the safety and efficiency of mail delivery will be a consideration in determining the details of mailbox relocations necessitated by this project. Mailboxes impacted by the project will be replaced with a safe breakaway mailbox system meeting NHDOT standards (NHDOT Standard MB-1 or equivalent). General locations and placement will be coordinated with the local USPS for input. Cluster boxes can be considered.

B. Based on GIS contours, it appears that stormwater treatment can be constructed between two adjacent properties (Parcels 36 and 37) without impacting any structures. This is to be further evaluated during final design.

C. The information provided by an abutter will be considered during final design as the conceptual stormwater treatment areas are refined adjacent to Parcel 36.)

D. The driveway for the Town of Derry's public safety complex is located within 200 feet of the major intersection of Folsom Road, NH 28, and Tsienneto Road. Due to heavy traffic demand, access management is necessary that includes restriction of left turns to and from the public safety complex between the signalized intersections. However, a proposed depression in the median island for left turns for emergency vehicles may be able to be provided, but access for the general public will be limited to right in/right out. The Department, and the Design-Builder, in coordination with the Town of Derry, will evaluate alternatives through the final design phase that may be able to improve safe egress and access to the public safety complex.

E. The new interchange at I-93 is restricted to provide vehicle access to the east only and will not include any direct routes for motorized vehicle access to serve land to the west of I-93.

F. A professionally prepared Stormwater Pollution Prevention Plan (SWPPP) will be prepared by the Design Builder prior to commencement of construction. The SWPPP will be subject to requirements set forth in 2016 NHDOT Standard Specifications Section 645.

6.5.2. Noise

Conduct a final design noise analysis utilizing the most recent approved version of the FHWA's Highway Traffic Noise Model in accordance with all applicable FHWA noise analysis and abatement guidelines, policies and procedures for the noise barriers committed in the FEIS/ROD (the barriers adjacent to the

Trolley Car Lane (North and South) and Seasons Lane neighborhoods). The FEIS/ROD committed barriers include two discontinuous barriers in the Trolley Care Lane neighborhood with a combined length of approximately 2,700 feet and an average height of approximately 13.5 feet along southbound I-93; and a single barrier in the Seasons Lane neighborhood of approximately 3,000 feet in length with an average height of approximately 18.1 feet along northbound I-93. Each barrier committed in the FEIS/ROD must be designed and constructed to meet or exceed the anticipated benefits at each receptor noted in the Noise Technical Report. The final design noise analysis shall be based upon the final project design and shall note the benefits of the final design of each barrier in comparison to the anticipated benefits noted in the Noise Technical Report. NHDOT must approve the final design noise analysis and final design noise barrier plans. The Design Builder must modify the final design noise analysis and barrier designs as appropriate to meet the NHDOT's approval before construction of the barriers.

6.5.3. Socioeconomics

Complete the private property acquisitions in accordance with the federal Uniform Relocation Act[1] and NHDOT's ROW Manual (NHDOT, 2011).

6.5.4. Geology, Minerals, and Soils

The Selected Alternative would disturb approximately 75 acres of soil. The Design-Builder will prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that will utilize Best Management Practices (BMPs) to prevent soil erosion and associated effects on stormwater during construction.

6.5.5. Contaminated Properties and Hazardous Materials

Mitigation for hazardous material or petroleum-contaminated involvement would follow standard New Hampshire Department of Environmental Services (NHDES) procedures, consistent with NHDES contaminated site management rules (Env-Or 600).

NHDOT has completed Phase I and Phase II Environmental Site Assessments (ESAs) for the project and identified the following properties with soil or groundwater impacts:

- B1062 Storm Water Basin Along Folsom Road
- B1085 Storm Water Basin Along Tsienneto Road
- Royal T Carwash
- B208 -Water Quality Swale along Crystal Avenue

Phase I Environmental Site Assessment and Phase II Environmental Site assessment are included with Reference Information Documents.

~~NHDOT has identified four locations as requiring Phase I and Phase II Environmental Site Assessments (ESAs). NHDOT will perform Phase I and/or Phase II ESAs at the following locations:~~

[1] Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, CFR 49, Part 24.

- ~~B 1062 – Parcels 63, 66, 67~~
- ~~Parcel 76~~
- ~~B 208 – Parcel 83~~
- ~~B 1085 – Parcel 88~~

Discharges from Contaminated Sites

Any Project-related surface water or groundwater discharges from contaminated sites would be subject to water quality standards, NPDES permitting requirements, and/or state permitting requirements, including the Remediation General Permit and/or the NHDES Groundwater Discharge Permitting and Registration Program. The NPDES program requires discharges in New Hampshire from certain remediation activities to obtain authorization under the Remediation General Permit (EPA, 2017d). Discharges of any non-domestic wastewater to groundwater in New Hampshire are required to be registered with the NHDES Groundwater Discharge Permitting and Registration Program and, in some cases, may require permitting, as determined by NHDES.

Any remediation activities on contaminated sites would be required to comply with water quality standards and to obtain the necessary permitting coverage for any discharges from the contaminated sites. These requirements would be in addition to the requirements for discharges covered under other NPDES permits including the construction general permit or MS4 general permit.

6.5.5.1. *Building Demolition*

Before building structures are removed, a professional hazardous material specialist shall complete a building audit to identify, quantify and develop a remediation plans for all pertinent building materials and waste materials. The Design Builder shall carry out the remediation plan upon acceptance of NHDOT. Materials that may be identified in the audit include:

A. Asbestos;
B. Lead-based paint;
C. Polychlorinated biphenyls;
D. Electrical transformers that may contain polychlorinated biphenyl dielectric oil;
E. Mercury-containing fluorescent light bulbs;
F. Mercury thermostats;
G. Miscellaneous containers of oil or hazardous materials;
H. Refrigerants (commonly found in such items as air conditioners, refrigerators, etc.);
I. Hydraulic lifts;
J. ASTs; and
K. USTs.

The level of audit for each location would vary based on building type, age, and current use. Residential buildings would typically be limited to asbestos and lead paint reviews. Commercial buildings would include a more intensive review for all pertinent materials.

Any oil and hazardous materials should be removed before each relevant building is demolished. In addition, tank closure assessments would be completed after each UST is removed. If contaminants are found with the tank closure assessments, remediation may be required.

The Design-Builder shall prepare any environmental hazard reports, which shall be approved by the Design-Builders environmental design professional prior to submittal to NHDOT for comment and acceptance. For all remediation costs subject to reimbursement by NHDOT, the Design-Builder shall obtain a minimum of two (2) written price quotes from firms capable of performing the work. The quotes shall be submitted to NHDOT prior to start of the applicable remediation work.

6.5.5.2. *Limited Reuse Soils*

LRS excavated from within the operational ROW shall be addressed in accordance with applicable NHDES rules (including Env-Or 600), general or site-specific NHDES waivers, and/or Soils Management Plans. Additionally, LRS along State roadways will be managed in accordance with NHDOT's guidance and directives on LRS. See also LRS Special Provisions.

LRS which contains invasive plants shall be segregated, handled and disposed of separately from other LRS soils not containing invasive plants, and other invasive plants present in non-LRS containing soils.

6.5.5.3. *Soil Management*

The Design-Builder will be required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that will utilize Best Management Practices (BMPs) to prevent soil erosion and associated effects on stormwater during construction. See 6.5.5.2 for additional soils management items. Design Build Contractor will provide one comprehensive Soil Management Plan for the Project and a Separate Soil Management Plan for impacted sites listed in 6.5.5.

6.5.5.3.1. Heavy Metal/ Total Petroleum Hydrocarbon, and Polyaromatic Hydrocarbons

The Design Builder will make every effort to maintain soils within the site and limit the need for offsite disposal.

The "site" is defined as each parcel identified in Section 6.5.5 as being impacted with Metals, PAHs or TPHs based on the area within the Project ROW.

The Design Builder will provide a Soil Management Plan to NHDOT that demonstrates the volume of material that can successfully be designed within the ROW and the amount that exceeds design criteria and required export from the site.

The Design Builder will be required to develop a HHMP for all soils requiring export from impacted sites identified in Phase II reports.

The Design Builder will be responsible for:

- Any soil sampling required to provide additional characterization required for export of material or to satisfactorily demonstrate applicability for beneficial reuse to remain within an acceptable location within project limits.
- Any risk assessment or other methodology applicable to NHDOT or NHDES to

demonstrate that material are safe for human health or the environment to remain within the site.

- Any permits or waivers required by NHDOT or NHDES to maintain the soils within the site.
- Any waste characterization samples required for export to an acceptable permitted facility for the contaminates of concern to meet facility permit requirements.

Exported soils requiring disposal at an outside facility will require written approval from NHDOT and NHDES. Transport and Disposal fees will be provided on a per ton basis as part of the submission. Design Build Team will acquire three separate bids for acceptable facilities along with their unit rates. Any unit rates must be held firm for a period of 6 months from award.

6.5.5.3.2. Per- and Polyfluoroalkyl Substances in Soil

NHDES identified PFAS as emerging contaminants in soil for two PFAS compounds: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS)~~.~~

NHDOT understands the practical nature of maintaining as much impacted soils on each site as possible. The Design Build contractor will be responsible to provide all labor and expenses to delineate PFOS and PFOA soil impacts from Heavy Metals/TPH/and PAH impacts to the satisfaction of NHDOT and NHDES. The results of the delineation will be reported in the SMP for the two sites, B1085 and Royal T carwash, and provide at a minimum:

- The volume of PFOS and PFOA impacted material.
- The volume of material that can remain on site.
- The volume of material that will require export
- Technical Support for NHDOT in completing a waiver process with NHDES to use impacted PFOS and PFOA soils in other areas of the Project ROW including any added areas of ROW

6.5.5.4. *Per- and Polyfluoroalkyl Substances in Groundwater*

NHDES identified PFAS as emerging contaminants and has developed Ambient Groundwater Quality Standards (AGQSs) for two PFAS compounds: ~~perfluorooctanoic acid (~~PFOA~~)~~ and ~~perfluorooctane sulfonate (~~PFOS~~)~~. Contaminated groundwater sites with PFAS levels above AGQSs may be subject to mitigating actions including adherence to a~~ groundwater management plan~~Groundwater Management Plan. The Design-Builder shall review the NH DES PFAS Sampling information. ~~There are sites~~Sites are identified in the Phase I and/or Phase II Environmental Site Assessments reports within the project vicinity that will require mitigation actions.

The Design Builder will make every effort to dispose of all groundwater that requires extraction during design and construction following the permit requirements and engineering controls of the Derry Waste Water Treatment Facility following all appropriate federal state and local laws.

If an alternative rational for disposal is provided Design Builder will provide written approval from NHDOT and NHDES along with an acceptable Groundwater Management Plan that meets all applicable federal, state and local laws.

~~Approval documentation for the Derry Waste Water Treatment facility can be found in Reference Information Documents.~~ Any pilot tests, permits or waivers required for disposal at the facility, including water meters, connection fees, pre-treatment or temporary storage equipment should be included in your submission. The Derry Waste Water Treatment Facility reserves the right to review, modify, cancel or accept permit applications and mitigation plans. The Derry Waste Water Treatment Facility reserves the right to request additional sampling as necessary to maintain their permit requirements.

Any groundwater studies for support of design or construction including dewatering calculations, well installation, well development, well sampling, groundwater disposal, groundwater characterization, or pilot studies to determine area of influence.

6.5.5.5. *Petroleum*

In April 2019, a NHDOT geotechnical crew encountered a faint, petroleum-like odor during a subsurface materials investigation (NHDOT test boring i.d. B142 at 3- to 5-foot sample depth) in front of Parcel 76, on Folsom Road in Derry and within the preferred alternative impact area. The test boring was terminated at a depth of 5 feet, and there have been no further explorations in that area. The area of the test borehole is within 500 feet of at least 12 sites identified in the environmental databases reviewed for the FEIS. Further investigations, to be performed as described in Section 6.5.5, of the site will be evaluated, to determine whether the site is subject to NHDES rules for contaminated soils (Env-Or 611).

6.5.6. Surface Waters and Water Quality

6.5.6.1. *Total Suspended Solids and Total Phosphorus*

Final design plans will show the location, type, and specifications of stormwater treatment BMPs for the Project. Stormwater treatment will be designed to meet all regulatory criteria, including the requirements of the 2017 NH Small MS4 Permit, as discussed in Section 4.11 of the FEIS.

Project is expected to be fully treated for stormwater and will meet either the Water Quality Volume retention criteria or the specified total suspended solids (TSS) and total phosphorus (TP) removal efficiencies detailed in Part 2.3.6 of the MS4 permit.

6.5.7. Surface Waters, Wetlands and Vernal Pools Mitigation

Mitigation is required for direct impacts to wetlands, streams, and vernal pools and indirect impacts to wetlands and vernal pools. Mitigation for wetland impacts includes the preparation by the Design-builder of stream restoration and landscaping plans as detailed in the April 2020 Wetland Mitigation and Monitoring Plan provided with the Wetland Permit Application in the Reference Information Documents. In addition, mitigation will involve an in-lieu-fee payment to the ARM fund at NHDES.

Trolley Car Lane Stream/Wheeler Pond Tributary located west of I-93 will require relocation of 1,703 linear feet of the stream. Sufficient information has been collected from the stream to partially restore habitat, functions and values, and stream morphology, and therefore this has been considered by NHDES as partial self-mitigation for the impacts to the stream, as noted in the NHDES May 5, 2020 Wetland Permit Approval Letter. Mitigation will be accomplished in accordance with the Trolley Car Stream Relocation Plan and narrative dated April 2020. Native material removed from the existing streambed shall be stockpiled and reused to emulate a natural channel bottom. No angular riprap or gravel shall be used in the channel bottom, unless specifically identified on plans approved by NHDOT. Additional materials use to emulate a natural channel bottom must be consistent with the material in the Stream Relocation Plan and the conditions of the May 5, 2020 Wetland Permit Approval Letter.

The in-lieu fee amount and conserved land, if any, would be determined in accordance with NH RSA 482-A:28 and NHDES Wetland Rules and with federal Section 404 guidelines in 40 CFR (b)(1)J, and with the USACE's 2016 *New England District Compensatory Mitigation Guidance.* The ARM fund payment was estimated based on the impacts associated with the advanced conceptual plans for the preferred alternative following the guidance documents and input from NHDES, USACE, and EPA (see Table 14.12-7 in the FEIS, Volume I). For direct impacts to wetlands and streams, area of wetland impact (see Table 4.12-2, in the FEIS, Volume I) was added to the ARM fund calculator, which calculates the cost to create a wetland of similar type within the impacted municipality at the required mitigation ratios.

The ARM fund payment that would result from the construction of the selected alternative was calculated based on the conceptual level design plans to be $3,769,086.39.

The crossing location of Prime Wetland B-12 is unavoidable, and upgrades are necessary to accommodate a slightly wider road and to meet stream crossing rules. At this time, the impact area is consistent with a conceptual level design. However, impacts at this location will be reduced as much as possible during final design, if it can be accomplished without compromising the value of the Project or public safety and health.

6.5.8. Groundwater

During final design, private water supply wells will be inventoried using the latest available water well data from NHDES and field verified to the extent possible to determine potential Project encroachment on setback distances specified in NHDES rules (Env-Wq 1008.08; We 100 through We 1000). Private water supply wells have the requirement to maintain a sanitary protective area of at least 75 feet for wells producing up to 750 gpd (Env-Wq 1008.08). The NH Water Well Board rules (We 100 through We 1000) also include setback criteria of 75 feet for private wells to property boundaries and roadways and 50 feet from state highway ROW (We 602.05(e)), as discussed in Section 4.13.3 of the FEIS.

Public water system (PWS) wellhead protection areas (WHPAs) will be reviewed during final design with respect to NHDES recommendations (NHDES, 1995) and Project proximity to PWS sanitary protective areas will need to be determined (Env-Dw 302.10; Env-Dw 303.09; Env-Dw 305.10; Env-Wq 1500). A PWS sanitary protective radius is defined as a 75- to 400-foot radius (depending on production volume) around the well that under current law must be controlled by the water supplier through ownership or easements. Within the sanitary protective area there are restrictions for certain uses and activities as specified in NHDES rules and discussed in Section 4.13.3 of the FEIS; e.g., discharges are not allowed

from roadways, parking lots, stormwater structures, or areas with fertilizer or pesticide application (Env-Dw 302.10; Env-Dw 303.09; Env-Dw 305.10; Env-Wq 1500).

The locations of roadway alignments, ROW, and stormwater structures will need to be considered during final design to ensure the Project is in conformance with all NH rules requiring protection of groundwater resources and to ensure the Project adheres to the latest NHDES guidance document *Recommendations for Groundwater Protection Measures When Siting or Improving Roadways* (NHDES, 1995), discussed in Section 4.13.3 of the FEIS, including restrictions within WHPAs, sanitary protective areas, and setback distances.

If setbacks or other groundwater protection criteria are not met as a result of construction or operation of the Project, it may be appropriate to consider further actions. If the Project falls within the sanitary protective area of drinking water wells, the municipality with jurisdiction will contact the public drinking water systems to coordinate easements as necessary. Other mitigating actions may include changes to the stormwater system design consistent with NHDES' recommendations (NHDES, 1995), water quality testing to establish baseline and post-construction water quality, and/or well replacement or compensation for well replacement costs under the NHDOT well replacement program. The NHDOT well replacement program was developed to replace, repair, or pay damages for water supplies that have been affected by construction or maintenance operations on the state highway system, primarily as a result of contamination from road salt. While the program is primarily intended to mitigate road salt contamination of private drinking water supplies, it has also been used to mitigate other adverse effects to private water supplies due to NHDOT actions. NHDOT intends to mitigate any Project related construction or operations damages to private water supplies along state highways through the well replacement program. For private wells along town-maintained roadways any Project-related effects to water supplies will require consideration of well replacement by the town of jurisdiction.

Final Design Groundwater Coordination

Several PWSs have WHPAs located within the Project area (discussed in Section 4.13.1 of the FEIS) including the following: Barkland Acres Association in Derry (Wells No. 1 and 2), Morningside Drive in Derry (Wells No. 7 and 8), PEU/Springwood Hills in Londonderry (Wells Nos. 16 and 17), and Rand Shephard Hill (Well Nos. 12, 13, and 14). The operators of the Barkland Acres Association, Morningside Drive, and PEU/Springwood Hills public water supplies will be contacted by NHDOT during the final design process as was committed in the 10/24/2019 conference call with EPA and NHDES.

6.5.9. Aquatic Life and Fish Habitat

Mitigation for stream impacts would be provided as part of the wetland mitigation package. Stream crossings are identified in Section 14.2 of the FEIS. Some of the stream crossings, such as Crossing 2 (Shields Brook) and Tributary E will be widened in accordance with requirements in NHDES Administrative Rules Env-Wt 900 et seq., Stream Crossings. Crossing 1 (Trolley Car Lane Stream/Wheeler Pond Tributary) will require relocation of 1,703 linear feet of the stream. Sufficient information has been collected from this stream to partially restore habitat, functions and values, and stream morphology, and therefore this stream restoration has been considered by NHDES as partial self-mitigation of these stream impacts in their May 5, 2020 Wetland Permit Approval Letter.

Crossings that provide improved hydraulic capacity and aquatic organism passage may also be considered self-mitigating, if sufficient baseline data are collected. Stream impacts that are not self-mitigating would be mitigated through a payment to the NHDES ARM fund.

6.5.10. Floodplains

Detailed hydraulic analyses of the Selected Alternative will be completed during final design to avoid and/or minimize impacts on the floodway, and in particular to avoid a cumulative increase in the base flood elevation of 1 foot or more (consistent with local floodplain regulations). The Contractor shall prepare and submit to the Federal Emergency Management Agency (FEMA) a Letter of Map Revision (LOMR) application for each of the two river crossings; Shields Brook at Folsom Road and Tributary E at Tsienneto Road. As-built surveys prepared by the Contractor will be required at the completion of construction in the vicinity of both crossings to complete the final conditions hydraulic model required for the LOMR application.

6.5.11. Plant Communities and Wildlife

NHDOT has committed to the purchase of an easement for preservation of an 8.7-acre parcel of land on the eastern side of the Woodmont Commons property south of Coteville Road. This land, to be preserved as a wildlife corridor, borders approximately 1,300 linear feet of Shields Brook, its floodplain, and adjacent 2.5 acres of forested and emergent/shrub wetlands. This purchase shall be in accordance with ENV WT 800 as applicable.

6.5.12. Threatened and Endangered Species

Records of New Hampshire rare species and exemplary natural communities in the vicinity of the project are identified in the November 25, 2019 NH Natural Heritage Bureau database search, found in the FEIS/ROD Volume 3 Appendix A. The US Fish and Wildlife Service (USFWS) List of Federal Threatened and Endangered Species, dated June 20, 2018, is found in the FEIS/ROD Volume 3 Appendix A.

6.5.12.1 *State Wildlife Species*

The following state-listed wildlife species records were identified within the project area: Blanding's turtle (state endangered); spotted turtle (state threatened); Northern black racer (state threatened); New England cottontail (state endangered); smooth green snake (species of special concern)' and; Jefferson/Blue-spotted salamander complex (tracked) species. The FEIS/ROD Section 4.17.3 - Mitigation includes specific state threatened and endangered mitigation for all species listed on the NHB datacheck results letter.

Coordination with the NH Fish and Game Department (NHFGD) has identified the following actions that reduce impacts on Northern black racers, Blanding's turtles, and spotted turtles associated with construction and operations. Further coordination with the NHFGD by the Design-Builder is to occur prior to and during the construction process to ensure that there are no additional concerns with listed wildlife species.

To reduce the potential for black racer mortality in the portion of the Project area from I-93 to Folsom Road due to construction, surveys for state endangered and threatened reptiles would be conducted, by the Design-Builder in the Project footprint prior to construction and before heavy machinery is brought on-site. All searches and surveys for state endangered and threatened species shall be supervised by a qualified biologist, provided by the Design-Builder. All materials storage areas would be fenced to exclude reptiles. All fencing would be in place by September 15 of each year of construction after receipt of Notice to Proceed with construction activities to exclude snakes returning to potential hibernacula within the Exit 4A Project site. The surveys would be conducted in this footprint prior to initial ground-disturbing activities, because black racers have the highest potential to be present when undisturbed habitat is still present. Once the new roadway alignment has been graded and compacted, the potential for black racers to shelter in the work zone would be significantly reduced, and the potential to crush a hidden black racer would be likewise reduced.

Searches for black racers would occur immediately before any heavy machinery enters the work zone or soil alteration begins. Searches, to be performed by the Design-Builder would be supervised by a qualified biologist, during appropriate weather conditions, and the effort would be sufficient to ensure that the work area is completely searched. All reptile species, including listed species, encountered during these searches would be captured and released in appropriate habitat on site, but outside the construction areas. The Design-Builder shall contact the NHFGD immediately if any state threatened or endangered species are encountered/captured during site surveys or during project construction (Melissa Doperalski at 603-479-1129 or NHFG Wildlife Administration at 603-271-2461). Photographs of animals should be taken if feasible to help in identification. Contact NHFG immediately if a potential Northern black racer hibernacula is found (this applies to spring surveys (April – May). If project construction is to occur prior to June, please contact NHFG for additional information on potential hibernacula. Captured species would not be released until after consultation with NHFGD. Depending on the sequence and timing of ground-disturbing activities, some or the entire undisturbed portion of the Exit 4A Project area may require repeated sweeps.

Materials storage areas would be fenced to exclude reptiles, because materials being stored have a high potential to provide suitable shelter for snakes even after natural habitats have been removed from the area. Reptile-proof fencing would be used and maintained for the duration of the Exit 4A Project, and the fencing would be removed when the Project area from I-93 to Folsom Road is complete. If using traditional silt fencing as reptile-proof fencing, the post shall be located on the inside of the project site and silt fence buried 8 to 12 inches below grade.

In addition to the sweeps and fencing of materials storage areas, all erosion control materials used for slope and winter stabilization would be wildlife-friendly, made from natural woven fibers (no plastic mesh products) without fixed knots and without welded plastic components. Additionally, construction personnel would receive training for recognizing black racers and to take the appropriate actions to protect them.

All personnel will be trained to understand and implement the appropriate protective actions and notifications to protect state listed species. Flyers on the Northern black racer, and Blanding's and Spotted turtles, to be distributed to construction personnel, are included in the Reference Information Documents. New England cottontail information and reporting can be found on the NHFG website at https://wildlife.state.nh.us/wildlife/profiles/ne-cottontail.html. Smooth green snake information can be found at https://wildlife.state.nh.us/wildlife/profiles/smooth-green-snake.html.

6.5.12.2 *State Plant Species*

Coordination has occurred with the NH Natural Heritage Bureau on state-endangered plants identified in the November 25, 2019 NH Natural Heritage Bureau database search. In accordance with April 2, 2020 NH NHB memo (found in the Reference Information Documents) in the summer of 2020 and prior to construction activities, NHDOT biologists, in coordination with NH NHB personnel, will search suitable habitat within the Project footprint for the state-endangered Nuttall's reed grass. Suitable habitat includes wet meadows, edges of wetlands, emergent/scrub-shrub wetlands within the utility rights-of-way, or other open areas with seasonally saturated soils. If this plant is found within the project area, seed collection or transplanting impacted whole plants may be requested by NH NHB. The relocation of the stream west of Trolley Car Lane may provide opportunity and habitat suitable for transplanting and/or seeding of Nuttal's reed grass. Coordination by NHDOT and the Design-Builder with NH NHB to identify appropriate location, soil preparation and monitoring would be required if the stream relocation area, or other areas within the project limits, is identified as a suitable site.

6.5.12.3 *Federal Wildlife Species*

The USFWS List of Threatened and Endangered Species, dated June 20, 2018, is located in the FEIS/ROD Volume 3 Appendix A, and the search results of the USFWS Information for Planning and Conservation (IPaC) tool can be found in the Reference Information Documents. The potential presence of federally-threatened Northern Long-eared Bat (NLEB) in the project area was identified, however acoustical survey of the project area did not find evidence of its presence, as detailed in Section 6.3.2.E. It will be the responsibility of the Design-Builder to update the IPaC when filing an NOI or NOC, re-evaluate the area for the NLEB presence if construction clearing is not finished by August 2021, and complete a Bridge/Structure Assessment Form to determine the presence of NLEB at the Shields Brook and Tributary E culverts prior to construction activities, as referenced in Section 6.3.2.F.

All Project personnel will be trained to understand and implement the appropriate protective actions and notifications to protect federally listed species. A flyer on the Northern Long-eared Bat, to be distributed to construction personnel, is included in the Reference Information Documents.

6.5.13. Cultural Resources

Design must avoid direct impacts to the potentially historic stone culvert at 30 Tsienneto Rd. with a retaining wall (Kent Parcel).

To mitigate for potential impacts to three areas of archaeological sensitivity (two pre-contact Native American sensitive areas and one historic-era sensitive area), Phase IB archaeological testing will be conducted by NHDOT in the following locations: (1) sensitive area P7 across the eastern extent of Tsienneto Road, in the vicinity of Jeff Lane; (2) sensitive area P6 crossed by improvements to NH 102 at the approach to the intersection with Tsienneto Road, and (3) potential foundation area and stone culvert at 30 Tsienneto Road.

Additionally, any further investigations determined necessary based on the Phase IB (e.g., Phase II, Phase III) will be conducted by the Design-Builder. FHWA and NHDHR shall be consulted throughout all necessary phases of archaeology. All final mitigation stipulations are formalized in the MOA between FHWA, NHDOT, NHDES and Town of Derry. The MOA can be found in the FEIS, Volume III, Appendix K.

6.5.13.1. *Stone Walls*

NHDOT has identified and completed Individual Stonewall Rating Sheets for stone walls impacted by the Base Technical Concept. Design-Builder will evaluate, in consultation with NHDOT, stone walls identified by their Individual Stone Wall Rating Sheets as meeting the criteria for further evaluation of their Reconstruction Feasibility in accordance with the NHDOT 2017 Stone Wall Policy Guidelines. Stone Wall Ratings Sheets, Stone Wall Ratings Summary and Stone Wall Label Plan can be found in the Reference Information Documents. Additionally, NHDOT has identified several stonewalls that require the input of the property owner to complete the Individual Stone Wall Rating. The coordination and Individual Stone Wall Rating Sheet completion shall be the responsibility of the Design-builder.

Stonewalls determined to be feasible for reconstruction shall be reconstructed in accordance with the NHDOT Bureau of Highway Design guidance for stone wall reconstruction as provided in the 2016 NHDOT Standard Specifications for Road and Bridge Construction, Section 572.

6.5.13.2. *Historical Mitigation*

Mitigation measures for the M&L Railroad Historic District include the following:

- **Preservation** – Construction of an underpass for a 900-foot pedestrian/bike path connecting to the Manchester & Lawrence railroad corridor. Location is shown on the BTC and in the FEIS, Volume II Figure 7.5-1.
- **Interpretive Signage** – NHDOT will work with the Town and the Derry Heritage Commission, to develop an interpretive panel that will focus on the history of the Manchester-Lawrence Railroad, and its association to the Town of Derry. The panel's content and material will be prepared by a 36 CFR 61-qualified architectural historian. The SHPO will be provided an opportunity to review one (1) draft of the panel's content with a review period of thirty (30) days. Upon approval of the panel, it will be fabricated by NHDOT and installed by the Contractor at a location to be determined in consultation with the Town of Derry, preferably along the rail trail near the new crossing. The interpretive panel will be installed by the Contractor on sign supports designed, furnished and installed by the Contractor. Digital copies of the panel will be provided to NHDOT and the Town of Derry.
- **Rail Trail Underpass Aesthetic Treatment** – NHDOT, and its consultant, will work with the Town of Derry on the aesthetic treatment to the newly constructed underpass headwalls. The concrete will be stamped with a faux-stone design that will be chosen in consultation with the Town. The style of lighting will be chosen in consultation with the Town. See also Section 7.8.2.4 and Section 7.9.2.2 of the Technical Provisions related to architectural finish requirements for this structure.

To mitigate for impacts to Rider Fields, Design-Builder will coordinate with the Town of Derry to move the mailbox and sign for the Upper Room Family Resource Center and to replace the stone walls and vegetation that would be impacted by the Project.

Impacts to historic resources listed or eligible for listing on the National Register of Historic Places that are greater than the impacts identified in the FEIS/ROD will necessitate additional coordination with NHDOT, FHWA, and NHDHR.

6.5.14. Construction Impacts

6.5.14.1. *Air Quality*

To minimize the potential impacts of construction on air quality at sensitive receptors, the following mitigation commitments would be incorporated in construction contracts.

A. Mitigation measures for controlling fugitive dust emissions during construction would include wetting and stabilization of all work areas, cleaning paved roadways, and scheduling construction to minimize the amount and duration of exposed earth.

B. The Design Builder shall include Tier 4 standard engines or best available retrofit technology on heavy diesel construction equipment in accordance with applicable state and federal laws at the time of construction.

6.5.14.2. *Soil Erosion and Water Quality*

Design-Builder to apply for coverage under this permit through the Environmental Protection Agency (EPA), Notice of Intent (NOI) website (http://cdx.epa.gov/epa_home.asp) at least 14 days prior to commencement of construction on any site which will result in the disturbance of the land and after your Storm Water Pollution Prevention Plan has been prepared. See Volume 2 Book 3 for Special Attention – NPDES Storm Water CGP Requirements for additional information.

To mitigate potential sedimentation impacts during construction a Stormwater Pollution Prevention Plan (SWPPP) consistent with the National Pollutant Discharge Elimination System Construction General Permit and the NHDES' AoT permitting requirements and the 2017 Construction General Permit (see Section 4.11 of the FEIS, Volume I) shall be developed and implemented. The SWPPP will be subject to requirements set forth in the 2016 NHDOT Standard Specifications Section 645. Additionally, if the Design-Builder exceeds 5 acres of open area, a Flocculant Treatment System will be required. The Flocculant Treatment System shall be designed in accordance with Env-Wq 1506.13, approved by the Department, and implemented in place to treat 1,000 gpm of sediment laden water, prior to release. The Design-Builder shall also retain the services of an environmental consultant with demonstrated experience in monitoring and reporting flocculant concentrations during use. A special provision has been included with additional information See Special Provision for Item 645.85. The implementation of a Flocculant Treatment System does not alleviate the Design-Builder from the requirements described in Env-Wq 1505.03 Maximum Open Area Allowed and Part 2.2.14 of the Construction General Permit. If implemented the Design-Builder must comply with Env-Wq 1506.13 Sediment Control Methods: Flocculants and Part 2.2.13 of the CGP using treatment chemicals. The Design-Builder shall dispose of sludge at a permitted disposal facility transported by a NH-permitted sludge hauler. The Design-Builder is made aware the management and transport of sludge shall be done in accordance with Env-Wq 800.

Design-Builder shall utilize the New Hampshire Stormwater Manual, Volume 3, for techniques for erosion and sediment controls during construction. Where appropriate, upslope drainage would be diverted around work areas and dissipated, and temporary erosion and sediment control devices, such as straw mulch, wood chips, erosion control blankets, check dams, and silt fences would be installed as necessary prior to (and during) construction. Refer to Table 6-2 – Temporary Soil Stabilization with Turf Establishment Matrix for acceptable soil stabilization measures.

Table 6-2 – Temporary Soil Stabilization with Turf Establishment Matrix

Application Areas	Dry Mulches		Hydraulically Applied Mulches[2]				Rolled Erosion Control Blankets[3]			
	HMT	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
Slopes[1]										
Steeper than 2:1	No	No	No	No	No	Yes	No	No	No	Yes
2:1 Slope	No	Yes	No	No	Yes	Yes	No	No	Yes	Yes
3:1 Slope	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No
4:1 Slope	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Channels [4]										
Low Flow Channels	No	No	No	No	No	No	No	No	Yes	Yes
High Flow Channels	No	No	No	No	No	No	No	No	No	Yes

Abbrev.	Stabilization Measure	Abbrev.	Stabilization Measure	Abbrev.	Stabilization Measure
HMT	Hay Mulch & Tack	HM	Hydraulic Mulch	SNSB	Single Net Straw Blanket
CB	Compost Blanket	SFM	Stabilized Mulch Matrix	DNSB	Double Net Straw Blanket
		BFM	Bonded Fiber Matrix	DNSCB	2 Net Straw-Coconut Blanket
		FGM	Fiber Reinforced Matrix	DNCB	2 Net Coconut Blanket

Notes:

1. All slope stabilization options assume a slope length ≤10 times the Horizontal distance component of the slope.
2. Products containing Polyacrylamide (PAM) shall not be applied directly to or within 100 feet of any surface water without prior written approval from the NH Department of Environmental Services.
3. All erosion control blankets shall be made with wildlife friendly biodegradable netting
4. All Channels to be matted in accordance with Items 645.23 and 645.24 on the Qualified Products List

Proper installation, inspection and maintenance of erosion controls would be an integral part of the Project to ensure protection of soil and water resources. Areas stripped of vegetation would be stabilized as soon as practicable after exposure to prevent soil loss by wind and water. Inspections would take place at least weekly and after threshold rain events during active construction. BMPs for fertilizer application during construction would also be followed. In addition, mechanisms to avoid and control chemical leaks and spills from the construction equipment would be instituted. With proper implementation and maintenance of a well-planned erosion and sedimentation control plan, impacts during construction should be temporary.

Minor road adjustments to limit stream and wetland crossings would continue to be evaluated for the Project to further minimize impacts. Where practical, efforts would be made to maintain a buffer strip of vegetation near streams. In those areas where vegetation removal is required, revegetation with appropriate seed mixes or plantings would be completed within three days of completion of the disturbance.

6.5.14.3. *Noise*

The Design-Builder will prepare a construction noise control plan and submit to NHDOT for review and approval. See also Section 7. 12.1 for restrictions on work involving high noise machinery during hours of limitation. The following mitigation strategies will be employed to the extent practicable to limit the potential impact of noise:

A. Source Control
   I. All exhaust systems in good working order, also using properly designed engine enclosures, and intake silencers.
   II. Regular equipment maintenance.

B. Site Control
   I. Placement of stationary equipment as far away from sensitive receptors as possible (e.g., pumps, compressors, aggregate crushers, AC plants, operators).
   II. Choice of disposal sites and haul routes thereto.
   III. Employing shielding where possible.

C. Time and Activity Constraints
   I. Schedule of operations to coincide with periods when people would least likely be affected.
   II. Limiting working hours and work days to least noise-sensitive times.

D. Community Awareness
   I. Public notification of construction operations.
   II. Methods to handle complaints.

6.5.14.4. *Traffic*

Coordination would occur between local and state emergency response personnel to develop efficient incident management procedures and protocols. Intelligent Transportation System (ITS) technologies would be deployed to more efficiently manage traffic, enhance incident management during construction, and provide real-time traveler information. A detailed Traffic Control Plan, to include incident management procedures, would be instituted to reduce traffic-related, short-term impacts and minimize construction zone delays. Additional temporary delays would be experienced along secondary roads in the Town of Derry during widening activities. Businesses and their customers may experience some inconvenience due primarily to construction activities along their frontage. Construction activities would be coordinated with property owners to ensure that reasonable access to properties is maintained. Temporary signing and other issues related to temporary relocation of access points, caused by construction activities, would be appropriately addressed on an individual basis.

6.5.14.5. *Invasive Species*

The Design-Builder is to develop an Invasive Species Control and Management Plan, which details the specific method(s) of controlling the spread of invasive plants located within the project limits and their proper disposal. The plan shall be submitted to NHDOT for review and approval prior to clearing and grubbing operations occurring in areas containing invasive plant species. All work must comply

with the NHDOT manual *Best Management Practices for the Control of Invasive and Noxious Plant Species*, available online at: https://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/documents/FINAL-ENV1Manual1-InvasiveSpecies.pdf.

All topsoil adjacent to roadway surfaces on property under the control of NHDOT, or soils to a depth of 6" when no topsoil is present, have been determined to be Limited Reuse Soils (LRS). LRS which contains invasive plants shall be segregated, handled and disposed of separately from other LRS soils not containing invasive plants and other invasive plants present in non-LRS containing soils.

6.6. Contaminated Materials Allowance

The Department has provided for a **$~~1~~400,000** Estimated Cost allowance for items associated with handling and disposing of Contaminated Materials in excavation as described in Contracts Section 12.1.6..

The Department has provided for a **$250,000** Estimated Cost allowance for items associated with handling and disposing of Contaminated Materials in building demo as described in Contracts Section 12.1.6.

7. DESIGN CRITERIA

7.1. General

The Technical Provisions and Special Provisions cited in the Technical Provisions establish the basic design and performance requirements to be used in the design and construction of the Project. In addition, NHDOT has prepared indicative Project Schematics (see Reference Documents) to standardize and guide the design activities through final design and the preparation of procurement and construction documents. All plans and documentations shall be developed to NHDOT CAD/D documentation and submitted with Release For Construction submissions for record.

The work elements associated with the project work, including bridges, roadways and other features shall be governed by the most recent edition of applicable engineering codes and standards, including those of the various federal, NHDOT, and local jurisdictions.

The Design-Builder shall develop the final design in such manner as to minimize impacts to private properties and to minimize impacts to any future use by owners of the remainder of properties subject to partial acquisitions under this project. The Design-Builder, during development of the final design, shall coordinate with the property owner to minimize any temporary and/or permanent impacts to any future development and/or planned use of the property by the owner. This shall include, but not be limited to, any future development and/or planned use of the properties identified on the BTC plans as Parcel No. 70 owned by Stinson Hills LLC and Parcel No. 104 owned by Trinity Assembly of God, Inc.

7.2. Utilities

The Design-Builder shall ensure that all utility coordination work is completed in accordance with the NHDOT Utility Accommodation Manual.

The Design-Builder shall certify in writing to the NHDOT that all necessary arrangements have been made for proper coordination of utility work with all physical construction under this Contract, using the NHDOT Utility/Railroad Certificate, a copy of which has been provided in the Reference Documents. Certification shall be provided before the Design-Builder begins any physical construction in the vicinity of the utility work.

The Design-Builder shall carry out all work carefully and skillfully and shall support and secure its work so as to avoid damage to all utilities. Flow in sewers and water supply lines shall be satisfactorily maintained. Unless otherwise directed by the Utility Owner, the Design-Builder shall not move or remove any utility without the Utility Owner’s written consent. At the completion of the Work, the condition of all utilities shall be as safe and permanent as before. If any utilities are damaged by the Design-Builder, it shall notify the affected Utility Owners, which may cause the damage to be repaired at Design-Builder’s expense.

There are utility facilities in the area belonging to, but not necessarily limited to, the following:

Eversource Energy (Distribution) Contact: Marco Martinelli Title: Field Supervisor Electric Design Phone: 603-879-1067 E-mail: marco.martinelli@eversource.com	**Eversource Energy (Transmission)** Contact: Donald DiBuono Title: Supervisor – Civil Engineering Phone: 603-634-2875 E-mail: Donald.DiBuono@eversource.com
Crown Castle Fiber Contact: Mark Bonanno Title: Manager Fiber Construction Phone: 508-616-7818 E-mail: mark.bonanno@crowncastle.com	**Liberty Utilities (Gas)** Contact: Bradford Marx Title: Gas Engineer – New Hampshire Phone: 603-782-2367 E-mail: Bradford.marx@libertyutilities.com
Derry Public Works Department (Water & Sewer) Contact: Thomas Carrier Title: Deputy Director of Public Works Phone: 603-432-6147 E-mail: tomcarrier@derrynh.org	**Town of Derry ITS** Contact: Doug Rathburn Title: IT Director Phone: 603-845-5411 E-mail: dougrathburn@derrynh.org
Town of Derry Fire Department Contact: Michael Gagnon Title: Fire Chief Phone: 603-432-6751 E-mail: mikegagnon@derrynh.org	**AT&T** Contact: Louis Marello Title: Senior Technical Project Manager Phone: 914-671-5330 E-mail: LM5215@att.com
Teleport Communications America, LLC Contact: Scott Ferreira Title: N/A Phone: 508-216-0059 E-mail: SF5412@att.com	**Consolidated Communications Inc.** Contact: Dave Kestner Title: Network Engineer Phone: 603-433-2119 E-mail: david.kestner@consolidated.com
Comcast Contact: Robert Lewis Title: Project Coordinator Phone: 603-693-7019 E-mail: Robert_lewis@cable.comcast.com	**FiberCast** Contact: Gent Cav Title: CTO Phone: 603-689-0000, x8010 E-mail: gent@fibercast.net
Pennichuck Water Works Inc. Contact: John Boisvert Title: Chief Engineer Phone: 603-913-2328 Email: john.boisvert@pennichuck.com	**Londonderry Public Works Department** Contact: Janusz Czyzowski Title: Director of Public Works & Engineering Phone: 603-432-1100, x193 Email: jczyzowski@londonderrynh.org

7.2.1. General Requirements

Design-Builder shall coordinate all Utility Adjustments/Relocations, including utility services, necessary to accommodate construction, operation, maintenance and/or use of the Project. The Design-Builder shall coordinate the utility work to ensure that utilities are properly identified and that all necessary relocations occur so as to enable the Design-Builder to achieve completion of the Project in accordance with the Contract. Work includes: the identification of existing utilities requiring relocation and notifications to and negotiation of design and agreements with Utility Owners.

The design shall address the manner in which utilities will be maintained and/or temporarily or permanently relocated.

NHDOT will assist Design-Builder in the Utility Adjustment/Relocation process, to the extent described in the Contract documents. A proposed Aerial Utility Adjustment is shown on the plans for the Eversource overhead transmission line currently crossing I-93 at the location of the proposed interchange. This Aerial Utility Adjustment/Relocation will be performed by the Utility Owner with its own forces and/or contractors and consultants (i.e. Owner-Managed). Additional Utility Adjustments/Relocations are to be designed and performed by the Utility Owners with their own forces and/or contractors and consultants (i.e., Owner- Managed); others shall be performed by Design-Builder with its own forces and/or Contractors and consultants (subject to any approvals required by the Utility Owner for those working on its facilities) (i.e., Design-Builder-managed). The allocation of responsibility for the Utility Adjustment/Relocation Work between Design-Builder and the Utility Owners shall be specified in the Utility Agreements.

Information from the Utility Companies on the amount of utilities within the project limits and the anticipated time to design and construct relocation is available in the September 13, 2019 Utility Meeting Conference Report available in the Reference Documents.

The State will be responsible for the cost of reimbursable (participating) utility work by payment to the Utility and the Design-Builder is responsible for all other costs in accordance with reimbursement provisions of the NHDOT Utility Accommodation Manual, regardless of whether the utility work is Owner Managed or Design-Builder managed. The Design-Builder can be reimbursed by the Utility for any non-reimbursable (non-participating) work performed by the Design-Builder for a Utility. Documentation of such reimbursement shall be in the form of a Utility Agreement. Template agreements for this have been provided by NHDOT in the Reference Information for this project.

7.2.1.1. *When Utility Adjustment is Required*

A Utility Adjustment may be necessary to accommodate the Project for a physical conflict between the Project and the Utility. The physical limits of all Utility Adjustments shall extend as necessary to functionally replace the existing Utility, whether inside or outside of the Project ROW. Utilities may remain in their existing locations within the Project ROW if the existing location will not adversely affect the construction, operation, safety, maintenance and/or use of the Project and conforms to the NHDOT Utility Accommodation Manual.

7.2.1.2. *Policy of Avoiding Relocations*

The location of utilities and potential impact of relocations shall be considered by the Design-Builder in developing changes to the NHDOT-supplied information with the following goals:

A. Avoiding relocations to the extent practicable;

B. If a relocation is not reasonably avoidable, protecting the utility in place to the extent practicable; and

C. Otherwise minimizing the potential costs and delays relating to relocations to the extent practicable.

7.2.1.3. *Certain Components of the Utility Adjustment Work*

7.2.1.3.1. Coordination

Design-Builder shall communicate, cooperate, and coordinate with NHDOT, the Utility Owners and potentially affected third parties, as necessary for performance of the Utility Adjustment/Relocation Work. Design-Builder shall be responsible for preparing (unless prepared by the Utility Owner) and securing execution (by Design-Builder and the Utility Owner and State, if said work is reimbursable (participating)) of all necessary agreements. All such executed Utility Agreements must be accepted by NHDOT prior to taking effect. Template Utility Agreements have been provided in the Reference Documents for this Project for utility engineering and construction work.

7.2.1.3.2. Betterments

Replacements for existing Utilities shall provide service at least equal to that offered by the existing Utilities, unless the Utility Owner specifies a lesser replacement. Utility Enhancements are not included in the Work; however, any Betterment work furnished or performed by Design-Builder as part of a Utility Adjustment shall be deemed added to the Work, on the date the Utility Agreement providing for same becomes fully effective. Design-Builder shall perform all coordination necessary for Betterments.

7.2.1.3.3. Protection in Place

Design-Builder shall be responsible for Protection in Place of all Utilities impacted by the Project and not Adjusted/Relocated as necessary for their continued safe operation and structural integrity.

7.2.1.3.4. Abandonment and Removal

Design-Builder shall make all arrangements and perform all work necessary to complete each abandonment or removal (and disposal) of a municipal Utility, including obtaining Governmental Approvals and consent from the affected Utility Owner and any affected landowner(s), or shall confirm that the Utility Owner has completed these tasks.

7.2.1.3.5. Municipal Utility Facilities and Appurtenances

Whenever required to accommodate construction, operation, maintenance and/or use of the Project, Design-Builder shall be responsible for any required Adjustments/Relocations of a Municipal Utility facility and appurtenance within a municipal roadway. On completion of these, Design-Builder shall be responsible for full reinstatement of the roadway, including reconstruction of curb, gutter, sidewalks, and landscaping, whether the Utility Adjustment/Relocation Work is performed by the Utility Owner or by Design-Builder.

In addition, the Design-Builder will be responsible for the design and construction of replacement water and sewer facilities in the Town of Derry requiring adjustment/relocation necessary to accommodate the Project. The Design-Builder will evaluate and resolve all conflicts relating to the design. Multiple adjustments to the same water line resulting in the addition of 3 or more angle points will not be considered an equal service.

All costs associated with the design and construction of utility conflicts in Town maintenance areas will be included as line items on Form N-1 and be considered part of the lump sum price.

Utility adjustments required to municipal utility facilities and appurtenances in State maintained areas will be conducted under a separate utility agreement. All costs associated with the design and construction of utility conflicts in State maintenance areas will be included as line items on Form N-1 and be considered part of the lump sum price.

7.2.1.3.6. Public Utility Facilities and Appurtenances

Whenever required to accommodate construction, operation, maintenance and/or use of the Project, Design-Builder shall coordinate any required Adjustments/Relocations of a Public Utility facility and appurtenance. On completion of these, the Design-Builder shall be responsible for full reinstatement of the roadway, including reconstruction of curb, gutter, sidewalks, and landscaping, whether the Utility Adjustment/Relocation work is performed by the Utility Owner or the Design-Builder.

7.2.1.4. *Agreements between Design-Builder and Utility Owners*

Each Utility Adjustment/Relocation shall be specifically addressed in a Master Utility Adjustment Agreement (MUAA) or in a Utility Adjustment Agreement Amendment (UAAA), as described elsewhere in this Section. Design-Builder is responsible for preparing, negotiating, and obtaining execution by the Utility Owners, of all Utility Agreements, (including preparing all necessary exhibits and information about the Project, such as reports, Plans and surveys). A Utility Agreement is not required for any Utility Adjustment consisting solely of Protection in Place in the Utility's original location within the Project ROW, unless the Utility Owner is being reimbursed for costs incurred by it on account of such Protection in Place.

7.2.1.4.1. Master Utility Adjustment Agreements (MUAA)

Design-Builder shall enter into one or more MUAAs with each affected Utility Owner to define the design, material, construction, QC inspection and testing, and acceptance standards and

procedures necessary to complete Utility Adjustments, as well as to define Design-Builder's and the Utility Owner's respective responsibilities for Utility Adjustment costs and Utility Adjustment activities such as material procurement, construction, QC inspection and testing, and acceptance. A MUAA may address more than one Utility Adjustment for the same Utility Owner. Additional Adjustments may be added to an existing MUAA by a Utility Adjustment Agreement Amendment (UAAA).

Following issuance of NTP1, Design-Builder shall begin negotiations with each affected Utility Owner to reach agreement on one or more MUAAs. Design-Builder shall use good faith efforts to finalize a MUAA with each affected Utility Owner within a reasonable time period after issuance of NTP1. Design-Builder shall include any proposed changes to a standard form (other than filling in blanks specific to a particular Utility Owner) in a Utility Owner-specific addendum. Each MUAA (including the Utility Adjustment/Relocation Plans attached thereto) shall be subject to NHDOT acceptance as part of a Utility Agreement.

7.2.1.4.2. Utility Adjustment Agreement Amendments

Except where Utility Adjustment Field Modifications are permitted, modification of an executed MUAA or any component thereof, after it has been accepted by NHDOT as part of a Utility package, shall be stated in a Utility Adjustment Agreement Amendment (UAAA). A UAAA may be used only when the allocation of responsibility for the Utility Adjustment Work covered by that UAAA is the same as in the underlying Utility Agreement; otherwise, an additional MUAA will be required.

Each UAAA (including any Utility Adjustment Plans attached thereto) shall be subject to NHDOT's acceptance as part of a Supplemental Utility package.

7.2.1.4.3. Recordkeeping

Design-Builder shall maintain construction and inspection records in order to ascertain that Utility Adjustment/Relocation Work is accomplished in accordance with the terms and in the manner proposed on the Utility Adjustment Plans and otherwise as required by the Contract documents and the applicable Utility Agreement(s).

7.2.2. Design

7.2.2.1. *Design-Builder's Responsibility for Utility Identification*

Design-Builder bears sole responsibility for ascertaining, at its own expense, all pertinent details of Utilities located within the Project ROW or otherwise affected by the Project, whether located on private property or within an existing public ROW, and including all service lines.

Plans provided by the various utilities showing their existing facilities are included in the Reference Documents. These plans contain Subsurface Utility Engineering (SUE) Quality Level “D” information. The Design-Builder is responsible to verify the utility information provided in these documents. Design-Builder shall use SUE techniques to achieve Quality Level Information appropriate for the significances of the utility during the utility verification process for all utilities.

Design-Builder shall coordinate with the various utilities to update the project utility location plans and submit proposed revised plans to NHDOT for concurrence.

The Design-Builder bears full responsibility for ascertaining, the existence and exact location and size of any utility impacted by the Project. If a surface inspection of the area shows the existence of or gives the Design-Builder cause to suspect the existence of any previously unidentified utilities, or the Design-Builder otherwise has cause to suspect that other previously unidentified utilities exist, then Design-Builder shall undertake all appropriate investigations by contacting Utility Owners and conducting field investigations at the expense of the Design-Builder as necessary to verify the existence, location, and size of such utilities.

7.2.2.2. *Technical Criteria and Performance Standards*

All design plans for Utility Adjustment/Relocation Work, whether furnished by Design-Builder or by the Utility Owner, shall be consistent and compatible with the following:

A. The applicable requirements of the Contract

B. Any Utilities remaining in, or being installed in, the same vicinity

C. All applicable Governmental Regulations and/or Specifications

   1. The following Town of Derry documents are provided in Reference Information Documents and can be found on the Town website for use in design of the water and sewer facilities.

      a. Sewer Main Specifications dated April 1993 as amended and revised Feb 1998 and Jan 2005

      b. Water Main Specifications dated April 1993 as amended and revised Feb 1998 and March 2001.

D. All applicable Governmental Approvals

E. Private approvals of any third parties necessary for such work

7.2.2.3. *Utility Adjustment/Relocation Concept Plans*

Design-Builder in coordination with the Utility shall obtain or prepare a proposed conceptual Utility adjustment/relocation design (a Utility Adjustment/Relocation Concept Plan) for the Project, showing the approximate location of each existing Utility, the existing Utilities to remain, and Design-Builder's Utility Adjustment recommendations.

Design-Builder shall submit the proposed Utility Adjustment/Relocation Concept Plans(s) to NHDOT for its review. The plan(s) shall be color-coded and shall utilize a scale that clearly depicts all of the required information. Design-Builder shall coordinate with the affected Utility Owners as necessary to obtain their respective plans or concurrence with the Utility Adjustment/Relocation Concept Plan(s) as initially submitted to NHDOT and with any subsequent revisions.

7.2.2.4. *Utility Adjustment / Relocation Plans*

Utility Adjustment/Relocation Plans, furnished by the Design-Builder, shall be signed and sealed by a Registered Professional Engineer (PE) in New Hampshire, with the exception of plans from Eversource, CCI, third party communications companies, cable television or fire departments.

7.2.2.4.1. Plans Prepared by Design-Builder

Where Design-Builder and the Utility Owner have agreed that Design-Builder will furnish a Utility Adjustment design, Design-Builder shall prepare and obtain the Utility Owner's approval of plans, specifications, cost estimates, and relocation time(s) for the Utility Adjustment (collectively, "Utility Adjustment Plans") by having an authorized representative of the Utility Owner sign the plans as "reviewed and approved for construction." The Utility Adjustment Plans (as approved by the Utility Owner) shall be attached to the applicable Utility Agreement, which Design-Builder shall include in the appropriate Utility package for NHDOT's acceptance.

The Design-Builder shall be responsible for preparing and obtaining approval of design plans for all municipal sewer and water adjustments/relocations that result from the work as part of this Project.

Unless otherwise specified in the applicable Utility Agreement(s), all changes to Utility Adjustment Plans previously approved by the Utility Owner (excluding estimates, if the Utility Owner is not responsible for any costs) shall require written Utility Owner approval. Design-Builder shall transmit any NHDOT comments to the Utility Owner, and shall coordinate any modification, re-approval by the Utility Owner and re-submittal to NHDOT as necessary to obtain NHDOT's acceptance.

7.2.2.4.2. Plans Prepared by the Utility Owner

For all Utility Adjustment Plans to be furnished by a Utility Owner, Design-Builder shall coordinate with the Utility Owner as necessary to confirm compliance with the applicable requirements. Those Utility Adjustment Plans shall be attached to the applicable Utility Agreement, which Design-Builder shall include in the appropriate Utility package for NHDOT's acceptance. Design-Builder shall transmit any NHDOT comments to the Utility Owner, and shall coordinate any modification, review by Design- Builder and re-submittal to NHDOT as necessary to obtain NHDOT's acceptance.

7.2.2.4.3. Design Documents

Each proposed Utility Adjustment shall be shown in the Design Documents, regardless of whether the Utility Adjustment Plans are prepared by Design-Builder or by the Utility Owner.

7.2.3. Construction

7.2.3.1. *General Construction Criteria*

All Utility Adjustment construction performed by Design-Builder shall conform to the requirements listed below. In addition, Design-Builder is responsible for verifying that all Utility Adjustment

construction performed by each Utility Owner conforms to the requirements described below. In case of nonconformance, Design-Builder shall cause the Utility Owner (and/or its contractors, as applicable) to complete all necessary corrective work or to otherwise take such steps as are necessary to conform to these requirements.

A. All criteria identified in Section 7.2.2.2 (Technical Criteria and Performance Standards)

B. The Utility Adjustment Plans included in the Utility Agreement accepted by NHDOT (other than Utility Adjustment Field Modifications complying with Section 7.2.3.6 (Utility Adjustment Field Modifications)

C. All Project safety and environmental requirements

D. Underground electrical utility crossings beneath the Connector Road shall be installed in sleeves in order to prevent the removal of pavement during future utility maintenance operations.

E. Poles for Aerial Utilities located parallel to roadways shall be located within the limits of the Project ROW, and follow guidance provided in the NHDOT Utility Accommodation Manual.

7.2.3.2. *Inspection of Utility Owner Construction*

Design-Builder shall set forth procedures for inspection of all Utility Adjustment Work performed by Utility Owners (and/or their contractors) to verify compliance with the applicable requirements described in Section 7.2.3.1 (General Construction Criteria).

7.2.3.3. *Scheduling Utility Adjustment Work*

The Utility Adjustment Work (other than construction) may begin at any time following issuance of NTP1. Design-Builder shall not arrange for any Utility Owner to begin any demolition, removal, or other Construction Work for any Utility Adjustment until all of the following conditions are satisfied:

A. The Utility Adjustment is covered by an executed Utility Agreement (and any conditions to commencement of such activities that are included in the Utility Agreement have been satisfied);

B. Availability and access to property affected by the Utility Adjustment have been obtained;

C. If applicable, the Alternate Procedure List has been approved by FHWA, and either (a) the affected Utility is on the approved Alternate Procedure List, as supplemented, or (b) the Utility Owner is on the approved Alternate Procedure List, as supplemented.

D. The review and comment process has been completed and required approvals have been obtained for the Utility package covering the Utility Adjustment.

E. All Governmental Approvals necessary for the Utility Adjustment construction have been obtained, and any pre-construction requirements contained in those Governmental Approvals have been satisfied.

F. All other conditions to that Work stated in the Contract have been satisfied.

7.2.3.4. *Standard of Care Regarding Utilities*

Design-Builder shall carefully and skillfully carry out all Work impacting Utilities and shall mark, support, secure, exercise care, and otherwise act to avoid damage to Utilities. At the completion of the Work, the condition of all Utilities shall be at least as safe and permanent as before.

7.2.3.5. *Emergency Procedures*

Design-Builder shall provide emergency procedures with respect to Utility Adjustment work. Design-Builder shall obtain emergency contact information from, and establish emergency procedures with each Utility Owner.

7.2.3.6. *Utility Adjustment Field Modifications*

Design-Builder shall establish a procedure to be followed if either Design-Builder or a Utility Owner proposes a Utility Adjustment Field Modification, after the Utility package (which includes the Utility Adjustment Plans) has been approved. The procedure shall contain, at minimum, the following processes:

A. The Utility Owner's review and approval of a Utility Adjustment Field Modification proposed by Design-Builder, or Design-Builder's review and approval of a Utility Adjustment Field Modification proposed by the Utility Owner;

B. Submittal of plans for the proposed Utility Adjustment Field Modification to NHDOT for its review and comment;

C. Transmittal of Utility Adjustment Field Modifications to the appropriate construction field personnel;

D. Inclusion of any Utility Adjustment Field Modifications in the Record Drawings for the Project.

Design-Builder shall follow the procedure for Utility Adjustment Field Modifications performed by the Design-Builder. The Design-Builder shall provide to the utility owner the procedure to be followed for all Utility Adjustment Field Modifications not performed by the Design-Builder.

7.2.3.7. *Switch Over to New Facilities*

After a newly Adjusted Utility has been accepted by the Utility Owner and is otherwise ready to be placed in service, Design-Builder shall coordinate with the Utility Owner regarding the procedure and timing for placing the newly Adjusted Utility into service and terminating service at the Utility being replaced.

7.2.3.8. *Record Drawings*

Design-Builder shall provide Record Drawings (as-built utility maps) and utility diaries to each Utility Owner for its Adjusted Utilities, in accordance with the applicable Utility Agreement(s).

Design-Builder shall provide Record Drawings (as-built utility maps) and utility diaries to NHDOT (regardless of whether design and/or construction of the subject Utilities was furnished or

performed by Design-Builder or by the Utility Owner). These drawings shall show the location of, and label as such, all abandoned Utilities, shall show and label all other Utilities, whether remaining in place or relocated, located within the Project ROW or otherwise impacted by the Project. Design-Builder shall provide the Record Drawings for each Adjustment to NHDOT no later than 90 Days after the Utility Owner accepts the Adjustment.

7.2.3.9. *Maintenance of Utility Service*

All Utilities shall remain fully operational during all phases of construction, except as specifically allowed and approved in writing by the Utility Owner. Design-Builder shall schedule Utility Adjustment Work in order to minimize any interruption of service, while at the same time meeting the Project Schedule and taking into consideration seasonal demands.

7.2.3.10. *Traffic Control*

Design-Builder shall be responsible for, and the Construction Traffic Management Plan shall cover, all traffic control made necessary for Utility Adjustment Work, whether performed by Design-Builder or by the Utility Owner. Traffic control for Adjustments shall be coordinated with, and subject to approval by, the local agency(ies) with jurisdiction. Traffic control shall comply with the guidelines of the MUTCD and of Section 7.12 (Traffic Control).

7.2.4. Deliverables

Design-Builder shall time all Submittals described in this section to meet the Project Schedule, taking into account NHDOT's designated review and response time. All deliverables shall conform to the standards required in the Project Management Plan.

An interim milestone shall be included in the Project Schedule to complete clearing for the Aerial Utility Adjustment shown in the BTC plans (Eversource Transmission Line).

7.2.4.1. *Utility Submittals*

The following procedure shall govern submittal and review of each Utility, including Supplemental and Abbreviated Utility Assemblies:

A. Before submitting a Utility package to NHDOT, Design-Builder shall:

   a. Verify that each subject Utility (or the Utility Owner) is on the approved Alternate Procedure List, if applicable;

   b. Submit the complete Utility package to the Quality Control entity designated by Design-Builder in accordance with the PMP and QMP; and

   c. Resolve all comments made by the Quality Control entity, coordinating with the Utility Owner as appropriate.

B. Design-Builder shall submit to NHDOT a color coded Utility package, complying with the requirements of Section 7.2.4.1. The submittal shall be for NHDOT's review and comment, except for any components of the Utility package for which NHDOT's acceptance is required by this Section 7.2.4.

C. NHDOT will review the Utility Package for compliance with the requirements of this Section 7.2.4.1, and within 10 Business Days will return the Utility Package to the Design- Builder with the appropriate notations to reflect its responses. This review duration is an approved deviation to the controlling review period specified in Section 3.2 of the Design-Build Contract.

D. Design-Builder shall transmit any NHDOT comments to the Utility Owner, and shall coordinate any modification, review and approval by the Utility Owner and re-submittal (three copies) to NHDOT, as necessary to resolve all NHDOT comments and/or obtain NHDOT's acceptance, as applicable.

E. Upon (a) NHDOT's acceptance of any Utility Package components for which NHDOT's acceptance is required, and (b) completion of the review and comment process for all other Utility Package components, NHDOT will sign three originals of any approved Utility Adjustment agreement and of any other components of the Utility Package for which this Section 7.2 requires NHDOT's signature.

7.2.4.2. *FHWA Alternate Procedure*

The Design-Builder will develop the Alternate Procedure List that includes the utility owner's name, approximate station numbers and estimated cost. NHDOT will then submit to the FHWA the Alternate Procedure List in order to obtain FHWA authorization for federal reimbursement upon determining that any additional Utility Owner not referenced on the Alternate Procedure List is impacted by the Project, Design-Builder shall submit to NHDOT all documentation as referenced above in order to update the Alternate Procedure List.

NHDOT will forward the approved Alternate Procedure List (and any amendments thereto) to Design-Builder, upon receipt of same from the FHWA.

7.3. Right-of-Way

7.3.1. General Requirements

Design Builder's obligations in respect of the acquisition of Project ROW are set forth in this Section 7.3 and subsections of the Agreement. This Section 7.3 and subsections state the ROW activities assigned to Design Builder, including acquisition activities, and designates which ROW activities the NHDOT will conduct. This section and subsections also set forth the requirements applicable to the work assigned to Design Builder related to the acquisition of Project ROW. Design Builder shall provide all services necessary to acquire title to the Project ROW, in form and substance acceptable to NHDOT, in the name of the State; relocation of displacees from the Project ROW, as more fully described in the following sub-sections. Except as otherwise set forth in the Agreement, Design Builder's Project ROW staff and/or Subcontractors shall function as independent contractors while acquiring Project ROW, and not as an agent, representative, or employee of NHDOT. If Design Builder obtains a property agreement in the name of the Design Builder to facilitate design, construction or maintenance in relation to the Project, Design Builder shall provide a copy of the agreement to NHDOT.

NHDOT will be responsible for the costs of the property, relocation benefits, condemnation proceedings and closing costs including Title Policies for each property purchased.

Design Builder shall perform any needed ROW title research, appraisals, acquisitions, relocation, closings and all other services stated in this Section 7.3 and subsections. The ROW services necessary to complete the ROW acquisition process for this project shall be performed by Design Builder with NHDOT support.

Design Builder shall be responsible for creating and recording ROW Layout Plan set that show existing and new ROW alignments and acquired properties and easements, suitable for recording at the Registry of Deeds for the entire length of the project. Design Builder shall update the plans as necessary to incorporate design changes as a result of the project design, and those as a result of the ROW process.

Design Builder shall be responsible for all engineering support services as may be required to complete the project ROW deliverables. Engineering support may be necessary at various stages of ROW for a variety of reasons not limited to services described in Section 7 and contract documents.

The Design Builder shall be responsible for the creation of the General Plan, depicting the design details, and ROW Layout Plan set depicting all project impacts and final ROW acquired.

Design Builder will be provided with the NHDOT's mandatory templates and examples of required documents utilized in the normal day-to-day operations of the ROW process. These documents and templates will be provided in an electronic format.

Pursuant to the applicable federal regulations, Design Builder shall (i) acquire ROW parcels for the Project on behalf of NHDOT, but without the direct participation of the NHDOT, subject to the NHDOT's rights of review, approval, and audit; (ii) certify acceptance of the NHDOT's ROW

Manual; (iii) provide adequate access to all occupied properties; (iv) maintain Utility service to occupied properties until relocation is complete;

All Project ROW activities must be completed, documented, and retained in compliance with all applicable Laws, including the Uniform Act, and the rules and regulations implementing the Uniform Act. A complete copy of all records will be provided to NHDOT upon completion of acquisition activities for each impact parcel.

Tasks to be included within this scope include:

A. ROW Layout Plan set that have geometric ties to the original I93 layout
B. Title abstracting for impacted parcels
C. Waiver Valuation (with NH DOT approval)
D. Appraisals
E. Negotiations
F. Closings
G. Relocations
H. Prepare Notices of Offer and Declarations of Taking
I. ROW Cost Estimates
J. ROW Schedules
K. Design Development

7.3.2. Administrative Requirements

7.3.2.1. *Standards*

Design Builder shall acquire all Project ROW in accordance with State and federal Law and the practices, guidelines, procedures, and methods contained in, but not limited to, the most current version of the following standards as they pertain to ROW:

A. 23CFR Part 710 Right of Way and Real Estate
B. 49 CFR Part 24 of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (Uniform Act), as amended
C. Chapter 124-A of the NH Revised Statutes “Relocation Assistance and Real Property Acquisition
D. Chapter 230 of the NH Revised Statutes Annotated “State Highways”
E. Chapter 478:1-a of the NH Revised Statutes “Recording of Plats” which requires a New Hampshire Licensed Land Surveyor (LLS)
F. Chapter 498-A of the NH Revised Statutes Annotated, i.e., “The Eminent Domain Procedure Act”

G. NHDOT ROW Manual, Revised December 19, 2018

H. NHDOT Survey Technical Standards Manual dated November 13, 2017;

I. NHDOT CAD/D Procedures and Requirements;

J. NH Bar Association Title Standards; and

K. Uniform Standards of Professional Appraisal Practice (USPAP).

L. NHDOT Stonewall Policy

M. Uniform Appraisal Standards for Federal Land Acquisitions (commonly referred to as the "Yellow Book")

N. NHDOT Pro Rata Appraisal Policy

7.3.2.2. *Software/Website Requirements*

Design Builder shall employ software that is fully compatible with the software in use by

NHDOT, or fully transferable to NHDOT's systems. Design Builder must supply and maintain parcel-by-parcel information that incorporates the fields and information required by NHDOT's ROW tracking system: ROWMS. Design Builder must maintain and participate in any other required ROW tracking system required by the Contract Documents. The database shall be fully accessible to Persons authorized by NHDOT.

7.3.2.2.1. Electronic Transfer of Data:

NHDOT requires the following to ensure compatibility with software used by NHDOT and to ensure the efficient and timely exchange of computer files between NHDOT and Design Builder. All files submitted must be fully compatible with the formats listed in this document without any conversion or editing by NHDOT. Any files requiring conversion and/or editing by NHDOT will not be accepted. All files shall be virus free. All files shall use the NHDOT's files naming convention.

7.3.2.2.2. Word Processing, and Spreadsheet:

For each Phase, all relevant files shall be provided in a format fully compatible, as appropriate, with the following:

Word Processing:	Microsoft Word 2010 or NHDOT compatible version
Spreadsheets:	Microsoft Excel 2010 or NHDOT compatible version

These specifications will be updated as necessary to reflect changes in NHDOT software such as adding new software or updating to new versions of existing software. In such instances, Design Builder will be promptly notified.

7.3.2.2.3. Computer File Exchange Media:

Electronic files shall be exchanged between NHDOT and Design Builder using the following media as appropriate for Windows Operating Systems:

FTP: Files posted to NHDOT's FTP site can be actual size or compressed. Contact the Project Manager for instructions for accessing the FTP site.

Email: Files 10 MB or smaller may be transferred via Email. If compressed, the files should be self-extracting and encrypted based on content.

7.3.2.2.4. Copies:

Design Builder shall provide hard (paper) and electronic copies of the deliverables for each Phase of Work. For all deliverables, provide electronic copies in two electronic versions; an electronic version in the original electronic file format (i.e., (*.dwg) MicroStation (*.dgn), Microsoft Word (*.docx), Microsoft Excel (*.xlsx), etc.) and an electronic version in Adobe Acrobat (*.pdf) file format.

7.3.2.3. *ROW Acquisition Process Plan*

Design Builder shall prepare and submit a ROW Acquisition Process Plan in accordance with the requirements of this Section 7.3 and subsections. The ROW Acquisition Process Plan shall be part of the Project Quality Management Plan or shall be a separate document that also meets the requirements specified for the QMP in Section 3. Communication with the public as part of the ROW process shall be included in the ROW Acquisition Process Plan, shall be closely coordinated with the Public Information and Communications Plan (PICP), and shall meet the requirements specified for the PICP in Section 5. The ROW Acquisition Plan shall set forth Design Builder's organization including names, titles and qualifications of Key Personnel and other Project ROW personnel, integration of the Project ROW schedule into the Project Schedule, interface between design and Project ROW activities, documentation and reporting, quality control procedures and quality review standards.

The ROW Acquisition Plan shall contain, as a minimum, the following:

A. The name and qualifications of the proposed ROW Acquisition Manager (ROW AM)

B. The resumes and qualifications for appraisers, relocation agents, negotiators, and other ROW personnel who shall have the minimum qualifications and experience specified in Section 7.3.2.7

The ROW Acquisition Plan shall establish the specific means by which Design Builder will:

A. Provide sufficient personnel to achieve, in accordance with the Project Schedule, the goals and milestones established for Project ROW acquisition, relocation assistance, appraisals and appraisal review, and clearance/demolition of the improvements from the Project ROW.

B. Provide administrative support.

C. Provide for translation services in accordance with the Uniform Relocation Act requirements, as necessary.

D. Provide documentation and reports.

E. Produce and distribute acquisition and relocation brochures as approved by the NHDOT.

F. Establish, implement, and maintain quality control procedures and quality review standards for the acquisition for Project ROW.

Design Builder shall update the ROW Acquisition Process Plan regularly, with updates made at least quarterly.

7.3.2.4. *Schedule and Review Procedures*

The Project Schedule shall indicate the date to begin the acquisition of the Project ROW and the anticipated completion date of acquisition activities for each parcel. Design Builder shall advise NHDOT of all Additional Properties and temporary rights or interests in real property to be acquired by Design Builder. In developing the Project Schedule, Design Builder shall give priority to the acquisition of parcels that have significant impact on the Project Schedule and/or affect the Critical Path as so indicated. The weekly status reports shall provide updated projections for the acquisition date of each parcel. In developing the Project Schedule, Design-Builder shall incorporate adequate time periods for NHDOT review and approval of all ROW submittals.

NHDOT intends to review and approve the completed Appraisals and ROW Layout Plan set prior to accepting the submission of an Offer Packet from the Design Builder. ROW Layout plan set shall be completed for each approved design work package section update approval of the design. For the purposes of the Project Schedule, Design Builder shall assume that the reviews performed by NHDOT will require 20 Business Days for Appraisals (including Updated Appraisals) referencing the relevant ROW Layout Plan sheets that the Design Builder submits as final and complete. NHDOT will review up to a maximum of 10 Appraisals within the 20 Business Days from NHDOT receipt. Any submittals that would require NHDOT to review more than 10 Appraisals within any given 20 Business Day period shall be considered excess, and NHDOT may defer its review of any such Appraisals to a subsequent 20 Business Day period (or periods as necessary).

NHDOT intends to review the completed Offer Packets and Condemnation Packets as expeditiously as possible; however, for the purposes of the Project Schedule, Design Builder shall assume 10 Business Days for Offer Packets and 30 Business Days for Condemnation Packets that Design Builder submits as final and complete. NHDOT will review up to a maximum of 10 Offer Packets within 10 Business Days and 5 Condemnation Packets within the 30 Business Days from NHDOT receipt. Any Submittals that would require NHDOT to review more than 10 Offer Packets within 10 Business Days and 5 Condemnation Packets with any given 30 Business Day period shall be considered excess, and NHDOT may defer its review of any such Offer Packet to a subsequent 10 Business Days and 5 Condemnation Packets to a subsequent 30 Business Day period (or periods as necessary).

Design Builder shall also assume that the reviews performed by NHDOT will require 10 Business Days for the following Submittals: Payment Submittals, Relocation Submittals, Administrative Settlement Submittals, and Closing Submittals, up to a maximum of 5 submissions for each type of Submittal in this subparagraph. NHDOT will review up to a maximum of 20 Submittals in this subparagraph (collectively) within 10 Business Days from NHDOT receipt. Any Submittals in this subparagraph that would require NHDOT to review more than 20 submissions in any given 10

Business Day period shall be considered excess, and NHDOT may defer its review of any such submissions in this subparagraph to a subsequent 10 Business Day period (or periods as necessary).

NHDOT will notify Design Builder of its election to defer any excess Submittals within 10 Business Days after receipt. When Design Builder submits more than 10 Appraisals,10 Offer Packets, 5 Condemnation Packets at any given time, Design Builder shall indicate the priority of review.

For the purposes of possession of the ROW that must be submitted to Condemnation, Design Builder should allow 30 Business Days from approval of the Condemnation Package in their schedule to obtain possession of the property.

If NHDOT notifies Design Builder that any Submittal described above has a deficiency, Design Builder shall correct such deficiency and resubmit the Submittal to NHDOT. Resubmissions shall be treated as a new Submittal as described above. Submittals shall be considered deficient, as determined by NHDOT, if any of its components fail to meet any of the criteria established by Section 7.3 of these Technical Provisions for such component, or contains any material errors or omissions. Schedule delays resulting from inadequate or incomplete submissions of Appraisals and/or Packets shall be the responsibility of Design Builder and will not be eligible for treatment as a Change Order.

NHDOT reserves the right to undertake additional review on Appraisals, and/or Packets that contain or identify facts or issues of an unusual nature or which do not clearly fit within NHDOT standards and will notify Design Builder in writing that the review period will be extended by an additional 10 Business Days before rendering a decision to Design Builder.

Table 7.3-1 – ROW Submittal and Review Matrix

1 Submittals	2 Level of Review	3 Submittal Schedule	4 NHDOT Action Time	5 Section Reference
A. PRELIMINARY ACTIVITIES				
ROW Acquisition Process Plan	Approval	As part of Project Quality Management Plan	21 calendar days	DBC 3.2.2.2; TP 7.3.2.2.4, 7.3.2.3
Project ROW Property Owner List	Approval	After ROW Acquisition Management Plan approval	21 calendar days	DBC 3.2.2; TP 7.3.2.2.4, 7.3.3.3
NHDOT Introduction Letter	Approval	After ROW Acquisition Management Plan approval	21 calendar days	DBC 3.2.3; TP 7.3.2.2.4, 7.3.3.3
B. SURVEY, RIGHT OF WAY LAYOUT PLANS, AND TITLE				
Base Plan Preparation	Approval	Prior to submitting first ROW Offer Packet and updated as needed (?)	20 calendar days	DBC 3.2.2; TP 7.3.3.1.2. 7.3.3.1.3

1 Submittals	2 Level of Review	3 Submittal Schedule	4 NHDOT Action Time	5 Section Reference
ROW Layout Plan set	Approval	Part of the acquisition survey documents; 1. Approval with appraisal prior to any offers 2. Final ROW Layout Plan set at conclusion of ROW acquisition	1. Approval period is same as that for Appraisal approval 2. 21 calendar days	DBC 3.2.2; TP 7.3.1, 7.3.2.4, 7.3.3, 7.3.3.1, 7.3.3.1.2, 7.3.3.1.3, 7.3.4,
General Plan	For Informatio n	Part of the Acquisition Survey Documents (?)	21 calendar days	DBC 3.2.2; TP 7.3.1, 7.3.2.2.4
ROW CADD files	For informatio n	Prior to submitting first ROW Offer Packet and updated as needed	N/A	TP 7.3.2.8
Title reports	Review and comment	For each impacted property where property right will be acquired and updated as needed prior to making an offer or acquiring title through agreement or condemnation	Review period is same as Submittal in which Title Report is included	TP 7.3.2.2.4, 7.3.3.2
Final title abstract report	Review and comment	Submitted for each parcel upon completion of acquisition activities	21 calendar days	DBC 3.2.2; TP 7.3.2.2.4, 7.3.3.2
Boundary Surveys for impacted properties not adjacent to existing roadway corridor	Approval	Prior to submitting first ROW Offer Packet and updated as needed (?)	21 calendar days	DBC 3.2.2; TP 7.3.3.1.4
C. APPRAISAL, ACQUISITION, ADMINISTRATIVE SETTLEMENT, RELOCATION, CONDEMNATION, PAYMENT				
Request for Valuation Waiver(s)	Approval	List of parcels meeting criteria for valuation waiver within 20 days of approval of ROW Layout Plan set	21 calendar days	DBC 3.2.2; TP 7.3.2.2.4, 7.3.3.4.1

1 Submittals	2 Level of Review	3 Submittal Schedule	4 NHDOT Action Time	5 Section Reference
Valuation Waiver	Approval	Prior to submitting Offer Packet	21 calendar days	DBC 3.2.2; TP 7.3.2.2.4, 7.3.3.4.1
Appraisal Reports	Approval	Appraisals must be reviewed and approved by NHDOT prior to ROW Offer Packet submittals	20 business days; maximum of 10 appraisals in 20 business days; additional 10 business days for unusual nature appraisal	TP 7.3.2.4, 7.3.3.4.2
Updated Appraisals	Approval	As requested	20 business days; maximum of 20 appraisals in 20 business days; additional 10 business days for unusual nature appraisal	DBC 3.3.2; TP 7.3.2.2.4, 7.3.3.4.2
ROW Offer Packets	Approval	Prior to delivery of the offer to the property owner	15 business days; maximum of 20 Offer/Condem-nation Packets in 15 business days; additional 10 business days for packets of unusual nature	TP 7.3.2.4, 7.3.3.5, 7.3.4
Administrative Settlement Packet	Approval	As necessary	10 business days; maximum of 5 each (20 collectively) of Payment, Relo-cation, Admin Settlement, and Closing Packets; additional 10 days for packets of unusual nature	TP 7.3.2.2.4, 7.3.2.4, 7.3.4
Relocation Assistance Packets	Approval	As part of the parcel's ROW Offer Packet or separately	10 business days; maximum of 5 each (20 collectively) of Payment, Relo-cation, Admin Settlement, and	TP 7.3.2.2.4, 7.3.2.4, 7.3.4.1

1 Submittals	2 Level of Review	3 Submittal Schedule	4 NHDOT Action Time	5 Section Reference
			Closing Packets; additional 10 days for packets of unusual nature	
Closing Packets	Approval	A minimum of 24 hours prior to closing	10 business days; maximum of 5 each (20 collectively) of Payment, Relo-cation, Admin Settlement, and Closing Packets; additional 10 days for packets of unusual nature	TP 7.3.2.2.4, 7.3.2.4, 7.3.4.2
Condemnation Packets	Approval	Upon approval by NHDOT	30 business days; maximum of 20 Offer/Condemnatio n Packets in 30 business days; additional 10 business days for packets of unusual nature	TP 7.3.2.3.4, 7.3.2.4, 7.3.4.3
Exhibits, transcripts, and photos associated with condemnation	Review and comment	As requested by Attorney General's Office	21 calendar days	DBC 3.2.2; TP 7.3.2.2.4, 7.3.2.9
All specific reports and supporting documentation during acquisition process	Approval	1. Together with any ROW Submittals, and as requested by NHDOT 2. Final reports and supporting documentation to be provided upon completion of acquisition activities for each impacted parcel	1. Approval time will be the same as the ROW Submittal of which the report or documentation is a part; 2. 21 calendar days	DBC 3.2.2; TP 7.3.1, 7.3.2.2.4, 7.3.2.8,

1 Submittals	2 Level of Review	3 Submittal Schedule	4 NHDOT Action Time	5 Section Reference
Payment Requests	Approval	As needed	For Payment packet request approval: 10 business days; maximum of 5 each (20 collectively) of Payment, Relocation, Admin Settlement, and Closing Packets; additional 10 days for packets of unusual nature; Payment processing times: Below $5,000 is 3 weeks, $5,000 and above is 6 to 8 weeks	TP 7.3.2.2.4, 7.3.2.4, 7.3.2.10
Copies of property agreements in name of DB to facilitate design, construction, or maintenance	For informatio n	Upon securing agreement or upon request	N/A	TP 7.3.1, 7.3.2.2.4

Design Builder shall request NHDOT Bureau of Right of Way to perform a preliminary review of the ROW Layout Plan set upon approval of design but prior to submission of any appraisal. ROW layout plan sets shall be completed for each approved design work package section upon approval of the design. A ROW layout plan checklist has been included in the Reference Information Documents. At the completion of the project, the design-builder shall collectively register the ROW layout plan set in accordance with this Section. Design-Builder shall request NHDOT Bureau of ROW to perform and preliminary review of Appraisals before the complete Offer Packet is submitted.

7.3.2.5. *ROW Personnel Qualifications*

Design Builder's ROW Acquisition Manager shall have at least five years' experience managing the acquisition of transportation ROW projects for a condemning authority, be

familiar with appraisal and appraisal report review pursuant to the Uniform Standards of Professional Appraisal Practice (USPAP), and be familiar with the Uniform Act and applicable Laws of the State of New Hampshire.

Quality Control Specialist(s) – Design Builder shall designate a specific person(s) responsible for internal quality control and quality assurance. This individual will review all Design Builder deliverables associated with ROW Layout Plan sets, title, appraisal, acquisition, relocation and eminent domain prior to the deliverable being delivered to NHDOT for review.

Appraiser – Each appraiser shall be a Certified General Appraiser in the State of New Hampshire and shall have a minimum of five years' experience in appraising real property for eminent domain purposes, including partial taking appraisal, partial taking appraisal review and expert witness testimony. He or she must also have been actively and continuously engaged for at least three years immediately preceding his or her selection for this Project in appraisal work, or as approved by NHDOT. All appraisers preparing and signing appraisals must be on NHDOT Approved Appraiser list and approved by NHDOT before performing any appraisals on the Project. If required by NHDOT, the appraiser will be required to provide expert witness testimony.

Relocation Agent - Each relocation agent shall have a minimum of three years' experience in relocation assistance for ROW projects pursuant to the Uniform Act. A relocation agent's responsibilities shall include the following: Determination of eligibility of all displacees, contacting all displacees and informing them of their benefits, maintaining a file of all documentation concerning the relocation of the displacees, and extending all relocation assistance advisory services.

Negotiator - Each ROW negotiator shall be familiar with the appraisal methodologies and report formatting. The negotiator shall have a minimum of three years' experience in ROW negotiations. The ROW negotiator's responsibilities shall include the following: contact with property owners on the Project to discuss the acquisition of property needed for the Project, maintaining complete and accurate files of all transactions and contacts with the property owners and/or their representatives, and actively working toward a joint resolution to acquire the property with the property owner.

Title Agents shall have at least three years' experience in title review and curative matters. Responsibilities shall include, but not be limited to the following: maintain complete and accurate files of all transactions and contacts with the property owners and/or their representatives, coordinate and clear all title issues and assist at closing for properties acquired for the Project.

Project Surveyor – Design Builder shall designate a specific person(s) responsible for surveying aspects of this project. The individual must be a New Hampshire Licensed Land Surveyor and have 10 years of post-licensure experience.

7.3.2.6. *Design Builder Conflict of Interest*

If at any time, Design Builder or to the best of Design Builder's knowledge, any Design Builder - Related Entity directly or indirectly (i) acquires or has previously acquired any interest in real property likely to be parcels of the Project ROW or the remainders of any such parcels; (ii) loans

or has previously loaned money to any interest holder in any real property likely to be a Project ROW parcel and accepts as security for such loan the parcel, or the remainder of any such parcel that is not a whole acquisition, or (iii) purchases or has previously purchased from an existing mortgagee the mortgage instrument that secures an existing loan against real property likely to be a Project ROW parcel, or the remainder of any such parcel, Design Builder shall promptly provide written disclosure of the same to NHDOT.

7.3.2.7. *Meetings*

Design Builder shall attend ROW Coordination meetings as requested by NHDOT, expected to be monthly as long as project ROW activities are ongoing, unless otherwise required by NHDOT. These meetings are in addition to progress meetings specified in Section 5.5.4 of the Contract, where ROW activities will be discussed and the ROW Project Administrator may be required to attend. At such meetings, Design Builder shall provide exhibits, take minutes, and distribute the minutes to all attendees for review and comment. Minutes will not be finalized until all attendees agree on content. Design Builder shall provide meeting minutes to NHDOT within five (5) Business Days from the date of the meeting. NHDOT will respond within five (5) Business Days or at the next occurrence of the meeting. Design Builder shall provide proposed agendas three (3) Business Days prior to each meeting.

7.3.2.8. *Documentation and Reporting*

Design Builder shall provide NHDOT with all specific reports and supporting documentation for review and approval during the acquisition process. All correspondence with THE NHDOT and property owners relating to acquisition of real property shall include a heading with the following information (at a minimum):

Project ID
Location/Address
Tax Map, Lot and Block #
Parcel number
Owner of Record

Design Builder shall utilize NHDOT's approved naming convention for all electronic files and reporting fields.

In administering and managing its Project ROW activities, Design Builder shall:

A. Maintain parcel records on file of all aspects of the acquisition process in accordance with NHDOT requirements and applicable Law. Each parcel file shall include all documents required by the Contract Documents, the FHWA, and/or NHDOT.

B. Provide monthly summaries for the cost of Project ROW acquisition and related relocation assistance including amounts authorized and amounts paid on a parcel-by-parcel basis and budget forecasting on an overall Project basis as requested by NHDOT.

C. Maintain and electronically transmit to NHDOT, in a format acceptable to NHDOT, monthly status reports including appraisal, acquisition and relocation status of all parcels and activities

related to Project ROW and provide weekly (or as requested) updates to NHDOT.

D. Evaluate and report to NHDOT, Subcontractor status and performance on a monthly basis or more frequently as requested.

E. Prepare and submit electronically to NHDOT, on a monthly basis, a spreadsheet that contains Project ROW specific data required in order to complete the fields in NHDOT's ROWMS tracking software program or as directed by NHDOT.

Design Builder shall provide the following reports and electronic files:

A. Weekly Parcel Report: Design Builder shall provide a report, prior to the first of the week, listing all parcel deletions, parcel additions, and parcel splits.

B. Monthly Progress Report: Design Builder shall provide a report of all survey activity that occurred during the previous month, including a two-week look ahead of anticipated survey activity.

C. CADD Files: Design Builder shall provide digital CADD files in .dgn MicroStation and .dwg format which includes: property lines and/or existing ROW lines, as surveyed; proposed ROW lines; parcel numbers; resource files; level assignments; and plot files. Design Builder shall submit CADD files prior to submitting the first Acquisition Package, and provide updates as needed.

~~C.~~D. Input and update parcel status in a web-based geographic tracking system that is accessible by NHDOT or its designees, to be displayed on the EDMS provided by NHDOT. See Section 2.1.1 for additional details.

Design Builder shall document all ROW acquisition services. This involves tracking the status of the title research, ROW and boundary research, appraisal, and acquisition processes, including the development of parcel-specific diaries that document all meetings, relevant information, and submission of all requests for monetary compensations/awards to be paid to property owners or displacees affected by the proposed project. In addition, the Design Builder shall develop parcel folders in which to file documents and information for each impacted property and displaced party such as all documentation relevant to the acquisition of property rights and/or the relocation of items of improvement (personal property) for each individual parcel assigned.

7.3.2.9. *Design Builder Costs*

Design Builder shall be responsible for the costs of all services and preparation of all documentation for all Project ROW acquisition, easement acquisition, and permitting and related relocation assistance for the Project. The Work related to Project ROW acquisition includes mapping, surveying, waiver valuation, appraisal, negotiation, acquisition, relocation advisory assistance and determination of relocation benefits to be provided, procurement of title insurance, clearing of title, closing of acquisitions, condemnation expert witnesses required by NHDOT and/or the Attorney General's Office for all condemnation proceeding. Design Builder shall also be responsible for all exhibits, transcripts, and photos associated with condemnation services and proceedings required by the Attorney General's Office. See also Section 6.5.5.1 regarding the

Design-Builder's responsibility related to demolition of structures, including those within a ROW acquisition.

Design Builder shall not contact the Attorney General's Office or an Assistant Attorney General handling a specific parcel that has been filed for eminent domain action or is in the process of settlement unless authorized by NHDOT.

Design Builder shall also be responsible for the costs of acquisition and documentation for the acquisition of any temporary right or interest in real property not necessary for the Project but that Design Builder deems advisable to acquire for work space, contractor lay-down areas, material storage areas, borrow sites, or any other convenience of Design Builder. NHDOT shall not be obligated to exercise its power of eminent domain in connection with Design Builder's acquisition of any such temporary right or interest, and NHDOT shall have no obligations or responsibilities with respect to the acquisition, maintenance or disposition of such temporary rights or interests.

7.3.2.10. *Payment Requests*

Design Builder shall be responsible for submitting payment requests of payments to NHDOT and distributing all payments. Design Builder's cost shall include all costs not paid by NHDOT. Award/payment requests under $5,000.00 take NHDOT approximately three (3) weeks to process. Awards/payments of $5,000.00 and greater require specific approval from the Governor and Council and will take approximately six (6) to eight (8) weeks to process. It is important that completion of the transaction with property owners occur as soon as possible after a check has been issued.

7.3.2.11. *Responsibilities of NHDOT*

NHDOT will furnish the following data to the Design Builder:

A. NHDOT will be responsible for the costs of the property, relocation benefits, condemnation proceedings and closing costs including Title Policies for each property purchased.

B. Except as otherwise set forth in this Section 7.3, provide final approval for the Right of Way Layout Plans, all Acquisition Packages, Condemnation Packages, payment submittals, relocation eligibility, relocation appeals, relocation submittals, administrative settlement submittals, court settlement requests, and other approvals required by the Contract Documents, by the State, or by applicable Law subject to submission requirements and timelines.

C. Provide NHDOT'S mandatory templates and examples of required documents utilized in the normal day-to-day operations of the ROW process. These documents and templates will be provided in an electronic format.

D. After receiving a complete payment submittal from Design Builder NHDOT will submit a payment request to the G & C. Upon receipt of the State check, NHDOT will relay the State check to Design Builder within (5) five Business Days.

E. NHDOT will coordinate with the Office of the Attorney General to provide legal counsel to NHDOT for eminent domain matters.

F. NHDOT will provide all coordination services between Design Builder and the Office of the Attorney General for eminent domain matters.

7.3.2.12. *NHDOT Project Monitor/Reviewer*

In addition to its review and approval authority as expressly set forth in other provisions of this Section 7.3, NHDOT may, at its sole discretion, audit and/or monitor the ROW activities and services performed by Design Builder. NHDOT may contract with independent contractors to assist it in fulfilling the audit/monitoring function provided that the audit authority is not delegated. In addition to any of the matters specifically required to be provided by Design Builder to NHDOT pursuant to the foregoing sections.

Design Builder shall provide information to NHDOT as requested to assist in its review and assessment of the progress, timeliness, adequacy, or sufficiency of Design Builder's Project ROW activities.

7.3.3. Project Survey Requirements for ROW Purposes (See Section 7.5 for general project Survey Requirements)

The Design Builder shall be responsible to produce Final ROW Layout Plan sets for the entire project area, and have them recorded in the appropriate registry of deeds.

7.3.3.1. *SCOPE OF WORK*

7.3.3.1.1. Survey Data Collection:

The Design Builder shall be responsible for the acquisition of all field data needed to supplement the data supplied by the NHDOT to produce the Final ROW Layout Plan sets. All survey work shall be done in accordance with NHDOT Survey Technical Standards Manual dated November 13, 2017 and to be performed under the supervision of a New Hampshire Licensed Land Surveyor.

7.3.3.1.2. Base Plan Preparation:

NHDOT and Fuss & O'Neill have prepared a base plan of existing ROW limits including the following:

A. I-93 – NHDOT will provide at the time of award or sooner, an Existing ROW Layout Plan set of the I-93 corridor within the project limits. Said plan will be prepared under the supervision of a licensed land surveyor and will recorded at the appropriate Registry of Deeds.

B. Connector Road Corridor – No existing roadways or ROW exist in this area. Fuss & O'Neill has prepared a topographic survey of the proposed roadway corridor, which will be supplied. NHDOT's responsibility will be to develop a traverse through this area for the purpose of geometrically connecting the NHDOT I-93 survey work to the Fuss & O'Neill survey work.

C. From Madden Road easterly – An Existing ROW Layout Plan set has been prepared by

Fuss & O'Neill, under the supervision of a licensed land surveyor, and has been recorded at the appropriate Registry of Deeds.

The Design Builder shall create the base plans for the project including the depiction of the existing ROW limits as provided by NHDOT, and the relevant existing conditions. All survey work and mapping to be done in US Survey Feet. The base plan shall be appropriately enhanced for display purposes at technical and public meetings and in documents prepared for this study. Wetlands mapping and mapping for other applicable environmental resources (including, but not limited to historic properties and districts, floodplains/floodways, contaminated properties, surface waters, areas sensitive to air quality and noise impacts), as well as ROW and utility information, shall be superimposed on the base plan by the Design Builder, as directed by NHDOT. All wetlands are to be delineated by NH Certified Wetland Scientists and flags to be located by survey crews adhering to the same standards specified above.

The Design Builder shall be responsible for all engineering support services that are required to complete the project ROW deliverables. Engineering support may be necessary at various stages of the ROW design for a variety of reasons. The Design Builder shall be responsible for updating proposed impacts on the ROW Layout Plan set as necessary to incorporate design changes throughout the entire design phase for any and all reasoning. At the conclusion of the ROW procurement process the Design Builder shall be responsible for the creation of the Final ROW Layout Plan set depicting all project impacts and acquired ROW and easements for the entire project area.

The Design Builder shall use software compatible with both .dgn and .dwg formats.

ROW Layout Plan set shall be recorded by the Design Builder in the appropriate County Registry in accordance with RSA 230:32 Required Filing, and 478:1a Plat Law. Any boundary surveys required to support this effort will be done by the Design Builder; this requires a New Hampshire Licensed Land Surveyor (LLS).

7.3.3.1.3. ROW and Boundary Research

The Design Builder shall perform all research necessary to determine the location of relevant property lines for impacts not adjacent to an existing roadway corridor, such as for the Connector Road and for off-location stormwater treatment areas.

7.3.3.1.4. Boundary Surveys

The Design Builder shall perform a boundary survey of all properties that have proposed impacts not adjacent to the existing roadway corridor. The purpose of this requirement is so that the boundaries that are in close proximity to any proposed impacts, not located immediately adjacent to the roadway corridor, are accurately represented on the plan to insure that no unknown encroachments are created on abutting parcels not intended to be impacted and so that the correct parties of interest are properly compensated for the impacts. Tax maps do not retain the accuracy needed for this task and should not be used solely to develop any such property lines. This task will require the supervision of a NH Licensed Land Surveyor.

7.3.3.2. *Title Services*

Design Builder shall provide a Title Report and potential updates as required by NHDOT. Title Reports will be required for each impacted property where property rights will be acquired.

Title Abstracts shall be updated as needed and/or as requested to ensure that ownership information is accurate and up-to-date. Title updates are typically performed prior to making an offer to purchase and just prior to acquiring title through either amicable agreement or the eminent domain processes. Final title abstract report shall be submitted for each parcel upon completion of acquisition.

Documentation of all tasks and services required for this contract must be retained by the Consultant. A complete copy of all records will be provided to NHDOT upon completion of acquisition activities for each impacted parcel.

Title updates and plan revisions shall be submitted weekly, as necessary, along with a title abstract summary report.

When appraisals are submitted for review, an updated title abstract shall be provided. Final title abstract report shall be submitted for each parcel upon completion of acquisition.

7.3.3.3. *Introduction to Property Owners*

The Design Builder shall prepare initial contact letters and mailing list for NHDOT review. The contact letters and mailing list shall be for both property owners and displacees. All costs associated with this task shall be the responsibility of the Design-Builder. The letters shall clearly describe the Project, NHDOT's need for the owner's property, and shall include the name and telephone number of a Design Builder's representative. NHDOT's ROW Administrator or his/her designee will sign the letters on NHDOT letterhead. The forms for these letters will be approved by NHDOT prior to use. Property owners or displacees unable to read or understand the notice must be given appropriate translation.

7.3.3.4. *Appraisals*

7.3.3.4.1. Valuation Waivers

Valuation Waivers. No later than 20 calendar days from approval of the ROW Layout Plan set, the Design Builder shall submit a list of parcels that meet the criteria for Waiver Valuation as described in the ROW Manual Section 4.62 "Waiver Valuation" for approval by NHDOT. Any Parcels approved for Valuation Waiver process must be closed by the appropriate conveyance document within 30 days from presenting the offer. Parcels not obtained by Waiver Valuation within the 30 days shall be appraised utilizing the Appraisal process as shown in Section 7.3.3.4.2. A or B.

7.3.3.4.2. Appraisals

The Design Builder shall utilize NHDOT appraisal reporting formats to determine the effect of the impacts to each property's value. All appraisers performing and submitting appraisal work under this Contract shall be Certified General Appraisers in the State of New Hampshire. Design Builder shall perform appraisals using the following formats:

A. Land Value Appraisal, LVA: A short form appraisal of the subject land as though vacant is used when damages are not present and when there are no measurable impacts or changes in market value between the before value and after value of the subject property as a whole. The NHDOT relies on a pro rata analysis using the NHDOT Pro Rata Appraisal Policy as a guide with minimum compensation established at $500 and maximum compensation established at $20,000 per parcel where no measurable damages are evident. LVAs can be used for condemnation purposes, however, prior to a hearing before the New Hampshire Board of Tax and Land Appeals, (NHBTLA) the appraisal must be upgraded to a full "Narrative Before and After Appraisal" of the subject property as a whole. Therefore, it is imperative that an adequate and complete property inspection be performed initially to collect all information required to prepare a Narrative Before and After Appraisal, if it should be needed.

B. Narrative "Before and After" Appraisal: Complete and comprehensive "Before and After" appraisal report of the subject property as a whole required for condemnation purposes when a hearing will be scheduled with the NHBTLA. This type of appraisal is used when a comparison of the "Before and After" values of the property show a reduction in value as a result of the Project's impacts.

C. In accordance with the "Uniform Relocation Act", all appraisals shall be reviewed by qualified NHDOT staff for establishing Just Compensation. Just Compensation must be established prior to an offer being made to the property owner. Submissions must be made in paper hard copy and electronic PDF formats and shall include a separate copy of plans and cross sections for the parcel area. NHDOT will furnish a summary report establishing Just Compensation within the time frames established regarding appraisal review in 7.3.2.4 of the Technical Provisions. If Just Compensation cannot be established by NHDOT based on the noted appraisal report, NHDOT will notify the Consultant and the Consultant shall remedy the identified problems with their appraisers.

D. Appraisals used for condemnation shall be updated by the appraiser to the date of taking prior to the scheduling of a hearing with the NHBTLA and upon written notice from the AG's office. NHDOT will review updates prior to submission to AG's office. LVA appraisal reports will require a Narrative "Before and After" appraisal of the subject property as a whole for litigation. Appraisals will require an update and new date of value, based on research for new and current comparable data. Appraisers will be required to work with the Attorney General's office during the condemnation process as needed. The appraiser shall be required to support the Attorney General's Office until final settlement. All appraisal efforts, following the acceptance of the initial appraisal, and any services required to support NHDOT and AG's Office are paid for utilizing the hourly per diem rates established in the fee proposal.

The Design Builder shall provide copies of all appraisal and specialty reports to NHDOT for FHWA and internal auditing requirements.

The Design Builder shall obtain and provide NHDOT with copies of all written leases, licenses and other occupancy agreements, including outdoor advertising/sign agreements, in order to identify lessees, licensee and other occupants with potential compensable interests in each parcel and to determine the value of each such interest.

The Design Builder shall cause the appraiser(s) to testify as an expert witness(es) or provide expert witness(es) approved by NHDOT in all necessary eminent domain proceedings and be available for depositions, other discovery, pre-hearing or pre-trial meetings and appeals, as directed by NHDOT. Design Builder shall also provide administrative and/or technical support for such proceedings as requested by NHDOT.

The Design Builder shall coordinate with the review appraiser regarding corrections and/or additional information that may be required for a particular appraisal.

The Design Builder shall prepare and deliver to NHDOT upon request, a copy of all file documents, as formally requested in discovery motions or request for production.

7.3.3.4.3. Appraisal Review

The NHDOT shall perform all appraisal review services. When appraisals are submitted for review, an updated title abstract shall be provided.

7.3.3.5. *Project ROW Offer Packet Approval*

Offer Packets shall be submitted by Design Builder for NHDOT's approval shall comply with the NHDOT ROW Manual.

No Offer Packet will be approved if performed or submitted by appraisers or agents not previously approved by NHDOT for this Project. Upon NHDOT’s prior written approval of the Acquisition the Design Builder may proceed.

7.3.4. ROW Acquisition Activities

The Design Builder shall be responsible for all ROW acquisition services for the Project ROW with the exception of parcels 6, 7, 13, 14, 15, 16, 23, 29, 39, 40, 66, 67, 68, 71, 72, 76, and the railroad corridor. NHDOT will begin the acquisition of the parcels listed above and based on the status of these parcels at NTP2 will determine if the Design Builder will be responsible for completion of the parcels. Additionally, preliminary deed(s) have been prepared for partial acquisitions for parcels 6, 7, 13, 15, and the railroad corridor. Refer to Section 7.3.4.5 –Early ROW Acquisition for additional information.

Documents in draft form shall be forwarded to NHDOT in “electronic format” (Microsoft Word) and in paper format, for review and processing. Once deeds, easements, or other legal documents are executed by the property owners and recorded, a copy of all executed documents shall be retained by the Design Builder in the parcel folder.

The Design Builder shall also create a final ROW Layout Plan set for the entire project for recording as required by RSA 230:32 and RSA 478:1a that depicts the property rights actually purchased for each parcel. All parcel folders, diaries, and the record plan along with a final .dgn Micro Station and .dwg CAD/D file shall be provided to the NHDOT upon completion of the acquisition and are the property of the NHDOT.

In conjunction with negotiations, Design Builder shall:

A. Explain the project impacts to affected property owners;

B. Present the initial offer of Just Compensation for the acquisition of needed property rights;

C. Negotiate for acquisition of needed property rights;

D. Prepare written Justification for Administrative Settlements;

E. Draft Legal Documents such as deeds, easements, lien releases and condemnation documents (Notice of Offer and Declaration of Taking). Review and final approval of legal documentation will be performed by NHDOT;

F. Processing and delivery of payments;

G. Schedule and coordinate conveyance of property rights to NHDOT and subsequent recording of documents at the appropriate County Registry of Deeds;

H. Documenting the ROW process (meetings, communications, research, etc.) in a diary format in accordance with NHDOT's ROW Manual;

I. Prepare Final ROW Layout Plan set of all property acquisitions for the project.

Upon completion of all ROW acquisitions for this project, the Design Builder shall prepare a set of Final ROW Layout Plan set. These Final ROW Layout Plan sets, once approved by NHDOT Bureau of Right of Way shall be recorded by the Design Builder at the appropriate NH County Registry of Deeds, in accordance with RSA 478:1a and RSA 230:32. Final ROW Layout Plans shall be full scale paper copy, color coded in accordance with the NHDOT's ROW Manual. Final ROW Layout Plan sets shall be created in conformance to Plat Law RSA 478:1-a, which requires a New Hampshire Licensed Land Surveyor stamp (LLS).

Design Builder shall document all ROW acquisition services. This involves tracking the status of the title research, ROW and boundary research, appraisal, and acquisition processes, including the development of parcel-specific diaries that document all meetings, relevant information, and submission of all requests for monetary compensations/awards to be paid to property owners or displacees affected by the proposed project. In addition, the Design Builder shall develop parcel folders in which to file documents and information for each impacted property or displaced party such as all documentation relevant to the acquisition of property rights and/or the relocation of persons or items of improvement (personal property) for each individual parcel assigned.

When acquiring property rights for NHDOT, the Design Builder shall make a reasonable and "good-faith" effort to reach an amicable agreement with as many property owners as possible, so as to avoid condemnation. A "good-faith" effort shall be defined as a minimum of three (3) direct contacts (face-to-face meetings, phone calls, faxes, mail and/or emails) with the property owners

and/or their duly appointed representative(s). The Design Builder shall request NHDOT's approval of a mailed offer following Just Compensation being established and will proceed with their "good faith" efforts to reach an amicable settlement.

All settlements that exceed the appraised value of the acquired property rights shall be approved by NHDOT prior to settling any final agreement with the property owner. Negotiated settlements shall be documented by the Design Builder's ROW Agent. Requests to approve a negotiated settlement shall be submitted by the Design Builder to NHDOT, in the form of an Administrative Settlement letter and accompanied by any back-up documentation.

The Design Builder shall be responsible for complying with federal government audit, if necessary, and be responsible for correcting any deficiencies.

7.3.4.1. *Relocation Assistance*

The Design Builder shall provide all relocation assistance service needed for all parties displaced by the project. This shall include, but not be limited to, the coordination and processing of:

A. Monitor Relocation assistance activities.

B. Rent Supplement Payments (RSP)

C. Replacement Housing Payments (RHP)

D. Moving Costs

E. Closing Costs

F. Increased interest payments

G. Business Reestablishment payments

In addition, the Design Builder shall coordinate moving activities and reimbursement for the relocation of personal property items such as: business signs, fences, etc. in order to clear the ROW for the proposed construction activities.

All relocation assistance payments shall be approved by NHDOT prior to presentation to the displacees. Supporting documentation shall be provided to NHDOT to justify the payment being requested.

Design Builder shall be available to all displacees for relocation services at the convenience of the displacees. Design Builder's major activities with respect to the relocation assistance of occupants from Project ROW include:

Assist with all requests and be responsible for carrying out decisions made by NHDOT, the review/appeal process and judicial reviews.

Design Builder shall provide relocation assistance strictly in accordance with the Law, and, in particular, the Uniform Act and NHDOT standards. With respect to relocation assistance, Design Builder shall:

A. Provide written notice to all property owners, lessees, licensees, occupants, other holders of compensable interests, and other potential displacees regarding relocation assistance and

produce and provide them with a relocation assistance brochure that has been approved by NHDOT. Design Builder shall perform relocation interviews, complete and maintain interview forms and discuss general eligibility requirements, programs, and services with potential displacees. Design Builder shall maintain a written record of all verbal contacts.

B. Give written notice of the pending acquisition to any non-eligible occupants. Any questions as to the eligibility of a potential displacee shall be directed in writing to NHDOT's ROW Administrator.

C. Contact and provide relocation assistance to those parties affected by the Project ROW acquisition and complete forms for all displacees, as required.

D. Locate, evaluate and maintain files on comparable available housing, commercial, retail, and industrial sites.

E. Calculate replacement housing payment eligibilities.

F. Compute and submit requests for replacement/housing payment eligibilities to NHDOT prior to presenting to displacees. All relocation supplements shall be subject to the NHDOT's written approval.

G. Perform a Decent, Safe and Sanitary (DSS) inspections for each replacement housing comparable, photograph the comparable and complete the DSS inspection form. Form to be provided by NHDOT.

H. Obtain at least two moving estimates from moving companies to effect relocation of personal property, consistent with the Uniform Relocation Act.

I. Prepare moving plan with appropriate photos, sketches and inventory of personal property to be moved.

J. Coordinate moves with displacees and moving companies in accordance with NHDOT standards and the Uniform Relocation Act.

K. Maintain relocation contact logs in accordance to the NHDOT ROW manual.

L. Attend all residential closings on replacement properties, if requested by any party involved, and assure supplemental payments, if any, are properly distributed.

M. Process and compute increased interest payments on the mortgage of owner-occupied residential dwellings, as required.

N. Deliver to displacees a 90 Day notice of eligibility letter simultaneous with the delivery of the relocation benefits package. Deliver a 90 Day notice to displacees with the location of the comparable property used to compute the supplement.

O. Deliver an actual vacate notice to displacees and property owners upon Possession of parcel.

P. Notify NHDOT's ROW Administrator office immediately if a displacee has not moved after vacating notice expires. Prepare a written recommendation to facilitate the displacee's move.

Q. Be available to provide expert witness testimony at any relocation appeals or hearings.

R. Prepare relocation payment claim submissions with a claim justification form for all displacees and all relocation assistance benefits.

S. Verify DSS dwelling criteria on all replacement housing selected by the displacees, unless previously used as RHP determination comparable.

T. Secure dwellings and structures no later than five Business Days after vacancy and protect the Project parcel following acquisition and relocation.

U. Maintain a complete file, separate from acquisition files, on each displacee and make available for inspection.

V. Be responsible for all relocation activities that may occur after eminent domain proceedings have been initiated with the Attorney General's office.

W. Prepare all correspondence to the displacees or their representative(s) on Design Builder's designated relocation letterhead and have Design Builder's correspondence signed by the Project ROW relocation agent.

7.3.4.2. *Closing Services*

For purposes of closing services, Design Builder shall:

A. Submit a closing packet to NHDOT for review a minimum of 2 business days in advance of closing. NHDOT will review the submittal and provide "clear to close" by email within 1 business day of closing. This review duration is an authorized deviation to the review periods specified in Section 3.2 of the Design-Build Contract. Closing submittals shall include the following: a.) a reference to the disposition of any environmental matters; b) updated title commitment, no more than fifteen (30) Days prior, with notations indicating the disposition of all schedule "C" items; c) a copy of the Approved conveyance document to be delivered; d) a proposed closing statement indicating disposition of all proceeds; e) a copy of any and all releases of liens; and f) a copy of any miscellaneous documents and other curative matters required to be delivered at closing

B. Obtain an issued title policy based on the approved updated title commitment within 30 Days following closing and transmit the same to NHDOT.

C. Obtain and deliver to NHDOT one certified copy of each instrument of conveyance immediately after closing, and provide the original title policy to NHDOT within five Business Days after receipt.

7.3.4.3. *Condemnation Support*

In the event that a settlement cannot be reached with a property owner, Design Builder shall be responsible for initiating the condemnation process. The initiation of the condemnation process shall be pre-approved by NHDOT. Design Builder shall draft the Notice of Offer and the Declaration of Taking, along with the property taking description labeled (Exhibit B) in accordance with NHDOT policy and formatting and shall be submitted in both electronic and hard copy format. Condemnations may be submitted at any time during the acquisition process.

If requested by NHDOT, Design Builder shall provide an individual or individuals having sufficient knowledge of the design of the Project to appear as an expert witness for eminent domain proceedings. This individual(s) is also responsible for preparing exhibits as requested by NHDOT or the Office of the Attorney General in support of said testimony.

Design Builder shall support condemnation efforts as directed by THE NHDOT and further delineated as follows:

A. Notify NHDOT of any potential condemnation and document the reason(s) for condemnation.

B. Make available to NHDOT on behalf of the Attorney General's office an agent who will be expected to assist in making arrangements for conferences with witnesses prior to trial, and to assist in all eminent domain proceedings.

C. Coordinate and provide support to NHDOT's counsel for Notice of Offer. Design Builder shall coordinate with NHDOT on behalf of the Office of the Attorney General regarding expert witnesses needed to testify on behalf of the State eminent domain proceedings. At the request of the Office of the Attorney General or NHDOT, Design Builder shall provide and pay for all necessary expert witnesses including: engineering, real estate Design Builder's, cost estimators, and environmental consultants. The selection of all expert witnesses shall be determined by the Attorney General's Office.

D. Cause the appraiser(s) to prepare appraisals, when required by NHDOT or Attorney General as needed during eminent domain proceedings.

7.3.4.4. *Property Fences and Stonewalls*

In connection with fences, Design Builder shall comply with the policies and procedures of NHDOT ROW Manual, as well as the specifications found in the current NHDOT Standard Specifications. Fencing standards for Design Builder provided fencing shall conform to the overall aesthetics requirements found elsewhere in these Contract Documents and referenced standards.

Reconstruction of stonewalls shall conform to Section 572 of NHDOT 2016 Standard Specifications.

The Feasibility of Reconstruction for Individual Stonewalls that were determined as qualifying for reconstruction in the Individual Stonewall Rating sheets, which are provided in the reference information, shall be evaluated in consultation with NHDOT and impacted property owners in accordance with the NHDOT Stonewall Policy. Additionally, NHDOT has identified several stonewalls that require the input of the property owner to complete the Stonewall Rating. The coordination and Stonewall Rating Completion shall be the responsibility of the Design-builder.

7.3.4.4.1. Property Fencing for Public Properties

Where public facilities now exist that are in high risk areas for public use (particularly those containing parks, sport areas, schools or any highly traveled pedestrian areas), Design Builder shall construct similar like fence as in the preexisting condition or, at a minimum, construct a 6-

foot-high chain-link fence with metal posts if no fence was in the preexisting condition. Design Builder shall use Good Industry Practice in fencing public properties to control public access to the Project.

7.3.4.4.2. Property Fencing for Private Properties

Design Builder shall instruct the appraiser to use the “Cost to Cure” format to compensate an owner of private property for a replacement fence when the Project ROW line leaves one or more unfenced remainder property (ies) that were fenced before the taking. Compensation for the fencing will be based upon the same type of fence as the property owner's existing fence. The amount of compensation for the replacement fencing “Cost to Cure” will be the lesser of 1) the cost of new replacement fencing on the remainder less the fair market value for the acquired fencing (commonly referred to as a net “Cost to Cure”) or 2) the cost of moving the acquired fencing and re-installing it on the remainder property.

When the property owner is paid through the appraisal process for the cost of replacement fencing on the remainder property, Design Builder shall include in the offer agreement for such property the following clause:

"It is further understood and agreed that the Grantor has been compensated for the value the impacted fence and shall be responsible for constructing the replacement fencing within 30 Days from the date of closing. Grantor specifically understands and agrees that the fences are the property of the Grantor and they shall be liable and responsible for any reconstruction, maintenance, or adjustment with regard to such fencing."

Design Builder shall make reasonable and good faith efforts to ensure that the property owners, who have been compensated for fencing of the remainder properties, erect the fence in accordance with the construction schedule.

If necessary to maintain the Project construction schedule and to control unauthorized access to the Project ROW by the public or livestock, Design Builder may provide temporary fencing at the edge of the Project ROW in cases where the property owner refuses to fence the property within the allotted timeframe.

After the property owner's retention period has expired and if any existing fencing remains, Design Builder shall remove the existing fences from the newly acquired Project ROW and will be responsible for all costs associated therewith.

As requested Design Builder shall re-stake the proposed ROW line to assist the property owner in relocating fences as required.

7.3.4.5. *Early ROW Acquisition*

When requested by the Design Builder, NHDOT shall update the status of the acquisition process for each parcel falling under the responsibility of the NHDOT, as outlined in 7.3.4. After NTP2, Design Builder shall be responsible for coordinating the scheduling of any remaining early Project ROW acquisition by other Government entities with the Project Schedule. Based on the status of

each parcel, NHDOT, at its sole discretion, may require Design Builder to complete the acquisition and/or relocation of certain parcels, including the removal of improvements.

7.4. Geotechnical

7.4.1. General Requirements

Design-Builder shall perform all geotechnical investigations, testing, research, and analysis necessary to effectively determine and understand the existing surface and subsurface geotechnical conditions of the Project ROW to be used by the Design-Builder to carry out the Work. Design-Builder shall ensure the geotechnical investigations and analyses are both thorough and complete, so as to provide accurate information for the design of roadways, pavements, foundations, structures, and other facilities that result in a Project that is safe, and meets operational standards and final acceptance requirements.

7.4.2. Design Requirements

7.4.2.1. *Subsurface Geotechnical Investigation by Design-Builder*

The Project Geotechnical Data Report, dated 1/22/2020, summarizes the locations and results of all geotechnical investigations in support of the Project performed by the Department in advance of the Project. Any additional investigations necessary to complete the design of the Project shall be identified by and performed by the Design-Builder.

Design-Builder shall interpret the existing geotechnical information, and shall perform additional subsurface investigations as needed, and conduct field and laboratory testing as may be necessary to satisfy itself as to the nature of the soil, rock, and groundwater conditions across the Project. The Design-Builder shall determine the specific locations, frequency, and scope of all subsurface geotechnical investigations, testing, research, and analysis the Design-Builder considers necessary to support the design of a safe and reliable roadway, pavement, foundation, structure, and other facilities for the Project.

The minimum number of borings required under this contract, either from NHDOT supplied investigations or by investigations performed by the Design-Builder are as follows:

A. Roadways - A minimum of one test boring per 200 feet shall be performed at uninvestigated portions each roadway.

B. Bridge Substructures- A minimum of two test borings per substructure, one at each end, shall be performed at each uninvestigated substructure.

C. Minor structures or bridge like structures - At buried box culvert structures with wingwalls, a minimum of one test boring shall be performed at each uninvestigated wingwall location

D. Retaining Walls - A minimum of two test borings shall be performed at each uninvestigated retaining wall location.

E. Signal Mast Arm Foundations – A minimum of one test boring shall be performed at each uninvestigated signal mast arm location.

F. Closed Circuit Television Pole Foundation – A minimum of one test boring shall be performed at each uninvestigated closed circuit television pole foundation.

G. Soundwall Foundations - A minimum of one test boring per 300 feet shall be performed at uninvestigated portions each soundwall.

H. Overhead Sign Structure Foundations – A minimum of one test boring shall be performed at each uninvestigated overhead sign structure foundation.

I. BMPS – Investigations shall follow the requirements in the NHDOT Infiltration Testing requirements, which have been provided in the Reference Information for this Project.

Design-Builder shall prepare and amend, as needed, Geotechnical Design Reports documenting the assumptions, conditions, and results of the geotechnical investigation and analysis. The final Geotechnical Design Report shall be prepared in conformance with the NHDOT Geotechnical Engineering and Geological Requirements, which are provided in the Reference Information for this Project. The final Geotechnical Design Reports shall address all of the requirements and all the final design recommendations, construction considerations, special provisions and calculations.

Separate Geotechnical Design Reports may be submitted to accommodate a variety of pier, abutment or foundation designs, as subsurface conditions vary across the site. The Geotechnical Design Report(s) shall include, but is not limited to, the requirements listed below:

A. Interpretation and analysis of soil, bedrock, and groundwater conditions based on the geotechnical information available and other investigations conducted by the Design Builder.

B. Design and construction recommendations for the following, as applicable:

   I. Bridge substructures: spread footing, and/or deep foundation.

   II. Retaining walls: type, foundations, settlement, backfill

   III. Embankment slope stability and special embankment construction: soil modification, lightweight fills, staged construction

C. Performance criteria of structure foundations, buried structures and highway embankments - total and differential settlement of retaining walls, highway embankments, bridge foundations (lateral and axial).

D. Construction Quality Control, including inspection, testing and load testing programs to verify design resistances and installation procedures for piles and/or drilled shafts, if used.

E. Instrumentation programs, if necessary, to monitor embankment, substructure, or adjacent structures response to construction activities. Instrumentation programs shall establish threshold movement of instruments from baseline conditions. The instrumentation plan shall also describe reading frequencies, reporting protocols, and subsequent corrective actions that shall be taken if threshold movement(s) is/are exceeded.

F. Construction considerations for all of the above geotechnical elements.

G. Field investigations and laboratory test results used to characterize conditions, including moisture content, plasticity index, gradations for each major soil strata change, levels of shrink/swell potential, and levels of sulfate (on-site and borrow). Include a plan view locations

of field sampling, boring logs and other field data, laboratory test results, calculations, and analyses that support design decisions.

Each Geotechnical Design Report, upon completion, shall be submitted to NHDOT for review and comment prior to report finalization.

If environmentally-sensitive conditions are encountered during the subsurface exploration activities, Design-Builder shall undertake appropriate actions in accordance with Section 6.

7.4.2.2. *Pavement Design*

Design-Builder shall design and construct roadway and parking lot pavements using standard industry practice and the subsurface geotechnical data collected by the Design-Builder. The pavement and pavement structural section shall be designed per the NHDOT Highway Design Manual Chapter 7 for the traffic information provided in the Engineering Report. The pavement design shall include the structural layer materials, general specifications, and thicknesses of all pavement layers.

Additionally, no assessment of the existing roadway structural sections has been done. It is assumed that the majority of the roadways will require full depth reconstruction to meet the design ADLs, with the possible exception of:

- Side roads that were recently reconstructed: NH Route 28 (Manchester Road/Crystal Avenue), NH Route 28 Bypass.
- Other minor side roads where the horizontal and/or vertical alignment is not being altered.

Except as described below, any roadway sections where step box widening is deemed to be acceptable, treatment of the existing roadway will consist of:

- Removal of all pavement
- Excavate existing base material to allow for 6 inch layer of crushed stone (fine)
- Place full width 6 inch layer of crushed stone (fine gradation)
- Place new pavement

Pursuant to Section 7.7.1., NH Route 28 Bypass from Station 320+35 extending northerly to project limit STA 333+31 has been included in the project for stormwater runoff collection and treatment purposes. As such, 2” full width cold plane with 2” full width high strength wearing course would be accepted for this portion of the project.

For roadway that is disturbed by the construction activities of the Project, the Design-Builder shall, at a minimum match the in-place surface type and structure of the existing roadways. Design-Builder shall design all tie-in work to avoid differential settlement between the existing and new surfaces. Where possible, pavement and subsurface materials on new roadways shall transition to match existing roadways where they intersect.

7.4.2.2.1. Extra Sand for Frost Protection

For frost protection, extra Sand (Item 304.1) shall be placed beneath proposed base course materials to match the minimum total base course material thicknesses as follows:

A. Interstates, Turnpikes, & Divided Highways (Tier 1) – 36 inches

B. Statewide Corridors (Tier 2) – 30 inches

C. Regional Transportation Corridors (Tier 3) – 30 Inches

D. Local Connectors (Tier 4) – 24 inches

E. Local Roadways (Tier 5) – 24 inches

7.4.2.2.2. Underdrains

Underdrains shall be installed in accordance with the Standard Plan details shown on Sheet HW-3 in areas where at least one of the following circumstances occur:

A. The estimated seasonal high water table is within 4 feet of the top of the proposed base course materials.

B. The materials within 4 feet of the top of the proposed base course materials have greater than 12% fines (particles passing the #200 sieve) in the sand (particles passing the #4 sieve) portion of the materials.

C. If the roadway passes through a cut area that is at least 4 feet deep.

7.4.2.3. *Final Geotechnical Investigations.*

The NHDOT does not necessarily consider the Supplemental Boring Program and corresponding Supplemental Geotechnical Data Report as final geotechnical explorations for the project. The Design-Builder shall conduct sufficient subsurface investigations to satisfy AASHTO LRFD Article 10.4 and LRFD Table 10.4.2-1, as needed. The NHDOT further anticipates that the Design-Builder will conduct additional laboratory soil and rock tests to supplement those provided as part of the Supplemental Boring Program as appropriate for their designs. The geotechnical report shall be prepared by an Engineer trained and/or experienced in the practice of geotechnical engineering. The geotechnical engineer or a senior geotechnical engineer with review responsibility of the geotechnical report shall have experience on at least five roadway projects and five bridge projects completed for state transportation agencies. The geotechnical report shall be signed and sealed by a Professional Engineer licensed in the State of New Hampshire per 106.12.2.5 in Division 100 of the Standard Specifications. The qualifications of the geotechnical engineer shall be submitted for review and approval.

The geotechnical report shall follow the direction of the “NHDOT Geotechnical Engineering and Geological Requirements” included in the project Reference Information.

The Design-Builder will be required to follow the NHDOT Standard Specifications and to comply with existing NHDOT Special Provisions in the Reference Documents for roadway, bridge and other work expected within the project.

7.4.2.4. *Rock Slope Design Requirements*

The rock slope design shall be performed by an engineer or geologist trained in rock slope engineering. The design of rock slope remediation measures shall be performed by an engineer or geologist trained and experienced in the design and construction of remediation measures for rock slopes. Training and/or experience in the following areas is required:

A. Rock slope field data collection

B. Rock mass rating systems

C. Discontinuity and rock mass shear strength

D. Kinematic slope stability analysis via stereonet projection

E. Two and three dimensional limit equilibrium block stability analysis

F. Two dimensional force and moment equilibrium rock mass analysis

G. Rockfall modeling

H. Rock slope remediation strategies (slope reconfiguration, drainage, block reinforcement, wire mesh, wire-rope nets, buttresses, rockfall catchment fences, rockfall barriers and scaling)

I. Blasting techniques

The designer or a senior engineer or geologist with review responsibility of the rock slope and rock slope remediation designs shall have experience that includes designing a minimum of ten rock slopes and designing rock slope remediation measures at six project sites. Proof of experience and training must be provided to the NHDOT for review and approval. The rock slope design and remediation measures shall be signed and sealed by a Professional Engineer or Professional Geologist licensed in the State of New Hampshire per 106.12.2.5 in Division 100 of the Standard Specifications.

7.4.2.4.1. Submittals, Inspections and Reviews for Rock Slope Work

A. Review and approval of qualifications:

A summary of the formal education, training and experience of the personnel responsible for the rock slope design, and the design and construction of rock slope remediation measures shall be submitted to the NHDOT for review and approval. The NHDOT reserves the right to deny approval if the education, training and experience do not meet the minimum requirements and/or are not considered adequate to perform the rock slope design work required by this document. The rock slope design will not be allowed to begin until approval has been given by the NHDOT.

B. Review of rock slope design:

The Bidder shall prepare plans and cross sections and complete design calculations of all geotechnical elements associated with the rock slope. All geotechnical/geologic data, rock stability analyses, rock fall simulation analyses, stereographic projections, slope designs and ditch catchment designs shall be submitted to the NHDOT for review and approval, prior to finalizing the rock slope design. Design calculations and plans shall be signed and stamped by a Professional Engineer or Professional Geologist licensed in the State of New Hampshire.

C. Inspection of rock slopes:

The newly excavated rock slopes shall be subject to inspection by the NHDOT upon the completion of any portion of the rock excavation work to review rock slope conditions.

D. Submittal of design for rock slope stabilization/remediation measures:

The Bidder shall submit the proposed locations and the design of all rock slope stabilization/remediation measures to the NHDOT for review and approval. The installation of rock slope stabilization/remediation measures will not begin until the NHDOT has granted approval. Design calculations and plan for rock slope stabilization/remediation measures shall be signed and stamped by a Professional Engineer or Professional Geologist licensed in the State of New Hampshire.

E. Inspection of rock slope stabilization/remediation measures:

Rock slope stabilization/remediation measures shall be subject to inspection by the NHDOT upon completion of the installation. Additional measures by the Bidder may be required if the NHDOT determines that the stability of the rock slopes is not adequate and/or the safety of the public is at risk.

7.4.2.4.2. Criteria for Design and Construction of NHDOT Rock Slopes

A. Rock Slope Stability and Design –

Geotechnical analyses of rock slopes shall be performed to assess rock slope stability along new and existing rock slopes. The analyses shall include:

i. Review of existing geologic and geotechnical data
ii. Collection of new geologic and geotechnical data
iii. Evaluation of the potential slope stability problems
iv. Slope design and stabilization measures
v. Rock fall hazard analyses

Rock properties for slope stability analyses shall be obtained from existing data provided in the Geotechnical Baseline Report and data generated from subsurface investigations, field mapping and laboratory testing completed by the Bidder. The data collected shall include rock mapping information, boring data and other geotechnical/geologic data. Discontinuity, orientation and strength shall be evaluated; discontinuity sets shall be established for each rock slope for use in stability analyses. Rock slopes with well-defined sets of discontinuities shall be evaluated for stability (potential planar, wedge and toppling

failure modes) using rock mechanics analytical methods as described and defined in "Geotechnical and Foundation Engineering - Rock Slopes," FHWA HI-99-007, 1998. Planar, wedge and toppling failures shall be analyzed for potential occurrence for each rock slope, and each slope and orientation. A dry slope condition shall be analyzed, and a partially saturated slope shall be analyzed. The factor of safety for rock slope stability shall be 1.3 or greater for static stability, and 1.0 or greater for seismic stability.

The slope angle for each rock slope shall be selected based on the rock conditions at the site and the orientation of the discontinuities within the rock. Stereographic projections shall be utilized in the interpretation of the geologic structural data collected for each rock slope.

Presplitting will be required in rock slopes where the designed slope is 10 feet or more in height above the bottom of the ditch. Unless otherwise approved, the NHDOT Standard Specifications requires presplit holes to be not greater than 3 inches in nominal diameter, and spaced 36 inches on center. The presplit holes shall be drilled along the presplit line and at the required slope inclination to the full depth of the slope or to a predetermined stage (lift) elevation. Rocks slopes that are presplit shall not be flatter than 1H:2V or steeper than 1H:8V. Refer to the NHDOT Standard Specifications, Section 203, paragraph 3.3, Presplitting for additional requirements.

A 12-foot wide clear zone needs to be constructed at the top of the rock slope, measured back from the crest of the rock face. All vegetation and overburden need to be removed within the clear zone. This clear zone at the top of the rock slope will eliminate potential tree roots that can grow into cracks in the rock, prying loose rock. The clear zone also provides a buffer zone, in the event that back break occurs at the crest of the rock slope. Back break at the crest could potentially undercut a soil slope located above the rock slope. Any soil slope above the rock slope should begin at the back of the clear zone and extend upward at a 2H:1V or flatter angle to where it intersects the existing ground surface.

B. Rock Fall Modeling and Design of Catchment Ditch –

Rock fall modeling or rock fall simulation analyses shall be performed to predict rock fall behavior and to design rock fall catchment widths and depths for each rock slope. The Colorado Rockfall Simulation Program (CRSP) shall be used for rock fall modeling. Rock fall paths shall be obtained and plotted for various rock block sizes. The number of rock blocks landing on the roadway shall be stated. The maximum energy at an analysis point shall be used to design rock fall catchment barriers. The program shall complete a minimum of 500 iterations for each slope and block size modeled. A minimum of two (2) block sizes (average and maximum) shall be modeled for each slope configuration. Block size shall be established based on rock mapping and rock fall hazard-mapping data determined by the Bidder during the Bidder's investigation program. Rock slope roughness factor and tangential and normal coefficients shall be based on field data and suggested values from the verified software program. A basis for value selection shall be provided as part of the analysis documentation. Existing slopes and new slopes shall be

modeled as stated above. Existing slopes shall be modeled using existing conditions (slope, ditch width and depth) to verify if the existing slope conditions/configuration are adequate to contain rock falls as defined below. All slopes shall be modeled to determine optimal ditch width and depth.

In addition to performing rock fall modeling or rock fall simulation analyses, the Oregon Department of Transportation, Rockfall Catchment Area Design Guide shall be used in the design of ditches in rock slope areas. The ditches should be designed to retain approximately 95% of rockfall. Both the Rock fall modeling analyses and rock fall catchment design shall be modified accordingly if a toe berm is constructed at the toe of the rock slope.

C. Stabilization/Remediation Measures for Rock Slopes –

For all rock slopes that do not meet the design criteria referenced above for stability, the Bidder shall implement the following measures:

i. Reduce the slope angle to produce a stable slope
ii. Provide rock reinforcement, such as rock bolts, rock dowels, tied back walls, or buttresses
iii. Provide horizontal drains in rock to lower the pore water pressure
iv. Reconfigure the rock slope or increase the rock fall catchment ditch width and depth to provide an adequate catchment area.
v. Provide rock fall catchment barriers, such as concrete or gabion walls, rock fall catchment fences (woven wire-rope nets), or wire mesh drapery hung on the rock face/slope. Rock fall catchment barriers shall be designed to resist the maximum energy obtained in the rock fall simulation analysis.
vi. Remove unstable rock remaining on rock slope by measures such as trim blasting, mechanical scaling and hand scaling.
vii. Provide energy absorbing crushed stone in the ditch area to cushion the impact of falling rocks and reduce bounce/roll of rock fragments.
viii. To reduce back break along the crest of the rock, to minimize blast damage to the rock and to improve breakage along the slope line Utilize controlled blasting methods such as line drilling, pre-shearing, cushion blasting and unloaded gas relief holes between loaded presplit holes

The Bidder will be required to follow the NHDOT Standard Specifications and to comply with existing NHDOT Special Provisions for rock slope related work. The following NHDOT special provisions for rock slopes items shall be reviewed for incorporation into the work:

The following items in the Standard Specifications shall be reviewed for incorporation into the work:

i. Presplit Holes (Item 203.81)
ii. Extra Drilled Holes without Explosives (Item 203.82)
iii. Rock Bolts (Item 225.2)

iv. Rock Dowels (Item 225.3)
v. Horizontal Drains (Item 224.1)
vi. Rock Fall Netting (Items 225.1, 670.0532, 670.0531) (Refer to Design Guidelines For Wire Mesh/Cable Net Slope Protection, WA-RD612.2, Research Office, Washington State Department of Transportation, April 2005)
vii. Energy Absorbing Stone (Item 315.5)
viii. Rock Scaling –Hand Method (Item 203.91), Machine Method (Item 203.92)

Note - Due to past long-term maintenance problems and failures of epoxy grouted bolts and anchors, only cement grouted rock bolts, dowels and anchors shall be used.

D. Quality Assurance During Blasting Operations –

To assure that the blasting operation is conducted safely and that the rock slope is constructed in a stable condition while ensuring the safety and convenience of the public, follow the requirements in the NHDOT Standard Specifications under Section 203.3.2 Rock Excavation as amended by the special provision for Section 203 - Best Management Procedures for Blasting. Damage to existing structures or property caused by the blasting shall be the responsibility of the Bidder to remedy. The Bidder shall notify the NHDOT immediately of any blast-induced damage and/or blasting complaints.

7.4.3. Instrumentation Programs

If an instrumented program is required to monitor vertical and/or lateral embankment deformations, soil pore-pressures, and/or structure movements, the instrumentation program shall be submitted with the Geotechnical Design Reports, for review and acceptance by the NHDOT. A New Hampshire Licensed Professional Engineer with at least five (5) years of instrumentation experience shall develop the instrumentation program.

The instrumentation program shall establish threshold movement of instruments from baseline conditions, such as allowable pore pressure increases or lateral deformations. The instrumentation plan shall also describe subsequent corrective actions that shall be taken if threshold movement(s) is/are exceeded, including removal and replacement of poor or nonconforming soils due to excessive consolidation.

If an instrumentation program is required, no construction shall be allowed until baseline pore pressures or movement data are collected.

Design-Builder shall perform monitoring and provide up-to-date results to NHDOT every 48 hours for the duration of monitoring or until the reporting requirement is relaxed by NHDOT. Readings shall include current readings as well as accumulated readings and their relationship to threshold movement limits.

The Design-Builder shall not decommission the instrumentation program at any time during the Project construction duration. The instrumentation shall be left in working condition and turned over to the NHDOT, along with readout equipment at the completion of the Project.

The NHDOT shall require that the Design-Builder perform a pre-construction building survey of any structure that will require instrumentation and for any structure identified in the Environmental Commitments Section 6.5 of the construction. In addition, the Design- Builder shall implement the accepted instrumentation program on these structures. During construction, reduced instrumentation data shall be submitted to the NHDOT for review within forty- eight (48) hours of readings, and staged construction of fills shall not proceed prior to submittal of instrumentation data to NHDOT.

7.5. **Survey**

7.5.1. Base Technical Concept Survey

The base plan and existing ground model information used to generate the plans and designs for the Exit 4A Base Technical Concept (BTC) are as follows:

A. Within the limits of the I-93 corridor:

i. The BTC utilized the proposed design for I-93 widening contracts Salem-Manchester 14633I and Salem-Manchester 14633D. The surface came almost exclusively from the design consultant's models, with the exception of a small area at the interface of the projects where it was necessary to modify the information based on the cross sections. The roadway features came directly from the MicroStation files provided to NHDOT from the consultant. Outside the footprints of the 14633I and 14633D projects, the existing ground surface and features are from the original I-93 Salem-Manchester survey.

ii. NHDOT will be collecting ground survey of the I-93 corridor within the project limits over the summer and fall of 2020. This will be reflective of as-built conditions of the 14633I and 14633D projects to the extent possible; however, the 14633 projects will still be under construction until September 2020. Intent is to have this ground survey available by NTP1. It will be the Design Builder's responsibility to combine this survey with previous survey data noted below, and to supplement it as needed to reflect final as-built conditions of the 14633 projects.

B. Outside the limits of the I-93 corridor:

i. The existing ground model and surface are from ground survey conducted by Fuss & O'Neill beginning in 9/2016 and ending in 3/2019. The ground survey encompasses nearly all proposed work outside of the I-93 corridor within the Town of Derry.

ii. There are areas where stormwater treatment is proposed outside of the roadway where ground survey was not collected. The Design-Builder will be required to obtain any survey in these locations required for the design and preparation of plans for approval of these features.

Beyond the limits of the ground survey, the plans and surfaces were supplemented with aerial mapping including 2 ft contours from the Towns of Derry (2014) and Londonderry (2010).

7.5.2. General Requirements

The Design-Builder shall provide all land surveying and mapping services necessary to support ROW acquisition, design and construction to complete the Work in conformance with this Contract, the NHDOT's Survey Manual, NHDOT Standard Specifications, the New Hampshire Land Surveyors Association "Ethics and Standards", and any local agency requirements. All land surveying services shall be performed under the supervision of a NH Licensed Land Surveyor. Available survey information has been provided on the Project website.

The Design-Builder and the Land Surveyor in charge shall bear sole responsibility for the accuracy of additional survey data used in the Design. The Design-Builder, in conjunction with the surveyor, shall review existing survey data and determine the requirements for updating or extending the existing survey and mapping data, as well as the requirements for new and additional survey and mapping data. The Design-Builder shall be responsible for the final precision and accuracy of all survey and mapping work. All field notes are to be recorded in Field Survey Notebooks that will be turned over to the NHDOT at the end of the Project.

Developer shall employ a survey manager to be responsible for all right of entry, control surveys, topographic surveys, construction staking, and all other surveying work necessary to complete the Project and produce accurate Record Drawings. Except for the initial survey control data furnished by NHDOT, all calculations, surveying and measuring required for setting and maintaining the necessary lines and grades shall be performed by the Developer

7.5.3. Right-of-Entry

Design-Builder shall secure written permission prior to entering any private property outside the ROW. It shall be Design-Builders' sole responsibility to negotiate this permission and Design-Builder shall be responsible for any and all damages and claims resulting from that ingress. Proper documentation of right-of-entry shall be maintained at all times by Design-Builder.

7.5.4. Survey Services

Survey documents shall be a part of the design documents and shall include:

A. A horizontal and vertical coordinate listing, monument description, and location description of all primary and secondary survey control points installed, marked, and referenced along with a listing of the existing control used to create the installed control points;

B. Survey notes, plans, and calculations completed as the work progresses and all originals and two copies of each survey document;

C. Construction staking plans. Construction survey notes shall be provided to the NHDOT.

D. Construction staking as deemed appropriate by the Design-Builder;

E. Original diary forms and related original survey record keeping; and

F. Construction staking survey control data key map and line index plans (to be included in the Construction Plans).

G. Construction staking for approved pole locations associated with utility relocations.

7.5.5. Administrative Requirements

7.5.5.1. *Standards*

Design-Builder shall ensure that all surveying conforms to the NHDOT Survey Manual and the General Rules of Procedures and Practices of the New Hampshire Board of Professional Land Surveying. Design-Builder shall ensure that any person in charge of a survey field party is proficient in the technical aspects of surveying.

7.5.5.2. *Right-of-Entry*

Design-Builder shall secure written permission prior to entering any private property outside the ROW. It shall be Design-Builder's sole responsibility to negotiate this permission and Design-Builder shall be responsible for any and all damages and claims resulting from that ingress. Proper documentation of right-of-entry shall be maintained at all times by Design-Builder.

7.5.5.3. *Survey by NHDOT*

In performing surveys for other adjoining projects, NHDOT may need to verify and check Design-Builder's survey work. Design-Builder shall coordinate with the developer of the adjoining project regarding planned construction activities. Design-Builder shall notify NHDOT within two Business Days if NHDOT stakes and marks are altered or disturbed

7.5.6. Design Requirements

7.5.6.1. *Units*

All survey Work shall be performed using the US Survey Foot. Work shall conform to state plane coordinates.

7.5.6.2. *Survey Control Requirements*

Design-Builder shall ensure that all surveying conforms to all applicable surveying laws and regulations must follow the requirements of the New Hampshire Board of Land Surveyors Association, "Ethics and Standards", and the standard practices for work performed for the NHDOT. Design-Builder shall ensure that any person in charge of a survey field party is proficient in the technical aspects of surveying.

Design-Builder shall establish and maintain additional survey control as needed and final ROW monumentation throughout the duration of the Project.

Design-Builder shall tie any additional horizontal and vertical control for the Project, including for final ROW monumentation, to the Primary or Secondary control network throughout the duration of the project. If Design-Builder chooses to use GPS methods, Design-Builder shall meet the accuracy of the appropriate level of survey as defined in the NHDOT Survey Manual and the New Hampshire Land Surveyors Association, "Ethics and Standards".

All survey control points shall be set and/or verified by a Licensed NH Land Surveyor.

Monuments shall be NHDOT bronze survey markers installed in concrete and marked as directed by the most current edition of the NHDOT Survey Manual. Design-Builder shall replace all existing survey monuments and control points disturbed or destroyed. Design-Builder shall make all survey computations and observations necessary to establish the exact position of all other control points based on the primary control provided.

Design-Builder shall deliver to NHDOT a listing of all primary and secondary control coordinate values, original computations, survey notes, and other records, including GPS observations and analysis made by Design-Builder as the data are available.

7.5.6.3. *Horizontal Control*

All horizontal data for the Project shall be in the New Hampshire State Plane Coordinate System (SPCS) on the North American Datum of 1983(2011), US Survey Feet, (NAD 83(2011)).

Horizontal survey shall meet minimum NHDOT survey accuracy requirements (1 in 15,000).

7.5.6.4. *Vertical Control*

Vertical control for the Project shall be established on the North American Vertical Datum of 1988, US Survey Feet, (NGVD88).

Vertical survey shall meet minimum Third-order, Class I survey accuracy and

procedures (0.05 ft (2.0 mm) X $\sqrt{\text{Distancein miles}}$

Existing photogrammetric survey of the I-93 corridor and I-93 proposed design information for NHDOT Contract 14633D and 14633I is based upon vertical datum NGVD1929. Field survey and proposed design for the Exit 4A connector road corridor is on vertical datum NAVD88. NGVD1929 is 0.68’ higher than datum NAVD1988. The proposed Exit 4A profile reflects a vertical datum station equation at Sta. 1008+00. All proposed design for the Exit 4A interchange, including the overpass and ramps, west of Sta. 1008+00 is based upon vertical datum NGVD1929. All proposed design for the remainder of the project east of Sta. 1008+00 is based upon NAVD1988.

As noted in Section 7.5.1 above, the vertical datum discrepancy is to be addressed by collecting new ground survey of the I-93 corridor based on the NAVD 1988 vertical datum.

7.5.6.5. *Survey Data Analysis and Adjustment*

All control point used for data gathering and stake out, including photo control, shall be analyzed by the method of least squares. Residuals should not exceed equipment specifications. Resected control points are adjusted for horizontal position by least squares before they are to be used in the field.

Primary Project control acquired by GPS must adhere to 0.03' or less than 95% confidence circle accuracy.

Primary Project control acquired by total station by way of traverse must adhere to 1 : 20,000 or less.

Refer to the NHDOT Department of Transportation Survey Technical Standards Manual last revised April 2018 for specifics.

Raw closures and post adjustment reports are required of all data dumps are a required deliverable.

7.5.7. Construction Requirements

7.5.7.1. *Units*

Comply with Design Requirements.

7.5.7.2. *Construction Surveys*

Comply with Design Requirements.

7.5.7.3. *ROW Monuments*

Upon final submittal of the ROW documents to NHDOT, Design-Builder shall set, using permanent and stable monuments as defined in Section 663.17 of the General Rules of Procedures and Practices of the New Hampshire Board of Professional Land Surveying (TBPLS), all significant points along all ROW lines of the Project including the following:

a) Points of curvature (PCs)
b) Points of tangency (PTs)
c) Points of intersection (PIs)
d) Points of compound curvature (PCCs)
e) Points of reverse curvature (PRCs)
f) All intersecting crossroad ROW lines and all property line intersections with the ROW line. These monuments shall be ½-inch iron rods, driven just below surface level, capped by a NHDOT-labeled aluminum cap (rod-and-cap monument)
g) All beginning and ending points of control of access (denied) lines

Upon completion of the ROW acquisition and all Construction Work, such that the final ROW lines will not be disturbed by construction, Design-Builder shall replace all rod-and-cap monuments located on the final ROW line at all points of curvature (PCs), points of tangency (PTs), points of

intersection (PIs), points of compound curvature (PCCs), and points of reverse curvature (PRCs), and all intersecting crossroad ROW lines, with NHDOT Type II monuments (constructed according to current NHDOT specifications).

Design-Builder shall monument with a NHDOT Type II monument all final ROW lines where the distance between such significant ROW line points exceeds 1500 feet. ROW line intersections with property lines shall remain monumented by a ½-inch iron rod with a NHDOT aluminum cap (rod-and-cap monument).

Design-Builder shall reset all disturbed ROW monuments in reference to the appropriate x, y, z data. Design-Builder shall purchase all materials, supplies, and other items necessary for proper survey monumentation.

7.5.8. Survey Records and Reports

Design-Builder may use an electronic field book to collect and store raw survey data. Design-Builder shall preserve original raw data and document any changes or corrections made to field data, such as station name, height of instrument, or target. Design-Builder shall also preserve raw and corrected field data in hardcopy output forms in a similar manner to conventional field book preservation.

Field survey data and sketches that cannot be efficiently recorded in the electronic field book shall be recorded in a field notebook and stored with copies of the electronic data.

All field notes shall be recorded in a permanently bound book. (Loose leaf field notes will not be allowed.) Design-Builder shall deliver copies of any or all field notebooks to NHDOT upon request.

7.5.8.1. *Electronic Field Book (EFB) Data*

The use of an EFB to collect and store raw data shall follow the procedures described in the NHDOT's Survey Manual. Original raw data shall always be preserved, and any changes or corrections made to field data, such as station name, height of instrument, or target shall be documented. Raw field data shall also be preserved in hard copy output forms similar to how a conventional field book is preserved.

7.5.8.2. *Survey Notebook Data*

Field Survey data and sketches which cannot be efficiently recorded in the EFB should be recorded in a Field Survey Notebook furnished and stored with copies of electronic data.

7.5.9. Electronic Deliverables

All collected survey data shall be Digital Terrain Model (DTM) and be created and submitted in both .dgn and .dwg formats to the NHDOT. In addition, a digital copy of the recorded Final ROW Layout Plan set is to be submitted to the NHDOT Bureau of ROW. The documents produced by the Surveyor, or the Surveyor's subcontractors, are the property of NHDOT, and release of any such document must be accepted by NHDOT.

7.5.10. Permanent Survey Control Network

The Design-Builder shall notify the NHDOT Survey Section at 603-271-1600 in advance of the removal of any existing survey control.

7.6. **Roadway, Bicycle, and Pedestrians**

7.6.1. General Requirements

The objectives of the Project include the construction of a new multi-modal transportation connection between the Towns of Derry and Londonderry and Interstate 93 that will reduce congestion on NH 102 in Derry, improve safety, include accommodations for bicycles and pedestrians, and increase capacity and connectivity of area roadways while enhancing economic vitality of the region. The Connector Road will include signal improvements and provide a safe, reliable, cost-effective, and aesthetically pleasing corridor for the traveling public. The new interchange at Interstate 93 will accommodate installation of a future light rail corridor along the median of Interstate 93. The requirements contained in this Section 7.6 provide the framework for the design and construction of the roadway improvements to help attain the Project objectives.

Design-Builder shall coordinate, design and construct the improvements on crossing streets in accordance with the regulations of NHDOT, the Town of Derry and the Town of Londonderry.

7.6.2. Roadway Design Requirements

Design-Builder shall coordinate its roadway design with the design of all other components of the Project, including aesthetics. The Project roadways shall be designed to integrate with streets and roadways that are adjacent or connecting to the Project. Particular attention shall be paid to the transition from the interchange ramps to the existing I-93 roadways.

Roadway Design on the Project shall be in accordance with the NHDOT Highway Design Manual, AASHTO Roadside Design Guide, 4th Edition (2011) with all updates and errata up to and including 2015, and the 2018 AASHTO Policy on Geometric Design of Highways and Streets (Green Book) with the only design deviations as specified in the Project Engineering Report or as specified in an ATC submission approved by the Department.

In the event of conflicts between two or more of the design requirements, the more stringent shall apply unless otherwise stated in the Contract or approved by NHDOT in writing.

Design of roadway pavement and the pavement structural section shall be in accordance with Section 7.4.2.2.

Design-Builder shall design all elements in accordance with the applicable design criteria and good industry practice based on the design speeds for various elements.

Driveways shall be designed to meet the requirements of the Town of Derry or Town of Londonderry where applicable. Preliminary design of driveways in the BTC is based on the NHDOT Driveway Policy (2000), as referenced in the Project Engineering Report.

7.6.2.1. *Horizontal and Vertical Control*

The design criteria, design speed and posted speed limit of roadways on the Project shall be as listed in the Project Engineering Report.

All work shall be constructed within the proposed ROW and easements shown in the BTC, except at locations where the Design-Builder proposes to modify the final design to deviate from the preliminary design and for ROW for the convenience and use of the Design-Builders own reasons. The Design-Builder will be responsible for the acquisition of additional ROW for its own reasons as outlined in Section 7.3.

The minimum longitudinal tangent grade for roadway profile at new bridges shall be one percent (1.0%) unless otherwise shown on the BTC. The maximum longitudinal tangent grade for roadway profile at new bridges shall be four percent (4.0%).

The final design shall be in accordance with NHDOT roadway design criteria and the information provided in the Project Engineering Report for roadway cross slopes, roadway crown and superelevation criteria.

The roadway geometry of roadways on the Project shall be as directed in the Project Engineering Report and as shown on the Typical Sections sheet of the BTC plans.

A. I-93 Exit 4A Interchange Ramps

The interchange ramps shall be constructed as described in the Project Engineering Report. Modifications to the profile of the Connector Road or the geometry of the Connector Road over I-93 Exit 4A bridge that affect the interchange ramps must be authorized by the ATC process and addressed in the final design. The limits of slope work at the approach to the I-93 Southbound Off-ramp and at the Southbound Off-ramp shown on the BTC plans are intended to allow for construction of a future second lane for that ramp. Proposed modifications by the Design-Builder to reduce the shown slope work to match a single lane off-ramp will not be considered.

B. Rail Trail Sections

The typical section, design criteria, horizontal and vertical alignment shall be as listed in the Project Engineering Report.

7.6.2.2. *Design Vehicles*

Design Vehicle shall be as specified in the Project Engineering Report and outlined below:

A. Proposed truck turns to match existing truck turns at a minimum.

B. For all dual turning lanes, the minimum acceptable side-by-side design vehicles will be a WB-62 in the outside lane and a Passenger Car in the inside lane.

7.6.2.3. *Design Deviations*

There are vertical alignment and vertical clearance design deviations listed in the Project Engineering Report. Any other design deviation must be approved by NHDOT through the ATC process.

7.6.2.4. *Surface Treatment*

A. Raised Median Islands – All raised medians shall use a 6” high granite slope curb. Medians with less than or equal to 10’ widths, as measured from face of curb to face of curb, shall be impervious cement concrete. Medians greater than 10’ width, as measured from face of curb to face of curb, shall have a grass interior to the median in order to minimize impervious surfaces on the Project. Planting on grass medians, if adopted, shall be included in the Project Aesthetics and Landscaping Plan. Regardless of surface construction, all medians shall be depressed as shown in the BTC and sloped to drain to the interior, with a drainage system provided within the median, and be adequately delineated.

   The break in the raised median along Folsom Road as shown in the BTC to allow access to the Derry Police Station is a design requirement and shall be for authorized and emergency vehicles only.

B. Sidewalks – Sidewalks off the bridges on the project shall have a minimum width of 5.5’, including width for granite curbing. Sidewalk surfaces shall be constructed of HMA. Curbing adjacent to sidewalks shall be 7” reveal.

C. ADA Ramps shall be concrete. Detectable Warning Devices shall be cast iron.

D. Curbing – Granite curbing shall be used for raised islands, sidewalks, and along edge of proposed pavement as per NHDOT Highway Design Manual Volume 2 typicals for roadway.

E. Loam – Defined as per NHDOT Highway Design Manual Volume 2 typicals and specifications.

F. Seeding – Define as Park Seed Type 15 for loam areas. Loam is to be utilized on all slopes. I-93 area and ramps can be humus and be seeded with Slope Seed (WF) Type 45.

G. Multi-use Pedestrian/Bike Paths – surfaces of the rail trail are considered multi-use paths and shall be paved for a nominal width of 10’ with 2’ stone dust or equivalent surface shoulder on both sides of the path. Refer to the Project Engineering Report for all other design requirements of the rail trail. Refer to the BTC plans for materials in the pedestrian/bike path cross-section under the Connector Road structure.

7.6.2.5. *Miscellaneous Roadway Design Requirements*

Design-Builder shall coordinate roadway design, construction, and maintenance with other elements of the Project to achieve the objectives of the Project.

The Project roadways shall be designed to incorporate roadway appurtenances, including fences, barriers, and hazard protection as necessary to promote safety. All roadside safety devices used on the Project shall meet current crash test and other safety requirements as determined by NHDOT.

7.6.2.6. *Access to Abutting Properties*

Design-Builder shall maintain all existing property accesses, including those not shown on the BTC, and shall not revise control of access without NHDOT, Town of Derry and Town Londonderry review and approval, and the written agreement of the affected property Owner.

Two access points along the Connector Road are allowed as noted on the BTC plans. Prior to the completion of final design and start of any construction of this section of roadway, the Design-Builder shall contact the Town of Londonderry to determine the status of land use approval for the adjacent property. Any costs associate with the cost of design and construction of any access to the parcels is not included in this contract and would be subject to a third party agreement. Any schedule impacts of any third party agreement to design and/or construct any access to the parcels shall be at the Design-Builders risk. The design of the Connector Road shall not preclude or hinder the construction of future access points as described in the BTC plans.

7.6.2.7. *Roadside Safety*

On Interstate I-93, Ramps and New Hampshire Route 102, all guardrail shall at a minimum meet NHDOT test level TL3, unless a higher level is warranted by the final design. Guardrail on all other roadways shall at a minimum meet NHDOT test level TL2 unless a higher level is warranted by design. All roadside safety devices used on the Project shall meet current crash test and other safety requirements as determined by NHDOT.

Railing on the Interchange 4A over I-93 NB & SB Bridge shall meet test level TL-4 as defined in Section 13 of the AASHTO LRFD Bridge Design Specifications. Railing on all other bridges on the project shall meet test level TL-4 unless noted otherwise.

All guardrail systems shall be MASH compliant. All guardrail and end treatments shall be in accordance with NHDOT standard details and special provisions, including Special Provision 606 – Guardrail, a copy of which has been provided in the Reference Information for this Project.

Roadside longitudinal barrier shall have a minimum height of 31 inches.

7.6.3. Bicycle Facilities

The storm drain inlets on roadway surfaces shall be bicycle safe grates, where applicable, as identified on the NHDOT Standard Plans for Road Construction. Heavy duty catch basin frames and grates within the Town of Derry shall conform to the sample catalogue cuts provided by the Town of Derry and found in the Reference Information, including a requirement to have 2” x 2” square openings and meet this criteria for being bicycle safe. Additional information on Town of Derry required catch basin frames and grates is provided in the Reference Information.

The typical minimum shoulder width on all roadways of the Project except the two-lane section of NH Route 102 (Chester Road) and side roads shall be 5’ in order to be as bicycle-friendly as possible.

7.6.3.1. *Rail Trail/Multi-use Path*

As part of the project, accommodation for a possible future expansion of the rail trail by others will be facilitated by the construction of an underpass under the Connector Road in the area that is

currently North High Street. In addition, a 900-foot paved Multi-use Pedestrian/Bike path connection from the railroad/rail trail ROW approximately 600 feet south of the proposed Connector Road to the railroad/rail trail ROW approximately 300 feet north of the proposed Connector Road shall be constructed as part of the project.

The paved section and subbase materials of the multi-use pedestrian/bike paths shall be as specified in the Project Engineering Report and the TSL plans for the underpass under the Connector Road.

The underpass carrying the pedestrian/bike path under the Connector Road shall be have lighting installed as specified in Section 7.13.

7.6.4. Pedestrian Facilities

Design-Builder shall design, construct, and replace sidewalks where sidewalks currently exist if disturbed under this Project. Sidewalks and pedestrian facilities, including temporary facilities, shall comply with the New Hampshire's Accessibility Standards as well as ADA requirements. Design-Builder shall install concrete curb ramps at all existing and proposed intersections and driveways as required within the Project.

Sidewalks and pedestrian facilities shall be installed as shown in the BTC and as described in the Project Engineering Report.

The pedestrian facilities (sidewalk) along Tsienneto Road will be as shown in the BTC and will terminate prior to intersecting with NH 102 at the east end of the project. There will be no pedestrian accommodations at the signals installed along NH 102 as part of the Project.

7.6.5. Construction

The wearing course for all roadways shall be 1.5 inches in thickness and shall be high strength utilizing a PG 76-28 binder, except as noted in Section 7.4.2.2. Depending on ADL and the roadway design, high strength pavement may be needed for the binder course of pavement.

If traffic is allowed to run on binder course pavement for a winter shut down, then the top most lift of binder course pavement shall be a "winter" binder mix.

Design-Builder shall use an MTV (Material Transfer Vehicle) for the pavement placement. Use of an MTV shall be required for all pavement layers on the project unless otherwise authorized by NHDOT.

Pavement joint adhesive (Item 403.6), shall be applied to all exposed longitudinal and transverse joints for all pavement courses/lifts prior to placement of each pavement course pass (joint), including joints against curb or barrier.

Surfaces of any pavement course shall have a tack coat applied as directed in paragraph 3.10.10 of Section 401 of the Standard Specifications.

An incentive/disincentive pay adjustment (QC/QA) has been implemented for the pavement work on this Project as follows:

- **QC/QA Tier 1:** Connector Road (From Exit 4A ramps to North High Street);

- **QC/QA Tier 2:** Exit 4A ramps, Connector Road (From North High Street to NH 102), and all other paving work (i.e., side roads, tie-ins, widenings, etc.)

The Design-Builder shall take note of the requirements set forth in NHDOT Standard Specifications for Road and Bridge Construction Section 401 for performance requirements (QC/QA). Level 1 Ride Smoothness testing will be performed by the Department for QC/QA Tier 1. A line item has been provided on Form N-1 for associated costs. See Special Attention included in Volume 2 Book 3 – Special Provisions.

At the completion of work at the interchange, the Design-Builder will be required to provide a full 2" mill and fill of the low speed lane of I-93 NB and SB, over the entire width of the lane, from the start of the off ramp deceleration lane until the end of the on-ramp acceleration lane. This work shall be performed regardless of any damage, or lack thereof, to the lanes by the Design-Builder.

Any damage caused by the Design-Builder to any lane of I-93 NB or SB, including shoulders, will require a full 2" mill and overlay of each lane damaged for a minimum of 1000 linear feet.

7.7. **Drainage**

7.7.1. General Requirements

The Design-Builder shall provide a well-drained corridor and a safe environment for those that use and maintain the facility. Work for all drainage structures and appurtenances shall adequately address functionality, durability, ease of maintenance, maintenance access, safety, aesthetics, and protection against vandalism. In fulfilling the requirements for drainage, the Design-Builder shall abide by and fulfill the requirements related to drainage features or systems while at the same time meeting the requirements of other required design elements on the Project.

The Design-Builder shall be aware and fully comply with federal, state, and local laws related to drainage design, as well as all applicable Governmental Approvals, including Environmental Approvals, and shall perform the Work such that there will be no substantial adverse effects on adjacent properties or drainage systems.

Efficient performance of the drainage system is an integral part of the performance of the Project. Design-Builder shall account for all sources of runoff that may reach the Project, whether originating within or outside the Project ROW, in the design of the drainage facilities. It is noted that the drainage system of the Project shall be designed to collect the runoff from the high point of the Route 28 Bypass located approximately 1000 linear feet north of the limits of the Project, as shown in the BTC.

See also requirements for extra sand for frost protection and underdrains in Section 7.4.2.2.

7.7.1.1 Stormwater Treatment Design

Stormwater treatment practices shown on the BTC have been designed as described in Section 14 of the Project Engineering Report, and associated Stormwater Treatment Memorandum. The BMPs on the BTC are preliminary. The Design-Builder shall perform final design of BMPs based on the final design of the project. BMPs shall be designed in accordance with the NHDOT Manual of Drainage

Design for Highways in conjunction with the NHDES New Hampshire Stormwater Manual. Stormwater treatment shall be designed to meet the environmental commitments listed in Section 6.5. ROW needs associated with the BMP designs and layout shall reference Section 7.3 (Right-of-Way) for direction regarding Design-Builder responsibilities and associated requirements.

In additional to guidance referenced in Section 7.7.1.1, the Design-Builder shall take care to account for groundwater conditions associated with design of stormwater treatment practices (BMPs). Specifically, wet ponds and wet extended detention pond designs require the creation of a permanent pool of water to achieve the desired pollutant removal efficiencies. Intercepting groundwater is an effective means of achieving this criteria. Seasonal groundwater information (elevations) at these specific stormwater treatment BMPs should be evaluated to establish the top of the permanent pool within the groundwater table (i.e., ensuring that the seasonal low groundwater elevations do not fall below the bottom of the ponds). If groundwater conditions at a particular site are shown to be higher than the elevations of the top of the permanent pool due to design constraints, the use of perimeter underdrain should be considered to minimize the potential for groundwater infiltration through the upper pond slopes.

NHDOT has installed observation wells at the BMP locations outlined on the BTC as part of the subsurface investigation program, detailed in the Geotechnical Data Report. The NHDOT has collected monthly elevation data for these points (beginning at the installation date through to the time of Contract award). Should the final design require adjustments and/or modifications to the BMP layouts, or additional data from the NHDOT installed wells needed, it will be the responsibility of the Design-Builder's responsibility to acquire the necessary groundwater information as noted above.

Infiltration rates utilized for infiltration practices (BMP's) shall be determined according to the NHDES New Hampshire Stormwater Manual. Refer to the NHDOT borehole infiltration testing guidelines (excerpt from the Draft Geotechnical Manual (currently under development)) provided in the Reference Information Documents for field testing guidance.

Construction Requirements:

Embankment fill material utilized for construction of stormwater treatment basins for shall not include any rock fill greater than 6 inches (diameter) or other objectionable material.

Stormwater treatment basin construction area limits shall be cleared of all trees, roots, stumps, boulders and sod to a depth of 2' below final grade.

Where a stormwater treatment basin berm is constructed with embankment fill, a "Low Permeability Fill" core shall be used with a berm key (into existing ground) to reduce seepage and stabilize the berm. Compact the material to at least 95% of the maximum density.

Where a stormwater treatment basin is constructed in an excavated area within existing ground, a "Low Permeability Fill" berm key is not required unless directed by the Engineer.

Stormwater treatment basin outlet control structures shall be precast, with all hole sizes greater than 1 ½" to be cast with the section to avoid possible rust staining from exposed reinforcement. All 1 ½" dia. holes (or smaller) may be core drilled in the field or cast.

Stone Fill Class C shall be used around stormwater treatment basin outlet control structure orifice openings that are 6" diameter and smaller to minimize the potential for clogging.

All stormwater treatment installations shall include a means of access for periodic maintenance. This includes providing an access road to facilitate full access to the BMP infrastructure.

All pipe connections associated with the stormwater treatment basin outlet pipes shall include flexible water-tight gaskets conforming to AASHTO M198. Pipe to outlet control structure connections shall be watertight with an embedded flexible rubber boot.

All stormwater treatment basin outlet structures shall include a trash grate covering all orifice openings that are 6” diameter or greater.

All stormwater treatment basin outlet structure hardware and steel appurtenances shall be hot dipped galvanized.

Temporary Stormwater Management:

Any stormwater treatment basin (BMP) not part of this Project cannot be utilized for construction stormwater treatment unless approved thy the Department. The Department will evaluate any proposal by the Design-Builder based upon availability, timing, and environmental commitments and/or requirements.

Any permanent stormwater treatment basin (BMP) constructed as part of the project may be utilized for construction stormwater treatment provided the basin is cleaned, and restored to its full final design condition (and functionality) prior to project completion.

7.7.2. Administrative Requirements

7.7.2.1. *Data Collection*

Design-Builder is responsible for collecting all necessary data to establish a drainage system that complies with the requirements and accommodates the historical hydrologic flows in the Project limits.

Design-Builder shall collect available data identifying all water resource issues, including water quality requirements as imposed by State and federal government regulations; National Wetland Inventory and other wetland/protected waters inventories; local floodplain requirements in FEMA-regulated floodplains; and official documents concerning the Project, such as the FEIS/ROD or other project documents such as drainage and environmental studies.

Design-Builder shall acquire all applicable municipal drainage plans. Design-Builder shall acquire all pertinent existing storm drain plans and/or survey data, including data for all culverts, drainage systems, and storm sewer systems within the Project limits. Design-Builder shall also identify existing drainage areas that contribute to the highway drainage system and the estimated runoff used for design of the existing system.

The data collected shall be taken into account in the Final Design of the drainage facilities.

7.7.2.2. *Coordination with Other Agencies*

Design-Builder shall coordinate and resolve all water resource issues with affected interests and regulatory agencies. Design-Builder shall document the resolutions of water resource issues.

7.7.3. Design Requirements

The Design-Builder shall be responsible for drainage design, including hydrologic and hydraulic analysis as required, locating, sizing, and constructing all temporary and permanent drainage facilities. Design shall be in accordance with the requirements of the NHDOT Manual on Drainage Design for Highways, 2015 edition, DRAFT. The design documents shall include a Final Drainage Report including calculations, storm drain plans, profiles, details, and site protection during the Work. Surface drainage shall be designed to accommodate anticipated settlement in embankments and operate effectively. The final drainage report shall include a storm water outfall routing diagram showing each treated and untreated outfall, the name of the receiving waters they drain to, the outfalls which are upstream and downstream, and the outfalls which drain to Hoods Pond and Beaver Lake. An EXCEL spreadsheet showing the following for each outfall shown in the routing diagram shall have the following information:

- The BMP type, if needed
- Roads draining to each outfall
    - Road Name
    - Beginning and end station
    - Existing and New impervious area
    - Treated and Untreated impervious area
    - Impervious area removed
- Each outfall
    - Existing and New impervious area
    - Treated and Untreated impervious area
    - Impervious area removed
- Receiving water name for each outfall
- Upstream and downstream outfall identification number
- If the BMP is a tributary to Hoods Pond
- If the BMP is a tributary to Beaver Lake

The drainage systems for the Project shall be designed to accommodate the surface runoff generated, offsite drainage currently being accepted into the existing drainage system, and seasonal high-water flooding. There are three different drainage systems associated with the project: the system within the Town of Derry, the system within the Town of Londonderry, and the system within the I-93 corridor, controlled by the requirements of the State of New Hampshire. Each drainage system shall have its own design submittal(s), engineered to meet its specific design requirements.

Design-Builder shall design all elements of the drainage facilities in accordance with the applicable design criteria and standards of the respective drainage system and good industry practice. Local requirements, if more stringent than those of the Contract Documents, shall supersede other requirements and be handled with a third party agreement, if needed.

The design of drainage systems shall include reconfiguration of the existing drainage systems impacted by the Project within the Project limits, and design of new and reconfigured storm drainage systems as required meeting the performance requirements as defined in this Section 7.7.

Design-Builder shall provide facilities compatible with existing drainage systems and all applicable municipal drainage plans or approved systems in adjacent properties. Design-Builder shall preserve existing drainage patterns wherever possible. There shall be no net increase in discharge flows (pre versus post flow conditions).

Elements of the existing drainage system impacted by the Project must meet hydraulic capacity requirements as detailed Section 7.7.

Design-Builder may make use of existing drainage facilities, provided overall drainage requirements for the Project are achieved.

Design-Builder shall base its Final Design on design computations and risk assessments for all aspects of Project drainage.

7.7.3.1. *Surface Hydrology*

7.7.3.1.1. Design Frequencies

Design-Builder shall use the design frequencies listed in Table 7.7-1 below.

Table 7.7-1: Drainage Design Frequencies

	Design					**Check Flood**
Functional Classification and Structure Type	**2**	**5**	**10**	**25**	**50**	**100**
Principal arterials:						
♦ stream crossings					X	X
Storm drain systems on other roadways						
♦ inlets and drain pipe			A	B		X
♦ inlets for depressed roadways*				X		X
Notes. * A depressed roadway provides nowhere for water to drain even when the curb height is exceeded. A – Inlets and drain pipes at other roadways in the Town of Londonderry and NHDOT roadways shall be designed to the 10-year storm B – Inlets and drain pipes at other roadways in the Town of Derry shall be designed to the 25-year						

storm

7.7.3.1.2. Hydrologic Analysis

Design-Builder shall design the drainage system to accommodate the proposed development of the drainage areas. Flood damage potential for the completed Project shall not exceed pre-Project conditions. Design-Builder shall perform hydrologic analysis for the design of drainage features to accommodate both the proposed development of the drainage areas and interim drainage during construction.

7.7.3.2. *Storm Sewer Systems*

Where precluded from handling runoff with open channels by physical site constraints, or as directed in Section 7.7, Design-Builder shall design enclosed storm sewer systems to collect and convey runoff to appropriate discharge points.

Design-Builder shall prepare a storm sewer drainage report encompassing all storm sewer systems that contains, at a minimum, the following items:

A. Drainage area maps for each storm drain inlet with pertinent data, such as boundaries of the drainage area, topographic contours, runoff coefficients, time of concentration, and land use with design curve number and/or design runoff coefficients, discharges, velocities, ponding, and hydraulic grade line data.

B. Location and tabulation of all existing and proposed pipe and drainage structures. These include size, class or gauge, catch basin spacing, detailed structure designs, and any special designs.

C. Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe alternates.

D. Complete pipe profiles, including pipe size, type, and gradient; station offsets from the centerline of the roadway; length of pipe; class/gauge of pipe; and numbered drainage structures with coordinate location and elevations.

E. A full set of drainage calculations including a signed statement of compliance with MS4/AOT permit requirements for each of the governing regulatory agencies.

This report shall be a component of the Final Drainage Design Report.

Design-Builder shall design all storm sewer systems such that the hydraulic grade line for the design frequency event is no higher than 1 foot below:

1) The nearest edge of pavement provided criteria for b & c are met;

2) The top of any grate inlet; and

3) The top of any manhole cover in the site stormwater system.

7.7.3.2.1. Pipes

Storm sewer pipes with design flow velocities less than 3 feet per second (fps) shall be designed for full flow at 80% of the internal diameter to account for sedimentation in the pipe. Other storm sewer pipes shall be designed using the optimum depth of flow for the pipe diameter. Storm sewers shall be designed to prevent surcharging of the system at the flow rate for the design year event. All storm sewers shall be designed and constructed to sustain all loads with zero deflection and shall have positive seals at the pipe joints.

All pipes shall be reinforced concrete within the Town of Londonderry. Pipes beneath paved surfaces of roadways on NHDOT and Town of Derry roadways shall be reinforced concrete. Other pipes in the Town of Derry (parallel to roadway or off-road) may be HDPE provided sufficient cover is provided.

The minimum pipe size inside diameter shall be 15” for laterals (running parallel to roadways), 18” for laterals placed under pavement, and 18” for trunk lines. The minimum pipe size inside diameter shall be 24” for all pipes installed under I-93 and interstate ramps.

Drainage Structures

Drop Inlets, Catch Basins, Manholes and other castings installed on the Project shall meet NHDOT design standards and Section 604 of the NHDOT Standard Specifications. Polyethylene Liners shall be manufactured and installed in accordance with NHDOT Standard Plans. Heavy duty catch basin frames and grates shall be installed in the Town of Derry to meet the specifications provided by the Town, which are provided in the reference information.

Underdrain shall be designed in accordance with the Highway Design Manual and the NHDOT Manual on Drainage Design for Highways. Underdrain, underdrain flushing basins and outlets shall be installed as directed in Section 605 of the NHDOT Standard Specifications. Underdrain pipe in systems over 600’ should be increased in size to 8” for the entire length, but should not exceed 1200 feet without an outlet. Underdrain systems shall have a 0.5% min profile.

Catch Basins shall be located as directed in the Highway Design Manual and Manual on Drainage Design for Highways. Catch Basins shall be evaluated for placement at locations where “snow curb” conditions are expected to occur.

Slope drainage shall be designed as directed in the NHDOT Manual on Drainage Design for Highways.

End sections and Headwalls shall be designed and installed as directed in the Highway Design Manual, the NHDOT Manual on Drainage Design for Highways, Section 603 of the NHDOT Standard Specifications and NHDOT Standard Plans.

Outlet protection shall be designed for all culverts and drainage systems as directed in the NHDOT Drainage Design Manual for Highways.

Cover requirements for drainage systems shall be in accordance with the NHDOT Manual on Drainage Design for Highways.

7.7.3.2.2. Spread/Ponding

Design-Builder shall design drainage systems to limit ponding to the widths specified in Chapter 6 of the Highway Design Manual and the Manual on Drainage Design for Highways for the design events listed in Table 7.7-1. Design criteria shall include:

- The recommended limit of spread is within the paved shoulders 8 to 10 feet wide. In sections with no paved shoulders or paved shoulders less than 8 feet wide, spread limits must not encroach beyond one-half the traveled way in either direction of travel;

- In general, more than permissible spread should not be substantially greater in sags than it is at inlets on grade;

- In sag locations where greater than permissible spread may occur, such as where snow curb or grate clogging is likely, place flanking basins on either side of the main inlet

7.7.3.3. *Hydraulic Structures*

7.7.3.3.1. Bridges

All bridge hydraulic computations, designs, and recommendations shall be consistent with past studies and projects in the area by the USACE and other State or federal agency studies and projects.

Where bridge design is influenced by upstream storage, the analysis of the storage shall be considered in the design of the bridge.

A. Method Used to Estimate Flows

Design-Builder shall ensure that the selected hydrologic method is appropriate for the conditions in the watershed.

For all crossings located within a FEMA Flood Insurance Study (FIS) with peak flow information, Design-Builder shall gather and utilize, as appropriate, the flow information provided in the FIS and any subsequent Letters of Map Revision (LOMR) for estimating flow.

For crossings not located within a FEMA FIS or on a gauged waterway, Design-Builder shall select the appropriate method for calculating the design flows based on site conditions, and Good Industry Practice.

B. Design Frequency

Major river crossings, bridges, culverts and storm drain systems shall be designed for the design-year frequency indicated in Table 7.7-1 as modified by details in Section 7.7 below.

Design-Builder shall evaluate bridges for contraction scour, local scour and pier scour concerns as applicable and incorporate protection in accordance with Good Industry Practice.

C. Hydraulic Analysis

Design-Builder shall design riprap at abutments in accordance with the procedures outlined in HEC-23. Design Builder shall analyze existing structures with the proposed flows to ensure the headwater does not exceed that of the current conditions. If this condition is not met, Design-Builder shall design replacement structures with sufficient capacity to pass the design-frequency flows and ensure the maximum headwater for any frequency event does not exceed that of the corresponding event for the current condition. Culvert extensions may increase the headwater elevation, but not above the maximum allowable headwater, with respect to adjacent property and floodplain concerns.

Bridge waterway design shall maintain the existing channel morphology through the structure, if possible.

I. Connector Road over Shields Brook Bridge

This structure shall be designed so that a minimum of 1' of freeboard exists while passing the flows of the Q_{100} storm event.

II. Tsienneto Road over Tributary E Bridge

This structure shall be designed so that a minimum of 1' of freeboard exists while passing the flows of the Q_{50} storm event. In addition, it shall be designed so that the roadway does not overtop while the structure passes the flows from the Q_{100} storm event. A weir structure shall be installed by the Design-Builder downstream of the crossing to help prevent the wetland area upstream of the bridge from draining. The weir structure shall be included in the hydraulic evaluation of the bridge.

III. Wheeler Brook at the Interchange 4A Southbound On-Ramp

Flows from Wheeler Brook shall be carried in an open channel along the west toe of slope of the southbound on-ramp and directed to the closed system installed beneath I-93 NB and SB as part of the I-93 widening project. The open channel shall be designed for the flows of the Q_{50} storm event. This constitutes a realignment of Wheeler Brook. Design of the Wheeler Brook channel modifications shall be done to meet the environmental commitments listed in Section 6.5 and are intended to meet "self-mitigating" requirements in ENV-WT 900

D. Bridge Deck Drainage

Runoff from bridge decks passing over roadways shall be carried off the bridge and into the adjacent roadway drainage system where possible. The roadway drainage design shall include bridge approach drains to intercept gutter flow at each end of the bridge. Stormwater flowing toward the bridge shall be intercepted upstream from the approach slab.

NHDOT will not accept open deck drains in the final design. Bridge deck drainage shall be accomplished by means of longitudinal grading to direct flow off the bridge structure into the roadway drainage system.

E. Drainage Report for Major Stream Crossings

Design-Builder shall prepare a report for all new structures. The report shall include the detailed calculations and electronic and printed copies of the computer software input and output files, as well as a discussion about hydrologic and hydraulic analysis and reasons for the design recommendations. At a minimum, for each crossing the report shall include:

F. Hydrology

I. Drainage area maps with watershed characteristics, hardcopy

II. Hydrologic calculations (where computer software is used, both hardcopy and electronic input and output files)

III. Historical or site data used to review computed flows

G. Hydraulics and Recommended Waterway Opening and/or Structure

I. Photographs of Site (pre- and post-construction)

II. General plan, profile, and elevation of existing and proposed waterway opening and/or structure

H. Scour Analysis

I. Channel cross-sections at bridge showing predicted scour

II. Calculations and summary of calculations, clearly showing predicted scour and assumptions regarding bridge opening and piers used to calculate predicted scour

III. Discussion of review of long-term degradation/aggradation and effects

IV. Recommendation for abutment protection

These reports shall be part of the Drainage Design Report.

7.7.4. Construction Requirements

Design-Builder shall design drainage to accommodate construction staging. The design shall include temporary erosion control ponds and other Best Management Practices needed to satisfy the NPDES and other regulatory requirements. The water resources notes in the plans shall include a description of the drainage design for each stage of construction. Pipe installation shall follow requirements in 2016 NHDOT Standard Specification Section 603.

7.7.5. Deliverables

Design-Builder shall submit to NHDOT, as part of the Record Drawings, a Drainage Design Report, which shall be a complete documentation of all components of the Project's drainage system. At a minimum, the Drainage Design Report shall include:

A. Record set of all drainage computations, both hydrologic and hydraulic, and all support data.

B. Hydraulic notes, models, and tabulations

C. Storm sewer drainage report

D. Bridge and culvert designs and reports for major stream crossings for all new structures

E. Correspondence file

F. Drainage system data (location, type, material, size, and other pertinent information) in a suitable electronic format

Design-Builder shall submit an as-built topographic plan at completion of the work to be included in the LOMR.

7.8. **Structures**

7.8.1. Interchange 4A over I-93 NB & SB Bridge

7.8.1.1. *Roadway Clearances*

Bridge span lengths and roadway clearances shall be provided or greater than as shown on the BTC Plans, including the TS&L Report for this bridge. Minimum vertical clearance over the travel way of I-93 shall be 16'-6". Minimum vertical clearance over the future light rail corridor in the median of I-93 shall be as specified on the BTC Plans. Abutment structures shall be located so that the face of abutments or supporting walls maintain at least a 34' clear zone from the nearest edge of the I-93 travel way.

7.8.1.2. *Design Requirements*

A. All bridge components shall be designed in accordance with the most current AASHTO LRFD Bridge Design Specifications, including interims, and NHDOT Bridge Design Manual (BDM), as appropriate, at the date of the Technical and Price Proposal submission. The order listed will be the order of importance if a conflict occurs. Design-Builder may ask for clarification between documents.

B. The bridge design shall follow the requirements of the Environmental Commitments in Section 6.5 and in all permits. The structures as shown on the BTC meet these requirements.

C. Live load deflection criteria shall be per AASHTO Bridge Design Specifications, Section 2.5.2.6.2, for facilities with pedestrians and BDM version 2.0 (2015) Section 4.3.5D.

D. All welding and fabrication shall be performed in conformance with the current AASHTO/AWS D1.5 Bridge Welding Code, as amended, and NHDOT Standard Specifications.

E. Changes to the roadway cross section configuration on the bridge from those depicted on the BTC plans and outlined in the Project Engineering Report requires approval by NHDOT through the ATC process.

F. Construction of the Interchange Bridge shall be performed to minimize impacts to traffic on I-93 below. Work at the bridge shall be in accordance with the Traffic Management

Plan and Traffic Control Plans prepared as described in Section 7.12.

G. The bridge structures shall be load rated using the Load and Resistance Factor Rating method in accordance with the current AASHTO Manual for Bridge Evaluation. Load ratings shall also be performed in accordance with Chapter 12 of the BDM v 2.0 (2015) and NHDOT Form 4 shall be submitted with final design calculations.

H. Design and construction of a crash wall to meet the pier protection requirements of the AREMA Manual for Railway Engineering for the future rail are not required under this Contract. The final design shall not preclude the installation of a crash wall under a future contract to meet the requirements for pier protection of AREMA.

7.8.1.3. *Materials*

A. Structural steel shall conform to the requirements of AASHTO M270 (ASTM A709). All structural steel shall be coated with a Duplex Coating – Metallizing and Sealer in accordance with the Project Special Provisions.

B. High-strength bolts for use with metallized steel shall be galvanized.

C. Stainless steel deck reinforcement shall be solid stainless-steel conforming to ASTM A 955, of one of the following types:

   a. AISI 316 (UNS S31600)

   b. AISI 316LN (UNS S31653)

   c. UNS S32304

   d. UNS S32101

   e. UNS S32205

D. Epoxy coated deck reinforcement shall conform to Section 544 – Reinforcement For Concrete of the 2016 NHDOT Standard Specification for Road and Bridge Construction.

E. Bridge railing shall be T3 steel bridge rail with Protective Screening in accordance with NHDOT Bridge Detail Sheets at brush curbs and shall be T4 steel bridge rail with Protective Screening in accordance with NHDOT Bridge Detail Sheets at sidewalks.

7.8.1.4. *Superstructure Features*

A. Future deck maintenance and replacement shall be a design consideration, as well as impacts to the interchange ramps. The preferred superstructure type is shown on the BTC plans. A two-span multiple pre-stressed concrete girder section with composite deck was evaluated during the BTC design phase, which resulted in a superstructure depth deeper than with steel girders, which impacted the height of the bridge and lengthened the interchange ramps and is not considered part of the BTC.

B. The bridge deck shall be a solid concrete deck using pre-stressed partial-depth concrete deck panels between the girders.

C. Construction joints shall be minimized to the extent practicable. No experimental or previously unapproved materials will be allowed without prior written approval from

NHDOT.

D. Bridge decks with membrane and pavement, including brush curbs and sidewalks, shall provide a minimum of 2 ½ inches of clear cover over the top mat of reinforcing steel, unless noted otherwise.

E. Brush curbs and sidewalks shall be constructed entirely of concrete. The use of granite curb shall not be allowed.

F. Empirical deck designs, as provided in AASHTO Bridge Design Specifications Section 9.7.2, shall not be allowed.

G. Reinforcing steel for decks with barrier membrane and pavement shall be epoxy-coated or solid stainless steel. Reinforcing steel for bare concrete decks shall be solid stainless steel unless additional cover is provided as noted in the Bridge Design Manual. The top ½ inch of bare decks shall be considered as a sacrificial wearing course.

H. Bare concrete decks shall have a surface finish in conformance with NHDOT Special Provision for Item 628.5. The installation of a bare concrete deck for this superstructure will not require submittal of an ATC provided the final design complies with all NHDOT requirements including those specified in the Bridge Design Manual.

7.8.1.5. *Substructure Features*

A. Bridge Substructures shall be evaluated in accordance with Chapter 6 of the NHDOT BDM.

B. The pier shall be located as shown on the BTC Plans. Acceptable pier types are limited to concrete multi-column bent, concrete hammerhead, and concrete wall pier.

C. The use of integral abutments was eliminated during preparation of the BTC due to existing geotechnical information (relatively shallow existing rock) which indicated that the proposed bridge site was unsuitable for integral abutments. The use of MSE Wrap Abutments supporting stub abutments was evaluated during preparation of the BTC. It was determined that stub abutments would need to be pile-supported.

D. Abutment wingwalls shall be designed in accordance with Section 6.5.2 of the Bridge Design Manual.

E. Stub abutments perched behind MSE walls shall be pile supported.

7.8.2. Pedestrian/Bike Path under the Connector Road

7.8.2.1. *Roadway Clearances*

The length and width of the pedestrian/bike path crossing under the Connector Road and roadway clearances shall be as shown or greater than as shown on the BTC plans, including the TS&L Report for this bridge, and as specified in the Project Engineering Report. The minimum vertical clearance from the paved bike path to the bridge superstructure, lighting or signage attachments shall be as specified in the BTC Plans. The minimum horizontal width inside the underpass shall be as specified in the TS&L report for the bridge and the Project Engineering Report.

7.8.2.2. *Design Requirements*

A. All bridge components shall be designed in accordance with the AASHTO LRFD Bridge Design Specifications, including interims, and NHDOT BDM, as appropriate, at the date of the Technical Proposal submission. The order listed will be the order of importance if a conflict occurs. Design-Builder may ask for clarification between documents.

B. Joints in the underpass structure shall be weather tight and prevent water penetration, including any water that may freeze to form icicles or ice patches on the pathway surface during storm events and colder weather. Shear keys shall be provided in conformance with Special Provision 529.002XX.

C. The bridge design shall follow the requirements of the Environmental Commitments in Section 6.5.14 and in the permits.

D. The bridge structures shall be load rated using the Load and Resistance Factor Rating method in accordance with the current AASHTO Manual for Bridge Evaluation. Load ratings shall also be performed in accordance with Chapter 12 of the BDM and NHDOT Form 4 shall be submitted with final design calculations.

E. Construction of the bridge shall be completed such that at least one lane of access to Madden Road in each direction along North High Street/Folsom Road is maintained at all times. Work at the bridge shall be in accordance with the Traffic Management Plan and Traffic Control Plans prepared as described in Section 7.12.

F. Design, detailing and construction of the structure shall provide lighting as required by Section 7.13.

7.8.2.3. *Superstructure Features*

A. The underpass structure shall be as shown on the BTC. Concrete head walls shall be designed and constructed for loading from the bridge guardrail mounted to the head walls shown in the BTC plans for this bridge...

B. Interior and exterior lighting of the underpass shall be installed in accordance with Section 7.13.

C. Lighting within the underpass shall be surface mount/vandal proof lighting including all associated conduits, pull boxes and other appurtenances. The style of lighting will be chosen in consultation with the Town of Derry.

7.8.2.4. *Substructure Features*

A. Wingwalls at the four abutment corners shall be provided as shown on the BTC plans and shall be designed in accordance with Section 6.5.2 of the BDM.

B. In order to provide a uniform bearing material, it is required that the Design-Builder over excavate bedrock, as needed, below the structure and replace it with a minimum layer of structural fill. The thickness of the structural fill layer shall be as shown on the BTC plans or as specified by the Design-Builder in the geotechnical report for this structure.

C. All exposed surfaces of the wingwalls shall have a formlined architectural finish as determined by the DOT in consultation with the Town of Derry. Refer to Section 7.9.2.2 of

the Technical Provisions for additional requirements related to the architectural treatments.

D. The buried structure shall be backfilled to the finished rail trail grade with subbase materials and pavement as specified in Section 7.6.

E. The drainage system at the rail trail through the underpass shall be designed to minimize entrance of stormwater or meltwater into the underpass structure and so that water within the underpass structure drains to the outside of the structure.

F. Cutoff walls are not required on this structure if constructed in conformance with the BTC.

7.8.3. Connector Road over Shields Brook Bridge

7.8.3.1. *Roadway Clearances*

The length and width of the bridge shall be equal to or greater than that shown on the BTC plans, including the TS&L report for this bridge, and in the Project Engineering Report unless approved by NHDOT through the ATC process. The span length shown meets the applicable NHDES Stream Crossing Requirements. A minimum 1'-0" freeboard shall be maintained at the crossing at Q_{100} flows.

7.8.3.2. *Design Requirements*

A. All bridge components shall be designed in accordance with the AASHTO LRFD Bridge Design Specifications, including interims, and NHDOT BDM, as appropriate, at the date of the Technical Proposal submission. The order listed will be the order of importance if a conflict occurs. Design-Builder may ask for clarification between documents.

B. The bridge design shall follow the requirements of the Environmental Commitments in Section 6.5.

C. The bridge structures shall be load rated using the Load and Resistance Factor Rating method in accordance with the current AASHTO Manual for Bridge Evaluation. Load ratings shall also be performed in accordance with Section 12.3 of the Bridge Design Manual v 2.0 (2015) and NHDOT Form 4 shall be submitted with final design calculations.

D. Construction of the bridge shall be completed in phases such that one lane in each direction is maintained on North High Street/Folsom Road at all times. Access to Ferland Drive shall be maintained throughout construction. Work at the bridge shall be in accordance with the Traffic Management Plan and Traffic Control Plans prepared as described in Section 7.12.

7.8.3.3. *Superstructure Features*

A. The bridge shall be as shown in the BTC plans. Superstructure options evaluated during design of the BTC included steel girders with composite concrete deck; precast, prestressed concrete voided slabs; and NEXT Beams. The preferred option is steel girders with composite concrete deck and shall constitute the BTC. The close vertical clearance of steel girders to channel flows requires metalizing of the steel girders.

B. Bridge rail shall be as shown on the BTC plans. The superstructure shall be designed for impact loads to the guardrail at all stages of construction.

7.8.3.4. *Substructure Features*

A. Wingwalls at the four abutment corners shall be designed in accordance with Section 6.5.2 of the NHDOT BDM.

B. Existing geotechnical information indicates shallow bedrock at the proposed abutment locations for the bridge, with localized material that may be unsuitable to support spread footings. The Design- Builder shall excavate any unsuitable material within the influence zone of the abutment footings and replace it with structural fill or equivalent.

C. Semi-integral abutments on spread footings are preferred and shall constitute the BTC. The use of pile-supported cantilevered and integral abutments were not chosen during the BTC process due to the presence of shallow bedrock.

7.8.4. Tsienneto Road over Tributary E Bridge

7.8.4.1. *Roadway Clearances*

The length and width of the bridge shall be provided or greater than as shown on the BTC plans, including the TS&L report for this bridge, and in the Project Engineering Report unless approved by NHDOT through the ATC process. The span length shown meets the applicable NHDES Stream Crossing Requirements. A minimum 1'-0" freeboard shall be maintained at the crossing at Q_{50} flows, and Q_{100} flows shall pass through the bridge without overtopping the roadway.

7.8.4.2. *Design Requirements*

A. All bridge components shall be designed in accordance with the most current AASHTO LRFD Bridge Design Specifications, including interims, and NHDOT BDM, as appropriate, at the date of the Technical Proposal submission. The order listed will be the order of importance if a conflict occurs. Design-Builder may ask for clarification between documents.

B. Design-Builder shall install a weir downstream of the bridge at the elevation specified in the BTC plans and TS&L report for this bridge in order to maintain existing upstream water surface elevations up to and including the 2-year event. A low-flow channel shall be built into the weir structure to accommodate fish passage. This weir shall be accounted for in the hydraulic evaluation of the proposed bridge.

C. The bridge design shall follow the requirements of the Environmental Commitments in Section 6.5.

D. The bridge structures shall be load rated using the Load and Resistance Factor Rating method in accordance with the current AASHTO Manual for Bridge Evaluation. Load ratings shall also be performed in accordance with Section 12.3 of the BDM and NHDOT Form 4 shall be submitted with final design calculations.

E. Construction of the bridge shall be completed to minimize traffic disruption on Tsienneto

Road and NH 102. The BTC plans show installing the bridge using phased construction, with one lane of westbound traffic maintained on Tsienneto road throughout construction and eastbound traffic detoured via Bypass 28 and NH 102. The Town of Derry has authorized a temporary full closure of this section of Tsienneto Road to support replacement of this bridge. See the limitations for this full closure in Section 7.12. Work at the bridge shall be in accordance with the Traffic Management Plan and Traffic Control Plans prepared as described in Section 7.12.

7.8.4.3. *Superstructure Features*

A. The bridge superstructure of the BTC plans is a butted precast pre-stressed concrete slabs with a variable thickness concrete overlay. The use of steel girders with a composite concrete deck was evaluated during the BTC design, but steel was not the preferred option due to the need to metalize and the very heavy steel sections required to meet the hydraulic clearance and live load deflection limits.

B. Bridge rail shall be as shown in the BTC plans. The superstructure shall be designed for impact loads to the guardrail at all stages of construction.

7.8.4.4. *Substructure Features*

A. The BTC substructure is concrete semi-integral abutments supported by concrete spread footings. Use of pile-supported abutments was deemed unsuitable due to the presence of shallow bedrock.

B. Wingwalls at the four abutment corners shall be designed in accordance with Section 6.5.2 of theBDM.

C. Abutment and wingwall footings shall be designed for frost depth and scour depth in accordance with the BDM.

7.8.5. Retaining Walls (Non-Bridge Structures)

Design-Builder shall construct retaining walls at the nine (9) locations identified in Section 3 of the Project Engineering Report and at other locations identified as requiring retaining walls based on the Design-Builder's final design plan submittals. Design submittals showing at least type, size and location for each retaining wall on the project shall be included with ALL design submittals for each roadway segment that each retaining wall is located within.

7.8.5.1. *Retaining Wall at Tsienneto Road Station 1155+25 to 1156+25, Rt*

A. A retaining structure shall be installed as needed to minimize or eliminate disturbance to the existing tree line on parcel 148.

B. Design-Builder shall design the retaining structure in accordance with Section 6.5 of the NHDOT Bridge Design Manual v 2.0 (2015).

C. The retaining structure type shall be as detailed in the Project Engineering Report and shall be coordinated with the landowner The Design-Builder must demonstrate the wall type proposed is constructible without disturbing the existing trees, including root structure, on the property, including disturbances from temporary excavations.

7.8.5.2. *All other Retaining Walls*

A. Design-Builder shall design the retaining wall structures in accordance with Section 6.5 of the NHDOT Bridge Design Manual v 2.0 (2015).

B. Retaining walls shall be constructed to match the aesthetics of other retaining structures in the project area where possible. Recent projects to improve the sidewalks along Tsienneto Road installed retaining walls using modular precast concrete blocks with split face exposed surfaces. Nominal block face dimensions for those projects were approximately 16” wide by 8” high. All walls shall be constructed with the same style modular block wall from the same manufacturer.

7.8.6. Overhead Sign Structure Foundations

A. Overhead sign structure foundations shall be constructed at the locations described in the Project Engineering Report.

B. Overhead sign structure foundations shall be designed by the Design-Builder in accordance with Section 10.3 of the NHDOT Bridge Design Manual v 2.0 (2015).

C. Bridge-Mounted sign supports shall be designed in accordance with Section 10.4 of the NHDOT Bridge Design Manual v 2.0 (2015).

D. A minimum of one test boring shall be performed at each uninvestigated overhead sign structure foundation location.

7.8.7. Signal Mast Arm Foundations

A. Signal mast arm foundations shall be evaluated in accordance with Section 10.5 of the NHDOT Bridge Design Manual v 2.0 (2015) and the NHDOT Special Details for Traffic Signal Mast Arm Foundations.

B. A minimum of one test boring shall be performed at each uninvestigated signal mast arm location.

7.8.8. Closed Circuit Television Pole Foundations

A. Closed circuit television pole foundations shall be designed and constructed in accordance with Section 10.6 of the NHDOT Bridge Design Manual v 2.0 (2015) and the NHDOT CCTV Pole Foundation Sheets (2018).

7.8.9. Soundwalls

A. Soundwalls shall be designed and installed at the locations specified in Section 10 of the Project Engineering Report and as shown on the BTC plans.

B. Design of the soundwall limits, dimensions and top of wall profile shall be coordinated with the final noise analysis and shall meet the environmental commitments of the Project. See Section 6.5.2 for additional information.

C. Soundwall type, materials and construction shall be in accordance with NHDOT Bridge Detail Sheets – Soundwalls, copies of which are provided in the Reference Information.

D. Soundwall foundations shall be evaluated in accordance with Section 10.7 of the NHDOT Bridge Design Manual v 2.0 (2015).

E. Reference 6.5 Environmental Section for additional requirements.

7.9. **Aesthetics and Landscaping**

This Section 7.9 defines requirements with which Design-Builder shall design and construct aesthetic treatments for the structures and landscaping elements of the Project.

The Design-Builder is required to develop the Project in compliance with the Environmental Commitments in Section 6.5.

7.9.1. Administrative Requirements

This Section 7.9.1 presents minimum aesthetics and landscape design requirements for Project designs. For purposes of this Section 7.9.1, the following list of items will be considered the aesthetics elements of the Project design:

A. Material, finish, color, and texture of bridge elements

B. Finish, color, and texture of retaining walls

C. Fencing

D. Trees, shrubs, and other plant material

7.9.1.1. *Aesthetics and Landscaping Plan*

Design-Builder shall prepare an Aesthetics and Landscaping Plan for approval by NHDOT, in its good faith discretion. Design-Builder shall base this presentation on the principles, requirements, and strategies provided in Section 7.9.2 (Design Requirements). This Aesthetics and Landscaping Plan shall provide guidelines and requirements for the aesthetics design of the Project. In addition, the Design-Builder shall prepare the stream restoration landscaping plan that is detailed in the Wetland Mitigation and Monitoring Plan provided with the Wetland Permit Application.

7.9.2. Design Requirements

7.9.2.1. *Aesthetics Principles and Strategies*

Design-Builder shall follow the guidelines and requirements of the approved Aesthetics and Landscaping Plan, including the following:

A. The Project design shall minimize impact on the existing natural environment to the extent possible.

B. All bridges and other structures shall match the design and aesthetics depicted in the BTC plans. Any deviations to the aesthetics of bridges and structures shall be as is depicted on an approved ATC submittal.

C. Graphics, signage, and lighting shall be consistent within the Towns of Derry and Londonderry and consistent in the I-93 corridor with NHDOT requirements and the design of similar installations between Exits 4 and 5.
D. Existing trees shall be preserved to the greatest extent possible.
E. Native-area and/or naturalized plant materials that exhibit good drought tolerance shall be used.
F. Aesthetic elements shall be easy to maintain and resistant to vandalism and graffiti.

7.9.2.2. *Bridges and Other Structures*

All aesthetic treatments for structural elements shall be coordinated with Design-Builder's structural design team to facilitate constructability and maintain safety requirements.

The Pedestrian/Bike path under the Connector Road structure shall be constructed of precast concrete box sections and precast or cast-in-place concrete wingwalls. All exposed vertical surfaces of the wingwalls at final condition shall have a formlined architectural finish determined by the DOT in consultation with the Town of Derry. A depiction of the stone pattern from the manufacturer or a photograph of that stone pattern installed at another similar project shall be included in the project Aesthetics and Landscaping Plan.

All retaining walls not part of a bridge structure shall be constructed such that the exposed vertical concrete surfaces of the wall at final condition are aesthetically treated as described in Section 7.8.5

Unless specified elsewhere in the Technical Provisions, exposed surfaces of abutments and piers for all structures, including the Interchange 4A Bridge over I-93 NB and SB, shall be as is stated in the TS&L reports and as depicted on the BTC plans.

7.9.2.3. *Trees, Shrubs, and Other Plant Materials*

All trees, shrubs, deciduous vines, and perennials shall comply with the applicable requirements of *ANSI Z60.1 American Standard for Nursery Stock*. Design-Builder shall consult with NHDOT for recommended plant species lists.

New vegetation screening/plantings shall be installed to replace brush removed as part of construction activities at the corner of Tsienneto Road and Scenic Drive on parcel 147 (E.F. Adams House) and shall be coordinated with the property owner. Details of these plantings shall be included in the project Aesthetics and Landscaping Plan.

Plantings on the grass median of the Connector Road, if installed, shall be coordinated with the Town of Londonderry. Any landscaping, including landscape screening of water quality basins, shall be included in the project Aesthetics and Landscaping Plan. Costs associated with the design, furnishing, installation and maintenance of ~~this~~ any landscaping installed on the Connector Roadway, including on the grass median, will need to be included in and be paid for under a third party agreement between the Design-Builder, the Town of Londonderry and the Developer of the adjacent parcels of land.

7.9.3. Construction Requirements

Design-Builder shall construct aesthetics and landscaping on the project in accordance with the project Aesthetics and Landscaping Plan.

7.9.4. Deliverables

7.9.4.1. *Aesthetics and Landscaping Plan*

Design-Builder shall submit the Aesthetics and Landscaping Plan and the stream restoration landscaping plan to NHDOT for review.

7.10. **Traffic**

7.10.1. General Requirements

This Section 7.10 includes requirements with which Design-Builder shall design, construct, and maintain all signing, signals and pavement markings within the Project limits, for the duration of the Project. Design shall be in accordance with the 2009 MUTCD with the 2012 supplement in effect at the time of price proposal, which will be considered the current design criteria.

Design-Builder shall arrange and coordinate all meetings with requesting agencies.

7.10.2. Design Requirements

7.10.2.1. *Permanent Signing*

The Work shall include traffic sign plans and installation as required by the NHDOT and MUTCD criteria and as specified in the Project Engineering Report. Design plans shall include a layout of the new permanent signing required, a sign legend, structural and foundation details and associated details for manufacturing and installation. The Design-Builder is also responsible for all design and construction related to modifying existing traffic signs on the approaches and adjacent roadways including Interstate 93 due to the construction of the Project.

The Design-Builder shall provide all Overhead Sign Structures, CCTV poles, RWIS and non-invasive pavement sensor system supports and their foundations in accordance with the *AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.* All other sign supports and foundations shall be provided in accordance with the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. The Design-Builder shall provide protection for the sign structures as required. Additional direction for Overhead Sign Structures and their foundations is provided in Section 7.8.6. Two-mile advanced guide signs for Exit 4A are not to be installed as part of the Project.

Design-Builder shall design and install all signs and structural supports as shown on the Final Design Plans. Signs include new signs, as well as modifications to existing sign panels and structures. Design-Builder's design shall include the locations of all ground and structure mounted signs, graphic representation of all signs, guide sign and special sign details, and structural and foundation requirements. Signs shall be located in a manner that avoids conflicts with other signs, larger vehicles, pedestrians and bicycles, driver sight lines, vegetation, lighting, and structures.

Design-Builder shall ensure that signs are clearly visible, provide clear direction and information for users, and comply with all applicable MUTCD requirements.

Lane use signs are required in advance of all intersections. Overhead regulatory lane use signs shall be required in advance of all intersections with 5 or more approach lanes. Lane use signs must be mounted to an overhead sign structure, mast arms or span wires. Span wire supported signs shall be limited to locations where the geometry of the intersection precludes the use of an overhead sign structure or mast arms. Ground mounted signs may be proposed where overhead signs are either impractical or ground mounted signs would provide a benefit over overhead signs. NHDOT reserves the right to require overhead signs in lieu of any proposed ground mounted signs.

Design-Builder shall review with NHDOT and applicable local agency all requests for new signs, or modifications of existing sign text. Such requests are subject to NHDOT's and local agency approval.

Permanent street name signs shall be in accordance with the local standards of the Towns and must meet the MUTCD requirements if they are within the ROW.

Design-Builder's design of delineators and object markers shall comply with MUTCD and NHDOT requirements.

A. Sign layout and wording recommended by the Designer shall be provided for review and feedback by NHDOT Bureau of Traffic as well as the Towns of Derry and Londonderry prior to final approval.

B. Permanent sign design shall follow the current MUTCD and Standard Highway Signs (SHS) Manual based on the following:

    i. Interstate and interstate interchange signage shall follow the Freeway guidance using the Intermediate Interchange column and Overhead column as appropriate.

    ii. Overhead signs on the connector roadway and conventional roads shall follow the Expressway guidance under the Intermediate column, NOT the overhead column, to be consistent with other similar roadways in NH.

    iii. Mast-arm street name signs shall follow the guideline provided by NHDOT.

    iv. Ground-mounted signage on connector roadway and conventional roads shall follow the current MUTCD and SHS guidance for conventional roadways.

7.10.2.2. *Traffic Signals*

The work shall include installing 2 signalized intersections at the Exit 4A Interchange, 5 new signalized intersections along the Connector Road, Folsom Road, Tsienneto Road and Route 102 and modifying the existing signalized intersections at Tsienneto Road with Route 28 and the Route 28 Bypass.

The documents “Traffic Signal Plan Review Checklist, Dated 02-13-2019” and “Guideline for Synchro Inputs, Dated 02-13-2019” have been provided in the RID to assist the Design-Builder in the design of traffic signals and signalized intersections to typical NHDOT standards.

Traffic signals along with their supporting poles, mast arms, foundations and associated equipment shall be designed in accordance with the NHDOT and MUTCD requirements. Design-Builder shall prepare Traffic Signal Plans for each signalized intersection of the Project that include traffic signal equipment layout, traffic signal phasing diagram, traffic signal head diagrams, and summary of signal equipment. Span wire mounted permanent signal heads are not allowed as part of this Project.

The traffic signals along the project shall be hardwired interconnected as described below and coordinated as follows:

A. The two Exit 4A interchange signals shall be interconnected coordinated and include interconnect two 4” conduit.

B. 2 4” schedule 80 sleeves with pull wire shall be installed across Connector Road from north to south for use by future development. DB team to coordinate with local land use board as described in Section 7.6.2.6 prior to installation.

C. The Connector Road and North High Street intersection signals shall be interconnected and coordinated with the signals at the Connector Road and Franklin Street.

D. The signals at the intersection of Folsom Road and Route 28 shall be interconnected with the signals at the intersection of Tsienneto Road and Pinkerton Street.

E. The signals at the intersection of Tsienneto Road and Route 102 shall be interconnected with the signals at the intersection of Route 102 and North Shore Road.

Signal mast arm locations and associated signal equipment (controllers, pull boxes, etc.) shall be located behind the sidewalks where sidewalks are present. Face of pole or equipment shall be 7’ behind curb or 10’ beyond the edge of pavement unless otherwise approved by NHDOT. Signal mast arms and signal poles shall be galvanized and designed in accordance with NHDOT standard specifications. Luminaire arms may be installed on signal poles, if required by the accepted lighting design, at signalized intersections as directed by the NHDOT and local agency.

Accessible Pedestrian Signal push buttons and signal poles shall be present and accessible from sidewalks at all intersections where pedestrians are being accommodated in accordance with the MUTCD and ADA accessibility guidelines

Detectible warning panels shall be cast iron and in accordance with NHDOT specifications and shall be installed at all pedestrian ramps at signalized and unsignalized intersections, and at public ways. Locations where detectible warning panels are to be provided shall be determined in accordance with the NHDOT design policies, including the Detectible Warning Device (DWD) Decision Making Flowchart, which is provided in the Reference Information for this project.

The preferred design for pedestrian phases at signal intersections is that the pedestrian phases operate concurrent with adjacent through traffic with a leading pedestrian interval. Pedestrian signal phases would be push button actuated and not operate in recall mode unless specified by the NHDOT or local agency.

Pull boxes are not permitted to be installed within the limits of HMA sidewalks.

Public access into the police department facility at the Municipal Drive and Folsom Road intersection from eastbound lanes and emergency vehicle access to eastbound lanes of Folsom Road from the police department facility shall be coordinated with input from the Town of Derry police department. The size of the opening in the raised median at Folsom Road and Municipal Drive or the installation of alternate access to the police department facility shall be coordinated between the Design-Builder and all affected parties early in the design process.

Signals at Uncontrolled Pedestrian crossings shall be designed for the following:

Install Pedestrian Hybrid Beacons per MUTCD guidelines (when met)

Install Rapid Flashing Beacon's for a) crossing more than a single lane in a given direction; b) crossing 40+ mph streets (design speed or speed limit); c) AADT >7,000 veh/day; d) if there are other RRFB's within the corridor; or e) uncontrolled crosswalks at multilane roundabouts

RRFB's to comply with FHWA Interim Approval 21, IA-21, or as amended, or superseded by a new IA or new version of MUTCD.

Design-Builder shall ensure that all signal equipment is located within the established ROW and/or permanent easements.

Pre-emption devices shall be provided in conformance with the specifications provided in the reference information.

Video detection shall be used on all signalized intersections included in the Project. For the Exit 4A interchange signals, 360° fisheye lens camera detection is required. In order to maintain consistency of performance for signals on the project, the same video/camera detection requirements, including 360° fisheye lens camera detection, shall be applicable to all other traffic signals on the Project. See Special Provision Amendment to Section 616 – Traffic Signals for the project included in Volume 2 Book 3.

7.10.2.3. *Third-Party Signs*

Design-Builder shall relocate existing third-party signs, including logo signs, Tourist-Oriented Directional Signs and General Service Signs, if present. Design-Builder shall coordinate and cooperate with any third party when performing such work.

7.10.2.4. *Sign Support Structures*

Design-Builder shall determine foundation types and design sign foundations based upon geotechnical surveys/tests using good industry practices.

Design-Builder shall design support structures to provide a vertical clearance with the roadway of not less than 21'-0".

Sign supports shall have breakaway mounts.

7.10.2.5. *Permanent Pavement Markings*

The Design-Builder shall be required to design and install pavement markings in accordance with the MUTCD, NHDOT and AASHTO guidance (guidelines, standards, details and specifications).

For I-93 all pavement markings shall be paint except as shown on NHDOT Standards or Details.

All other roadway pavement Markings material for all words, symbols, and transverse markings (crosswalks. Stop lines, etc) shall be thermoplastic (not paint). All lane lines and gores shall be thermoplastic. Lines between adjacent gore areas shall be thermoplastic. These materials shall meet NHDOT specifications.

7.10.2.6. *Temporary Pavement Marking*

The Design-Builder shall be required to design and install pavement markings in accordance with the MUTCD, NHDOT and AASHTO guidance (guidelines, standards, details and specifications).

Temporary pavement markings used for traffic management shall be designed and installed in accordance with MUTCD and NHDOT standards. The Design-Builder is responsible to obliterate conflicting markings and maintain temporary pavement markings such that they are visible to traffic at all times and do not cause driver confusion through any portion of the Project or any area directly adjacent to the Work area. If needed, temporary pavement markings may extend past the physical work limits and it is the responsibility of the Design-Builder to satisfactorily re-stripe these areas upon completion of the Project. Temporary pavement markings shall not be used on final wearing course.

7.10.3. Construction Requirements

7.10.3.1. *Permanent Signing*

Design-Builder shall use established industry and utility safety practices to erect and remove signs located near any overhead or underground utilities, and shall consult with the appropriate Utility Owner(s) prior to beginning such Work.

7.10.3.2. *Permanent Pavement Markings*

Design-Builder shall provide NHDOT a field layout indicating the proposed location of any permanent pavement markings for field review two weeks in advance of any marking.

- *For pavement marking plans, the following notes shall be included:*

PAVEMENT MARKING NOTES

1. ALL SYMBOLS, WORDS, TRANSVERSE MARKINGS (STOP BARS, CROSSWALK LINES, AND RAILROAD SYMBOLS), LANE LINES AND ALL OTHER MARKINGS NOTED WITH (T) SHALL BE THERMOPLASTIC.

2. THE CONTRACTOR SHALL CONTACT JULIE MATHEWS AT THE NHDOT BUREAU OF TRAFFIC AT (603)271-8011 TWO WEEKS PRIOR TO PAVEMENT MARKING.

3. REPLACE WORDS/SYMBOLS PER LATEST NHDOT STANDARD PLAN SHEETS.

4. PAVEMENT MARKINGS SHALL EXTEND BEYOND PROJECT PAVING LIMITS TO OVERLAP EXISTING MARKINGS DISTURBED BY CONSTRUCTION.

Town of Derry

Design-Builder shall use thermoplastic line markings and symbols at all roadways maintained by the Town of Derry.

Town of Londonderry

Design-Builder shall use thermoplastic line markings and symbols at all roadways maintained by the Town of Londonderry.

State-Maintained Roads (I-93, Route 102, Route 28)

Line markings on State-maintained roads shall be paint except as shown on NHDOT Standards or Details.

7.10.3.3. *Temporary Pavement Markings*

7.10.3.3.1. I-93

Temporary tape shall not be applied to surfaces of I-93 during the winter season.

Tapers for lane shifts must be marked and must meet the geometric requirements of the MUTCD and NHDOT standard practices.

Temporary eradications shall be by grinding.

Temporary lines striping shall be using paint or tape, except as noted in Section 7.10.3.3.1 and shall meet MUTCD standards.

Final paved surfaces must be free of damage to the satisfaction of the Engineer at the end of each phase of construction. Final paved surfaces must be free of damage from construction prior to opening the Exit 4A interchange.

7.10.3.3.2. Folsom Road and Connector Road

Temporary pavement markings may be paint, on binder only, with refresh as needed. No paint shall be applied where thermoplastic is to be installed at final condition. Temporary pavement markings shall be refreshed up to two times per year or as directed by the Engineer, including just prior to winter operations.

7.10.4. Deliverables

All deliverables shall be presented to NHDOT in electronic form compatible with NHDOT software. Plan deliverables shall be compatible with MicroStation. Signal models shall be submitted in Synchro. SignCAD files shall be provided.

7.10.4.1. *Permanent Signing*

Design-Builder shall provide a sign layout plan package including a layout of the new permanent signing required, a sign legend, and structural and foundation details for each sign to NHDOT for review. A draft submission of the sign layout plan package shall be submitted early in the project in order to aid in determining the ROW impacts of the signs.

Before placing any permanent signs, third-party signs, or non-standard sign structures, Design-Builder shall stake each sign location in the field and provide NHDOT 72 hours' notice prior to installation of any sign.

7.10.4.2. *Traffic Signals*

Design-Builder shall submit complete Traffic Signal Plans to NHDOT for review (see Traffic Signal Checklist).

7.10.4.3. *Pavement Markings*

7.10.4.3.1. Temporary

Design-Builder shall submit temporary pavement marking plans, as part of a construction traffic control plan submittal, to the NHDOT two weeks in advance of any project work that requires a modification to the existing pavement markings.

7.10.4.3.2. Permanent

Permanent pavement markings shall be submitted for review with the Project Design Plans.

7.11. Intelligent Transportation Systems (ITS)

7.11.1. General Requirements

Design-Builder shall design and construct the Project, in conformance with the requirements stated in this Section 7.11, to provide for the following work.

Install a new CCTV camera on the overhead sign structure at STA 1010+00 RT. The camera shall be installed on a parapet mount meeting the requirements in Special Provision 677. The CCTV will need to be connected to the NHDOT fiber backbone network located within the median of I-93. New pull boxes, conduits, fiber and splices, and associated equipment to connect between the CCTV camera and the I-93 fiber backbone. The design shall provide a minimum of two (2) 4" diameter conduits with inner ducts between the new camera location and the existing fiber backbone.

The tie in point to the existing facility located within the median shall be in the vicinity as shown on the existing plans. The location of the proposed CCTV camera and associated equipment shall be accessible for maintenance operations and protected based on appropriate clear zone requirements. The Design-Builder shall also provide electrical power and a service connection as required to the camera. The Design-Builder will not be allowed to install conduit beneath I-93 using open cut techniques. Horizontal directional drilling, if required by the Design-Builder's final design, shall be performed in conformance with the Special Provision for Section 671 provided in the Reference Information.

A Motor Vehicle Detection Sensor (MVDS) is to be added to the existing CCTV tower along I-93 Northbound at Station 1658+25 right. The MVDS shall meet all requirements provided in Special Provision 677.465.

The traffic signals at Exit 4A shall be connected to the NHDOT fiber backbone network along I-93. The Design-Builder shall coordinate the routing of conduit and associated equipment between the Interchange traffic signals and fiber backbone pull box with the NHDOT TSMO group.

The Department has existing facilities in this location. Information related to the existing facilities is provided in the referenced information documents.

The Design-Builder shall design and construct the new facilities with connections to the existing NHDOT fiber backbone located along I-93 as follows:

A. New CCTV facilities shall be connected to strands number 5 and 6.

B. The signal interconnections shall be made using connections to strands 49 through 60.

All hardware shall be in conformance with the Special Provisions for Section 677.

See Section 7.10.2.2 for a detailed description of the signals to be installed as part of the Project.

7.11.2. Administrative Requirements

7.11.2.1. *Maintenance*

The Design-Builder shall bear all expense of maintaining the ITS system including temporary components including communications and power until the system is tested and accepted. Once tested and accepted the Design-Builder shall transfer the communications and power bills to the NHDOT Bureau of TSMO.

7.11.3. Design Requirements

7.11.3.1. *ITS Systems*

The Design-Builder shall develop detailed ITS plans, which provide for all construction stages and phasing, as well as all required permanent installations. Design shall be in conformance with the Departments special provisions and standard details.

7.11.4. Construction Requirements

Construction shall be in accordance with the manufacturer's directions or recommendations where applicable, and the applicable provisions of the Contract.

If there is any damage to the Department's existing ITS devices or infrastructure as a result of construction activities; the Design-Builder responsible for the damage and those responsible for the project shall contact the TMC immediately to notify the TSMO Design and Maintenance staff. TSMO will coordinate a site visit with the Design-Builders and Construction staff to evaluate the damages within 36 hours of notification. Following the field assessment the Design-Builder will be provided guidance for restitution which may consist of full or partial replacement of structures and equipment, costs associated with realignment or reconnection of the communications infrastructure, and temporary ITS equipment to maintain the existing level of service prior to the damage until the equipment or infrastructure is fully repaired, tested, and accepted. All costs for equipment, service connections, testing, and temporary equipment shall be at the cost of the Design-Builder unless otherwise noted in the field inspection report.

7.11.5. Deliverables

Before placing any permanent facilities, the Design-Builder shall provide NHDOT a layout indicating the proposed location of such items.

The Design-Builder shall provide NHDOT the as built locations of all ITS facilities within the Project limits.

7.12. Traffic Control

The Design-Builder shall prepare and submit to NHDOT for review and approval a Traffic Management Plan (TMP) as detailed below for the project. The plan shall specifically identify any planned closures, either full or partial, of any existing roadway, accessible pedestrian route, access point, or bridge, along with traffic detours and supporting traffic analyses. Any such closure shall be preceded by a concerted public information effort to communicate closure information to all affected parties. Supplemental liquidated damages will apply as specified in the Contract, Section 17.

The Design-Builder is responsible for providing a temporary access to all within the project limits for vehicular, pedestrian and bicyclists. Refer to the Environmental Commitments Section 6.5 for information on this matter.

7.12.1. General Requirements

Design-Builder shall design and construct the Project, in conformance with the requirements stated in this Section 7.12, to provide for the safe and efficient movement of people, goods, and services, through and around the Project, while minimizing negative impacts to users, residents, and businesses.

In accordance with the requirements of the Guidelines for Implementation of the Work Zone Safety and Mobility Policy, the Project has been designated a Significant Level I project and requires a separate Traffic Management Plan (TMP) document that includes detailed discussion of the Traffic Control Plans (TCP) submission process, Transportation Operations (TO) and Public Outreach (PO) associated with the project. The Design-Builder shall present the TMP to the Traffic Control Committee (TCC) and receive TCC approval of the TMP prior to the start of construction activities. The TCC typically meets the third Thursday of each month.

The contractor shall not perform any work involving high noise machinery such as jackhammers or excavating equipment, including starting and warming up the equipment, prior to 7am or after 7pm Monday through Friday and during all hours of the day on Saturday and Sunday, unless otherwise permitted in the Contract or approved in writing by the Contract Administrator.

The Design-Builder shall keep all roads open to all traffic during construction except where allowed in the Contract. Where provided in the Contract, or approved by the NHDOT, traffic may be bypassed over an approved detour route. The Design-Builder shall submit proposed detour plans, which shall show the proposed location, alignment, grade, typical cross section, protective fixtures and signing. The Design-Builder shall furnish, erect, and maintain barricades, warning signs, delineators, pavement markings and striping in accordance with the MUTCD and NHDOT Standard Specifications.

Traffic control shall utilize flaggers, uniformed police with vehicles and uniformed police officers as proposed in the Traffic Management Plan and traffic control plans. All cost for traffic control shall be included in the lump sum price. Design-Builder is referred to the NHDOT Flagger and Uniformed Officer Use In Work Zones Guidelines (2/2013) to estimate where uniformed officers

or uniformed officers with vehicle are expected to be used. For clarity, uniformed officers with vehicle shall be used for construction activities on I-93, to include rolling road blocks, and while directing traffic through complex or signalized intersections.

7.12.2. Administrative Requirements

7.12.2.1. *Traffic Management Plan*

Design-Builder shall develop, implement, and maintain a Traffic Management Plan (TMP) that includes the following items:

A. Descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, and other personnel with traffic control responsibilities.

B. Procedures to identify and incorporate the needs of Utility Owners, Governmental Entities, TSMO design staff, local governmental agencies, Emergency Service providers, school districts, business owners, and other related users, Customer Groups or entities in the Project corridor and surrounding affected areas. Within the Town of Derry, this shall include the Public Works Director, fire dispatch, police dispatch, and the branch manager of First Student bus company.

C. Procedures for obtaining acceptance of detours, road and lane closures and other traffic pattern modifications from applicable Governmental Entities, and implementing and maintaining those modifications.

D. Procedures for signing transitions during construction from one stage to the next and from interim to permanent signing, including procedures for accommodating the intermediate completion date for the opening of the new interchange.

E. Procedures for maintenance and replacement of traffic control devices, including pavement markings and traffic barriers, if used.

F. Procedures to regularly evaluate and modify, if necessary, traffic signal timings, and the procedures for the development, NHDOT approval, implementation, testing, and maintenance of all affected signals.

G. Procedures to coordinate with the appropriate Governmental Entities operating signal networks along the Project or Project detour routes to ensure temporary system compatibility, establish responsibilities for temporary signal installation, maintenance, operation and removal, and coordinate traffic signal timing with local signal networks.

H. Procedures and process for the safe ingress and egress of construction vehicles in the work zone.

I. Provisions to provide continuous access to established truck routes and Hazardous Material (HazMat) routes, and to provide suitable detour routes, including obtaining any approvals required by the appropriate governmental entities for these uses.

J. Procedures to modify plans as needed to adapt to current Project circumstances.

K. Procedures to communicate TMP information to Design-Builder's public information personnel and notify the public of maintenance of traffic issues in conjunction with the requirements of Section 5.

L. Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours.

7.12.2.2. *Maintenance*

The Design-Builder shall bear all expense of maintaining the section of road undergoing improvement including all temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages, farms, and other features as may be necessary. Snow removal from the roadway is not required during winter work suspensions if all conditions set forth in NHDOT Standard Specifications are met.

7.12.2.3. *Maintenance of Traffic during Suspension of Work.*

A. Suspensions ordered by the NHDOT, and not caused by the Design- Builder or Winter Suspensions due to climatic conditions:

The Design- Builder shall make passable and open to traffic (including pedestrians and/or non-motorized vehicles) the sections of the project and temporary roadways as agreed upon between the Design-Builder and the NHDOT for the accommodation of necessary traffic during the anticipated period of suspension.

Suspension of work related to legal holidays shall be as specified in Section 108.04 of the Standard Specifications.

During the suspension period, the maintenance of the temporary roadway and sections of the Project will be the responsibility of the Towns or the NHDOT by roadway, consistent with whomever is typically responsible for each roadway.

When Work is resumed, the Design-Builder shall replace or restore any work or materials lost or damaged because of the temporary use of the Project and remove work or materials used in the temporary maintenance and complete the Project as though its prosecution has been continuous and without interference. Additional work caused by the suspension, for reasons beyond the Design-Builder's control, in accordance with NHDOT Standard Specifications.

B. Other Suspensions of Work.

When Work is suspended for any other reason including but not limited to the following: for failure to correct conditions unsafe for the workers or the general public, for failure to carry out orders of the NHDOT, or for other reasons caused by the Design- Builder, all costs for maintenance of the roadway to accommodate traffic during the suspended period shall be borne by the Design-Builder.

7.12.2.4. *Project Winter Maintenance Meeting*

All Projects, which will encompass construction activities over the course of two or more construction seasons, shall be required to hold a "Project Winter Maintenance Meeting" prior to October 15th of each year. This meeting shall, as a minimum, involve personnel from the Design-Builder, Bureau of Construction, Bureau of Traffic, Division of Operations, and the local municipality, as appropriate. The meeting will serve to determine and document the work required by the Design-Builder prior to the winter maintenance season and the responsibilities of all the parties during that season. Should the Design-Builder fail to perform the required work in advance of the winter maintenance season, all costs for maintenance of the roadway to accommodate the safe flow of traffic (including pedestrians and/or non-motorized vehicles) during that period, whether work is suspended or not, shall be borne by the Design-Builder, including all snow removal costs.

See Section 8.5 for the Design-Builder's responsibilities, including for maintaining lanes and shoulders during the winter maintenance season

7.12.3. Design Requirements

7.12.3.1. *Traffic Control Plans*

Design-Builder shall use the procedures in the TMP and the standards of the MUTCD, NHDOT Standard Traffic Control Sheets, and NHDOT Work Zone Safety and Mobility Policy, as augmented with the NHDOT Positive Protection Guidance for Work Zone (2/2010) to develop detailed traffic control plans, which provide for all construction stages and phasing, as well as all required switching procedures.

Design-Builder shall produce a traffic control plan for each and every phase of Work that impacts traffic and involves traffic control details. The traffic control plan shall include details for all detours, signals, traffic control devices, portable changeable message signs, striping, and signage applicable to each phase of construction. Information included in the traffic control plans shall be of sufficient detail to allow verification of design criteria and safety requirements, including typical sections, alignment, striping layout, drop off conditions, and temporary drainage. The traffic control plans shall clearly designate all temporary reductions in speed limits. Changes to posted speed limits will not be allowed unless specific prior approval is granted by NHDOT.

Within the Town of Derry, all traffic control plans shall be designed to maintain at a minimum the existing lane widths on all traveled ways. When temporary traffic controls to existing roadways are proposed, the preference is to design for 12' lane widths. The use of 11' lane widths with 1' shoulders locally may be considered acceptable with sufficient justification.

Portable changeable message signs (PCMS) shall be installed to inform the public of pending changes for two weeks in advance of any signed closures. Number and location of PCMS for each detour shall be clearly indicated on the applicable traffic control plan for the construction activity that generates the signed closures.

PCMS shall be used for advance notice of construction activities. Up to 2 units may be required concurrently. The intent is to reserve the use of these signs for meaningful messages that will help motorists get through the work zone safely and not simply repeat information found on other Construction Signs. The Design-Builder shall have available two (2) PCMS available for use by NHDOT on the project throughout the period of active construction. These 2 additional PCMS shall be in excess of any PCMS in use as part of active traffic control measures.

The Design-Builder is hereby made aware that NH Route 102, Pillsbury Road/Ash Street, Folsom Road and Tsienneto Road are integral links in the school bus routing for the Towns of Derry and Londonderry. Care shall be taken to minimize disruption to the school bus flow along these roadways during morning and afternoon pupil transport time periods. Should delays be anticipated during certain operations, contact the Branch Manager at First Student Transportation (name, phone number, extension).

Opposing traffic on a normally divided roadway shall be separated with appropriate traffic control devices. Design-Builder shall maintain signing continuity on all active roadways within or intersecting the Project at all times.

Throughout the duration of the Project, Design-Builder shall ensure all streets and intersections remain open to traffic unless otherwise approved by constructing the Work in stages. Design-Builder shall maintain access to all adjacent streets and shall provide for ingress and egress to public and private properties at all times during the Project.

Design-Builder shall limit the duration that traffic is running on gravel to 10 days, including only one weekend on local roads. State-maintained roads (Route 28, Route 28 Bypass, NH 102) shall be paved at the end of each work day.

Design-Builder shall prepare public information notices, in coordination with Section 5 (Public Information and Communications), in advance of the implementation of any lane closures or traffic switches. These notices shall be referred to as Traffic Advisories.

7.12.3.1.1. Interstate 93 NB & SB Additional Requirements

Four (4) lanes of traffic shall be maintained in each direction, except as allowed by this Section. Localized closures or reduction in widths of shoulders are possible to allow for access for construction of structures in the median for the Interchange 4A over I-93 NB & SB Bridge. The Design-Builder shall notify the Contract Administrator and the Towns of Londonderry and Derry a minimum of 7 days in advance of proposed night work operations. No differentiation for night work versus day work will be made and there will be no additional payment for night work.

Lane closures and traffic shutdowns will be permitted as follows, unless otherwise approved by the Contract Administrator:

I-93 NB: Between the hours of 8:00 PM to 6:00 AM

I-93 SB: Between the hours of 6:30 PM to 4:30 AM

Rolling roadblocks along I-93, with the use of Uniformed Officers with Vehicles and the approval of the Contract Administrator, to accommodate critical construction operations along I-93 related to Interchange 4A construction, will be permitted between the hours of 10:00 AM to 2:00 PM, and 8:00 PM to 4:30 AM.

The Design-Builder is hereby made aware that Pillsbury Road/Ash Street provides a critical transportation infrastructure east-west link from an Incident Management standpoint. Provisions for maintaining access for Emergency Responders through the project area to and from Pillsbury Road/Ash Street shall be integral to the construction operations and maintenance of traffic In addition, special attention shall be given to notifying the appropriate Town officials of any changes and/or adjustments to the traffic management operations that would impact Incident Response through the construction zone to Pillsbury Road/Ash Street.

Non-Winter conditions

High speed - maintain full shoulder

Low speed – reduced shoulder to 5’

Tie ins to ramps (accel decel) under barrel control but no drop offs at end of day. Use lane drop for a no more than three days.

Winter conditions maintain full shoulders widths.

7.12.3.1.2. Folsom Road and Tsienneto Road (Route 102 to Route 28 Bypass) Additional Requirements

Local roads are not suitable to provide any relief for detours. Limited and localized one-lane closures (setting up alternating one-way traffic) are acceptable M-F from 7am to 5pm only. Sixteen (16) feet clear for alternating one-way traffic shall be maintained during all operations unless otherwise authorized. Any other limitation for traffic that does not provide for maintenance of through traffic in the work zone shall be part of a full closure, with this section of road being designated “Local Traffic Only”.

The BTC plans propose phased construction and traffic control during replacement of the Tsienneto Road over Tributary E Bridge, with one-way westbound traffic maintained across the bridge, and with eastbound traffic detoured to the Route 28 Bypass and then Route 102.

The Town of Derry will consider full closure of Tsienneto Road from Route 102 to the Route 28 Bypass during replacement of the Tsienneto Road over Tributary E Bridge. The maximum allowable duration of the full closure is 14 days, limited to between June 15 and August 25. Any full closure must be included in a detailed traffic control plan submitted by the Design-Builder with each major Tributary E bridge design submission. Work hours during the closure period will be from 6am to 10pm. The only approved detour route for through traffic during full closure of this section of Tsienneto Road is using Route 28 Bypass to Route 102.

7.12.3.1.3. Tsienneto Road (Route 28 to Route 28 Bypass) Additional Requirements

Limited and localized lane closures are acceptable M-F from 7am to 5pm only, provided that one lane in each direction is maintained at all times. NHDOT reserves the right to request modification to the traffic control if backups through the work zones are deemed to be excessive. Changes to the traffic control shall be at no cost to the State.

7.12.4. Construction Requirements

Construction shall be in accordance with Design-Builder's TMP, Standard Specification 619, the manufacturer's directions or recommendations where applicable, and the applicable provisions of the MUTCD.

All steel fabricated for mast arms, mast arm poles, overhead structures and their supports shall be subject to the inspection requirements for steel fabricated under this contract.

7.12.4.1. *Design-Builder Responsibility*

If at any time NHDOT determines Design-Builder's traffic control operations do not meet the intent of the TMP or any specific traffic control plan, Design-Builder shall immediately revise or discontinue such operations to correct the deficient conditions.

The Design-Builder shall identify a qualified, on-site, traffic control coordinator for this project (Subsidiary to Item 619.1 – Maintenance of Traffic). This designee's primary responsibility will be to ensure that the correct traffic control measures are in place when needed, to ensure traffic flows safely and efficiently through the project area. This designee shall have a clear understanding of the basic principles of temporary traffic control, knowledge of standard devices used and the ability to implement these measures in conformance with the MUTCD.

Design-Builder shall provide NHDOT the names of the traffic control coordinator and support personnel, and the phone number(s) where they can be reached 24 hours per day, seven days per week.

Design-Builder shall provide NHDOT and appropriate Customer Groups a minimum of two weeks' advance notice for lane closures and/or traffic switches planned to be in effect longer than 24 hours, and a minimum of 24 hours advance notice for lane closures that are planned to be in effect less than 24 hours, using all appropriate tools as needed. The Public Information Coordinator shall input all lane closures (or an event that results in lane closures) into the NHDOT's HCR.

7.12.4.2. *Access*

Bicycle and pedestrian access to existing bicycle and pedestrian facilities and mobility shall be maintained.

7.12.4.3. *Detours*

Design-Builder shall maintain all approved detours in a safe and traversable condition. A pavement transition, suitable for the posted speed of the section shall be provided at all detour interfaces. See Section 7.12.3.1 for allowable detour routes.

7.12.4.4. *Smart Work Zone (SWZ)*

Smart Work Zones (SWZ) items are currently being utilized along the I-93 northbound and southbound barrels within the project area to help mitigate construction activity effects to traffic flow. These include Portable Changeable Message Signs (PCMS) (specific to the smart work zone package), portable queue detectors (PQT), and video cameras (PTZ) that have been installed and paid for under a separate contract. The Design-Builder shall coordinate with the I-93 Salem-Manchester concurrent Contractors and the Contract Administrator with regards to issues relating to these components, including placement, and construction related relocations. Relocation efforts, including necessary leveling pad construction (associated with these SWZ components) will be by others. (Prior to relocating SWZ devices, contact the Transportation Systems Management Operations Transportation Management Center Operations Supervisor (603-271-6862).

7.12.5. Deliverables

7.12.5.1. *Traffic Management Plan*

The TMP must be approved by NHDOT and the TCC prior to the start of construction activities. Design-Builder shall provide the TCC sufficient time for review of, and comment on, the TMP. The Design-Builder shall present the proposed TMP to the TCC and allow sufficient time for the TCC to review and comment on the TMP. NHDOT retains the right to require revision and re-submittal of the TMP within a reasonable amount of time. Concept Traffic Control Plans shall be submitted with the TMP for use of the reviewer in reviewing the TMP.

7.12.5.2. *Traffic Control Plans*

Traffic control plans shall be provided for review with each design submittal for the bridge or roadway construction activity they are applicable to. They shall be prepared to meet the requirements of Section 7.12.3.1. At a minimum, each traffic control plan shall be submitted to NHDOT for review at least 21 Days prior to implementation.

7.13. **Roadway Lighting**

Design-Builder shall design and provide partial interchange lighting at the I-93 Exit 4A interchange. Roadway lighting is not required on the Connector Road from Exit 4A to the intersection with North High Street, with the exception that the intersection of the Connector Road and Madden Road shall have lighting in accordance with NHDOT lighting policies. Design-Builder shall provide continuous roadway lighting along the Connector Road and Folsom Road from the intersection of North High Street to the intersection with Pinkerton Street.

7.13.1. Design

7.13.1.1. *Permanent Lighting*

Permanent lighting shall be designed in accordance with the AASHTO Roadway Lighting Guide, IESNA Lighting Handbook, Recommended Practice 8 (RP-8-00) Roadway Lighting, NHDOT 2010 Highway Lighting Design Manual, and NHDOT Street Lighting Discontinuance Protocol memorandum dated January 12, 2012.

Light poles on State roadways shall be aluminum one-piece, round tapered tubes with a 12 foot truss type bracket arm with luminaires mounted at 40 feet and Transformer (breakaway) base. Luminaires on State roadways shall be approximately 135 watt “cobra” style Light Emitting Diode (LED) with IES Type III wide asymmetric distribution, Full Cutoff optics and a NEMA twist-lock, adjustable photoelectric control unit. The color temperatures shall be 3000k with the minimum color rendering index (CRI) of 70 full cutoff luminaries.

All uncontrolled pedestrian crossings shall comply with the lighting guidelines of FHWA Publication #FHWA-HRT-08-053 (April, 2008).

Design-Builder shall arrange and coordinate all meetings with State and local agencies for roadway lighting.

Design-Builder shall design the lighting system to minimize or eliminate illumination of areas outside the Project ROW.

Luminaire poles and breakaway bases shall be designed in accordance with AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. For all poles located within the clear zone of the roadways, Design- Builder’s design shall incorporate breakaway devices within a transformer base.

Design-Builder shall determine and design appropriate foundation types and lengths for permanent lighting structures.

Design-Builder shall not place fiber-optic lines, signal conductors, or any other non-lighting related cables or conductors in the lighting conduit, ground boxes, or junction boxes.

Design-Builder shall minimize the potential hazards of lighting poles through the careful consideration of mounting options and pole placements, including placing poles behind existing or proposed concrete traffic barrier or metal beam guardrail

Within the Town of Derry, local street lighting shall match the current locations and furnish others as warranted at signalized intersections, along Tsienneto Road, the Connector Road, including the intersection with Madden Road, and the widened Folsom Road. Street lights at non-signalized intersections, signalized intersections and new pole-mounted lights and their poles on Folsom Road shall be in accordance with NHDOT design specifications and shall be consistent for all new fixtures along the corridor.

Lighting for the multi-use path underpass shall conform to this Section 7.13.1.1 and Section 7.8.2. The Design-Builder provide shall comply with all laws and municipal ordinances and the National Electric Code with such supplementation rulings as are applicable. The Design-Builder shall apply for and pay for all permits required and, before ordering material, shall submit detailed plans for approval. Electrical installation including wiring, assemble, and appurtenances, shall be in accordance with the requirement of the latest edition of the National Electrical Code. All wiring connections shall be waterproof connections. The Design-Builder shall contact the electric company at least 30 days in advance of scheduled inspection and completion of the meter pedestal installation to energize the system. Lighting fixtures shall be ceiling or wall mounted, LED type high abuse luminaires. Lighting units shall provide a minimum of 10 foot-candles of illuminance on the trail surface and be capable of providing variable level light to match outdoor lighting conditions.

7.13.1.2. *Visual Quality*

Design-Builder shall provide luminaires mounted at a constant height along the roadway.

7.13.2. Agreements

Design-Builder shall prepare and obtain execution by the electric company of a Lighting Utility Agreement for any new roadway lighting fixture. The Agreement shall specify the location of each individual light fixture, power source location, whether aerial or underground service, the amount due to the electric company for installation of electric service conductor, and the entity responsible for payment of operating expenses. It is noted that all existing lighting fixtures mounted on wooden poles are to be relocated to new poles and do not require Lighting Utility Agreements. See Sample Lighting Utility Agreement (PSNH Supplemental Agreement - Installation) in the reference documents.

7.13.3. Construction

Design-Builder shall coordinate with the Utility Owner(s) and ensure power service is initiated and maintained for permanent lighting systems with the appropriate Government Entity. Where the Work impacts existing lighting, Design-Builder shall maintain existing lighting as temporary lighting during construction as needed.

Design-Builder shall construct and/or furnish and install all light pole foundations, conduits, pull boxes, light poles, and luminaires as necessary under the project.

Design-Builder shall maintain control and ownership of roadway lighting for the duration of the contract. At the end of the contract, control and maintenance, and billing for operation of the roadway lighting shall be transferred to the Town of Derry, the Town of Londonderry or the State of New Hampshire as applicable.

Design-Builder shall submit inventory information to NHDOT. This identification shall denote that these are property of Design-Builder until final acceptance of the project, and shall provide a contact phone number and address in the event of Emergency or necessary maintenance during construction until the facilities are turned over to the final owners as noted above.

7.13.4. Deliverables

Before placing any permanent lighting, Design-Builder shall provide NHDOT a layout indicating the proposed location of such items, manufactures details of light poles, and luminaires, and the photometric data results for all lighted areas within the Project limits.

8. MAINTENANCE

8.1. General Requirements

The Design-Builder shall maintain the Project work site in a satisfactory condition until the project is accepted. This maintenance shall consist of continuous and effective work prosecuted day-by-day.

The Design-Builder shall take every reasonable precaution against spillage of construction materials on existing highways and bridges. The Design-Builder's attention is called to "Spillage of Material" under 107.01. If spillage does occur, the Design- Builder shall remove such spillage immediately after its occurrence.

Maintenance shall include, but not be limited to:

A. Mowing grass,

B. Cleaning and maintenance of erosion control and drainage structures

C. Remove debris, including litter, graffiti, animals, and abandoned vehicles or equipment from the Project ROW.

D. Identify and correct all Defects and damages from Incidents

E. Pay all utility costs.

F. Removal of snow and ice. (see Section 8.5 and 7.12.2 for additional requirements related to snow and ice removal)

NHDOT will notify the Design-Builder in the case of failure to meet these provisions. If unsatisfactory maintenance is not remedied within 24 hours after receipt of the notice, NHDOT will proceed to maintain the Project. The Design-Builder shall pay the entire cost of this maintenance.

Once the work involves the placement of material on, or the use of a previously constructed subgrade, base course, pavement, or structure, the Design-Builder shall maintain the previously constructed work.

8.2. General Maintenance Obligations

Design-Builder shall take all necessary actions to achieve the following:

A. Maintain the Project in a manner appropriate for a facility of the character of the Project.

B. Minimize delay and inconvenience to users.

C. Monitor and observe weather and weather forecasts to proactively deploy resources to minimize delays and safety hazards due to heavy rains, snow, ice, or other severe weather events.

D. Minimize the risk of damage, disturbance, or destruction of third-party property during the performance of maintenance activities.

E. Coordinate with and enable NHDOT and others with statutory duties or functions in relation to the Project to perform such duties and functions.

Design-Builder is responsible for providing all resources necessary for the performance of all maintenance activities required under this Project.

8.3. Design-Builder's Obligation to Remedy and Repair

Design-Builder is responsible for operations and maintenance of all Elements within the limits of the Project limits during all project times, with the exception of the time prior to the issuance of a NTP2, including existing Elements. The Design-Builder may request relief of operations and maintenance responsibilities under this requirement until the start of any physical construction on the project, subject to the approval of NHDOT. Approval by NHDOT is not guaranteed.

8.4. NHDOT Obligation to Remedy and Repair

In the period prior to the issuance of NTP2, NHDOT or the respective Town will perform the routine maintenance for continued use the public. NHDOT will no longer maintain any elements after the issuance of NTP2. If the Design-Builder requests, and NHDOT approves, relief of their obligation as noted in Section 8.3, NHDOT or the respective Town will perform routine maintenance up until the start of field construction.

8.5. Winter Maintenance Season

Prior to the winter maintenance season (November 1) the Design-Builder shall meet with the Contract Administrator, the Bureau of Traffic (Michael O'Donnell 603-271-2291), the District Maintenance Engineer (Richard Radwanski, 603-666-3336), the Londonderry Public Works Director (Janusz Czyzowski, 603-432-1100), and the Derry Public Works Director (Michael Fowler, 603-432-6144) to ensure that the roadways are in a condition which are acceptable for the winter season. All required work which is not part of the permanent Contract items, shall be subsidiary to Item 619.1. Refer to Section 7.12.2.4 for requirements related to Winter Maintenance Meetings.

Provide for the following measures, as a minimum, prior to winter suspension of construction work:

A. Stabilize and/or vegetate all disturbed slopes

B. Remove temporary traffic control barrier that hinders winter maintenance. If removal would create a safety condition, the condition shall be remedied prior to the removal of the barrier.

C. Set top of all drainage structures flush with the adjacent pavement grade and make all drainage operational

D. Prior to October 15 of each year that this Contract is in effect, at the Contract Administrator's discretion, the Design-Builder shall restripe the project between "ROAD WORK 500 FEET" and "END ROAD WORK" signs. The cost of this work shall be paid for under the 632 items of the Contract.

E. All project signage to be verified by the Bureau of Traffic prior to suspension of work.

Throughout the winter maintenance season, the Design-Builder shall maintain all lanes on paved plowable surfaces, including manholes and other obstructions. The Design-Builder's responsibility for this starts at the start of any physical construction by the Design-Builder or his subcontractor's that involves any active roadway within the project limits and extends until final acceptance of the project by NHDOT, subject to any modifications allowed under Section 8.3 above.

F. On I-93, the Design-Builder shall maintain all lanes plus a minimum shoulder width of 8 feet each side of the highway and all ramps during winter.

G. For roads within the Town of Derry, the Design-Builder shall provide a continuous road width of 30 feet minimum or two single lanes with a minimum 16' of each throughout winter maintenance. During this time, the Design-Builder will only be responsible for snow removal in active areas of construction. The Design-Builder shall remove accumulated snow banks, piles and snow in front of impact attenuators, guard rails, jersey barriers, etc. that impact traffic safety and operations, as directed by the NHDOT. Snow removal on the roadway surfaces, with the exception of that noted above, will be performed by the Town and at no cost to the Design-Builder.

H. Any exceptions to the requirements for maintaining lanes and shoulders during winter maintenance seasons will require written approval from NHDOT.