NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

REQUEST FOR PROPOSAL (RFP)

DESIGN-BUILD SERVICES FOR

US Route 4 over Bunker Creek Bridge Replacement Project

DURHAM, NH
16236, A001(202)

Volume II – Book 2

Technical Provisions

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION
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1 GENERAL REQUIREMENTS

1.1 Project Scope

The overall scope of the project is to replace the US Route 4 Bunker Creek Bridge and its approach. A Design-Build team selected by NHDOT 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 Bunker Creek Bridge is a 15 foot concrete slab bridge that carries US Route 4 over Bunker Creek as it flows into the Oyster River. The bridge was constructed in 1933 by creating a causeway out to the main flow section of the creek and has been in continuous service.

The replacement structure will need to accommodate the Q100 elevation (spring high tide including tidal storm surge) plus an additional 1 foot of freeboard below the low superstructure elevation. This elevation also accommodates the Mean High Water elevation plus 3.9 feet of predicted sea-level rise by the year 2100. In addition, the replacement structure will be widened to accommodate bicycles in a wide shoulder by providing 12 foot travel lanes and 5 foot shoulders in each direction rail to rail across the bridge and along the project roadway length. The causeway in the project area that US Route 4 runs upon is underlined with soft compressible clays that will need to be addressed / compensated for in the widening of the roadway and the replacement of the bridge.

Associated roadway improvements for US Route 4 are identified in Section 1.3.

The design of the new bridge shall be in conformance with the design criteria included within the project specifications as described in Section 7.7. No additional permanent ROW, beyond that to be obtained by the Department as depicted on the Right-of-Way plans, is required for the project as described herein.

1.2 US Route 4 Bunker Creek Bridge Replacement

The overall scope of work for the US Route 4 Bunker Creek Bridge Replacement includes but is not limited to the following items:

a. Removal of the existing structure.

b. Construction of a new bridge structure that meets the requirements of this document.

c. Grading and landscaping of new earthen structures.

d. Paving and striping of new roadway surface areas.

e. Maintenance and Protection of Traffic during Construction.

f. Preparation of as built plans.

The permitting requirements for this work will include vibration monitoring during construction for the preservation of adjacent historic and non-historic structures.

A major objective of the project is to minimize roadway closure period.

1.3 Roadway Approach Work

The overall scope of work for US Route 4 within the project limits includes:

a. Widening the roadway typical to accommodate 12 foot lanes and 5 foot shoulders in each direction from the western project limit (approximate Station 110+00) to Station 117+55.

b. Widening the roadway typical to accommodate for the transition between a 2-lane cross section and a 3-lane cross section (Station 117+55 to Station122+50)

c. Widening the roadway typical to accommodate an 11 foot westbound lane, a 12 foot eastbound lane, and an 11 foot left-hand turn lane with 5 foot shoulders from Station 122+50 to the eastern project limit (approximate Station 126+40).

d. Adjusting the US Route 4 profile to meet AASHTO Requirements for a 45 mph design speed, hydraulic control elevation at the bridge, and all other design criteria.

e. Adjusting the US Route 4 roadway alignment to minimize project impacts to the adjacent properties along the project limits.

2 PROJECT MANAGEMENT PLAN (PMP)

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	Environmental Management
7	Design Management
8	Construction and Traffic Management During Construction

2.1 General Project Management

The Project Management Plan (PMP) 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:

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

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

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

2.1.1.2 Electronic Document Management System (EDMS)

Design-Builder shall develop and implement an Electronic Document Management System (EDMS). Additionally, Design-Builder shall:

- Use data systems, standards and procedures 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.
- Employ appropriate standards and procedures, and train Design-Builder personnel to operate any NHDOT data management system which NHDOT may require in connection with the Project.
- 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.
- 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.

2.1.1.3 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.

2.1.1.4 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's Project Manager and/or the Contract Administrator 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 periodically throughout the duration of the Contract.

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.

2.1.2 Deliverables

2.1.2.1 Project Management Plan

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

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 Durham, City of Dover, University of New Hampshire and other Stakeholders.

(b) A description of the approach to communication and cooperation with residents and the motoring public.

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.

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:

- A description of the system used for preparing and updating the Project schedule.
- A description of the system used for preparing and updating the schedule of values.
- A description of the proposed plan to integrate Subcontractor activities into Design-Builder's scheduling and reporting system.
- A description of the proposed approach for calculating progress performance on a monthly basis and preparing payment requests.
- 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.

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 planning, design, construction, and completion of the Work shall be undertaken and completed in accordance with the most recent Project Schedule accepted 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 submittal shall include both hard copies and electronic files, in PDF format and the native version of the 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 the 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 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 accepted 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 acceptance 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 accepted Project Schedule to reflect the current status of the Project, including approved Change Orders.

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 acceptance of NHDOT in accordance with Section 2.4.1.2.3 (Project Schedule Revisions). 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 accepts a revision, all Project Schedule submittals shall be tracked against the previously accepted 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 14 calendar days for NHDOT to review all submittals except as noted in Volume II – Book 1, Design-Build Contract Section 3.2.2 and Appendix 2 item 104.15.2. NHDOT will try to accommodate any request from the Design-Builder to expedite this review period where requested.

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, fugitive dust, 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 the 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:

- Qualifications and experience of proposed key staff members who will be engaged for purposes of community outreach.
- Adjustments to construction activities in response to community and Stakeholder concerns.
- Proposed communications strategies, such as, a newsletter, websites, and hotlines.
- The proposed methodology for capturing and resolving complaints, concerns or questions from the public.
- The proposed methodology for dealing with the news media.

2.6 Environmental Management

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

(a) Applicable laws, rules and regulations.

(b) The method Design-Builder will use to ensure planning commitments are integrated into design, construction and maintenance of the Project.

2.7 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, right of way, 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.

2.8 Construction and Traffic Management During Construction

The Project Management Plan shall provide a description of Design-Builder's plan and approach for performing construction and traffic management 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. A description of how these areas 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.

(c) A description of how the right of way 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.

(e) A description of how Design-Builder will manage and control traffic during construction.

2.9 Requirements for NHDOT Offices and Equipment

2.9.1 General Description

Except where noted elsewhere in the Agreement, at a minimum the Design-Builder's Key Personnel and major task managers, and NHDOT 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) prior to commencement of construction activities and shall remain in use and throughout the duration of the construction effort. Design-Builder shall, as part of the project:

- Provide and pay for all office space, facilities, equipment, and services necessary for NHDOT to oversee the Work.
- Maintain the Project office space for the period specified or until otherwise agreed to by NHDOT in writing.
- 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.

2.9.2 NHDOT Project Office Space

Design-Builder shall provide and maintain a NHDOT Project Office, which meets the space requirements identified in Section 2.9.2.1, 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 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 2.9.

2.9.2.1 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*:

- Office space for four (4) NHDOT employees or its representatives for the duration of the design and construction phases of the Project. Personal office areas shall be at least 150 square feet.
- One enclosed large conference room meeting the requirements of Section 2.9.2.2. This conference room shall be dedicated for NHDOT use and not part of a common area shared with the Design-Builder.
- One lockable enclosed space for storage of equipment/filing at least 150 sf.

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

2.9.2.2 Large Conference Room

The Design-Builder shall provide a large conference room for conferences and meetings. This room may be separate from the NHDOT Project Office Spaces, 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:

- The conference room shall be large enough to comfortably fit 20 to 25 people around a table.
- The conference room shall also be equipped with videoconferencing and teleconferencing equipment and service so that long-distance meetings can be held from here.
- Includes two large white boards with markers and erasers;
- Includes a projector and screen, or equivalent, that can be used for powerpoint or video conferencing viewing;
- Includes a table big enough to seat 20 people around; fifteen (15) 5-pedestal desk chairs on wheels; and ten (10) padded folding chairs.

2.9.2.3 Field Office and Large Conference Room Site Requirements

Design-Builder shall, as part of the Project:

- Secure a well-graded site that has an access road, a parking area, and building space that meets all local building code requirements.
- Obtain all site permits.
- Provide all utility services.
- 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.
- Provide an outside shed of at least 150 sf at the Project site for storage of small tools and equipment, including wheelbarrow (to be provided by Design-Builder), for the exclusive use of NHDOT.

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

2.9.2.4 Maintenance, Services and Utilities

The Design-Builder shall provide and pay for NHDOT Project Office Space 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:

- Potable water service;
- Weekly janitorial service, including maintenance of trash containers and trash pickup service;
- Maintenance of the exterior areas, including the access to parking areas, that keeps them neat, clean, in good repair, and safe;
- 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;
- 24-hour security patrol service or a silent watchman-type security system;
- Hard-wire high-speed internet access in each personal office area, including monthly service charges; wireless internet access (wi-fi); and
- Telephone service with at least one outside line (with voice-mail service) for the Personal Office Space and one for the Large Conference Room. Provide one separate line dedicated to the fax service and one separate line dedicated to a voice grade, touch tone dialing line for the computer modem. All necessary hardware and appurtenances for the computer modem shall be provided. Telephone service in the Large Conference Room must meet the needs listed in Section 2.9.2.2. (This bullet replaces Section 3.2.1C of Section 698 of the 2016 NHDOT *Standard Specifications for Road and Bridge Construction)*

2.9.3 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:

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.

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.

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.

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.

NHDOT will reimburse 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 or willful misconduct of NHDOT.

2.9.3.1 Furniture

- One locking desk with a minimum of three drawers or one desk with a three-drawer locking file cabinet for each employee office space;
- One 5 pedestal office desk chair on wheels for each desk provided; and
- One straight back office guest chair for each desk provided.

2.9.3.2 Telephones

- See the last bullet of Section 2.9.2.4

2.9.3.3 Copier and Fax Equipment

- See Specifications for Copier/Scanner/Printer/ in Section 2.9.3.4.

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.

2.9.3.4 Computer and Other Accessories

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

☒ Smart Phone*

Quantity: _4____

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

☒ Internet Access for Department Supplied Equipment:

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.

Quantity: __4_____

☒ Internet Access for Desktop

Unlimited-hours Broadband Internet Access
Wireless router

☒ Desktop Computer or better

Quantity: _1_____

Processor:	Intel Core i5, Dual Core 2.4 GHz
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

- Computer workstation unit: Approximately 6 feet long with 5 pedestal chair and static guard mats.

☒ Monitor

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*.

Quantity*: __4___

- 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)

☒ 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: _2_(1 for NHDOT Office Space and 1 for Large Conference Room)

☒ Digital Camera specifications: Quantity: __1___	Digital camera with the following minimum • Min. 8.0 Mega Pixels resolution • Picture file storage media, compatible for uploading picture data to the computer unit and printer (min. 8 GB) • 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
☒ Surge Protector/ Quantity**: _4____	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 <u>is</u> <u>in addition to</u> the desktop computer surge protector quantity.*
☒ Strobe Light VP420M or Quantity: __1__	Magnetic mount, 20 watt, 12/24 Volt DC (Whelen model equivalent) with Port car or equivalent DC adapter.
☒ Concrete Testing Equipment	<u>In addition to</u> 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: ____	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
- Range: .01 to 1100 NTU

* 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 Contractor 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.

2.9.4 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 (QMP)

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. 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:

- Design Quality Control (QC) system by the Design-Builder
- 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:

- Construction Quality Control (QC) system by the Design-Builder
- Construction Acceptance/Verification system by NHDOT (or its Designated Agent)
- Independent Assurance (IA) by NHDOT (or its Designated Agent)
- Dispute Resolution system
- Qualified/Accredited Laboratories (all Contractors and NHDOT)
- Qualified/Certified Inspection & Testing Personnel (all Contractors and NHDOT)

3.2 QA Program Responsibilities

The Design-Builder is responsible for implementing a comprehensive Quality Control (QC) System that addresses Design QC activities, Construction QC activities, qualified/accredited QC laboratories, and qualified/certified QC inspection & testing personnel. 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.

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 a QC Audit Team. 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 NETTCP Laboratory Certification Program or comparable laboratory qualification program acceptable to NHDOT.

The complete Quality Management Plan shall incorporate the following features:

- Roles and Expectations of the Design-Builder's QC Audit Team
- 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.
- The QMP shall encompass all Work performed by Design-Builder and Contractors of all tiers.

- Design-Builder shall submit to NHDOT the results of all internal audits within seven days of their completion.
- Design-Builder shall submit Non-Conformance Reports (NCRs) both upon issuance and resolution to NHDOT within three days of their completion.
- Coordination with NHDOT that includes procedures that will allow for appropriate advance notification that work is ready for Acceptance/Verification inspection or testing by NHDOT.

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:

- Organization: Design-Builder's organization, including any Affiliates and Contractors.
- Customers: the Users of the roadways, NHDOT, Customer Groups, and key stakeholders that have an adjacent property interest or connecting roadway.
- 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. NHDOT shall be afforded the opportunity to perform Acceptance/Verification inspection and testing over all aspects of the Work.

3.5.2 Quality Control Laboratory Requirements

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

- Random QC tests shall be conducted by the 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.
- 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.
- 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 Quality Management Summary 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 acceptance 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.

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.

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:

- The organizational chart that identifies all Quality Control personnel, their roles, authorities and line reporting relationships.
- Description of the roles and responsibilities of all Quality Control personnel and those who have the authority to stop Work.
- 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.
- Resumes for all Quality Control personnel.

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 NH and have a minimum of 5 years' experience in managing bridge replacement projects as well as 2 years with major design-build construction management of transportation projects, unless otherwise approved in writing by NHDOT at their sole discretion. 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 outlined 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. 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 Professional Engineer (minimum 5 years' experience in highway and/or bridge design, unless otherwise approved in writing by NHDOT at their sole discretion), Registered in the State of NH and shall report directly to the Design-Builder's QC Administrator. The specific duties of the Design QC Manager shall be outlined 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 Professional Engineer (minimum 5 years' experience in highway and/or bridge design, unless otherwise approved in writing by NHDOT at their sole discretion), Registered in the State of NH and shall report directly to the Design-Builder's QC Administrator. The specific duties of the Construction QC Manager shall be outlined 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.

All Design and Construction Production Personnel shall receive periodic Quality Control training under the direction of the QC Administrator and QC Staff. All training and related proposed schedules shall be documented in the QMP.

Formal Quality Control checks will be performed independent of Design Production Personnel by the Design QC 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.

3.7.3 QMP Section 3 – Document Management Procedures

The Quality Control procedures for the Design-Builder's Design plans, specifications, reports, calculations, shop drawing reviews, 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:

- An electronic project filing system (electronic folders).
- Standard file naming convention (for all types of documents).
- Electronic file revisions and redline markup standards.
- Email standards, protocols, and filing system.

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

- Quality Control inspection reports and QC material sampling/testing results. All inspection reports and test results shall be submitted to NHDOT within twenty-four (24) hours following the inspection or test. Control Charts shall be available in an accessible location for review by NHDOT at any time.
- 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 acceptable electronic format within twenty-four (24) hours after the work shift.

- 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.

- 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.

The Design-Builder shall develop, maintain, and provide As-Built Record Drawings. The Quality Management Plan shall include the procedure for capturing and providing As-Built data and records.

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:

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

- 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.

- 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.

- 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.

- Procedures shall be described for coordinating Professional Services performed by different individuals 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.

- 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.

- 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.

- 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 approved 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 State of NH.

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". The Quality Management Plan shall define the members of the QC Audit Team and their roles.

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, bridge substructure, bridge superstructure,, roadway, traffic sequencing, and others); (iii) a list of mandatory design submittals; and (iv) a proposed design 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 3.7.4.3. 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:

- Preliminary Bridge Layout submittals
- Preliminary Roadway Design submittal
- Intermediate Design Submittal for Environmental Review
- Final Design Submittal
- Any deliverables described in the Technical Provisions
- 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, 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:

- The design meets all applicable requirements of the Design-Build Documents, applicable Law and the Governmental Approvals.
- The design has been checked in accordance with Design-Builder's accepted QMP and Professional Services Quality Procedures.

- The item or element is ready for construction.
- 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.

Design QC Manager shall submit draft minutes of formal review presentations to NHDOT 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 of Design Documents

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:

- Design drawings
- Design calculations
- Design reports
- Specifications
- Electronic MicroStation filesDocumentation required for all Final ROW
- Governmental Approvals
- 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:

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

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

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.

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 a portion of the Work, specific pertinent items of the design 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. For example, Early Start of Construction may be early procurement of materials for a specific portion of the Project, for which specific pertinent items of the design may include:

- Horizontal and vertical alignment
- Typical sections
- Related elements of the drainage system

- Related elements of the Traffic Control Plan specifically applicable during the term of the Early Start of Construction scope
- Subsurface geotechnical investigations and recommendations
- Slope stability analysis and recommendations
- Preliminary structure general plans (if a structure is within the element or portion of the nonstructural Work)
- Settlement monitoring program
- 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. 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 the Design-Builder constructed.

Design-Builder shall ensure that the Record Drawings reflect the actual condition of the constructed Work. Design-Builder shall submit to NHDOT the electronic files used to prepare the Record Drawings and Documentation.

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 by QC Audit Team personnel. At a minimum, the QMP shall specify:

- Methods and procedures that clearly define the distinction/authority/responsibility for the administration of Design-Builder's QMP.
- 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.
- 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.
- 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.
- The 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.
- Procedures for inspecting, checking, and documenting the Work. Inspection, examinations and measurements shall be performed for each operation of the Work to assure quality.
- 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.
- 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.
- 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.

- 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.

- 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.

- 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.

- 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.

- 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.

- 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 accepted by NHDOT.

- 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.

- 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.

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

- A program to ensure performance of all QC testing required demonstrating 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.

- 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 potential 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.

- 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.

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

- Procedures to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, defective material and equipment, deviations and other Nonconforming Work are identified and corrected within five days. 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 taken.

- 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.

- 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.

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

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

- The form and distribution of Certificates of Compliance (COCs) that meet Section 106.04 of NHDOT's Standard Specifications for Roads and Bridges.
- 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.
- The form and distribution of the final Buy America Certificate of Compliance that confirms that the Project is in compliance with federal "Buy America" requirements. Form can be found at the following: https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/documents/BuyAmericaCertofComp.pdf

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 approved 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 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 Design-Builder, 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 Team 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 not be part of the Design-Builder's production staff responsible for building the 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 that exceed NHDOT's frequency requirements for Acceptance inspection and testing. At the sole discretion of NHDOT, 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 Substantial Completion and Final Acceptance deadlines.

Should NHDOT determine that Design-Builder is not complying with the QMP because of lack of QC Audit Team staffing, or any other reason, NHDOT shall have the right, without penalty or cost, including time extensions or delay damages, to restrict Work efforts until appropriate levels and expertise 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 NHDOT 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:

- Embankment and Roadway Construction
- Roadway Fine Grading
- Drainage Installation
- Bridge Substructures, broken down into subactivities
- Bridge Bearings & Bridge Seats
- Bridge Superstructure, broken down into subactivities
- Concrete (material and placement - broken down by location and/or type)
- Hot Mix Asphalt Pavement (material and placement)
- Erosion Control Features
- Maintenance of Traffic

It is expected that all major materials and processes needed to complete the Work of the contract will be addressed in one of the individual Quality Control Plans. Inspection hold points and QC frequency for testing and inspection shall be included in each QC Plan.

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:

- The sampling and testing frequencies specified in the Quality Control Plans shall be more than the frequencies specified in the NHDOT's Division 700 of its Construction Manual which can be found at the following:
  https://www.nh.gov/dot/org/projectdevelopment/construction/documents/division700.pdf
  The frequencies listed here are minimums for NHDOT Acceptance. Appropriate QC frequencies shall be employed by the Design-Builder to assure NHDOT Acceptance.

- 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 Asphalt and Concrete Inspection Attributes, unless already specified by NHDOT.

- 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), or equivalent, 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.

- 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.

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

- 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)

The Quality Management Plan shall include process and forms for reporting Non-Conformance.

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 NHDOT 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 NHDOT with test results in a timely way. NHDOT 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 with the Contract requirements. The Design-Builder shall also submit a “Buy America” Certificate of Compliance as referenced in Section 3.7.5.

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 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 NHDOT 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 NHDOT, 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.

4.2 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 maintaining the Project Website 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.

5.2 Administrative Requirements

5.2.1 Public Information and Communications Plan

Design-Builder shall prepare a Public Information and Communications Plan (PICP), 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 PCIP 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:

Public Liaison

- Gain and maintain public support, building on existing community partnerships and communication networks.
- Provide the public with opportunities for input.
- Demonstrate to the public that the Project will be developed pursuant to a well-executed program.
- Notify the public in advance of key construction, and maintenance activities and communicate the potential impacts of these activities.
- Develop, disseminate and display timely, high-quality, innovative, user-friendly, accurate and appropriate community information including exhibits showing slope grading, drainage, bridge structures, and retaining walls.
- Develop and manage a public relations campaign and communication strategy to convey key messages, branding and pertinent information about the Project.

Customer Groups

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

- 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.

Media

- Build on existing NHDOT media resources and/or create and develop advertising messages, including graphics, logos, and slogans.
- Place Project-related messages in the appropriate media.
- Develop and distribute public service announcements, paid advertising, and news reports.
- Manage media relations with key transportation and business reporters and prepare and distribute news releases and media kits.

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 throughout the Term of the Agreement. The Public Information Coordinator shall have the ability to competently perform the following:

- Provide the primary point of contact between Design-Builder and NHDOT and be responsible for the receipt and response to written or verbal complaints regarding the Project.
- Lead the production, implementation, audit, Quality Control and update of the PICP.

- Coordinate and supervise activities of Design-Builder's personnel in performing the activities described in the PICP.
- Facilitate communication among Design-Builder, NHDOT personnel (including NHDOT's Public Information Officers), and Customer Groups.
- Interact with affected Customer Groups and represent the interests of the Project at associated public meetings and other formal and informal occasions.
- 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.
- 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 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:

- Governmental Entities, including regulatory and law enforcement agencies
- General public residing or working within the general vicinity of the Project, or traveling within or across the limits of the Project
- Business owners within or adjacent to the Project corridor
- Utilities and transportation authorities and providers affected by the Project.

5.2.4 Public Meetings

Design-Builder shall support NHDOT in meetings with the Customer Groups during design and construction activities.

During such meetings, NHDOT 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:

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

- Street and roadway detour design and implementation
- Scheduling and duration of Work, including hours of construction
- Haul routes
- Methods to minimize noise and dust
- 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 manipulative form, all necessary information regarding potential Customer Groups at NHDOT's request.

Design-Builder shall accommodate 3 such meetings being called by NHDOT.

5.2.5 Meeting Minutes

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

- A complete list of attendees (including their affiliations, telephone numbers, and e-mail addresses)
- Documentation of the issues discussed and any associated solutions
- Description of remaining open issues and action items (including the person(s) responsible for follow-up and target date for resolution)

5.2.6 Disseminating Public Information

Design-Builder shall prepare and provide materials for NHDOT review, comment, and approval, who will then distribute materials regarding Project-related subjects, using all appropriate methods, including: meetings, news releases, telephone correspondence, newsletters, email, hotlines, HCR, dynamic message signs, Web alerts, maps, displays, renderings, presentations, brochures, and pamphlets.

All written materials produced for Customer Groups shall follow the Publications Style Guide published by the NHDOT 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 acceptance. Submittal shall be in both hardcopy form and electronic format compatible with NHDOT software. NHDOT acceptance 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.

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 (including permits), issues, and commitments and applicable Environmental Laws as set forth, 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 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, 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 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, 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 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.

6.2 Environmental Approvals

6.2.1 Permits and Limitations

A Categorical Exclusion has been submitted and approved by FHWA under the National Environmental Policy Act (NEPA).

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, they expect to have permit conditions reasonably well defined by that time. NHDOT has the NEPA process completed and expects 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. The Design-Builder may be required to support the preparation of any remaining permits as needed, as final design proceeds, and NHDOT will submit the permit applications. 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 responsible for the procurement of these additional permits or permit amendments. Any delay and associated costs caused by procuring the permits, 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 Project Schematic 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 Project Schematic 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 and/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 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 support from NHDOT as indicated, shall be responsible for conducting continuing environmental studies based on the Project approved NEPA document and Project Schematic.

The Design-Builder, with 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		
United States Coast Guard	Coast Guard Bridge Permit	Received exemption status for structure from US Coast Guard
Federal Highway Administration	Categorical Exclusion	An Environmental Study (Categorical Exclusion) has been approved by FHWA on December 20, 2017.
Environmental Protection Agency	NPDES	NPDES construction site permit is the responsibility of the contractor.
NOAA	Section 7 of the Endangered Species Act	Consultation has occurred for any listed or proposed listings of endangered or threatened marine species (Atlantic Sturgeon) or Critical habitat through FHWA, ACOE, and NOAA. Commitment to provide protective measures during construction to prevent the incidental impacts that could occur to the Atlantic Sturgeon.
NOAA	Essential Fish Habitat	Consultation has occurred on the EFH, with Conservation Recommendations provided by NOAA to be taken into consideration . Continued coordination with NOAA on the impacts through wetland impact permitting/mitigation process with the ACOE and NHWB.
USFWS	Section 7 of the Endangered Species Act	Programmatic consultation on the endangered Northern Long-eared Bat has occurred with a determination of Likely to Adversely Affect the species. Commitments to implement impact avoidance and minimization measures, and NHDOT conducting a bat survey of the bridge prior to the start of construction.
U.S. Army Corps of Engineers	Section 404 permit	The Section 404 permit for NH is anticipated to be issued under the NH Programmatic General Permit and will be concurrent with issuance of the NH Dredge and Fill Wetland Permit. Endangered Species will be reviewed under the ACOE general permit. Special Conditions and in-water work timing restrictions will apply.

State Agencies – NH		
New Hampshire Department of Environmental Services (NHDES	Standard Dredge and Fill Wetland Permit	It is anticipated that the application will be submitted in May 2018 and that the permit will be received in February 2019
New Hampshire Department of Environmental Services (NHDES)	Section 401 Water Quality Certification (NH)	The 401 Water Quality Certification will be issued concurrent with the Wetland Permit
New Hampshire Department of Environmental Services (NHDES)	Coastal Zone Management Consistency Certification (NH)	It is anticipated that the CZM application will be submitted in July 2018 and that the certificate will be received in February 2019
New Hampshire Department of Environmental Services (NHDES)	Shoreland Permit	It is anticipated that the Shoreland application will be submitted in June 2018 and that the permit will be received in August 2018

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 accepted 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:

- Environmental Management System (EMS),
- Environmental Compliance and Mitigation Plan (ECMP),
- Environmental Protection Training Plan (EPTP),
- Contaminated Materials Management Plan (CMMP),
- Communication Plan (CP),
- Construction Monitoring Plan (CMP),

The dates by which component parts comprising the CEPP are to be submitted for NHDOT acceptance 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 and the Design-Builder's approach to satisfying mitigation requirements, including mitigation requirements identified after completion of the ECMP.

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 environmental commitments that have been assembled as of May 17, 2018. 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 or Approvals issued by New Hampshire state agencies. These may include, but are not necessarily limited to, the following:

- New Hampshire Standard Dredge and Fill Permit
- New Hampshire Comprehensive Shoreland Protection Act Permit
- Coastal Zone Management Act Consistency Certificate

C. U.S. Coast Guard

Although the project will not require a bridge permit, the Design-Builder shall document how they will comply with the terms and conditions for the U.S. Coast Guard jurisdiction stipulations, including the lowest portion of the superstructure of the bridge should clear the 100-year flood elevation, and; any spillage of oil or oil-based product must be promptly reported to the Coast Guard. The requirement to display permanent navigation lights at the bridge is waived.

D. Clean Water Act - Sections 404 and 401: Waters and Wetlands of the United States

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) and associated Section 401 State Water Quality Certification(s) as administered by the New Hampshire Department of Environmental Services as well as any additional Section 404 permits and 401

certifications issued to the Design-Builder during the life of the Project. The documentation at a minimum shall include:

- Process for training personnel to recognize Waters of the U.S. that fall under the jurisdiction of the USACE,
- Process for communicating the terms and conditions of all USACE 404 permits and certifications,
- Procedures for carrying out any required mitigation,
- Procedures for handling off-right-of-way Project Specific Locations (PSL) as required by all Section 404 permit(s) issued to either NHDOT or the Design-Builder by the USACE.

E. **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. The documentation shall include that the Design-Builder has day-to-day operational control over activities necessary to ensure compliance with the Storm Water Pollution Prevention Plan (SWPPP) and has the sole responsibility for any potential non-compliance issue. The documentation shall also include that the Design-Builder is responsible for submitting a Notice of Intent (NOI) to the appropriate agency. The documentation at a minimum shall include:

- Process for training personnel on the requirements and conditions of the NPDES Construction General Permits for Storm Water Discharges from Construction Sites (CGP),
- Procedures for incorporating additional properties outside the original NEPA approved schematic and any off-right-of-way PSL within one linear mile of the project limits to comply with the CGP and the project's SWPPP,
- Procedures for handling non-compliance issues,
- Escalation procedures for SWPPP items.

F. State Listed Species

The Design-Builder shall develop a plan to document how they will address state listed threatened or endangered, listed or candidate species, if any are found to occur in the project area. The documentation shall be in agreement with any agreements, which may be made with the New Hampshire Fish and Game Department (NHFG), including the requirement for coordination with NHFG to be conducted by NHDOT. The documentation at a minimum shall include:

- Process for communicating any commitments regarding state listed species,
- Procedures for complying with any commitments.

G. Endangered Species Act and Fish and Wildlife Coordination Act

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

- Process for training personnel on the requirements of the ESA, MSA and FWCA,
- Process for communicating any commitments regarding ESA, MSA and FWCA,
- Procedures for complying with any commitments including mitigation.

H. Traffic Noise

The Design-Builder shall document how they will address traffic noise mitigation.

To fulfill the commitments the Design-Builder shall be responsible for implementing all noise mitigation measures to minimize construction and long-term impacts of the Work.

I. Public Involvement

The Design-Builder shall document how they will comply with all public involvement requirements, including 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 Design-Builder is responsible for conducting 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:

- Process for handling public involvements requirements,
- Procedures for documenting public involvement.

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:

- Educate every worker to:
  a. Recognize the overall importance of environmental issues to constructing, operating and maintaining a successful Project.
  b. Appreciate the various environmental sensitivities of the Project.
  c. Potential Hazards and Safety protocol.
- Train every worker to:
  a. Recognize environmentally sensitive resources that may be encountered during the Work.
  b. Avoid or take appropriate action to minimize environmental impacts from the Work.
  c. Know the required actions, practices, and procedures regarding regulated resources.
  d. Recognize a potentially unsafe condition.

- Foster the Design-Builder's management and supervisory personnel's attitude of commitment to the Project's environmental quality.
- Convey to all workers, the Design-Builder's management commitment to the Project's environmental quality.
- 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:

- Overall importance of environmental protection to the Project.
- Compliance responsibility and Governmental Entity authority including background and environmental issues regulatory overview.
- Overview of the Design-Builder’s environmental commitments and responsibilities at the Project level.
- Worker responsibilities.
- Wetlands identification.
- Environmental Approvals terms and conditions including an overview of the provisions of the ESA, and Stormwater Pollution Prevention Program (SWPPP).
- BMPs for environmental compliance, including pollution prevention, erosion, sedimentation, and dust control measures to maintain water and air quality.
- Required mitigation measures.
- Procedures and precautions in the event of spills of or discovery of Hazardous Materials or unknown chemicals or contamination.
- Procedures and precautions in the event human skeletal remains or other archeological or paleontological resources are discovered.
- Groundwater protection requirements.
- CWA regulations and surface water protection requirements.
- Overview of noise and residential impact reduction procedures.
- Overview of vibration monitoring requirements

- Air quality requirements.
- Penalties and/or fines for violations of and noncompliance with Environmental Approvals and Environmental Laws, including termination of employment.

6.3.4 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.

6.3.4.1 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.

6.3.5 Concrete Barrier Bridge Rail System

Due to noise concerns from project abutters, NHDOT is offering an incentive for the use of concrete barrier for the sections listed below. The incentive will be awarded in the form of a $75,000 reduction in the Design-Builder's Price Value. In order to receive this benefit the Design-Builder's proposed system must include the following:

- Concrete Barrier/Concrete Bridge Rail spanning from the Southeast side of the bridge to the Southwest abutter's driveway, allowing the appropriate length for transition and end rail units, (approximately Sta. 113+20 to Sta. 117+40) as well as on the North Side to mirror the South (approximately Sta. 113+20 to Sta. 117+40).
- Minimum concrete barrier height of 42 inches.
- The remaining limits of need shall be standard w-beam guardrail.
- <u>ALL</u> rail shall meet MASH Test Level 4 Crashworthiness Standards.
- The need for a closed drainage system to collect and outlet storm water from the roadway must be addressed.
- The implications of adding significant additional loading to the soil due to a heavyweight concrete system shall be addressed.

6.3.6 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.

6.3.7 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, 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.

6.4 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 Compliance Inspectors (ECIs), Water Quality Specialist, and Contaminated Materials Manager.

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

- Staffing and availability of ECM and all ET personnel.
- ET staff response times during the Work.

6.4.1 Environmental Compliance Manager (ECM)

The Design-Builder shall designate a 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 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.

6.4.3 Water Quality Specialist

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

Qualifications: The Water Quality Specialist shall have verifiable experience in implementing Storm Water Pollution Prevention Plans and be able to demonstrate a working knowledge of permit requirements for New Hampshire, as applicable to this Project.

6.4.4 Contaminated Materials Manager

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

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

- Verify all employee certifications prior to and required for any handling of Contaminated Materials.
- Maintain records of all incidents involving Contaminated Materials and notify the ECM, NHDOT and appropriate authorities in writing of any such incidents.

Qualifications: The Contaminated 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:

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

6.5 Summary of Environmental Commitments

The following environmental commitments have been made for this project as of May 17, 2018 for this project. 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 conditions may be deleted. Responsible parties are listed parenthetically following each commitment.

- Construction monitoring of the Twombly Family Burial Ground on Parcel 10 shall occur should construction impacts occur within 25 feet of the boundaries of the resource. (Design-Builder)
- If abnormal field conditions are identified during construction that present unanticipated environmental concerns or would require deviations from any other environmental commitment, work shall be suspended in the immediate area and the NHDOT's Bureau of Environment shall be contacted to provide further guidance. (Design-Builder, NHDOT)
- The span length of the Bunker Creek Bridge, currently established at a maximum of 76 feet, shall be designed through the Design Build Contract process to meet environmental parameters for open width and flood passage for the 100 year predicted flood risk occurrences. (Design-Builder)
- A NHDES wetland permit and a NHDES Shoreland permit will be acquired prior to construction. (NHDOT)
- A NHDES Coastal Zone Consistency Finding will be acquired prior to constructions. (NHDOT)

- A USACE Programmatic General Permit will be acquired prior to construction. (NHDOT)

- Areas known to contain invasive species found on the NH List of Prohibited Invasive Species (AGR PART 3802.01) are depicted on the project plans. Disturbances of any prohibited invasive species areas shall be conducted in accordance with the Department publication *Best Management Practices for Roadside Invasive Plants*. (Design-Builder)

- Implementation of appropriate Avoidance and Mitigation Measures, as detailed in the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat Project Submittal Form, including posting of an NLEB Awareness flyer. (Design-Builder, NHDOT)

- Prior to commencement of any work on the bridge, the NHDOT Bureau of Environment shall conduct an inspection to detect the presence or evidence of any use by bats. If bats are found to be present, or if there is evidence of bat usage, work at the bridge shall not commence until after the Bureau of Environment has completed coordination with the US Fish and Wildlife Service to determine the appropriate follow up or mitigative actions. (NHDOT)

- Turbidity booms shall be installed along the causeways approaching the bridge as a preventative measure that would exclude federally endangered Atlantic Sturgeon that may incidentally be present in the project area during construction. (Design-Builder)

- NOAA's Fisheries "Atlantic and Shortnose Sturgeon" Fact Sheet shall be included in the construction contract documentation, to be shared with all project operators, employees and contractors. (Design-Builder)

- Intertidal habitat impacts shall be avoided and minimized. Compensatory mitigation will be provided for remaining unavoidable impacts. (Design-Builder, NHDOT)

- Contact information for community outreach agencies are to be included in notification or public outreach that might be undertaken for the project. (Design-Builder)

During the approximately 14 day bridge closure, construction signing will be placed to advise motorists of the changed conditions. There will be detour signs placed directing those wanting to cross Bunker Creek. Through traffic is anticipated to be detoured along NH Route 108 and the Spaulding Turnpike. (Design-Builder, NHDOT)Access to all properties will be maintained during construction. Outside the 14 day bridge closure time frame the existing traffic patterns and circulation in this area will largely be maintained. (Design-Builder)

- To protect managed or protected fish species such as winter flounder, shortnose sturgeon, and Atlantic sturgeon, no in-water work will be conducted between February 15 and June 30 of any year. Any in-water, silt producing work conducted between February 15 and June 30 should occur within cofferdams or similar silt-containment structures, provided these structures are installed and removed during the recommended work window. (Design-Builder)

- NHDOT will coordinate with the NHDES Wetland Bureau, US Army Corps of Engineers, National Marine Fisheries Service, and NH Fish and Game Department, and the Design-Builder as soon after selection as is reasonable to discuss permit commitments, mitigation requirements, timing restrictions and fisheries concerns. (Design-Builder, NHDOT)

- In accordance with the conservation recommendations of the National Marine Fisheries Service (NMFS), any modification to the construction timeframe that may require work within Bunker Creek and the Oyster River outside the work window of February 15 to June 30 will require that consultation recommence with NMFS to determine appropriate actions. (Design-Builder, NHDOT)

- Containment systems will be used during construction to prevent debris from entering Bunker Creek and the Oyster River during demolition. (Design-Builder)

- A professionally prepared Stormwater Pollution Prevention Plan (SWPPP), consistent with Section 6, will be prepared by the contractor prior to commencement of construction, specifying measures designed to protect the water quality of the Bunker Creek and Oyster River during construction. (Design-Builder)

- All appropriate Best Management Practices will be employed during construction. This is especially important for work that involves alteration of the Bunker Creek/Oyster River riverbed or shoreline. This work would include abutment replacement and other work. Work will follow all conditions of permits to be obtained for work in aquatic resources and any other state or federal jurisdictional areas. (Design-Builder, NHDOT)

- Erosion and sedimentation control measures must be installed prior to the commencement of construction and maintained appropriately throughout the project construction. (Design-Builder)

- If dewatering is required during construction, provisions will be made for discharge to surface waters, provided that the water quality of the discharge complies with applicable provisions under the National Pollutant Discharge Elimination System (NPDES) permit program. (Design-Builder)

- No impact to the Section 4(f) Fish & Game property in the northwest quadrant of the bridge.

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.

The work elements associated with Bunker Creek Bridge, and US Route 4 in the Town of Durham shall be governed by the most recent edition of other applicable engineering codes and standards, including those of the various federal, NHDOT, and local jurisdictions.

7.2 Geotechnical

7.2.1 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 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.

7.2.2 Design Requirements

7.2.2.1 Subsurface Geotechnical Investigation by Design-Builder

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.

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 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:

1. Interpretation and analysis of soil and bedrock conditions based on the geotechnical information available and other investigations conducted by the Design-Builder.
2. Design and construction recommendations for the following, as applicable:
    a. Bridge substructures: spread footing, and/or deep foundation.
    b. Retaining walls: type, foundations, settlement, backfill.
    c. Embankment slope stability and special embankment construction: soil modification, lightweight fills, staged construction.
3. Performance criteria of structure foundations and highway embankments - total and differential settlement of retaining walls, highway embankments, bridge foundations (lateral and axial).
4. 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.
5. 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.
6. Construction considerations for all of the above geotechnical elements.
7. All field investigations and laboratory test results, including information provided by NHDOT and data obtained by the Design-Build Team, used to characterize the project site conditions and to properly complete the project design. 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.

If environmentally-sensitive conditions are encountered during the subsurface exploration activities, Design-Builder shall undertake appropriate actions in accordance with Section 6.

7.2.2.2 Pavement Design

Design-Builder shall design and construct roadway pavements to NHDOT standards and be submitted to the NHDOT for review and comment. The pavement and pavement structural section shall be designed per the NHDOT Highway Design Manual for a mean year ADL of 350 or per the design included in the Reference Material. The pavement design shall include the structural layer materials, general specifications, and thicknesses.

Roadway that is disturbed by the construction activities of the Project, 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.

7.2.2.3 Final Geotechnical Investigations.

The NHDOT does not necessarily consider the explorations contained in the Preliminary Design Phase Geotechnical Report or any supplemental explorations completed by NHDOT 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 Reference Documents as appropriate for their designs.

7.2.3 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.

If an instrumentation program is required, no construction shall be allowed until baseline pore pressures or movement data are collected.

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 within two hundred (200) feet or as identified in the Environmental Commitments Section 6.5 of the construction. In addition, the Design-Builder shall implement the accepted instrumentation program. 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.

7.3 Survey

7.3.1 General Requirements

The Design-Builder shall provide accurate and consistent land surveying and mapping necessary to support 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. Survey shall be under the supervision of a Licensed New Hampshire Surveyor. Available survey information has been provided on the Project website.

The Design-Builder shall bear sole responsibility for the accuracy of additional survey data used in the Design. The Design-Builder shall review existing survey data and determine 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.

7.3.2 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.

7.3.3 Survey Services

Survey documents shall be a part of the design documents and shall include:

1. 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;
2. Survey notes, plans, and calculations completed as the Work progresses and all originals and two copies of each survey document;
3. Construction staking plans. Construction survey notes shall be provided to the NHDOT.
4. Construction staking as deemed appropriate by the Design-Builder;
5. Original diary forms and related original survey record keeping; and
6. Construction staking survey control data key map and line index plans (to be included in the Construction Plans).

7.3.4 Design Requirements

7.3.4.1 Units

All survey Work shall be performed using the US Survey Foot.

7.3.4.2 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 to the NHDOT-supplied Primary or Secondary control network. 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 Land Surveyor in the State of New Hampshire.

7.3.4.3 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(86), US Survey Feet, (NAD 83(96)).

Horizontal survey shall meet minimum NHDOT survey accuracy requirements (1 in 15,000).

7.3.4.4 Vertical Control

Vertical control for the Project shall be established on the North American Vertical Datum of 1929, US Survey Feet, (NGVD29).

Vertical survey shall meet minimum Third-order, Class I survey accuracy and procedures (0.05 ft (2.0 mm) X $\sqrt{\text{distance in miles (kilometers)}}$).

7.3.5 Construction Requirements

7.3.5.1 Units

Comply with Design Requirements.

7.3.5.2 Construction Surveys

Comply with Design Requirements.

7.3.6 Survey Records and Reports

Design-Builder may use an electronic field book to collect and store raw 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.

7.3.6.1 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.

7.3.6.2 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.

7.3.7 Electronic Deliverables

All collected survey data shall be Digital Terrain Model (DTM) and be created and submitted using the latest version of Microstation to the NHDOT.

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.

7.3.8 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.

7.4 Roadway and Bicycle

7.4.1 General Requirements

The objectives of the Project include the provision of a safe, reliable, and cost-effective corridor for the traveling public. The requirements contained in this Section 7.4 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 Governmental Entity having jurisdiction of said roadway.

7.4.2 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.

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. The roadway geometry for US Route 4 shall be as described below.

Driveways shall be designed to meet the requirements of NHDOT where applicable.

7.4.2.1 Horizontal and Vertical Control

1. The Design Speed along US Route 4 shall be a minimum of 45 mph, including achieving 45 mph intersection sight distance from Morgan Way.

2. The roadway geometry of US Route 4 shall have two 12' wide through lanes, an 11' wide left turn lane at the Morgan Way intersection, and 5' wide shoulders. All work shall be constructed within the proposed right-of-way and easements, except at locations where the Design-Builder proposes to modify the preliminary design and ROW for its own reasons.

3. The minimum longitudinal tangent grade for the new bridge shall be one percent (1.0%). The maximum longitudinal tangent grade for US Route 4 shall be 7.0%.

4. Superelevation design for US Route 4 shall use the emax=0.08 chart. Superelevation transitions to meet AASHTO criteria with 70/30 split desired.

5. The minimum vertical clearance of US Route 4 over the Bunker Creek shall be as specified in Section 1.1 of this document.

6. Normal Crown – Defined at 2%.

7. Roadway lane tapers shall be at least 45 to 1.

8. Design Vehicle – WB-50 for US Route 4 at the Morgan Way intersection. Proposed truck turns to match existing truck turns at a minimum.

9. Roadway longitudinal barrier shall have a minimum height of 31 inches.

10. No impacts to the trees in front of the Tirrell property, Station 119+50 to 121+25 Rt.

7.4.2.2 Surface Treatment

1. Curbing – Granite curbing shall be used for raised islands and along edge of proposed pavement as per NHDOT Highway Design Manual Volume 2 typicals for roadway.

2. Loam – Defined as per NHDOT Highway Design Manual Volume 2 typicals and specifications.

3. Seeding – Define as Park Seed Type 15 for loam areas. Loam is to be utilized on all slopes.

7.4.2.3 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.

7.4.2.4 Control of Access

Design-Builder shall maintain all existing property accesses, including those not shown on the schematic, and shall not revise control of access without NHDOT review and the written agreement of the affected property Owner.

7.4.3 Bicycle Facilities

The storm drain inlets on the roadway surface shall be bicycle safe grates as identified on the NHDOT Standard Plans for Road Construction.

7.5 Traffic

7.5.1 General Requirements

This Section 7.5 includes requirements with which Design-Builder shall design, construct, and maintain all signing and pavement markings for the Project.

Design-Builder shall arrange and coordinate all meetings with requesting agencies or individuals regarding special signs.

7.5.2 Design Requirements

7.5.2.1 Permanent Signing

The Work shall include traffic sign plans and installation as required by the NHDOT and MUTCD criteria. 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 signs on the approaches and adjacent roadways due to the construction of the Project.

Design-Builder shall design and install all signs as shown on the Final Design. Signs include new signs, as well as modifications to existing sign panels and structures. Design-Builder's design shall include the locations of ground-mounted, graphic representation of all signs, proposed striping, guide sign and special sign details, and structural and foundation requirements. Signs shall be located in a manner that avoids conflicts with other signs, 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 and NHDOT practices.

Design-Builder shall review with NHDOT all requests for new signs, including traffic generators, or modifications of existing sign text. Such requests are subject to NHDOT's approval.

Design-Builder's design of delineators and object markers shall comply with NHDOT and MUTCD requirements.

A dynamic message sign (DMS) is to be constructed along the westbound side of US Route 4 approximately one mile west of the Bunker Creek bridge. See the ITS Design Narrative and concept plan in the TSMO DMS Report located under "Resource Documents" on the project website.

7.5.2.2 Permanent Pavement Marking

The Design-Builder shall be required to design and install pavement markings in accordance with the AASHTO, MUTCD, and NHDOT guidance (standards, specifications, and current practices).

Temporary pavement markings used for traffic management shall be designed and installed in accordance with MUTCD standards. The Design-Builder is responsible to maintain these 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.

Pavement Markings material for all words, symbols, and crosswalks shall be thermoplastic (not paint). All lane lines shall be retroreflective paint. These materials shall meet MUTCD and NHDOT requirements.

7.5.3 Construction Requirements

7.5.3.1 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.

All installed signs are required to meet the requirements of MUTCD and NHDOT.

7.5.3.2 Permanent Pavement Markings

Design-Builder shall use retroreflective paint for lane markings.

7.5.4 Deliverables

All deliverables shall be presented to NHDOT in electronic form compatible with NHDOT software.

7.5.4.1 Permanent Signing

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 3 working days' notice prior to installation of any sign.

7.5.4.2 Permanent Pavement Marking

Before placing any permanent pavement markings, Design-Builder shall provide NHDOT a layout indicating the proposed location of such items and at least 3 working days' notice prior to installation of permanent markings.

7.6 Drainage

7.6.1 General Requirements

The Design-Builder shall provide a well-drained corridor and a safe environment for those that use 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.

7.6.2 Administrative Requirements

7.6.2.1 Data Collection

Design-Builder is responsible for collecting all necessary data to establish a drainage system that complies with the requirements and accommodates the 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 Categorical Exclusion or other 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.

7.6.2.2 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.

7.6.3 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. 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 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.

Design-Builder shall design all elements of the drainage facilities in accordance with the applicable design criteria and standards, including the NHDOT Manual on Drainage Design for Highways, the most current FHWA Hydraulic Engineering Circular No. 25 (HEC 25), 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.

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 7.6.

Design-Builder shall provide facilities compatible with existing drainage systems and all applicable municipal drainage plans or approved systems in adjacent properties.

Elements of the existing drainage system impacted by the Project must meet hydraulic capacity requirements as detailed Section 7.6.

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.

Stormwater treatment is required. See the Post Hearing Plan on the project website for conceptual location and design. The intent of the grass swale shown at Sta 119+00, Lt is to capture stormwater from the left side of the road Sta 113+00 to 119+00. This area captured is meant to equal "2 x the area of increased impervious surface". The plan shown relies on sheet flow-ditch line capture; however, an inlet is needed at Sta 119+00, Lt under the guardrail, to ensure future capture.

7.6.3.1 Surface Hydrology

7.6.3.1.1 Design Frequencies

Design-Builder shall use the design frequencies listed in Table 7.6-1 below.

Table 7.6-1: Drainage Design Frequencies

	Design					**Check Flood**
Functional Classification and Structure Type	**2**	**5**	**10**	**25**	**50**	**100**
Principal arterials:						
♦ major river crossings					X	X
Storm drain systems on other roadways						
♦ inlets and drain pipe			X			X
♦ inlets for depressed roadways*				X		X
Notes. * A depressed roadway provides nowhere for water to drain even when the curb height is exceeded.						

7.6.3.1.2 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.

7.6.3.2 Storm Sewer Systems

Where precluded from handling runoff with open channels by physical site constraints, or as directed in Section 7.6, 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:

- 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.
- 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.
- Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe alternates.
- 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.

This report shall be a component of the 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:

a. The nearest edge of pavement provided criteria for b & c are met;

b. The top of any grate inlet; and

c. The top of any manhole cover in the site stormwater system.

7.6.3.2.1 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 (typically 89 -94% full). 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.

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.

7.6.3.2.2 Ponding

Design-Builder shall design drainage systems to limit ponding to the widths listed below for the design frequency event:

Table 12-2: Allowable Ponding Widths by Roadway Classification

Roadway Classification	Design Storm Allowable Ponding Width	Check Storm Allowable Ponding Width
Principal Arterials/Highways	Low shoulder plus ½ of 1 lane	Low shoulder plus ½ of 1 lane
Minor Cross Streets	Low shoulder plus ½ of 1 lane	No adverse impact on adjacent property

7.6.3.3 Hydraulic Structures

7.6.3.3.1 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.

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.

Design Frequency

Major river crossings, bridges, culverts and storm drain systems shall be designed for the design-year frequency indicated in Section 7.6.3.1.1.

Hydraulic Analysis

Design-Builder shall evaluate bridges for contraction scour and pier scour concerns and incorporate protection in accordance with Hydraulic Engineering Reference manual 18 (HEC 18), Evaluating Scour at Bridges, and HEC 20, Stream Stability at Highway Structures.

Design-Builder shall design riprap at abutments in accordance with the procedures outlined in HEC-23, if applicable.

Bridge/Culvert Waterway Design

For existing crossings, Design-Builder shall analyze the existing structure 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 a replacement structure 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.

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.

Open deck drains are permissible for bridges passing over waterways.

Drainage Report for Major Stream Crossings

Design-Builder shall prepare a report for all new structures. The report shall include the detailed calculations and copies of electronic models 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:

Hydrology

- Drainage area maps with watershed characteristics, hardcopy
- Hydrologic calculations (where computer software is used, both hardcopy and electronic models with input and output files)
- Historical or site data used to review computed flows

Hydraulics and Recommended Waterway Opening and/or Structure

- Photographs of Site (pre- and post-construction)
- General plan, profile, and elevation of existing and proposed waterway opening and/or structure

Scour Analysis

- Channel cross-sections at bridge showing predicted scour
- Calculations and summary of calculations, clearly showing predicted scour and assumptions regarding bridge opening and piers used to calculate predicted scour
- Discussion of review of long-term degradation/aggradation and effects
- Recommendation for abutment protection
- Any electronic models used to determine hydraulic and sediment transport parameters.

These reports shall be part of the Drainage Design Report.

7.6.4 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 phase of construction.

7.6.5 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:

- Record set of all drainage computations, both hydrologic and hydraulic, and all support data.
- Hydraulic notes, models, and tabulations
- Storm sewer drainage report
- Bridge and culvert designs and reports for major stream crossings for all new structures
- Correspondence file

- Drainage system data (location, type, material, size, and other pertinent information) in a suitable electronic format

7.7 Bunker Creek Bridge Structure

7.7.1 Navigational and Roadway Clearances

Bridge span lengths shall be provided as shown on the Project Schematics in the Reference Materials unless allowed by an ATC.

Mean High Water (MHW) is Elevation 4.00 on the North American Vertical Datum of 1929 (NGVD29).

7.7.2 Design Requirements

7.7.2.1 Specifications

- 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.

- The bridge design shall follow the requirements of the Environmental Commitments in Section 6.5. Live load deflection criteria shall be per AASHTO Bridge Design Specifications,

- 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.

- All 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 915 of the Bridge Design Manual and NHDOT Form 4 shall be submitted with final design calculations.

7.7.3 Materials

A. Structural steel shall conform to the requirements of AASHTO M270 (ASTM A709). All structural steel shall be galvanized or metalized in accordance with the Section 550 of the 2016 NHDOT *Standard Specifications for Road and Bridge Construction*.

B. Concrete shall conform to the requirements of Item 520. All concrete beams/girders shall be 8000 psi as a minimum.

C. High-strength bolts for use with painted steel shall be galvanized.

D. Stainless steel reinforcement shall be solid stainless steel conforming to ASTM A 955, Type 2205 (UNS S31803).

E. Steel bridge railing shall be galvanized.

7.7.4 Superstructure Features

7.7.4.1 Bridge Deck Details

1. Future deck maintenance and replacement shall be a design consideration.

2. The bridge deck shall have a solid roadway surface. All construction joints for the concrete bridge deck shall be minimized to the extent practicable. No experimental or previously unapproved materials will be allowed without prior written permission from the Department.

3. Bridge deck shall be designed in accordance with criteria specified in the Bridge Design Manual. Empirical deck designs, AASHTO Bridge Design Specifications Section 9.7.2, shall not be allowed.

4. Bridge deck, including brush curbs, shall provide a minimum of 2 ½ inches of clear cover over the top mat of reinforcing steel, unless noted otherwise.

5. Brush curbs shall be constructed entirely of concrete. The use of granite curb shall not be allowed.

6. Bridge Deck shall be constructed with class AA concrete as a minimum. Reinforcing steel for decks with barrier membrane and pavement shall be epoxy-coated. Reinforcing steel for bare concrete decks shall be solid stainless steel. The top ½ inch of bare decks shall be considered as a sacrificial wearing course. Stay-in place forms are not allowed. See Bridge Design Manual for clear cover values for each.

7. Bare concrete decks shall have a surface finish in conformance with NHDOT Special Provision for Item 520.7.

7.8 Traffic Control

The plan shall specifically identify any planned closures, either full or partial, of any existing 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.

7.8.1 General Requirements

Design-Builder shall design and construct the Project, in conformance with the requirements stated in this Section 7.8, to provide for the safe and efficient movement of people, goods, and services, through and around the Project, while minimizing negative impacts to users, and residents.

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, and striping in accordance with the MUTCD and NHDOT Standard Specifications.

7.8.2 Administrative Requirements

7.8.2.1 Traffic Management Plan

Design-Builder shall develop, implement, and maintain a Traffic Management Plan (TMP) that includes the following items:

- Descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, and other personnel with traffic control responsibilities.
- Procedures to identify and incorporate the needs of Utility Owners, Governmental Entities, 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.
- 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.
- Procedures for signing transitions during construction from one stage to the next and from interim to permanent signing.

- Procedures for maintenance and replacement of traffic control devices, including pavement markings and traffic barriers, if used.
- Procedures and process for the safe ingress and egress of construction vehicles in the work zone.
- 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.
- Procedures to modify plans as needed to adapt to current Project circumstances.
- 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.
- Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours.

7.8.2.2 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.

A. Maintenance of Traffic During Suspension of Work.

1. 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 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.

   During this suspension period, the maintenance of the temporary roadway and sections of the Project will be the responsibility of the NHDOT.

   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.

2. 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.

7.8.2.3 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. This meeting shall, as a minimum, involve personnel from the Design-Builder, Bureau of Construction, 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.

7.8.3 Design Requirements

7.8.3.1 Traffic Control Plans

Design-Builder shall use the procedures in the TMP and the standards of the MUTCD and NHDOT Work Zone Safety and Mobility Policy 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, traffic control devices, 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,

which shall be in accordance with typical NHDOT practice. Changes to posted speed limits will not be allowed unless specific prior approval is granted by NHDOT.

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 to the greatest extent possible 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 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.

7.8.4 Construction Requirements

Construction shall be in accordance with Design-Builder's TMP, the manufacturer's directions or recommendations where applicable, and the applicable provisions of the MUTCD.

7.8.4.1 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.

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 a minimum of two weeks advance notice for the roadway closure.

Design-Builder shall provide NHDOT a minimum two days notice for daily lane closures that are allowed 9 am to 3 pm.

7.8.4.2 Access

Existing bicycle access and mobility shall be maintained except during the complete closure period. Access to existing transit stop locations shall be maintained during construction or reasonable alternative locations shall be provided.

7.8.4.3 Detours

Design-Builder shall maintain all 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.

7.8.4.4 Allowable Surface Conditions for US 4

a. **Non-Closure Period**

During the non-closure period, traffic (vehicular and bicycles) will be allowed on non-paved, structurally supportive surface which shall be passable for bike access, and shall be maintained in smooth, dust free condition for all cross lateral and longitudinal drainage removal and installation; and for pre-closure construction to adjust the US Route 4 profile.

The maximum number of days allowed for travel on non-paved surface for US Route 4 profile adjustment shall not exceed twenty-one (21) total days.

The maximum number of days allowed for travel on non-paved surface for drainage trenches shall not exceed five (5) consecutive days.

The maximum differential between travel lanes during non-work hours shall not exceed 1.5 inches and shall be clearly delineated.

b. Closure Period

During the road closure the travelling surface maintained for local access may be a gravel surface with grades acceptable for passenger vehicles during the day and night.

Prior to removing the detour, and thus achieving Substantial Completion, a paved surface shall be provided to a width of 26’ and at least 3 ½” of pavement.

7.8.4.5 Allowable Delay

Design-Builder shall minimize impacts on traffic to the extent practical.

During a two-way alternating one lane traffic control operation, the maximum delay shall not exceed ¼ mile. If delay exceeds ¼ mile the Design-Builder shall make adjustments to traffic control plan or suspend the operation until more favorable conditions exist.

7.8.5 Deliverables

7.8.5.1 Traffic Management Plan

The TMP must be approved by NHDOT prior to the start of construction activities. Design-Builder shall provide NHDOT 14 days for review of, and comment on, the TMP. NHDOT retains the right to require revision and re-submittal of the TMP within 14 days.

7.8.5.2 Traffic Control Plans

Each traffic control plan shall be submitted to NHDOT for review a minimum of 14 Days prior to implementation.

7.9 Roadway Lighting

Design-Builder shall maintain existing permanent roadway lighting along US Route 4, collectively termed the Bridge in coordination with the electric company.

Design-Builder shall provide temporary roadway lighting along US Route 4 illuminating the approach ends of concrete barrier adjacent to or shifting the travel way.

7.9.1 Design

7.9.1.1 Permanent Lighting

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 and not behind traffic barrier, Design-Builder's design shall incorporate breakaway devices.

Design-Builder shall determine and design appropriate foundation types and lengths for permanent lighting structures.

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 traffic barrier.

7.9.1.2 Temporary Lighting

Design-Builder shall arrange and coordinate all meetings with State and local agencies for roadway lighting as noted within the Referenced Documents.

Design-Builder shall prepare lighting studies that consider illumination levels and uniformity at the approach ends of concrete barrier adjacent to or shifting the travel way. Design-Builder shall provide an average to minimum uniformity ratio of 4:1, with an average illumination of 0.8 fc.

7.9.2 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.

7.9.3 Deliverables

Before placing any permanent lighting, Design-Builder shall provide NHDOT a layout indicating the proposed location of such items with the photometric data.

Before placing any temporary lighting, Design-Builder shall provide NHDOT a layout indicating the proposed location of such items with the photometric data.

7.10 Utilities

The Design-Builder shall ensure that all utility work is completed in accordance with 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 physical construction.

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. 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.

7.10.1 General Requirements

Design-Builder shall coordinate all Utility Adjustments, 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. This 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 process, to the extent described in the Contract documents. A proposed Aerial Utility Adjustment is shown on the plans. Aerial Utility Adjustments will be performed by the Utility Owner with its own forces and/or contractors and consultants (i.e., Owner-Managed)

7.10.1.1 When Utility Adjustment is Required

A Utility Adjustment will 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 requirements of the NHDOT Utility Accommodation Manual.

7.10.1.2 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:

1. Avoiding relocations to the extent practicable;
2. If a relocation is not reasonably avoidable, protecting the utility in place to the extent practicable; and
3. Otherwise minimizing the potential costs and delays relating to relocations to the extent practicable.

7.10.1.3 Certain Components of the Utility Adjustment Work

7.10.1.3.1 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 Work.

7.10.1.3.2 Betterments

Replacements for existing Utilities shall be designed and constructed to 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.

7.10.1.3.3 Protection in Place

Design-Builder shall be responsible for Protection in Place of all Utilities impacted by the Project as necessary for their continued safe operation and structural integrity.

7.10.1.3.4 Abandonment and Removal

Design-Builder shall make all arrangements and perform all work necessary to complete each abandonment or removal (and disposal) of a 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.

7.10.1.3.5 Service Lines and Utility Appurtenances

Whenever required to accommodate construction, operation, maintenance and/or use of the Project, Design-Builder shall cause Service Line Adjustments and Utility Appurtenance Adjustments. On completion of these, Design-Builder shall cause full reinstatement of the roadway, including reconstruction of curb, gutter, sidewalks, and landscaping, whether the Utility Adjustment Work is performed by the Utility Owner or by Design-Builder.

7.10.1.4 Agreements Between Design-Builder and Utility Owners

Each reimbursable Utility Adjustment shall be specifically addressed in a Utility Agreement (UA) or in a Utility Agreement Amendment (UAA) in the NHDOT format, as described elsewhere in this Section 7.10. 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.

7.10.1.4.1 Utility Agreements (UA)

Design-Builder shall enter into one or more UAs 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 UA may address more than one Utility Adjustment for the same Utility Owner. Additional Adjustments may be added to an existing UA by a Utility Agreement Amendment (UAA).

Following issuance of NTP1, Design-Builder shall begin negotiations with each affected Utility Owner to reach agreement on one or more UAs. Design-Builder shall use good faith efforts to finalize a UA with each affected Utility Owner within a reasonable time period after issuance of NTP1. Design-Builder shall include any proposed changes to the NHDOT standard form (other than filling in blanks specific to a particular Utility Owner) in a Utility Owner-specific addendum. Each UA (including the Utility Adjustment Plans attached thereto) shall be subject to NHDOT acceptance as part of a Utility Agreement.

7.10.1.4.2 Utility Agreement Amendments

Except where Utility Adjustment Field Modifications are permitted, modification of an executed UA or any component thereof, after it has been accepted by NHDOT as part of a Utility package, shall be stated in a Utility Agreement Amendment (UAA). A UAA may be used only when the allocation of responsibility for the Utility Adjustment Work covered by that UAA is the same as in the underlying Utility Agreement; otherwise, an additional UA will be required.

Each UAA (including any Utility Adjustment Plans attached thereto) shall be subject to NHDOT's acceptance as part of a Supplemental Utility package.

7.10.1.5 Recordkeeping

Design-Builder shall maintain construction and inspection records in order to ascertain that Utility Adjustment 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).

7.10.2 Design

7.10.2.1 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.

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.

7.10.2.2 Technical Criteria and Performance Standards

All design plans for Utility Adjustment Work, whether furnished by Design-Builder or by the Utility Owner, shall be consistent and compatible with the following:

- The applicable requirements of the Contract
- Any Utilities remaining in, or being installed in, the same vicinity
- The October 2017 Utility Accommodation Manual
- All applicable Governmental Approvals

7.10.2.3 Utility Adjustment Concept Plans

Design-Builder shall prepare a proposed conceptual Utility design (a Utility Adjustment Concept Plan) in coordination with the affected Utility Owners for the Project, showing the approximate location of each existing Utility, the existing Utilities to remain, and Design-Builder's Utility Adjustment recommendations if different than shown on the Project plans.

Design-Builder shall submit the proposed Utility Adjustment 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 concurrence with the Utility Adjustment Concept Plan(s) as initially submitted to NHDOT and with any subsequent revisions.

7.10.2.4 Utility Adjustment Plans

Utility Adjustment Plans for water and/or sewer facilities, whether furnished by Design-Builder or by the Utility Owner, shall be signed and sealed by a Registered Professional Engineer (PE).

7.10.2.4.1 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.

7.10.2.4.2 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, and cost estimates 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.

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.

7.10.2.4.3 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.

7.10.3 Construction

7.10.3.1 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.

1. All criteria identified in Section 7.10.2.2 (Technical Criteria and Performance Standards)
2. The Utility Adjustment Plans included in the Utility Agreement accepted by NHDOT (other than Utility Adjustment Field Modifications complying with Section 7.10.3.6 (Utility Adjustment Field Modifications)
3. All Project safety and environmental requirements

7.10.3.2 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 7.10.3.1 (General Construction Criteria).

7.10.3.3 Scheduling Utility Adjustment Work

The Utility Adjustment Work (other than reimbursable work and 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:

1. A reimbursable 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);
2. Availability and access to property affected by the Utility Adjustment have been obtained;
3. 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.
4. The review and comment process has been completed and required approvals have been obtained for the Utility package covering the Utility Adjustment.
5. 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.

6. All other conditions to that Work stated in the Contract have been satisfied.

7.10.3.4 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.

7.10.3.5 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.

7.10.3.6 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:

1. 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;
2. Submittal of plans for the proposed Utility Adjustment Field Modification to NHDOT for its review and comment;
3. Transmittal of Utility Adjustment Field Modifications to the appropriate construction field personnel;
4. Inclusion of any Utility Adjustment Field Modifications in the Record Drawings for the Project.

Design-Builder shall cause the procedure to be followed for all Utility Adjustment Field Modifications, whether the construction is performed by Design-Builder or by the Utility Owner.

7.10.3.7 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.

7.10.3.8 Record Drawings

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 not later than 90 Days after the Utility Owners complete their Adjustments.

7.10.3.9 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.

7.10.3.10 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 7.8.

7.10.4 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.

7.10.4.1 Utility Submittals

The following procedure shall govern submittal and review of each Utility, including Supplemental and Abbreviated Utility Assemblies:

1. 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.

2. Design-Builder shall submit to NHDOT three identical and complete originals of each Utility package (each of which shall be bound and labeled "Design-Builder Copy," "NHDOT Copy," or "Utility Owner Copy," as appropriate), complying with the requirements of Section 7.10.4.1. The "NHDOT Copy" shall be color coded. These submittals 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 7.10.4.

NHDOT will review the Utility Package for compliance with the requirements of this Section 7.10.4.1, and within 10 Business Days will return the Utility Package to Design-Builder with the appropriate notations to reflect its responses. 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 to NHDOT, as necessary to resolve all NHDOT comments and/or obtain NHDOT's acceptance, as applicable. 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 Agreement for reimbursable work and of any other components of the Utility Package for which this Section 7.10 requires NHDOT's signature.

7.10.4.2 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.

7.11 Removal of the Existing Bridge

Removal shall conform to relevant portions of the NHDOT Standard Specifications and to the extent specified in the Project Requirements in the RFP.

The existing bridge shall be removed by and become the property of the Design-Builder. Removal requirements may change due to permit or 106/4(f)/NEPA stipulations noted under Section 6.5, Environmental Commitments.

Existing substructures, to be removed, shall be removed to 3 feet below proposed ground elevation or to bottom of footing.