



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



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VICTORIA F. SHEEHAN
COMMISSIONER

WILLIAM CASS, P.E.
ASSISTANT COMMISSIONER

Bureau of Highway Design
March 1, 2016

Her Excellency, Governor Margaret Wood Hassan
and the Honorable Council
State House
Concord, New Hampshire 03301

REQUESTED ACTION

Authorize the Department of Transportation to enter into an Agreement with the firm of HNTB Corporation, Westbrook, ME, Vendor #175663, for an amount not to exceed \$737,399.35, for final design engineering services to widen and retrofit the existing Bedford toll plaza facility on the F.E. Everett Turnpike to implement Open Road Tolling, effective upon Governor and Council approval, through December 31, 2017. 100% Turnpike Funds.

Funds to support this request are available in the following account in State FY 2016 and FY 2017, with the ability to adjust encumbrances between State Fiscal Years through the Budget Office, if needed and justified:

Table with 3 columns: Account Number, FY 2016, FY 2017. Row 1: 04-96-96-961017-7511 Toll Collection Equipment. Row 2: 046-500463 Eng Consultants Non-Benefits \$200,000.00 \$537,399.35

EXPLANATION

The Department requires professional engineering consulting services for the preparation of final design, contract plans, specifications, estimates, and construction support services for the widening and retrofit of the existing Bedford toll facility to implement Open Road Tolling (ORT). Four new highway speed toll lanes (two lanes and shoulders on either side of the roadway centerline) will be constructed. Concrete barrier will be used to separate highway speed traffic from low speed traffic and to separate northbound and southbound traffic, and a full span toll gantry will be installed over the Open Road Tolling lanes. The minor widening required for the project is envisioned to extend approximately 2,500 feet north and 4,000 feet south of the toll plaza. This project was authorized under HB 391 and is included in the State's Ten-Year Transportation Improvement Plan (Bedford-Merrimack 16100).

The consultant selection process employed by the Department for this qualifications-based contract is in accordance with RSAs 21-I:22, 21-I:22-c and 21-I:22-d, all applicable Federal laws and the Department's "Consultant Selection and Service Agreement Procedures" dated December 1999. The Department's Consultant Selection Committee is a standing committee that meets regularly to administer the process and make determinations. The Committee is comprised of the Assistant Director of Project Development (Chair), the Chief Project Manager, the Administrators of the Bureaus of Highway Design, Bridge Design, Environment, and Materials and Research, and the Municipal Highways Engineer.

The consultant selection process for this qualifications-based contract was initiated by a solicitation for consultant services for a Bedford-Merrimack 16100 Conversion to ORT at the Bedford Toll Plaza Final Design Services contract. The assignment was listed as a "Possible Action Project" on the Department's website on January 9, 2015 asking for letters of interest from qualified firms. From the list of firms that submitted letters of interest, the Committee prepared a long and then short list of Consultants on February 12, 2015 for consideration and approval by the Assistant Commissioner. Upon receipt of that approval, three shortlisted firms were notified on June 2, 2015 through a technical "Request for Proposal" (RFP). Committee members individually rated the firms on July 9, 2015 using a written ballot to score each firm on the basis of comprehension of the assignment, clarity of the proposal, capacity to perform in a timely manner, quality and experience of the project manager and the team, previous

performance, and overall suitability for the assignment. (A compilation of the completed individual rating ballots and the ranking summary form is attached.) The individual rankings were then totaled to provide an overall ranking of the three firms, and the Committee's ranking was submitted to the Assistant Commissioner for consideration and approval. Upon receipt of that approval, the short listed firms were notified of the results and the highest-ranking firm was asked to submit a fee proposal for negotiations.

The long list of six consultant firms that were considered for this assignment, with the three short-listed firms shown in bold, is as follows:

Consultant Firm

Office Location

AECOM  
Gannett Fleming  
**HNTB Corporation**  
Jacobs  
Stantec Consulting Services Inc.  
VHB

Manchester, NH  
Newton, MA  
**Westbrook, ME**  
**Bedford, NH**  
Auburn, NH  
Bedford, NH

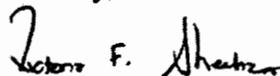
The firm of HNTB Corporation was recommended for this contract. This firm has an excellent reputation and has demonstrated their capability to perform the required services in previous similar contracts with the Department. Background information on this firm is attached.

HNTB Corporation has agreed to furnish the professional engineering services for an amount not to exceed \$737,399.35. This is a reasonable fee and is commensurate with the complexity of the project and the scope of the engineering and technical services to be furnished.

This Agreement (Bedford-Merrimack 16100) has been approved by the Attorney General as to form and execution. The Department has verified that the necessary funds are available. Copies of the fully-executed Agreement are on file at the Secretary of State's Office and the Department of Administrative Services, and subsequent to Governor and Council approval will be on file at the Department of Transportation.

It is respectfully requested that authority be given to enter into an Agreement for consulting services as outlined above.

Sincerely,



Victoria F. Sheehan  
Commissioner

Attachments

**PROJECT: Bedford – Merrimack ORT 16100**

**DESCRIPTION:** Final design and construction support services contract for the conversion of the existing Bedford conventional toll facility to an Open Road Tolling (ORT) facility. Final design is expected to include the development of contract plans and documents for the plaza widening, turnpike widening on approaches and retrofit of the center of the existing plaza for the ORT lanes and gantry. Additionally, turnpike signage evaluation and design, utility coordination, drainage design, stormwater treatment and management, constructability and traffic management considerations will be necessary. Additionally, an environmental study and support for environmental permitting will be needed in support of the project. The minor widening required for the project is envisioned to extend approximately 2,500 feet north and 4,000 feet south of the toll plaza. A conceptual design and estimate has been developed by the Department and can be provided for reference upon request. A single construction contract is envisioned with a targeted advertising date in September 2016. This work will require Professional Engineer licensure in the State of New Hampshire. Past experience with similar type of work, ability to meet an aggressive design schedule, and firm's qualifications are of utmost importance. Contract is anticipated to be cost plus fixed fee or lump sum format and have duration of 18 months.

Services Required: RDWY, ENV, TRAF, UTIL, STRC

**SUMMARY**

HNTB Corporation	1	1	1	1	1	1		6
Jacobs Engineering Group, Inc.	3	3	3	3	3	3		18
Stantec Consulting Services, Inc.	2	2	2	2	2	2		12

**EVALUATION OF TECHNICAL PROPOSALS**

Rating Considerations	W E I G H T	Scoring of Firms		
		HNTB Corporation	Jacobs Engineering Group, Inc.	Stantec Consulting Services, Inc.
Comprehension of the Assignment	20%	20	15	19
Clarity of the Proposal	20%	19	16	20
Capacity to Perform in a Timely Manner	20%	20	17	18
Quality & Experience of Project Manager/Team	20%	19	18	17
Previous Performance	10%	10	6	7
Overall Suitability for the Assignment*	10%	10	6	8
<b>Total</b>	<b>100%</b>	<b>98</b>	<b>78</b>	<b>90</b>

\*Includes: Proximity to project and usage, quality and experience of subconsultant

Ranking of Firms: 1. HNTB  
2. STANTEC  
3. JACOBS

Rating Considerations	W E I G H T	Scoring of Firms		
		HNTB Corporation	Jacobs Engineering Group, Inc.	Stantec Consulting Services, Inc.
Comprehension of the Assignment	20%	20	17	19
Clarity of the Proposal	20%	19	17	18
Capacity to Perform in a Timely Manner	20%	19	18	19
Quality & Experience of Project Manager/Team	20%	20	17	17
Previous Performance	10%	10	8	9
Overall Suitability for the Assignment*	10%	10	7	8
<b>Total</b>	<b>100%</b>	<b>98</b>	<b>84</b>	<b>90</b>

\*Includes: Proximity to project and usage, quality and experience of subconsultant

Ranking of Firms: 1. HNTB  
2. STANTEC  
3. JACOBS

## EVALUATION OF TECHNICAL PROPOSALS (continued)

Rating Considerations	Scoring of Firms			
	W E I G H T	HNTB Corporation	Jacobs Engineering Group, Inc.	Stantec Consulting Services, Inc.
Comprehension of the Assignment	20%	19	15	18
Clarity of the Proposal	20%	19	14	18
Capacity to Perform in a Timely Manner	20%	19	16	18
Quality & Experience of Project Manager/Team	20%	19	14	18
Previous Performance	10%	10	6	8
Overall Suitability for the Assignment*	10%	10	6	8
Total	100%	96	71	88

\*Includes: Proximity to project and usage, quality and experience of subconsultant

Ranking of Firms: 1. HNTB Corporation  
2. Stantec Consulting Services, Inc.  
3. Jacobs Engineering Group, Inc.

Rating Considerations	Scoring of Firms			
	W E I G H T	HNTB Corporation	Jacobs Engineering Group, Inc.	Stantec Consulting Services, Inc.
Comprehension of the Assignment	20%	18	18	18
Clarity of the Proposal	20%	18	16	18
Capacity to Perform in a Timely Manner	20%	19	16	15
Quality & Experience of Project Manager/Team	20%	19	19	18
Previous Performance	10%	10	8	8
Overall Suitability for the Assignment*	10%	10	8	8
Total	100%	94	84	85

\*Includes: Proximity to project and usage, quality and experience of subconsultant

Ranking of Firms: 1. HNTB  
2. STANTEC  
3. JACOBS

Rating Considerations	Scoring of Firms			
	W E I G H T	HNTB Corporation	Jacobs Engineering Group, Inc.	Stantec Consulting Services, Inc.
Comprehension of the Assignment	20%	20	16	17
Clarity of the Proposal	20%	19	15	17
Capacity to Perform in a Timely Manner	20%	20	15	15
Quality & Experience of Project Manager/Team	20%	20	10	16
Previous Performance	10%	10	7	8
Overall Suitability for the Assignment*	10%	10	7	8
Total	100%	99	70	81

\*Includes: Proximity to project and usage, quality and experience of subconsultant

Ranking of Firms: 1. HNTB  
2. STANTEC  
3. JACOBS

Rating Considerations	Scoring of Firms			
	W E I G H T	HNTB Corporation	Jacobs Engineering Group, Inc.	Stantec Consulting Services, Inc.
Comprehension of the Assignment	20%	20	15	17
Clarity of the Proposal	20%	20	15	17
Capacity to Perform in a Timely Manner	20%	20	16	16
Quality & Experience of Project Manager/Team	20%	20	15	16
Previous Performance	10%	10	7	8
Overall Suitability for the Assignment*	10%	10	6	8
Total	100%	100	74	82

\*Includes: Proximity to project and usage, quality and experience of subconsultants

Ranking of Firms: 1. HNTB  
2. Stantec  
3. Jacobs

# Robert Driscoll, PE

## PROJECT MANAGER

Bob has 34 years of experience as a civil engineer specializing in highway design, roadway reconstruction, parking facilities, toll plazas, maintenance facilities, bridge rehabilitations, maintenance and protection of traffic, and turnpike operations. He is currently serving as the project director for all Maine Turnpike Authority (MTA) design and construction projects. He has extensive experience with bridge reconstruction and bituminous rehabilitation contracts on interstate highways including maintaining traffic while reconstructing existing facilities. In addition, he has managed the design and construction of numerous maintenance buildings, such as material storage, maintenance garages and vehicle storage buildings. Other clients to which Bob has provided services include NHDOT, Maine Department of Transportation and the City of Portland.

### **New Hampshire Department of Transportation Bureau of Turnpikes, Hooksett Toll Plaza Open Road Tolling Conversion, Hooksett, NH**

Project manager for the Hooksett toll plaza conversion from a conventional toll plaza to a toll plaza that accommodates highway-speed tolling. This project involved the construction of four new toll lanes, concrete barrier separating the cash toll lanes from the highway-speed toll lanes, demolition of toll booths and canopy in the center of the plaza, reconstruction of several interchange ramps, construction of new snow plow ramps, construction of new tolling gantries, reconstruction of three bridges and new signing. HNTB was responsible for traffic modeling, air and noise analysis, and wetland and permitting plans. HNTB was also responsible for the design of the stormwater treatment, traffic and signing, highway and structures, and coordination with vendors. The design of the project was completed within 18 months of the signed contract.

### **New Hampshire Department of Transportation Bureau of Turnpikes, Hooksett Toll Plaza Wetland Mapping, Hooksett, NH**

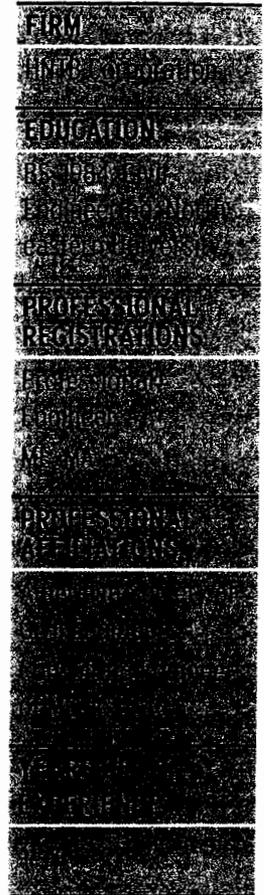
Project manager responsible for wetland delineation services in support of the planning for the Hooksett Toll Plaza conversion to open road tolling. The work included field wetland delineation and the preparation of a report, including a description of the methodology used to conduct the delineation, Army Corp of Engineers (ACOE) transect data sheets, photographs representative of the wetland resources, identification of potential vernal pools and wetland system classifications.

### **New Hampshire Department of Transportation Bureau of Turnpikes, Hampton Toll Plaza Open Road Tolling Conversion, Hampton, NH**

Project manager for the Hampton toll plaza conversion from a conventional toll plaza to a toll plaza that accommodates highway speed tolling. This project involved the construction of two new toll lanes, concrete barrier separating the cash toll lanes from the highway-speed toll lanes, demolition of toll booths and canopy in the center of the plaza, reconstruction of several interchange ramps, construction of new snow plow ramps, construction of new tolling gantries, and new signing. HNTB was responsible for traffic modeling, air and noise analysis, wetland, and permitting plans. HNTB was also responsible for the design of the stormwater treatment, traffic and signing, highway and structures, and coordination with two toll vendors. The design of the project was completed on an accelerated schedule. HNTB was able to complete final design plans for the first contract within four months from notice to proceed, and the second contract within eight months from NTP.

### **Maine Turnpike Authority, Falmouth Spur Toll Plaza Open Road Tolling Conversion, Falmouth ME**

Project director of HNTB's MTA work, which includes overseeing the design of roadway, toll lane and sign layout for the redesigned toll plaza, as well as the review of proposed tolling equipment to be installed at the redesigned toll plaza; both cash lane and ORT lanes. The post-bid toll system support includes toll system equipment installation, coordination, toll system commissioning and acceptance testing.



## Robert Driscoll, PE (continued)

### **Maine Turnpike Authority, West Gardiner Toll Plaza Open Road Tolling Conversion, West Gardiner ME**

Project director of HNTB's MTA work, which includes overseeing the design of roadway, toll lane and sign layout for the redesigned toll plaza, as well as the review of proposed tolling equipment to be installed at the redesigned toll plaza; both cash lane and ORT lanes. The post-bid toll system support includes toll system equipment installation, coordination, toll system commissioning and acceptance testing.

### **Maine Turnpike Authority, Maine Turnpike Toll Conversion, Various Locations, ME**

Project engineer on the \$20 million toll barrier conversion project, which involved converting the southern end of the Maine Turnpike from a ticket system to a fixed fare system with electronic tolls. Bob was involved with the design of the toll plaza alterations required to support the new toll system. This involved demolition of booths, construction of antenna support structures, construction of new toll plazas at Exit 3 in Kennebunk, and construction of new toll administration buildings at two locations.

### **Maine Turnpike Authority, On-Call Construction Services 2011-2015, Statewide, ME**

Project manager for this four-year, \$6 million construction inspection and resident engineering services contract. Major areas of the contract include inspection, project development design review and material testing. Assignments include bridge rehabilitation/reconstruction/repairs and toll plaza repairs. Throughout MTA's history, HNTB has successfully provided these services - from the initial construction of the turnpike to its successful \$135 million widening; renovation and replacement of its service plazas; ground-breaking deployment of its electronic toll collection system and conversion to E-ZPass; and construction of the new MTA Safety and Operations Building.

### **Maine Turnpike Authority, Bridge and Highway Design Services 2011-2015, Turnpike Corridor, ME**

Project manager for assignments that included Blackstrap Road (Falmouth), Old Lisbon Road (Lewiston) and Snow Hill Road (New Gloucester) Bridge Rehabilitations; Lewiston Interchange and Bridge Reconstruction; and Central Street (Hallowell), Hunts Hill Road (Gray) and Mousam River (Kennebunk) Bridge Repairs.

### **Maine Turnpike Authority, Maine Turnpike Reserve Maintenance Program, Statewide, ME**

Program manager for the MTA's Annual Reserve Maintenance Program. Bob is responsible for

managing the annual inspection of all the Turnpike's facilities and the preparation of the Operation and Maintenance Annual Report. This report documents the condition of the facility and notes the maintenance and improvements that should be conducted in the future. Features discussed include bridges, pavement, drainage, buildings, toll plazas and side slopes. Bob is also responsible for the preparation of studies and contract documents for construction projects, such as bridge deck replacements, bridge repair, bridge joint repair, bridge painting, guardrail modifications, pavement rehabilitation and safety improvements. This program is completed annually and typically has a construction budget of approximately \$15 million.

### **Maine Turnpike Authority, Maine Turnpike Service Plaza Reconstruction Program, Statewide, ME**

Program manager for the MTA Service Plaza Reconstruction Program. The purpose of this program was to replace the existing six service plaza buildings on the Maine Turnpike with five new modern buildings. Bob was responsible for the overall planning, environmental planning design, and construction. Two of the buildings required extensive utility relocations and staged construction.

### **Maine Turnpike Authority, Widening and Modernization Program, York to Portland, ME**

Project manager for the design and construction of the \$135 million Maine Turnpike Modernization project. This was a five-year project that involved improving the safety and increasing the capacity of a 30-mile section of the Maine Turnpike from York to Portland. The project consisted of the addition of a 12-foot travel lane and other related safety improvements to both the northbound and southbound travel lanes. In addition, it involved the replacement of 17 bridges. Key components of the project were the development of construction phasing and maintenance and protection of traffic plans so traffic could safely and efficiently move through the project corridor during construction with minimal delays and the development and implementation of a construction phasing plan that allowed multiple adjacent contracts to proceed concurrently with minimal coordination issues. Bob also managed the preliminary design and assisted in the preparation of the environmental permit applications. HNTB prepared contract specifications contained lane rental fees as well as supplemental liquidated damages for failure to meet milestone construction dates. This program started in 1998 and was completed in 2004.

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**ATTACHMENTS**

- A. **SCOPE OF WORK FOR FINAL DESIGN AND CONSTRUCTION SERVICES**  
Prepared by HNTB Corporation, Revision #1, dated November 30, 2015
1. CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS, ETC.
  2. CONSULTANT DISCLOSURE STATEMENT FOR PREPARATION OF ENVIRONMENTAL EVALUATIONS
  3. CERTIFICATION OF CONSULTANT/SUBCONSULTANT
  4. CERTIFICATION OF STATE DEPARTMENT OF TRANSPORTATION
  5. CERTIFICATION FOR FEDERAL-AID CONTRACTS EXCEEDING \$100,000 IN FEDERAL FUNDS
  6. CERTIFICATION OF GOOD STANDING
  7. CERTIFICATION OF INSURANCE
  8. CERTIFICATION OF AUTHORITY / VOTE
  9. SIGNATURE PAGE

AGREEMENT  
FOR PROFESSIONAL SERVICES

PREAMBLE

THIS AGREEMENT made this 2 day of March in the year 2016 by and between the STATE OF NEW HAMPSHIRE, hereinafter referred to as the STATE, acting by and through its COMMISSIONER OF THE DEPARTMENT OF TRANSPORTATION, hereinafter referred to as the COMMISSIONER, acting under Chapter 228 of the Revised Statutes Annotated, and HNTB Corporation, with principal place of business at P.O. Box 419299, in the City of Kansas City, State of Missouri, and local branch office at 340 County Road, Suite 6-C, in the City of Westbrook, State of Maine, and hereinafter referred to as the CONSULTANT, witnesses that:

The Department of Transportation, State of New Hampshire, hereinafter referred to as the DEPARTMENT, proposes to widen and retrofit the existing Bedford toll plaza facility on the F.E. Everett Turnpike to implement Open Road Tolling. The minor widening required for the project is envisioned to extend approximately 2,500 feet north and 4,000 feet south of the toll plaza.

The DEPARTMENT intends to have prepared for said project final design, contract plans, specifications, special provisions, and estimates of quantities and costs. These services are outlined in the CONSULTANT'S revised scope of work dated November 30, 2015 and revised fee proposal dated December 30, 2015, which are hereby adopted by reference and considered to be part of this AGREEMENT.

This AGREEMENT becomes effective upon approval by the Governor and Council.

## ARTICLE I

### **ARTICLE I - DESCRIPTION OF PROFESSIONAL SERVICES TO BE RENDERED**

NOW THEREFORE, in consideration of the undertakings of the parties hereinafter set forth, the DEPARTMENT hereby engages the CONSULTANT, who agrees to render services to the DEPARTMENT that shall include, but not be restricted to, the following items, in accordance with conditions and terms hereinafter set forth:

#### **A. LOCATION AND DESCRIPTION OF PROJECT**

This project involves the conversion of the existing F. E. Everett Turnpike mainline toll plaza in Bedford, NH to a plaza that accommodates highway speed tolling, referred herein as Open Road Tolling (ORT). The design for the following is included in the work scope:

- Construction of a new toll lane, island, booth and canopy on the easterly side of the existing plaza.
- Demolition of six toll lanes, five islands, five booths and canopy in the center of the plaza.
- Construction of four ORT lanes (two lanes and shoulders on either side of the roadway centerline).
- Minor widening of the approach roadways and in the direct vicinity of the plaza to accommodate the new toll lane and ORT lanes.
- Installation of concrete barrier to separate highway speed traffic from low speed traffic and to separate northbound and southbound ORT traffic.
- Construction of a new pavement profile and crown line in the areas of the highway speed toll lanes.
- Installation of full span or cantilever overhead sign structures and ground mounted signs (which may use existing or new mounting structures).
- Installation of full span toll gantry over the ORT lanes.
- Rehabilitation of the existing toll plaza islands, booths and canopy, to include structural, electrical and mechanical components, as well as the toll plaza tunnel.
- ITS elements may be incorporated, in whole or in part, into the contract plans and documents for the project design. A Smart Work Zone will be assessed for inclusion into the construction contract.

#### **B. SCOPE OF WORK (GENERAL)**

The scope of the work involves the final design and preparation of contract plans, further refinement of line and grade as currently developed by the Department, specifications, and estimates for the layout described above. The CONSULTANT shall utilize the DEPARTMENT's base mapping ground model as required to develop the final design and contract plans. The CONSULTANT shall incorporate reasonable adjustments to the ground model, such as updates to individual properties

## ARTICLE I

due to new developments, etc., as may be needed with supplemental ground survey to be done by the DEPARTMENT, as required to develop the final design and contract plans.

### SPECIFIC DESIGN ELEMENTS OF THE PROJECT INCLUDE THE FOLLOWING:

#### Toll Plaza Slab, Booth, Bumpers, and Canopy Construction

The CONSULTANT shall design one new toll lane, island, bumper, and canopy adjacent to the easterly side of the toll plaza.

New toll lane shall be at least 14' wide. Island shall be 6'6" wide.

The DEPARTMENT will provide the CONSULTANT with a draft specification for the construction of the new concrete slab (in area of new booth), furnishing and installing of the one new toll booth, lane equipment (AVI, AVC, signal, patron fare indicator, treadle, treadle frames etc.) for inclusion in the contract. The CONSULTANT shall review specification and revise for the project. The CONSULTANT shall include plans for the toll booth in the contract. Booth plans shall be copied from plans provided by the DEPARTMENT and shall be modified as necessary by the CONSULTANT.

The DEPARTMENT shall provide the CONSULTANT with a draft specification for the removal of five booths as well as a list of equipment to be salvaged (AVI, AVC, signal, patron fare indicator, treadle, treadle frames, etc.) for inclusion in the contract. The CONSULTANT shall review specification and revise for the project.

The CONSULTANT will prepare plans to depict the area where the booths will be installed and will diagram and provide details for conduit feeds from the treadles to the tollbooths.

#### Demolition - Canopy, Concrete Bumper, Booth Enclosure, and Concrete Slab

The CONSULTANT shall prepare plans and specifications for the demolition of six toll lanes, five islands, booths, and canopy in the center of the plaza. Concrete slab shall be replaced within this area and structural slab repairs as necessary. CONSULTANT shall provide details for a new concrete roadway for the Open Road Tolling in area of highway speed toll lanes. Length is anticipated to be no more than 200'.

The CONSULTANT shall prepare plans and specifications for the modification of the parking lot to the east side of the toll plaza resulting from the widening. Minor modifications are anticipated and may consist of replacing parking spaces that are lost due to the toll plaza expansion.

#### Snow Plow Ramps

The CONSULTANT shall prepare plans and specifications for the construction of two snow plow ramps to provide access to/from Exit 12 on the FEET.

Designs shall consider temporary and permanent erosion control measures and Best Management Practices (BMPs) consistent with current New Hampshire Department of Environmental Services

## ARTICLE I

(NHDES) guidelines, traffic control measures, utility coordination, drainage, and treatments to minimize environmental impacts, highway signage, traffic analysis, pavement markings, lighting, and highway landscaping.

The CONSULTANT will develop colored plans for the DEPARTMENT's use in meetings and coordination with the public. The colored plans will be developed subsequent to the Preliminary submission, and incorporate necessary refinements based on DEPARTMENT review to date.

The CONSULTANT shall prepare the final design and contract plans, specifications and estimates for the development of wetland impacts, erosion control, and water quality improvements. The CONSULTANT shall tabulate the wetland impacts for the project, and complete the wetland permit application with all applicable attachments.

Coordination will be required between the DEPARTMENT and the Town of Bedford. The CONSULTANT shall be prepared to support such efforts, as required. Responsibilities of the CONSULTANT team shall include attendance of meetings when asked, preparation of minutes reflecting meeting commitments, and preparation of illustrative plans and exhibits for the meetings, as directed by the DEPARTMENT.

### **C. SCOPE OF WORK (GEOTECHNICAL)**

The DEPARTMENT anticipates completing the full geotechnical program required for the project. In support of the DEPARTMENT's geotechnical program, the CONSULTANT shall provide project plans and cross sections suitable for completion of the geotechnical program, as needed. The CONSULTANT shall also provide engineering to include preliminary and final subsurface exploration plan development and siting of the subsurface explorations by providing the station(s), offset(s) and associated GPS coordinate(s) for proposed or actual subsurface exploration locations for all bridge structures, as well as highway design elements including, but not limited to, water quality BMPs, roadways, retaining walls, box culverts, overhead sign structure foundations, traffic signal foundations, etc. No geotechnical work by the CONSULTANT is anticipated other than the support efforts noted above.

### **D. SCOPE OF WORK (ENVIRONMENTAL)**

The CONSULTANT shall be responsible for the following:

The CONSULTANT shall prepare the wetland plans and material for the permit application. The CONSULTANT shall tabulate the wetland impacts. Coordination will be required between the DEPARTMENT and the STATE and Federal Natural Resource agencies to develop concurrence for the appropriate timing prior to, or in conjunction with, the highway project.

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1. All applicable environmental permits and supporting documentation, including photographs. Anticipated permits include: NHDES Major Impact Dredge and Fill, NHDES Section 401 Water Quality Certificate, and US Army Corps of Engineers Section 404.
2. Consideration of identified cultural resources (architectural and archeological) within the project limits. Confirmation of sensitive, and probable sensitive, areas with all necessary phases of archaeological investigation to be undertaken within impacted areas of the project. If additional, previously unidentified architectural resources are to be impacted, review and documentation of these resources shall be completed in consultation with the DEPARTMENT and the NH Division of Historical Resources.
3. Minimizing impacts to floodplain and wetland areas to the greatest extent practicable during the final design.
4. The development of erosion control plans substantially conforming to (NHDES) PART Env-Wt 501.02 to include existing contours and finished grade contours at 2-foot intervals, and erosion control strategies for the completed project condition. The DEPARTMENT will submit the plans to NHDES, as part of the Wetland Permit application. The plans shall be prepared in "roll plan" and "cut sheet" format. The plan package shall also include an erosion control strategy legend (developed by the DEPARTMENT), drainage note sheets, traffic control phasing notes and a preliminary construction schedule. The DEPARTMENT will assist the CONSULTANT in the design of the perimeter erosion control strategies. The information will also be included in the project Proposal for the Contractors' use during the bidding period.
5. The design of the permanent erosion and sedimentation control and water quality renovation features. The development of the Temporary Erosion Control and Stormwater Pollution Prevention Plan (SWPPP) (a permitting requirement during construction of the project) shall not be the responsibility of the CONSULTANT. However, recommended controls shall be addressed during the final design to the extent that appropriate items, quantities, and an appropriate layout are developed for bidding purposes. Permanent erosion and sedimentation control and water quality features shall be shown at the Slope and Drain Plan submissions with design backup calculations complete. Conceptual erosion and sedimentation control and water quality plans shall be part of the Preliminary Plans - Roadway submission. The CONSULTANT shall furnish pre and post-development design calculations with Q2, Q10, Q25, and Q50 flows, and water quality volumes, as appropriate. Site locations for BMPs, estimated areas, and design elevations shall be proposed in sufficient detail to complete geotechnical investigations of each site.

In addition, the CONSULTANT shall be responsible for the following:

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1. Incorporate stormwater runoff treatment areas and detention basins and evaluate their environmental impacts (such as archaeological sensitivity, wetland impacts, hazardous materials, etc.).
2. Incorporate water quality treatment measures (e.g. Low Impact Development (LID) Best Management Practices, treatment basins and swales) into the overall project design according to the guidance provided in the NHDES Alteration of Terrain regulations, and the NH Stormwater Management Manual. NHDES BMP worksheets shall be completed and submitted as part of the Drainage Report.
3. Development of an Inspection and Maintenance Manual for the LID water quality measures that will be implemented in the project.

The CONSULTANT'S plans shall include all commitments made in the environmental documents.

### **E. SCOPE OF WORK (FINAL DESIGN)**

The scope of work proposed by this AGREEMENT includes:

1. The development of base plans by the CONSULTANT using updated ground survey provided by the DEPARTMENT. The CONSULTANT shall develop plans at a scale of 1" = 50', unless otherwise noted. The CONSULTANT shall be responsible for the incorporation of environmental resource mapping, utility information, right-of-way and property line information, etc. All of these will be provided by the DEPARTMENT, or as noted elsewhere in this document.
2. The refinement of the alignment, grades and intersections of the proposed roadway(s) as shown on the preliminary conceptual designs furnished by the DEPARTMENT. The preliminary horizontal alignment prepared will be used as a basis for developing the final horizontal and vertical alignments in preparation of the final plans.
3. The preparation of complete designs, including all plans, specifications for work not included in the current specifications of the DEPARTMENT, computations, estimates and documents for the required submissions to the DEPARTMENT and/or any other STATE or Federal agency that may be required.
4. The design and preparation of contract plans for construction of the roadway, structures, traffic control plans, construction phasing plans, layout and design of overhead sign structures (conceptual design of foundations for purposes of developing quantities with final design based on shop drawings provided by the Contractor), guardrail, drainage facilities, temporary/ permanent erosion control measures and related water quality features, and

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appurtenances in accordance with the policy and procedures of the DEPARTMENT and the provisions of this AGREEMENT.

5. The refinement of the design of overhead, all permanent guide, warning and regulatory signs, including the quantity summary sheets, with guidance from the DEPARTMENT. Contract signing shall include site reviews and documentation of the existing signing. The permanent guide, warning, and regulatory signs shall be progressed such that once reviewed and approved by the DEPARTMENT, the approved design can be incorporated into the PPS&E submission. All signing on the plans shall be closely coordinated with the location of guardrail installations, slopes, utility locations (including street lights and underground utilities) and drainage system locations to avoid conflicts and to determine which support system will be required to install the signs. The CONSULTANT shall be responsible to identify all conflicts and to make necessary adjustments to highway signing.
6. Final foundation designs and quantity development of these foundations based on shop drawings provided by the Contractor during the construction phase.
7. The development of the permanent construction sign and warning device package, including the quantity summary sheets.
8. The design and incorporation into the contract plans (including the quantity summary sheets) of all temporary guide and regulatory signs, and permanent construction signing required for use with detours or construction staging. These signs and locations shall be shown on the Traffic Control Plans.
9. The design and development of all pavement marking layouts, item numbers, item descriptions, and quantities for inclusion into the contract and appropriate summary tables within the plan sets. The pavement markings shall be progressed such that the design can be reviewed and approved by the DEPARTMENT for incorporation into the PPS&E submission.
10. The incorporation of utility relocations, as designed by the individual utility owner, into the contract plans.
11. Preparation of presentation (colored) base plans at the Preliminary, Slope and Drainage, PPS&E and PS&E submissions.

The engineering design shall take into consideration all factors affecting the cost of the construction, such as foundation problems, earthwork quantities, erosion and sedimentation control, water quality treatment issues, construction phasing and complexity, utilities affected, environmental, construction materials, etc. During all phases of design, the CONSULTANT shall make a continuous effort to identify and minimize impacts on existing and proposed utilities.

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The CONSULTANT shall, when requested by the DEPARTMENT, render such assistance as required, including the preparation and explanation of sketches and plans for, or at, any meetings or conferences held by the DEPARTMENT. Meeting notes and conference memos shall be the responsibility of the CONSULTANT.

The CONSULTANT shall submit for review, as requested, progress prints (black line) showing grades, cross-sections, special details and general design. Paper prints shall be submitted upon request for soils studies, right-of-way use, evaluation of utility impacts, and other purposes. The DEPARTMENT will provide the existing right-of-way and approximate, abutting property information in the appropriate CAD/D format. The CONSULTANT shall incorporate the existing right-of-way information into the base plans.

Designs shall conform to the current standards, specifications, policies and guidelines enumerated in the Federal-Aid Policy Guide, Subchapter 6, Part 625, or to 23 Code of Federal Regulations, Part 625 and the DEPARTMENT'S Design Manual and Standard Plans for Road Construction, except as approved.

Data from survey notes shall be transcribed and plotted on base plans, profiles and cross-sections as required, if not furnished by the DEPARTMENT under Article I-G.

Multiple visits to the site shall be made during the design to detect changed field conditions and, if required, the DEPARTMENT upon request will perform additional surveys. The DEPARTMENT will process additional survey requests to ensure continuity between new and current detail model files. The DEPARTMENT will incorporate these files into the current detail base plans and digital terrain models (DTM) to include all drafting, labeling, detailing and field checking of the detail. Additional surveys may be required throughout the design process, and the CONSULTANT shall modify the design, as necessary, based upon the updated survey information.

The CONSULTANT shall examine which elements of design, such as horizontal and vertical alignments, typical sections, traffic control, earthwork utilization, drainage pipes and structures, as well as soils suitability, might affect aerial and underground utilities. Any conflict between design elements and utilities shall be identified and brought to the attention of the DEPARTMENT. A special effort shall be made by the CONSULTANT to modify drainage features in order to avoid conflicts with underground utilities.

All plotting, drafting and calculations performed by the CONSULTANT shall be independently checked by members of the CONSULTANT'S staff other than those who performed the original work. The work of each stage submission (including quantity estimates) shall have been appropriately checked. The PS&E submission and final mylars shall have had complete final and "three-way" checks.

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The CONSULTANT shall verify all computations and design calculations. The CONSULTANT shall furnish two (2) permanent, legible copies of the design calculations, suitably bound, and when directed, all study plans, work plans, alternate studies, and estimates indexed in accordance with DEPARTMENT procedures.

The CONSULTANT'S Licensed Professional Engineer stamp for the State of New Hampshire shall appear on the construction plans, reports and any other documents that will be submitted to the DEPARTMENT. Stamps shall be those of the professional engineers who prepared them or under whose direct supervisory control they were prepared.

### **F. SCOPE OF WORK (UTILITIES)**

The utility coordination for this project will be performed by the DEPARTMENT, if any is required. The CONSULTANT shall incorporate utility relocations, as designed by the individual utility owner, into the contract plans. Municipal utility relocations (e.g., sewer and/or water), as approved by the DEPARTMENT, shall be included, as necessary, into the contract plans, cross sections, summary sheets and estimate. Non-participating municipal utility relocation items shall be kept separate from the highway and/or bridge items in the estimates submitted. The DEPARTMENT will provide the unit item numbers and unit prices to be used for the utility relocations.

### **G. MATERIAL FURNISHED BY THE DEPARTMENT OF TRANSPORTATION**

The DEPARTMENT will furnish the following data to the CONSULTANT:

1. Electronic files in English units of the following information in accordance with the DEPARTMENT'S CAD/D Procedures and Requirements, for incorporation into the plans by the CONSULTANT.
  - a. All existing survey and baseline data on disk or other electronic means, notes and note reductions in the format outlined in the DEPARTMENT'S CAD/D Procedures and Requirements. An electronic ground model will be provided, if available, along with all existing information that can be used to create a model.
  - b. Any additional surveys of adjacent parcels, mitigation sites, wetland boundaries or other pertinent items deemed necessary will be processed and incorporated by the DEPARTMENT.
  - c. Electronic drawings in Microstation format, along with reproducible sheets, of roadway typical cross sections and other detail sheets shall be provided, when available from the DEPARTMENT'S CAD/D library, upon request by the CONSULTANT, in accordance with the DEPARTMENT'S CAD/D Procedures and Requirements.
  - d. Electronic drawings in Microstation format of the existing underground utilities, if provided to the DEPARTMENT by the utility. The CONSULTANT shall be prepared to

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provide an electronic copy of preliminary base plans to the DEPARTMENT for use by the utilities. The CONSULTANT shall be responsible for the incorporation and manipulation of this information (either in paper or electronic format) into the plans, in accordance with the DEPARTMENT'S CAD/D Procedures and Requirements.

- e. Electronic drawings of roadway typical cross sections and other available detail sheets for inclusion in the contract plans.
  - f. Electronic drawings in Microstation format of the Right-of-Way data, approximate property lines, and parcel owners. These electronic files containing abstracting information will be updated, as necessary, throughout development of the project. The CONSULTANT shall be prepared to incorporate refinements from the Department, to the electronic files, as needed.
  - g. Prints of any information outlined in Article I.G.1.a. thru f. above, both existing and proposed, when available, for verification by the CONSULTANT.
2. Prints of the following information:
    - a. Any additional information (e.g., abstracting, utilities, etc., not available electronically) for the CONSULTANT to incorporate into the plans in accordance with the DEPARTMENT'S CAD/D Procedures and Requirements.
  3. Prints and data exchange files of existing conditions not previously provided to the CONSULTANT. Reduction and incorporation of this material shall be the responsibility of the CONSULTANT.
  4. All required permits. The CONSULTANT shall be responsible for plans and computations for impacted areas. These plans shall provide all necessary data, area hatching (according to DEPARTMENT standards) and detail so that these plans can be forwarded to the respective regulatory agencies as appropriate attachments for the permit applications. The CONSULTANT shall be responsible to complete the permit applications and provide all supporting documentation (e.g. photographs).
  5. Necessary traffic counts and crash data, as collected by the DEPARTMENT.
  6. Proposal for bidding and Standard Specifications for Road and Bridge Construction, Standard Plans for Road Construction, plus supplemental specifications and special provisions that the DEPARTMENT currently has.
  7. Geotechnical investigations.
  8. Geotechnical recommendations for the roadway, bridge, and overhead sign and toll gantry foundation design, as needed.

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9. The location of all existing utilities through direct contact with the various utility companies. Following the determination by the CONSULTANT of all unavoidable conflicts between existing utilities and the proposed construction, the DEPARTMENT will coordinate the necessary relocation of the conflicting utilities. The CONSULTANT shall be prepared to furnish CAD/D files in the current DEPARTMENT format to the DEPARTMENT for use in assisting with the Utility design.
10. The DEPARTMENT and the CONSULTANT will cooperatively develop the detailed Traffic Control Plans. The CONSULTANT shall develop the initial conceptual Traffic Control Plan and construction phasing. The DEPARTMENT will assist the CONSULTANT in the final design of the Traffic Control Plans as it relates to potential complications with concurrent work, utilities and closures. The CONSULTANT shall complete the final design and the associated quantity calculations.
11. Conceptual design and layout of highway lighting (temporary and permanent) if deemed necessary. The CONSULTANT shall be responsible for incorporating the design and layout into the project documents and for recommending adjustments required to avoid conflicts.
12. Conceptual signing for ORT and roadway including overhead (full and cantilever) sign structures locations, conceptual sign text layouts and quantities.
13. Any updates of the DEPARTMENT-supplied CAD/D information will be released to the CONSULTANT throughout the duration of the AGREEMENT, as appropriate. The DEPARTMENT shall be held harmless from any and all loss, damage, expense or liability whatsoever resulting from the use of these programs and macros or translated information. The DEPARTMENT may supply the documentation for use with these programs and macros, but shall not be responsible for any training in their use.
14. ITS plans and specifications (prepared by others) for incorporation into the final design plans, as appropriate.

### **H. WORK SCHEDULE AND PROGRESS REPORTS**

The CONSULTANT shall begin performance of the services designated in the Contract promptly upon receipt from the DEPARTMENT of a Notice to Proceed and the material to be furnished as herein described. The CONSULTANT shall complete these services without delay unless unable to do so for causes not under the CONSULTANT'S control.

The CONSULTANT'S sequence of operation and performance of the work under the terms of this AGREEMENT shall be varied at the direction of the DEPARTMENT to give priority in critical areas so that schedules and other STATE commitments, either present or future, can be met.

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The CONSULTANT shall develop an acceptable reporting system capable of indicating project status on at least a monthly basis for all critical activities of the project. Monthly progress reports shall be submitted by the CONSULTANT to the Project Manager, giving the percentage of completion of the work required by this AGREEMENT. Separate progress reports for bridge design(s) shall be required. These monthly progress reports shall be received by the DEPARTMENT by the 10th day of each month. All correspondence shall include the STATE and Federal project numbers as well as the municipality's name.

### **I. SUBMISSION OF REPORTS, PLANS AND DOCUMENTS**

During the prosecution of this AGREEMENT, the CONSULTANT shall prepare and submit to the DEPARTMENT separate submissions as described hereinafter.

The CONSULTANT, with each submission, shall submit a transmittal describing the "design issues" addressed in that submission. In addition, the transmittal shall include anticipated or outstanding issues and the CONSULTANT'S recommendations. All issues shall be noted as to whether the CONSULTANT feels that the issue is within the scope of work described in Article I. Meetings between the CONSULTANT and the DEPARTMENT shall be held prior to submissions to discuss design issues and recommendations.

All plan drawings, including size of sheets, lettering, symbols and scale of said drawings, shall conform to the requirements and standards of the DEPARTMENT. Any and all CAD/D-related work completed during the course of this project shall be performed in conformance with the DEPARTMENT'S CAD/D Procedures and Requirements in effect at the time of execution of this AGREEMENT. The final construction plans Front Sheet shall be submitted in waterproof ink on permanent, archival-quality, double-matte, polyester-base film (.004 in. thick) or silver-halide emulsion ("wash-off") reproduction on polyester-base film (.004 in. thick). Cross section sheets shall be submitted on quality paper prints. Construction and right-of-way plans shall be submitted on 22 in. x 34 in. sheets.

In addition to the final reproducible plans being furnished as noted herein, the CONSULTANT shall provide electronic file copies of all highway and bridge project plan sheets with real State plane coordinates, including, but not limited to, final quantity sheets, typicals and detail sheets, general plans and profiles, traffic-signal sheets, cross sections and right-of-way plans. In addition to these plan sheets, an electronic file of the entire project's final design shall be submitted in an "uncut" format showing all design features in a real State plane coordinate system, unrotated. These final electronic files shall be indexed with file name, description of the contents of the file and project sheet number as applicable. All files shall be submitted in conformance with the DEPARTMENT'S CAD/D Procedures and Requirements. Any plans (e.g. quantity summary sheets) produced from a

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spreadsheet (e.g. Excel, or equivalent) shall be submitted in ASCII file or format suitable for incorporation into Microsoft Office or the current DEPARTMENT software. The final Special Provisions(s) and other documents, as requested, shall be submitted in both electronic format (Microsoft Word-compatible) and hard copy. The CONSULTANT shall also be prepared to submit separate electronic files of all alignments, bound locations and other project features, as requested, in a format acceptable to the DEPARTMENT, throughout the design contract, in conformance with the DEPARTMENT'S CAD/D Procedures and Requirements. The CONSULTANT shall also provide a hard copy of all proposed alignments (25-foot minimum station interval and curve control points) with associated State plane coordinates (x, y, z).

### 1. Roadway, Bridge Structure and Toll Plaza Design Submissions

The plan submissions for roadway design shall follow the procedures outlined below:

#### a. Preliminary Plans - Roadway

Based on a complete review of the material furnished by the DEPARTMENT and developed and/or supplemented by the CONSULTANT, particularly in regard to the proposed design criteria, predicted traffic, preliminary soil data, expected temporary and permanent erosion measures, conceptual traffic control and topography of the project area, the CONSULTANT shall prepare and submit to the DEPARTMENT five sets of roll plans (paper prints 8 ft. to 10 ft. in length) (cross sections and other applicable plan sheets may be submitted on cut sheets) showing:

- 1) The recommended horizontal and vertical alignment of all necessary roadway construction.
- 2) Roadway cross sections at critical locations which shall be plotted with the top line of the template of the proposed roadway cross-sections shown. The CONSULTANT shall recognize that, typically, geotechnical information is not available at this time and, therefore, this submission may need to be re-cut and reordered for subsequent submissions when soils/ledge information is made available. Plans addressing significant modifications to private parking areas and accesses shall be developed and used to coordinate with property owners early in the process.
- 3) Proposed pavement layouts and major control elements.
- 4) The alignment (horizontal and vertical) of major diversions or construction phases that will have significant implications for the project in the final design. Critical cross sections (with superelevations) shall be developed, and labeled by phases, to assist in the assessment of the conceptual traffic control phasing and conceptual location of overhead sign structures (if needed), and traffic signal foundations.

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- 5) Conceptual designs for erosion and sedimentation control (temporary and permanent) and related water quality features shall be shown with approximate flows.
- 6) Roll plans shall show where match lines are anticipated for future cut sheets.
- 7) Preliminary typical sections with top line template.
- 8) Proposed limits and recommendations for letting the construction under separate contracts (if applicable), including cost estimates, areas of overlap, maintenance of traffic, drainage, etc.

The following issues shall also be considered in the development of the above-mentioned plans:

- 1) Traffic Control Plan and construction phasing.
- 2) Recommended water quality treatment.
- 3) Wetland impacts.
- 4) Earthwork balances and availability.
- 5) Potential closed drainage and underdrain outlets, and depth of cover over drainage structures.
- 6) Right-of-way involvement.
- 7) Potential conflicts with major utilities.

This submission shall be supplemented with such conceptual drawings, illustrations and descriptive matter as are necessary to facilitate a comprehensive review of both the proposed design and the feasibility of construction, and the coordination with the design of bridges or other structures. This shall include profiles and cross sections, particularly where clearance and setbacks may be issues.

Estimates for this submission shall be reasonably itemized to cover roadways, structures, drainage and other construction items, as well as costs of utility changes to be financed by the STATE.

For development of the right-of-way lines, sight distance review and the assessment of environmental impacts, it shall be necessary that critical cross-sections be plotted to develop slope lines. This shall require computation and submission of pavement superelevation calculations. Rounding of slopes shall be considered in developing slope lines, but plotted cross section templates do not need to have roundings shown at this submission. Guardrail calculations shall also be submitted.

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### b Slope and Drain Plans - Roadway

Upon approval in writing by the DEPARTMENT of the Preliminary submission, the CONSULTANT shall proceed to prepare and submit to the DEPARTMENT for approval the Slope and Drain Plans submission. The Slope and Drain submission shall consist of five sets of cut sheet plans (paper prints) showing slope lines, drainage system details and drainage features, and proposed right-of-way lines, including drainage, slope and/or construction easements. The cut sheets shall include typical sections, plan views, profiles, guardrail locations, and cross sections with complete template plotted and appropriate references on the plans relative to the drainage design to assist with the review of the drainage design and the backup drainage calculations. The submission shall be supplemented with a list of utility conflicts that could not be avoided during the design. Complete Best Management Practice (BMP) designs for permanent erosion and sedimentation control features, and water quality appurtenances, shall be shown accompanied by backup calculations, including a pre vs. post- development pollutant loading assessment. The BMPs shall be designed in accordance with the (NHDES) CHAPTER Env-Wq 1500 ALTERATION OF TERRAIN requirements, as well as the guidance in the New Hampshire Stormwater Manual. The backup calculations shall also include a narrative, mapping and computations addressing pre-construction and post-construction (and post-development, if applicable) drainage conditions and applicable drainage control features. Two bound drainage computation books shall be submitted with all backup drainage calculations illustrated and referenced to each drainage appurtenance shown based on the drainage design.

At this time, a field inspection shall be held with the DEPARTMENT, and indicated design changes or corrections shall be made and incorporated into the plans for the Preliminary PS&E submission. Any indicated revisions to fit actual field conditions, including any horizontal and vertical alignment revisions found necessary during this field inspection, and any resulting corrections to the right-of-way requirements, shall be made by the CONSULTANT.

Also, with the Slope and Drainage submission, the CONSULTANT shall submit the Traffic Control Plans in near-final form (roll plans, as a minimum) showing temporary slopes, lane uses and widths, overhead sign structures, temporary guardrail and barrier locations, temporary drainage, temporary easements, profiles, temporary drives, diversion cross sections and superelevations, etc. with backup calculations. Construction phasing shall be shown with narratives for each phase. The CONSULTANT shall also

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submit a conceptual construction schedule, showing the phased construction and utility relocation time frames (as applicable), for review and comment by DEPARTMENT staff.

Following incorporation of the DEPARTMENT'S comments on the Slope and Drain Submission, the CONSULTANT shall submit Wetland Impact plans showing permanent and temporary impacts for each wetland for inclusion with the wetland permit application. These areas shall be hatched according to the DEPARTMENT'S standards. Accompanying these plans, the CONSULTANT shall provide a tabulated impact summary showing wetland identification numbers, areas of fill or dredged volumes in the temporary and permanent conditions for this project, a draft copy of the wetland permit application package, and the Erosion Control Plans.

c. Preliminary PS&E – Roadway

Upon approval in writing by the DEPARTMENT of the Slope and Drain submission, the CONSULTANT shall proceed to prepare and submit to the DEPARTMENT for approval the Preliminary PS&E submission. The Preliminary PS&E submission shall consist of three to five sets of plans (paper prints) of preliminary contract drawings, draft special provisions for items for which current specifications are not available from the DEPARTMENT, and a Preliminary PS&E estimate of quantities and costs. The plans shall include title sheet, typical sections, detail sheets, all plan sheets, profile sheets, curb and pavement layout plans, pavement marking and signing plans, signal plans (including coordination), ITS infrastructure (designed by others), complete traffic control plans, and cross section sheets (including TCP sections). The plans shall also include utility relocations, if available.

Quantity Summary sheets shall be submitted. All item summary boxes for drainage, clearing and grubbing, earthwork, surfacing and select materials, curbing, guardrail, sidewalks, traffic signs, construction signs and warning devices, pavement markings, conduit and pull boxes, ITS components, landscaping and slope protection, bounds, fencing, delineation and witness markers, and other items that are nearly complete shall be shown and note line-entries completed. Rounding and totals are not required. Item summary boxes of expected work not listed above shall be included and shown without line-entries completed. In developing the plans to the Preliminary PS&E stage, the DEPARTMENT will require an estimate of the quantities, expected unit costs, and total costs prepared in the form and manner prescribed by the DEPARTMENT for the Preliminary PS&E submission. An electronic copy of the spreadsheet shall be submitted for the estimate in Excel format. Roadway items shall be kept separate from bridge

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The final contract plans shall include:

- (1) A front sheet.
- (2) Typical sections of improvement.
- (3) Summary of quantities sheets.
- (4) Detail Sheets and/ or special sheets required.
- (5) Plan and profile sheets required.
- (6) Cross section sheets (shall be submitted on quality paper prints)

Each of the plan sheets shall be labeled with its corresponding electronic file name.

### **J. SCOPE OF WORK (CONSTRUCTION SUPPORT SERVICES)**

If a contract for construction of the project, or part of it, is entered into within two years after completion by the CONSULTANT of the services outlined in Articles I, III and IV, the CONSULTANT shall, without additional compensation therefore, render services to the DEPARTMENT, including, but not restricted to, the following:

#### **1. Construction**

If and when required by the DEPARTMENT during the construction of the project, the CONSULTANT shall:

- a. At the CONSULTANT'S sole expense, correct and resolve errors and/or omissions within the contract plans and specifications found during construction.
- b. Render interpretations, as necessary, of the contract plans and specifications and submit recommendations for necessary modifications in either or both and, upon approval of recommendations by the DEPARTMENT, revise the contract plans and specifications to cover same and prepare other detailed drawings as may be needed to supplement the contract plans in order to permit the proper completion of the project. This work effort, if required, will be viewed as additional services, subject to an adjustment in the fee.

#### **2. Shop Drawings**

The CONSULTANT shall:

- a. Review, check and approve all working drawings prepared by others including the construction contractors or their subcontractors subject to the provisions of Section 105.

Only that work designed by the DEPARTMENT will be excluded from this requirement.

### **K. DATE OF COMPLETION**

In accordance with the Governor and Council Resolution authorizing this AGREEMENT, the date of completion for the professional design services rendered under this AGREEMENT is **December 31, 2017**. Completion of construction support services shall be in accordance with Article I-J - Construction Support Services.

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items. Two bound copies of the quantity calculations shall be furnished with the estimate. The plans shall reflect all comments from the Slope and Drain Plans submission and issues that appear during final design. Two bound copies of the drainage computations book (as revised, based on Slope and Drainage comments) including temporary drainage computations shall be submitted with the Preliminary PS&E submission.

d. PS&E - Roadway

Upon approval in writing by the DEPARTMENT of the Preliminary PS&E submission, the CONSULTANT shall proceed to prepare and submit to the DEPARTMENT for approval the PS&E submission, which shall consist of three complete sets of paper prints of construction plans, two bound copies of the revised quantity books, and a PS&E estimate. Special Provisions shall be submitted in both electronic format (Microsoft Word-compatible) and hard copy for all items not in the Standard Specifications for Road and Bridge Construction of the STATE and for which a current special provision is not available.

e. Contract Plans (Mylars) and Consultant Documents

Upon approval of the foregoing in writing by the DEPARTMENT, the CONSULTANT shall make the final submission of contract plans, any final special provisions required and a final PS&E estimate of costs. These final contract plans and documents shall reflect all comments resulting from the Draft Contract Plans (Paper Mylar) review. The CONSULTANT shall be prepared to incorporate all comments, furnish drafting services for omissions found and generally assist the DEPARTMENT in finalizing the contract plans. If changes are requested to be made to the CONSULTANT'S plans by the DEPARTMENT, the CONSULTANT shall be prepared to update the corresponding electronic files and submit them to the DEPARTMENT. Final acceptance of the contract plans will be made in writing. The final contract plans submitted shall include one mylar Front Sheet and two sets of paper prints. The first paper set and the mylar Front Sheet shall be submitted prior to the final set, so that the DEPARTMENT can complete a final "three-way" check. Also, all CONSULTANT backup documents shall be resubmitted to reflect the final Draft Contract Plans (Paper Mylar) comments and final contract plan conditions. The CONSULTANT shall also submit two bound copies of the final Drainage Calculations as well as two bound copies of the final Quantities Books.

## ARTICLE II

### ARTICLE II - COST PLUS FIXED FEE COMPENSATION OF CONSULTANT

#### A. GENERAL FEE

In consideration of the terms and obligations of this AGREEMENT, the STATE, through the DEPARTMENT, hereby agrees to pay and the CONSULTANT agrees to accept as full compensation for all services rendered to the satisfaction of the DEPARTMENT under this AGREEMENT (except as otherwise herein provided) an amount equal to the sum of the following costs:

1. Actual salaries\* approved by the DEPARTMENT paid to technical and other employees by the CONSULTANT, including salaries to principals, for the time such employees are directly utilized on work necessary to fulfill the terms of this AGREEMENT. A list of those personnel working on the project with their classifications and current salary rates shall be submitted to the DEPARTMENT for approval. The rates of any additional personnel working on the project, if any, shall require written approval of the DEPARTMENT prior to working on the project. The CONSULTANT shall submit classifications and rates for any additional personnel a minimum of 14 days prior to using the additional personnel.

\*In accordance with DEPARTMENT policy, the maximum direct-labor rate allowed for all positions under this AGREEMENT shall be \$50.00 per hour unless a waiver to the salary cap has been specifically approved for specialty services.

2. Costs which are directly applicable to the salaries, salary burden, and direct and indirect costs, including administration costs. These costs may be applied to only straight time salary extensions where overtime is employed. These amounts shall be based on actual costs to the CONSULTANT for such items during the period of the AGREEMENT and those allowable in accordance with the applicable cost principles contained in Federal Acquisition Regulations Subpart 31.2 and Subpart 31.105. Further, any overtime required for this project shall have the prior written approval of the DEPARTMENT.
3. A fixed fee amount as shown in Article II, Section B for profit and non-reimbursed costs.
4. Reimbursement for direct expenses, including work performed by other parties, such as borings, laboratory tests, field survey, special electronic computer services, services of other specialists, printing, photogrammetry, traffic counts, reproductions and travel not included in normal overhead expenses. The reimbursable costs for mileage and for per diem (lodging and meals) shall be that allowed by the CONSULTANT'S established policy but shall not exceed that allowed in the Federal Acquisition Regulations (Subpart 31.205-46) and in the Federal Travel Regulations. The General Services Administration (GSA), Regulation 41 CFR Part 301-4, specifies the FTR automobile mileage reimbursement. Mileage and per diem costs shall be subject to approval by the DEPARTMENT.

## ARTICLE II

All costs as described in the foregoing paragraphs are to be determined by actual records kept during the term of the AGREEMENT which are subject to audit by the STATE and Federal Governments. The final payment and all partial payments made may be adjusted to conform to this final audit. In no case will any adjustments exceed the total amount to be paid shown in the following paragraph and in Article II, Section C.1. All Subconsultant costs may also be subject to audit by the STATE and Federal Governments.

The total amount to be paid under this AGREEMENT shall not exceed \$737,399.35, the sum of the amounts shown in Article II, Section B (which amount is based on the CONSULTANT'S fee and manhour estimates of December 30, 2015), except by agreement of all parties made after supplemental negotiations. Should circumstances beyond the control of the CONSULTANT require extension of the time of completion more than one (1) year, the general fee may be renegotiated; however, the fixed fee (b) shall not change for reasons of work duration alone. The fixed fee (b) shall only change when there has been a significant increase or decrease in the scope of work outlined in this AGREEMENT.

All salaries and increases thereof paid to technical or other employees assigned to this project shall be the result of a company-wide evaluation of all employees and shall not be restricted to employees assigned to this project.

If, in the opinion of the DEPARTMENT, any salary or increase thereof of engineering or technical personnel assigned to this project is unreasonable, it shall notify the CONSULTANT of its opinion with regard thereto and request the CONSULTANT to justify said salary or increase thereof. In the event that the CONSULTANT furnishes justification satisfactory to the DEPARTMENT for said salary or increase thereof, then such salary or increase thereof shall be approved as a payroll expense.

The DEPARTMENT shall have the right to exercise the power of review and approval of salary increases thereof, for a period of thirty (30) days after the submission of a monthly invoice by the CONSULTANT. Unless the DEPARTMENT notifies the CONSULTANT in writing during the thirty-day period that such salary increase thereof is, in its opinion, unreasonable, such lack of notice shall constitute approval of said salary increase thereof from the first day of the preceding month.

The DEPARTMENT shall have the right, at the time of audit, to review all items charged to overhead on this project. If, in the opinion of the DEPARTMENT, such payment is unreasonable, the CONSULTANT shall be required to justify such payment or payments before they will be approved as direct or indirect cost.

The CONSULTANT shall maintain adequate cost records for all work performed under this AGREEMENT. All records and other evidence pertaining to cost incurred shall be made available at all reasonable times during the contract period and for three (3) years from the date of final voucher payment for examination by the STATE and copies thereof shall be furnished if requested.

## ARTICLE II

### **B. SUMMARY OF FEES**

The STATE, through the DEPARTMENT, hereby agrees to pay and the CONSULTANT agrees to accept as full compensation the following:

- a. Actual CONSULTANT'S salaries, costs applicable to actual salaries, salary burden (direct and indirect), and administrative costs attributable to overhead, the sum of which is estimated at \$633,090.32. For billing purposes, salary burden and overhead costs are currently estimated at 141.52% of actual salaries.
- b. A fixed fee to cover profit and non-reimbursed costs at \$63,309.03.
- c. Reimbursement for direct, out-of-pocket expenses estimated at \$16,000.00.
- d. Reimbursement for actual cost of subconsultants estimated as follows:
  - Normandeu Associates, Inc. (Environmental) \$15,000.00.
  - Bartlett Engineering, Inc. (Electrical/Communication) \$6,500.00
  - Mechanical Systems Engineering, Inc. (Mechanical) \$3,500.00

The actual amount payable under each category (a), (c) and (d) is only estimated and shall be changed only upon mutual agreement of the DEPARTMENT and CONSULTANT and documented by a formal amendment to the AGREEMENT.

### **C. LIMITATION OF COSTS**

1. Costs incurred against this AGREEMENT shall not exceed \$737,399.35 unless otherwise authorized. The CONSULTANT shall give the DEPARTMENT a ninety (90)-day written notice when it appears that this limit will be exceeded.
2. It is expected that the total cost to the STATE shall be the cost set forth under Article II, Section A and the CONSULTANT agrees to use its best efforts to perform the work specified in the AGREEMENT and all obligations under this contract within such limiting amount.
3. The STATE shall not be obligated to reimburse the CONSULTANT for costs incurred in excess of the limiting amount set forth in Article II, Section A.
4. Change orders issued under this Contract shall not be considered an authorization to the CONSULTANT to exceed the limiting amount set forth in the Summary in the absence of a statement in the change order, or other contract modifications, increasing the limiting amount.

### **D. PAYMENTS**

Payments on account of services rendered under this AGREEMENT shall be made as follows:

1. Monthly payments on account may be made upon written request by the CONSULTANT. Detailed vouchers shall include certification of man-hours of effort by employee classification and actual salaries and other costs incurred accompanied by satisfactory evidence of work performed during the period. Actual salaries paid and percentage factor shown in Article II,

## ARTICLE II

Section B, part (a) as well as for all approved subconsultants, including those listed in part (d) of Section B, shall be used until such time as true costs of salary burden and overhead are fixed by audit. At that time, payments shall be adjusted to agree with the percentage factors as determined by audit for the period in which the work was performed, as approved by the DEPARTMENT. The fixed fee shall be invoiced during the billing period based upon the overall percent complete of the project's scope of work as approved by the DEPARTMENT.

1. The CONSULTANT shall submit a final voucher upon completion of services required by this AGREEMENT, which includes any unbilled portion of the allowable costs or fixed fee and adjustments, if necessary, for audited actual costs and deliver all required plans, documents and records.

## ARTICLE III

### **ARTICLE III - GENERAL PROVISIONS**

#### **A. HEARINGS, ETC.**

The DEPARTMENT will make all arrangements for and hold all necessary hearings in connection with the project, including recording and filing of surveys and plats, enter into all necessary agreements with railroads, public utilities, municipalities, agencies of the Federal Government or others, and make orders of takings and financial settlements with owners of properties affected.

#### **B. CONTRACT PROPOSALS**

After the CONSULTANT has furnished to the DEPARTMENT contract drawings, special provisions, specifications, and estimate of quantities and unit cost by items, the DEPARTMENT will prepare the documents for receipt of proposals from construction contractors and for execution of a construction contract or contracts.

## ARTICLE IV

### **ARTICLE IV - STANDARD PROVISIONS**

#### **A. STANDARD SPECIFICATIONS**

The CONSULTANT agrees to follow the provisions of the Design Manuals, Standard Specifications for Road and Bridge Construction, and Standard Plans for Road and Bridge Construction of the DEPARTMENT; A Policy on Geometric Design of Highways and Streets and LRFD Bridge Design Specifications of the American Association of State Highway and Transportation Officials (AASHTO), and amendments thereto, and/or other professional codes or standards applicable to the services to be performed under this AGREEMENT. When a publication (including interim publications) is specified, it refers to the most recent date of issue in effect at the time of execution of this AGREEMENT.

#### **B. REVIEW BY STATE AND FHWA - CONFERENCES - INSPECTIONS**

It is mutually agreed that all portions of the work covered by this AGREEMENT shall be subject to the inspection of duly-authorized representatives of the STATE and Federal Highway Administration, United States Department of Transportation, at such time or times as the STATE or Federal Highway Administration deems appropriate.

The location of the office where the work will be available for inspection by STATE and Federal Highway Administration representatives 340 County Road, Suite 6-C, Westbrook, ME.

It is further mutually agreed that any party, including the duly-authorized representatives of the Federal Highway Administration, may request and obtain conferences, visits to the site, and inspection of the work at any reasonable time.

#### **C. EXTENT OF CONTRACT**

##### **1. Contingent Nature of AGREEMENT**

Notwithstanding anything in this AGREEMENT to the contrary, all obligations of the STATE, including, without limitation, the continuance of payments, are contingent upon the availability and continued appropriation of funds, and in no event shall the STATE be liable for any payments in excess of such available appropriated funds. In the event of a reduction or termination of those funds, the STATE shall have the right to terminate this AGREEMENT.

##### **2. Termination**

The DEPARTMENT shall have the right at any time, and for any cause, to terminate the work required of the CONSULTANT by this AGREEMENT, by written notice of such termination provided to the CONSULTANT by the DEPARTMENT, and, in the event of such a termination of this AGREEMENT, without fault on the part of the CONSULTANT, the CONSULTANT shall be entitled to compensation for all work theretofore satisfactorily performed, pursuant to this AGREEMENT, such compensation to be fixed, insofar as possible, based upon the work performed prior to termination. If no contract or contracts for construction of the project contemplated by this

## ARTICLE IV

AGREEMENT is (are) entered into within two (2) years after satisfactory completion of the services outlined in Article I, all of the services contemplated by this AGREEMENT shall be deemed to have been completed. It shall be a breach of this AGREEMENT if the CONSULTANT shall fail to render timely the services required under this AGREEMENT, in accordance with sound professional principles and practices, to the reasonable satisfaction of the DEPARTMENT, or shall be in such financial condition as to be unable to pay its just debts as they accrue, or shall make an assignment for the benefit of creditors, or shall be involved in any proceeding, voluntary or involuntary, resulting in the appointment of a receiver or trustee over its affairs, or shall become dissolved for any cause. In the event of the happening of any one or more of the foregoing contingencies, or upon the substantial breach of any other provisions of this AGREEMENT by the CONSULTANT, its officers, agents, employee, and subconsultants, the DEPARTMENT shall have the absolute right and option to terminate this AGREEMENT forthwith, and, in addition, may have and maintain any legal or equitable remedy against the CONSULTANT for its loss and damages resulting from such breach or breaches of this AGREEMENT; provided, however, that as to all plans, drawings, tracings, estimates, specifications, reports, proposals, sketches, diagrams and calculations, together with all material and data theretofore furnished to the DEPARTMENT by the CONSULTANT, of a satisfactory nature in accordance with this AGREEMENT, which plans, drawings, tracings, etc., are of use to the DEPARTMENT, the CONSULTANT shall be entitled to a credit, based on the contract rate for the work so performed in a satisfactory manner and of use and benefit to the DEPARTMENT.

### **D. REVISIONS TO REPORTS, PLANS OR DOCUMENTS**

The CONSULTANT shall perform such additional work as may be necessary to correct errors in the work required under the AGREEMENT, caused by errors and omissions by the CONSULTANT, without undue delays and without additional cost to the DEPARTMENT.

Furthermore, prior to final approval of plans, specifications, estimates, reports or documents by the DEPARTMENT, the CONSULTANT shall make such revisions of them as directed by the DEPARTMENT, without additional compensation therefor except as hereinafter provided:

1. If, after its written approval thereof, the DEPARTMENT shall require changes to the plans or documents that revise engineering or other factors specifically approved, thereby necessitating revisions of the contract plans or documents, or,
2. When applicable, if during the term of this AGREEMENT, a revision of the alignment is ordered to the extent that the revised alignment will lie completely or partially outside the limit of the survey data plotted by the CONSULTANT (this does not apply to those adjustments and refinements to the alignments anticipated under the scope of work), or,

## ARTICLE IV

3. If, after approval by the DEPARTMENT of the final contract plans or documents, the CONSULTANT shall be ordered in writing by the DEPARTMENT to make revisions, or to perform services other than those necessary in order to adapt said plans, reports or documents to conditions observed during field inspections and encountered during construction; the CONSULTANT shall be entitled to compensation therefor in accordance with Article II, Section B, such compensation to be in addition to the fee specified in Article II, Section A, for its original work on the plans, reports or documents.

### **E. ADDITIONAL SERVICES**

If, during the term of this AGREEMENT, additional professional services are required due to a revision in the limits of the project, or it becomes necessary to perform services not anticipated during negotiation, the DEPARTMENT may, in writing, order the CONSULTANT to perform such services, and the CONSULTANT shall be paid a fee in accordance with the provisions of Article II, Section B.

If, during the term of this AGREEMENT, additional professional services are performed by the CONSULTANT due to the fact that data furnished by the DEPARTMENT are not usable or applicable, the STATE will, upon written approval of the DEPARTMENT, reimburse the CONSULTANT for such additional design services in accordance with the provisions of Article II, Section B.

If additional services are performed by the CONSULTANT through its own acts, which are not usable or applicable to this project, the cost of such additional services shall not be reimbursable.

### **F. OWNERSHIP OF PLANS**

All data, plans, drawings, tracings, estimates, specifications, proposals, sketches, diagrams, calculations, reports or other documents collected, prepared, or undertaken either manually or electronically by the CONSULTANT, under the provisions of this AGREEMENT, immediately shall become the property of the DEPARTMENT, and, when completed, shall bear the CONSULTANT'S endorsement. The CONSULTANT shall surrender to the DEPARTMENT, upon demand at any time, or submit to its inspection, any data, plan, drawing, tracing, estimate, specification, proposal, sketch, diagram, calculation, report or document which shall have been collected, prepared, or undertaken by the CONSULTANT, pursuant to this AGREEMENT, or shall have been hitherto furnished to the CONSULTANT by the DEPARTMENT. The CONSULTANT shall have the right, with the written approval of the DEPARTMENT, to use any of the data prepared by it and hitherto delivered to the DEPARTMENT at any later stage of the project contemplated by this AGREEMENT.

### **G. SUBLETTING**

The CONSULTANT shall not sublet, assign or transfer any part of the CONSULTANT'S services or obligations under this AGREEMENT without the prior approval and written consent of the DEPARTMENT.

## ARTICLE IV

All subcontracts shall be in writing and those exceeding \$10,000 shall contain all provisions of this AGREEMENT, including "Certification of CONSULTANT/Subconsultant". For subconsultants working on design, hazardous materials, geotechnical services, etc., the minimum limits of their professional liability (errors and omissions) insurance coverage shall be not less than \$2,000,000 in the aggregate, with a deductible of not more than \$75,000. For subconsultant contracts with less risk, e.g., wetland evaluations, materials inspection and testing, structural steel fabrication inspection, underwater bridge inspection, research, bridge deck condition surveys, surveying, mapping, noise studies, air-quality studies, etc., the minimum limits of their professional liability (errors and omissions) insurance coverage shall be not less than \$1,500,000 in the aggregate, with a deductible of not more than \$25,000. For subconsultant contracts with no risk, e.g., subsurface exploration, archaeology, cultural resources, data gathering, etc., professional liability insurance shall not be required. If coverage is claims made, the period to report claims shall extend for not less than three years from the date of substantial completion of the construction contract. A copy of each subcontract shall be submitted for the DEPARTMENT'S files.

### **H. GENERAL COMPLIANCE WITH LAWS, ETC.**

The CONSULTANT shall comply with all Federal, STATE and local laws, and ordinances applicable to any of the work involved in this AGREEMENT and shall conform to the requirements and standards of STATE, municipal, railroad and utility agencies whose facilities and services may be affected by the construction of this project. The services shall be performed so as to cause minimum interruption to said facilities and services.

### **I. BROKERAGE**

The CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the CONSULTANT, to solicit or secure this Contract, and that it has not paid or agreed to pay any company or person, other than a bona fide employee working solely for the CONSULTANT, any fee, commission, percentage, brokerage fee, gift or any other consideration, contingent upon or resulting from the award or making of this Contract. For breach or violation of this warranty, the STATE shall have the right to annul this Contract without liability, or, at its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

### **J. CONTRACTUAL RELATIONS**

#### **1. Independent Contractor**

The CONSULTANT agrees that its relation to the STATE is as an independent contractor and not as an agent or employee of the STATE.

## ARTICLE IV

### 2. Claims and Indemnification

#### a. Non-Professional Liability Indemnification

The CONSULTANT agrees to defend, indemnify and hold harmless the STATE and all of its officers, agents and employees from and against any and all claims, liabilities or suits arising from (or which may be claimed to arise from) any (i) acts or omissions of the CONSULTANT or its subconsultants in the performance of this AGREEMENT allegedly resulting in property damage or bodily injury and/or (ii) misconduct or wrongdoing of the CONSULTANT or its subconsultants in the performance of this AGREEMENT.

#### b. Professional Liability Indemnification

The CONSULTANT agrees to defend, indemnify and hold harmless the STATE and all of its officers, agents and employees from and against any and all claims, liabilities or suits arising from (or which may be claimed to arise from) any negligent acts or omissions of the CONSULTANT or its subconsultants in the performance of professional services covered by this AGREEMENT.

c. These covenants shall survive the termination of the AGREEMENT. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the STATE, which immunity is hereby reserved by the STATE.

### 3. Insurance

#### a. Required Coverage

The CONSULTANT shall, at its sole expense, obtain and maintain in force the following insurance:

1. Commercial or comprehensive general liability insurance including contractual coverage, for all claims of bodily injury, death or property damage, in policy amounts of not less than \$250,000 per occurrence and \$2,000,000 in the aggregate (STATE to be named as an additional insured); and
2. comprehensive automobile liability insurance covering all motor vehicles, including owned, hired, borrowed and non-owned vehicles, for all claims of bodily injury, death or property damage, in policy amounts of not less than \$500,000 combined single limit; and
3. professional liability (errors and omissions) insurance coverage of not less than \$2,000,000 in the aggregate. If coverage is claims made, the period to report claims shall extend for not less than three years from the date of substantial completion of the construction contract. No retention (deductible) shall be more than \$75,000; and
4. workers' compensation and employer's liability insurance as required by law.

## ARTICLE IV

### b. Proof of Insurance

The policies described in paragraph (a) of this section and Section G shall be in the standard form employed in the STATE, issued by underwriters licensed or approved by the Department of Insurance of the STATE. Each policy shall contain a clause prohibiting cancellation or modifications of the policy earlier than 30 days, or 10 days in cases of non-payment of premium, after written notice thereof has been received by the STATE. The CONSULTANT shall provide to the STATE a certificate of insurance evidencing the required coverages, retention (deductible) and cancellation clause prior to submittal of the AGREEMENT to Governor and Council for approval and shall have a continuing duty to provide new certificates of insurance as the policies are amended or renewed.

### 4. No Third-Party Rights

It is not intended by any of the provisions of the AGREEMENT to make the public or any member thereof a third-party beneficiary of the AGREEMENT, or to authorize anyone not a party to this AGREEMENT to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Contract. The duties, obligations and responsibilities of the parties to this AGREEMENT with respect to third parties shall remain as imposed by law. No portion of this AGREEMENT shall be understood to be a waiver of the STATE'S sovereign immunity.

### 5. Construction of AGREEMENT

This AGREEMENT is executed in a number of counterparts, each of which is an original and constitutes the entire AGREEMENT between the parties. This AGREEMENT shall be construed according to the laws of the STATE.

### **K. AGREEMENT MODIFICATION**

The assignment of the CONSULTANT, generally established by the scope of work in this AGREEMENT, shall not be modified in any way without prior approval of the Governor and Council.

### **L. EXTENSION OF COMPLETION DATE(S)**

If, during the course of the work, the CONSULTANT anticipates that he cannot comply with one or more of the completion dates specified in this AGREEMENT, it shall be the CONSULTANT'S responsibility to notify the DEPARTMENT in writing at least ninety (90) days prior to the completion date(s) in question. The CONSULTANT shall state the reasons that a completion date(s) cannot be met and request a revised date(s) for consideration by the DEPARTMENT.

### **M. TITLE VI (NONDISCRIMINATION OF FEDERALLY-ASSISTED PROGRAMS) COMPLIANCE**

During the performance of this AGREEMENT, the CONSULTANT, for itself, its assignees and successors in interest agrees as follows:

## ARTICLE IV

- (1) Compliance with Regulations: The CONSULTANT shall comply with Title VI of the Civil Rights Act of 1964 regulations relative to nondiscrimination in federally-assisted programs of the DEPARTMENT, such regulations entitled Title 49 Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the REGULATIONS), and which are herein incorporated by reference and made a part of this AGREEMENT.
- (2) Nondiscrimination: The CONSULTANT, with regard to the work performed by it during the AGREEMENT, shall not discriminate on the grounds of race, color, religion, age, sex, handicap, sexual orientation, or national origin in the selection and retention of subconsultants, including procurements of materials and leases of equipment specific to this project. The CONSULTANT shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the REGULATIONS, including employment practices when the AGREEMENT covers a program set forth in Appendix B of the REGULATIONS.
- (3) Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the CONSULTANT for work to be performed under a subcontract, including procurements of materials or leases of equipment specific to the project, each potential subconsultant or supplier shall be notified by the CONSULTANT of the CONSULTANT'S obligations under this AGREEMENT and the REGULATIONS relative to nondiscrimination on the grounds of race, color, religion, age, sex, handicap, sexual orientation, or national origin.
- (4) Information and Reports: The CONSULTANT shall provide all information and reports required by the REGULATIONS or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the DEPARTMENT or the Federal Highway Administration to be pertinent to ascertain compliance with such REGULATIONS, orders and instructions. Where any information required of a CONSULTANT is in the exclusive possession of another who fails or refuses to furnish this information, the CONSULTANT shall so certify to the DEPARTMENT or the Federal Highway Administration, as appropriate, and shall set forth what efforts it has made to obtain the information.
- (5) Sanctions for Noncompliance: In the event of the CONSULTANT'S noncompliance with nondiscrimination provisions of this AGREEMENT, the DEPARTMENT shall impose sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
  - (a) withholding of payments to the CONSULTANT under the AGREEMENT until the CONSULTANT complies; and/or

## ARTICLE IV

- (b) cancellation, termination, or suspension of the AGREEMENT, in whole or in part.
- (6) The CONSULTANT shall take such action with respect to any subcontract or procurement as the DEPARTMENT or the Federal Highway Administration may direct as a means of enforcing such provisions, including sanctions for noncompliance, provided, however, that in the event a CONSULTANT becomes involved in, or is threatened with, litigation with a subconsultant or supplier as a result of such direction, the CONSULTANT may request the DEPARTMENT to enter into such litigation to protect the interests of the STATE, and, in addition, the CONSULTANT may request the United States to enter into such litigation to protect the interests of the United States.
- (7) 23 CFR 710.405(b) and Executive Order 11246 entitled "Equal Employment Opportunity," as amended by Executive Order 11375 and as supplemented in Department of Labor REGULATIONS (41 CFR Part 60), shall be applicable to this AGREEMENT and any subagreements hereunder.
- (8) Incorporation of Provisions: The CONSULTANT shall include the provisions of paragraphs (1) through (7) in every subcontract, including procurements of materials and leases of equipment specific to the project, unless exempt by the REGULATIONS, or directives issued pursuant thereto.

In accordance with EXECUTIVE ORDER 11246, the DEPARTMENT has the authority and responsibility to notify the Office of Federal Contract Compliance Programs of the United States Department of Labor if they become aware of any possible violations of Executive Order 11246 and 41 CFR Part 60. The Office of Federal Contract Compliance Programs is solely responsible for determining compliance with Executive Order 11246 and 41 CFR Part 60 and the CONSULTANT should contact them regarding related compliance issues.

### **N. DISADVANTAGED BUSINESS ENTERPRISE POLICY AGREEMENT REQUIREMENTS**

1. Policy. It is the policy of the United States Department of Transportation (USDOT) to ensure nondiscriminatory opportunity for Disadvantaged Business Enterprises (DBE's), as defined in 49 Code of Federal Regulations (CFR) Part 26, to participate in the performance of agreements and any subagreements financed in whole or in part with Federal funds. Consequently, the DBE requirements of 49 CFR Part 26 apply to this AGREEMENT.
2. Disadvantaged Business Enterprise (DBE) Obligation. The STATE and its Consultants agree to ensure nondiscriminatory opportunity for disadvantaged business enterprises, as defined in 49 CFR Part 26, to participate in the performance of agreements and any subagreements financed in whole or in part with Federal funds. In this regard, the STATE and its Consultants shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that disadvantaged

## ARTICLE IV

business enterprises have the opportunity to compete for and perform work specified in the agreements. The STATE and its Consultants shall not discriminate on the basis of race, color, religion, age, sex, handicap, sexual orientation, or national origin in the award and performance of agreements financed in whole or in part with Federal funds.

3. Sanctions for Non-Compliance. The CONSULTANT is hereby advised that failure of the CONSULTANT, or any Subconsultant performing work under this AGREEMENT, to carry out the requirements set forth in paragraphs 1 and 2 above shall constitute a breach of agreement and, after the notification of the United States Department of Transportation, may result in termination of this AGREEMENT by the STATE or such remedy as the STATE deems appropriate.

### **O. DOCUMENTATION**

The CONSULTANT shall document the results of the work to the satisfaction of the DEPARTMENT and the Federal Highway Administration. This shall include preparation of progress reports, plans, specifications and estimates and similar evidences of attainment of objectives called for in this AGREEMENT.

### **P. CLEAN AIR AND WATER ACTS**

If the amount of the AGREEMENT or subcontract thereunder exceeds \$100,000, the CONSULTANT or subconsultant shall comply with applicable standards, orders or requirements issued under Section 306 of the Federal Clean Air Act (43 U.S.C. 1857(h), Section 508 of the Federal Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15), which prohibit the use under non-exempt Federal contracts, grants or loans of facilities included on the EPA List of Violating Facilities. The CONSULTANT or subconsultant shall report violations to the FHWA and to the U. S. Environmental Protection Agency Assistant Administrator for Enforcement (EN-329).

# ATTACHMENT A



ARCHITECTS ENGINEERS PLANNERS  
340 County Road, Suite 6-C, Westbrook, ME 04092 (207) 774-5155 FAX (207) 229-0909

New Hampshire Department of Transportation  
Bedford, 16100

Bedford Mainline Toll Plaza ORT Conversion  
Scope of Work for Final Design and Construction Services

Original: October 16, 2015  
Revision #1: November 30, 2015

## I. INTRODUCTION

This Scope of Services addresses the final design, contract document preparation, and construction services for the conversion of the existing F.E.E.T. mainline toll plaza in Bedford, NH to a plaza that accommodates Open Road Tolling.

The work will be developed based on a single contract.

## II. LOCATION AND DESCRIPTION OF PROJECT

The design for the following is included in the work scope:

- Construction of one toll lane, island, booth and canopy on the easterly side of the plaza.
- Demolition of six toll lanes, five islands, five booths, and canopy in the center of the plaza.
- Construction of four highway speed toll lanes (two lanes and shoulders on either side of the roadway centerline).
- Minor widening of the approaches to the plaza to accommodate the toll conversion. No bridge widening is anticipated.
- Minor modifications to the parking lot north along the NB barrel due to FEET widening and toll plaza administration building renovations (toll plaza building renovations is done under separate contract by Bureau of Public Works)
- Installation of concrete barrier to separate highway speed traffic from low speed traffic and to separate northbound and southbound traffic. Limits of ORT concrete barrier shall be approximately 1,750 feet north and south of the toll plaza, with approximately 2,000 feet placed in the median between the two ORT barrels. Construction of a new pavement crown line in the areas of the highway speed toll lanes is anticipated
- Installation of full span (or cantilever) overhead sign structures and ground mounted signs. Installation of full span toll gantry over the Open Road Tolling

The following detailed work scope is arranged by major discipline and the corresponding submittals for that discipline. The work is subdivided into the following major disciplines:

- Geotechnical

- Environmental
- Highway Traffic Drainage
- Bridge Structure (Includes sign foundations)
- Toll Plaza (includes electrical, mechanical, structural, and toll systems)

The work is further subdivided into the following submittals/phases:

- Preliminary Plans (30%)
- Slope and Drain (60%)
- Preliminary PS&E Plan (80%-85%)
- PS&E (98%)
- Contract Plans/Mylars (100%)
- Construction Services

A summary of anticipated project plan sheets is provided in Appendix A. The proposed projects schedule is provided in Appendix B.

### **III. SCOPE OF WORK**

Following is an outline of each Final Design and Construction Services Scope item:

#### **A. Geotechnical**

Geotechnical work will be completed for this project. NHDOT shall be responsible for completing all geotechnical work including field explorations, materials testing, analyses, and geotechnical report development. HNTB's efforts will be limited to developing the boring plan, communicating geotechnical needs to NHDOT and reviewing NHDOT provided Geotechnical report and recommendations.

##### **1. Preliminary Plans**

- a. Coordinate with NHDOT for the completion of geotechnical work.
- b. HNTB will prepare a boring plan with boring coordinates for all proposed overhead sign structures, roadway work, and toll gantry foundations.

##### **2. Slope & Drain – Coordination with NHDOT**

##### **3. Preliminary PS&E - Coordination with NHDOT**

##### **4. PS&E - Coordination with NHDOT**

##### **5. Contract Plans/Mylars - Coordination with NHDOT**

##### **6. Construction Services – None anticipated for this discipline**

**B. Environmental**

The HNTB team, together with environmental subconsultant Normandeau Associates, will assist NHDOT in securing environmental permits for this project. The HNTB team will complete the following:

1. **Preliminary Plans** – No environmental work is anticipated for this phase.

**2. Slope and Drain**

- a. **Prepare Wetland Plans:** HNTB will prepare standard Dredge and Fill permit plans for use by Normandeau Associates
- b. HNTB will coordinate with Normandeau Associates as needed to provide design information required to advance the environmental process.
- c. **Normandeau Associates:** Normandeau Associates (Normandeau), under contract to HNTB, will be responsible for delineating jurisdictional wetlands in the vicinity of the proposed project. A New Hampshire Certified Wetland Scientist (CWS) will mark the jurisdictional boundary with sequentially numbered flags and will survey the flags using a hand held Trimble GPS unit with sub-meter accuracy in accordance with federal and state requirements. Normandeau will also locate invasive species populations for inclusion of project plans. Normandeau will prepare a brief memo describing the functions and values of the existing resources and description of wetlands proposed to be impacted for use by NHDOT in preparation of an Environmental Study.

Once impacts to jurisdictional wetland resources have been quantified, Normandeau will prepare a New Hampshire Department of Environmental Services (NHDES) Standard Dredge and Fill Wetland Application and all required attachments including a photo log, correspondence with various resource agencies, and GIS graphics of the project area. Normandeau will assist HNTB in preparation of permit plans for the application. Plans will depict the location and extent of jurisdictional resources and wetland impacts as well as coding the different impact areas in accordance with NHDOT practices. A table will be included on the plans providing a detailed accounting of impacts to jurisdictional resources with USACE and NHDES resource types distinguished by column. Notes on the plans will provide all required information necessary to guide the permitting reviewers through the project.

The environmental scope has been developed based on the following assumptions:

- i. Normandeau will attend two Natural Resource Agency meetings at NHDOT to present the proposed project.
- ii. The project will not trigger any of the thresholds that would require Wetland Mitigation under Env-Wt 302.03. Cultural/historic resource reviews will be performed by NHDOT. No special studies for threatened/endangered

species or exemplary natural communities will be undertaken as part of this contract. NHDOT will be responsible for all application fees.

- iii. Electronic versions of the Draft NHDES wetland application, including plans will be e-mailed to the NHDOT, Bureau of Environment. Upon resolution of the comments from NHDOT, ten hard copies of the Permit application, and one full size copy of the permit plans will be provided for NHDOT's use.
- d. Qualitative Air Analysis: HNTB will prepare a Qualitative Air Quality Memo addressing local and regional air quality for the proposed improvements to the Bedford Toll Plaza in Hillsborough County, NH. The memo will discuss potential changes in the NAAQS pollutants of hydrocarbons (HC), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO) and particulate matter (PM<sub>2.5</sub>) motor vehicle emissions along with the greenhouse gas equivalent (CO<sub>2e</sub>) emissions comparing the existing barrier toll plaza operations with the proposed open road toll plaza operations. The discussion will be based on previous analysis performed for the Hampton Mainline Toll Plaza and the Hookset Toll Plaza.

3. Preliminary PS&E – No work anticipated for this phase
4. PS&E – No work anticipated for this phase
5. Contract Plans/Mylars – No work anticipated for this phase
6. Construction Services – No work anticipated for this phase

**C. Highway - Traffic - Drainage**

The design will be based on AASHTO's Geometric Design of Highways and Streets (2011), FHWA's State of the Practice and Recommendations on Traffic Control Strategies at Toll Plazas; FHWA's MUTCD, 2009 Edition including 2012 revisions; ITE's Freeway and Interchange Geometric Design Handbook, and NHDOT's Design Manual and Standard Plans for Road and Bridge Construction (2010).

**1. Project Initiation**

- a. Develop project design schedule
- b. Develop budget
- c. Develop Contracts/Task Orders with subconsultants
- d. Review CADD and as-built files from NHDOT

**2. Preliminary Plans**

- a. Interdisciplinary Coordination – Coordinate with design team to advance design of project
- b. Conference calls – Eight project update calls with NHDOT are assumed

- c. Field Visit – Two team members from HNTB will complete a site visit to make visual observations and understand existing conditions. Photographs and field notes will be collected (existing signs, deficiencies, BMP's, etc.)
- d. Traffic Analysis (Toll Plaza Sizing and Constructability Analysis)
  - i. Confirm/validate final toll plaza size based on the following:
    - (1) Traffic volumes during peak periods: This includes assessing the mix of E-ZPass vs. cash-paying traffic, as well as the mix of cars vs. trucks.
    - (2) Capacity of the existing lanes: Review historical NHDOT data from this plaza to determine existing cash lane capacity
  - ii. Validate Future Traffic Projections. Projections will be derived from the following:
    - (1) A review of peak-period growth rates over the past three to five years.
    - (2) A review of projected growth rates from recent traffic and revenue (T&R) forecasts.
    - (3) An analysis of both daily and peak period growth in E-ZPass market share.
      - (a) HNTB will evaluate three basic peak-period traffic conditions for each direction of travel based on data collected from the Bedford-Merrimack mainline toll plaza:
        - (i) Peak E-ZPass: typically occurs on weekdays in the spring or fall.
        - (ii) Peak Cash: Typically occurs on summer weekends on Saturday or Sunday.
        - (iii) Peak Total: Typically occurs on Friday afternoons in the summer.
  - iii. Validate NHDOT's 20 year design. HNTB will review traffic conditions over a 20-year horizon and document that the toll facility has adequate cash and E-ZPass capacity to handle peak conditions throughout the 20-year design life of the facility. A detailed spreadsheet model employing risk-based analytical techniques will be used to identify the appropriate ultimate design. The key consideration will be to have sufficient capacity to handle higher cash volumes in the early years and higher E-ZPass volumes in the later years.
  - iv. Determine minimum number of toll lanes required during construction to maintain capacity.
  - v. Document results in a technical memorandum.
  - vi. Traffic Analysis Assumptions:

- (1) All analysis will be limited to spreadsheet-level analysis. No Vissim behavior-based simulations are assumed.
  - (2) Construction analysis will consider up to three (3) scenarios (or phases) in each direction
  - (3) The final Technical Memorandum will be 8-10 pages in length.
- e. Develop/Refine Plan and Profile: A profile will be developed for new ORT lanes.
- f. Define Preliminary Typical Sections: Typical sections will be developed for the following:
- i. ORT lanes
  - ii. Pavement widening areas
  - iii. Pavement removal areas
- g. Pavement Superelevation
- h. Cross Sections at Critical Locations: Critical locations are as follows:
- i. Profile touchdown points
  - ii. Centerline of toll plaza
  - iii. ORT lanes with maximum increase in elevation
  - iv. Adjacent to wetlands
- i. Drainage: Closed Drainage Analysis to Document impact to existing BMP

HNTB will complete a detailed drainage analysis to determine the impacts to existing closed drainage systems and existing BMP's. NHDOT will provide information (Drainage Report Narrative, and HydroCAD models) for the existing condition related to the Manchester Airport Access Road contracts. HNTB will assess the existing information provided and refine based on As-Built conditions. Drainage design will follow the guidelines as outlined in the NHDOT Drainage Manual. A comparison between the pre-development peak discharge rates and the post-development peak discharge rates as modeled using HydroCAD software for the one, 2, 10 and 50-year, 24-hour storm events will be provided. A Drainage Report Narrative outlining how treatment is provided will be summarized and will include all supporting calculations. Type A grates will be used and analyzed for spread to meet interstate highway standards. Spread analysis will be limited to the proposed closed system, modeled using InRoads Storm and Sanitary Version 8i, which will be developed for the Slope and Drain Submission.

Within the limits of the project boundaries there are four existing BMP's (two detention basins, A2 and C1, and two treatment swales). Treatment basin A2 and the two treatment swales will be modeled using HydroCAD software. Per discussions with the NHDOT, treatment basin C1 will not be analyzed because we assume that the proposed condition will truncate the F.E.E.T. related drainage, and re-direct the system to the west into a new BMP within the Southbound Ramp

E loop. Similarly, the drainage areas north of the plaza attributed to the F.E.E.T that currently flow into the closed system draining down East Point Drive will be truncated adjacent to the employee parking area and re-directed to the west into the previously mentioned new BMP located within the Southbound Ramp E loop. The existing closed drainage systems will remain unchanged downstream from the point of truncation.

For the increase in impervious area of approximately 20,000 SF in the southwest quadrant adjacent to the Manchester Airport Access Road Southbound On Ramp, the Department stated the existing vegetated swale BMP should be mimicked at the new toe of slope to provide treatment. Additionally, the Department stated the existing vegetated channel BMP at approximately Station 284+00 LT should be modified to provide treatment. Detention basin A2 will also be considered for minor modifications to support the proposed condition.

This scope of has been developed assuming that calculations for the existing BMP's will be provided to HNTB. The Preliminary Plan submission will be proof of concept in order to appreciate the magnitude and direction of flows. This will allow Department review and approval of concept prior to developing detailed plans and calculations which will be provided at the Slope and Drain submission.

- a. Model conceptual drainage routing and treatment locations to gain Department concurrence prior to finalizing at Slope and Drain Submission.
  - i. Review As-Built plans and site visit
  - ii. Preliminary analysis of existing storm sewer and BMP's
    1. Delineation of subcatchment areas and existing closed drainage system using HydroCAD.
    2. High level (preliminary) modeling of three existing BMP's using HydroCAD (Detention basin A2, and two vegetated swales).
  - iii. Conceptual design of proposed storm sewer and BMP's
    1. Delineation of subcatchment areas and proposed closed drainage system using HydroCAD.
    2. Modification of existing detention basin A2 using HydroCAD for new development.
    3. Development of three new BMPs:
      - a. One new detention basin west of toll plaza approximately 263+00,
      - b. One detention basin west of the F.E.E.T. at approximately Station 284+00 (converting an existing treatment swale into a detention basin), and

- c. One treatment swale within the southwest quadrant of the project.
  - iv. Preliminary plans submission
    - 1. Prepare plans outlining conceptual BMP's with locations
    - 2. Prepare conceptual design memorandum for proposed BMP modifications approach
  - j. Signing
    - i. Cross-reference sign photo inventory to survey data is assumed to be provided by NHDOT.
    - ii. Coordinate preliminary OHSS locations with other highway features (barrier, drainage, utilities)
    - iii. Finalize OHSS locations and submit boring requests
    - iv. This scope has been developed assuming eight new overhead guide signs will be required.
    - v. Preliminary guide sign text layouts will be provided by NHDOT.
  - k. Develop Engineering Report: An engineering report will be developed similar to the Engineering Report prepared by NHDOT for the Hooksett ORT Project.
  - l. Progress / Working / Review Meetings: Three meetings at NHDOT are assumed
  - m. Public meeting preparation and attendance: The HNTB team will prepare for and attend one public meeting. The following work activities are assumed:
    - i. Preparation of colored plans
    - ii. Preparation of PowerPoint presentation
    - iii. Attendance at Public Meeting
  - n. Milestone Submission Quality Reviews will be completed by senior-level staff
  - o. Submission Compilation (Plotting/Copies/Design narrative)
- 3. Slope & Drain**
- a. Interdisciplinary Coordination
  - b. Conference calls: Eight project update calls with NHDOT are assumed.
  - c. Progress / Working / Review Meetings: Two meetings at NHDOT are assumed.
  - d. General Plan/Profile Development
  - e. Cross Section Development, incl. Drive Matches, Detailing, and Review
  - f. Review and Incorporation of Geotechnical Information
  - g. Pavement Superelevation
  - h. Guardrail Calculations



- i. Refine Preliminary Typical Sections
- j. Signing: Sign text layout and disposition of existing signs will be established
- k. Utility Conflict Identification: The NHDOT Utility Bureau will complete the utility coordination required for the project. HNTB will not approve or be responsible for designing any utility relocations
- l. Drainage: Closed drainage design and detailing will be completed by HNTB (Plans/Profiles/Sections/Drainage Notes)
  - a. Finalize design of existing storm sewer and BMP's
    - i. Delineation of subcatchment areas and closed drainage system using HydroCAD.
    - ii. Modeling of three existing BMP's using HydroCAD.
  - b. Proposed closed system Spread analysis and catch basin spacing using InRoads Storm and Sanitary
  - c. Finalize analysis of proposed storm sewer and BMP's
    - i. Delineation of subcatchment areas and closed drainage system using HydroCAD.
    - ii. Import InRoads Storm and Sanitary output for use in HydroCAD model.
    - iii. Modification of model and completion of design for one existing BMP's using HydroCAD with all supporting calculations for use in report.
    - iv. Modification of models and completion of design of three new BMP's with all supporting calculations for use in report.
  - d. Water quality analysis
    - i. Analyze BMP's for water quality (standard forms)
    - ii. Address Comments
- m. Drainage Report: A drainage report will be developed summarizing the results of the project drainage design.
- n. Slope line development & coordination with environmental team (NHDOT & Normandeau)
- o. Maintenance Ramps: Plans, profiles, and cross sections will be prepared for the construction of two maintenance ramps to provide access from the F. E. Everett Turnpike. Maintenance Access Ramps south of the toll plaza; one for Southbound connecting to Back River Road, and one for Northbound connecting to Bedford Road will be designed. The location of the Maintenance Access Ramps is based on conceptual sketch provided to HNTB at the September 21, 2015 preliminary scoping meeting.
- p. Traffic Control Plans, Typical Sections and Cross Sections: Plans will be developed based on the following assumptions:

- i. Construction will be completed in three phases
  - (1) Phase 1 – Build new toll booth, canopy and toll lane
  - (2) Phase 1B – Build new gantry foundations
  - (3) Phase 2 – Build ORT lanes
- ii. The limits of the traffic control plans will be F.E. Everett Turnpike Station 247+00 to 280+00
- iii. Traffic control for outside pavement widening and removal will be covered by typical sections and notes (no site plans showing traffic control)
- iv. Traffic control for sign structure foundations will be prepared as a schematic for a single location intended to be applicable for all foundation locations not within the detailed traffic control plans.
- v. Traffic control plans will be developed assuming wide load/permit vehicles will be maintained to the extent practical within limits of the proposed roadway. Detour of wide load/permit vehicles through employee parking area is assumed not acceptable. Development of detour plans for wide loads/permit vehicles is not included.
- q. Quantities and Estimate
- r. Milestone Submission Quality Reviews will be completed by senior-level staff
- s. Submission Compilation (Plotting/Copies)

#### 4. Preliminary PS&E

- a. Interdisciplinary Coordination
- b. Conference calls: Four project update calls with NHDOT are assumed
- c. Progress / Working / Review Meetings: One meeting at NHDOT is assumed
- d. General Plan and Profile Revisions
- e. Traffic Control Plan Revisions
- f. Final Guardrail calculations
- g. Final Drainage Design (w/ Notes and Summary Sheet)
- h. Incorporation of Proposed Lighting (NHDOT design)
- i. Signing and Pavement Marking Plans
- j. Curbing and Pavement Layout Plans
- k. General Sheet Development (title sheet, index sht, etc.)
- l. Final Cross Section Revisions
- m. Typical Section Revisions
- n. Develop Detail Sheets (including Median Barrier Elevation Calculations)

- o. Summary Sheets Development
  - p. Construction Quantity Estimate
  - q. Signing
    - i. Finalize Guide Sign Layouts
    - ii. Prepare OHSS Stick Diagrams
    - iii. Develop Sign Quantities and Summary Sheets
  - r. Review of NHDOT Construction Schedule
  - s. Review of NHDOT Prepared specifications (POW and TCP)
  - t. Milestone Submission Quality Reviews will be completed by senior-level staff
  - u. Submission Compilation (Plotting/Copies)
- 5. PS&E**
- a. Interdisciplinary Coordination
  - b. Conference calls: Two project update calls with NHDOT are assumed
  - c. Plan Revisions
  - d. Special Provisions
  - e. Quantity Estimate Revisions
  - f. 3-way Check / Apples and Oranges
  - g. Progress / Working / Review Meetings: One meeting at NHDOT is assumed
  - h. Milestone Submission Quality Reviews will be completed by senior-level staff
  - i. Submission Compilation (Revisions, Plotting / Copies / Design Narrative)
  - j. Field Visit
  - k. Client Coordination
  - l. Sign Structures
    - i. Update sign quantities and cost estimate
    - ii. Finalize Sign Text Layout sheets
- 6. Contract Plans/Mylars**
- a. Interdisciplinary Coordination
  - b. Conference calls: Two project update calls with NHDOT are assumed
  - c. PS&E Review Comments
  - d. Paper Mylar Submission Comments
  - e. Milestone Submission Quality Reviews will be completed by senior-level staff
  - f. Submission Compilation (Revisions, Plotting / Copies / Design Narrative)

- g. Electronic File Transfer w/ Project Journal
- h. Client Coordination

**7. Construction Services**

- a. Project Meetings and Conference calls
  - i. No specific deliverable will be provided. HNTB will provide assistance through project meeting and conference call in order to assist the NHDOT team during construction. This effort is limited to 32 hours.
- b. Respond to submittals, questions & RFIs
  - i. This effort is limited to 40 hours for responding to submittals, questions and RFIs under the assumption NHDOT will typically respond.
  - ii. Project analyst/administration efforts have been included to assist in project invoicing, subconsultant coordination, budget/schedule preparation and maintenance, and progress reports.

**D. Bridge Structures**

MAAR Bridge: Modifications to the Manchester Airport Access Road (MAAR) Bridge will be completed to accommodate the planned Bedford ORT facility. The work shall include evaluating the load capacity of the existing bridge, determining how much additional load can be safely added to the structure, and coordinating with the design team and NHDOT to determine an appropriate roadway profile and cross section for the proposed ORT lanes.

The work also includes coordinating with NHDOT regarding the use of a bituminous or concrete wearing surface, proposed barrier type and details, and proposed transverse expansion joint modifications. Contract plans, quantities, engineer's estimates and specifications will be developed based on the selected bridge modifications.

A revised load rating of the proposed bridge condition will be developed and an updated Form 4 will be prepared for NHDOT's records.

Development of the MAAR bridge modification scope and fee is based on the following assumptions:

- No bridge widening or other major structural modifications/repairs, such as bridge concrete repairs, deck replacement and girder strengthening, will be completed. The bridge work will be limited to changes in wearing surface, expansion joints, and the addition of concrete barrier.
- The proposed bridge wearing surface will be asphalt pavement.
- The proposed barrier will be precast concrete barrier. The barrier will not be pinned to the bridge deck.
- The existing asphaltic plug joints will be replaced in-kind.

- Special provisions are not required.

**Overhead Sign Foundations:** HNTB will develop conceptual designs for new overhead sign structure foundations with guidance on preliminary foundation loadings provided by the NHDOT. Overhead sign bridges will be bid by specification and designed by the Contractor. Final design of sign structure foundations, in accordance with Chapter 10 of the 2015 NH Bridge Design Manual, will be completed by HNTB as part of construction phase services after the Contractor has submitted fabrication plans and design parameters for the overhead sign structures.

Overhead and cantilever sign structures will be designed in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 5<sup>th</sup> edition. Proposed median foundations that cannot be sufficiently protected by barrier will be designed to withstand vehicular collision loads in accordance with the AASHTO LRFD Bridge Design Specifications, 7<sup>th</sup> edition with 2015 Interims, Article 3.6.5.

Development of the sign foundation scope and fee is based on the following assumptions:

- All sign structures will be new ground-mounted overhead sign structures. The scope has been developed assuming existing sign bridges will not be reused.
- The following sign structures are anticipated:

Location	Direction	Structure Type	# of Foundations
Interchange, 1 mile	NB	Cantilever	1
Interchange, 1 mile	SB	Cantilever	1
Interchange, 1/2 mile	NB	Full Span Sign Bridge	2
Interchange, 1/2 mile	SB	Full Span Sign Bridge	2
E-ZPass Advance Sign	NB	Full Span Sign Bridge	2
E-ZPass Advance Sign	SB	Full Span Sign Bridge	2
E-ZPass Signs at Gore	NB	Full Span Sign Bridge	2
E-ZPass Signs at Gore	SB	Full Span Sign Bridge	2
<b>TOTAL</b>			<b>14</b>

- All proposed sign foundations will consist of spread footings.
- No more than four unique foundation designs will be required.
- Final design of foundations will be completed as part of construction phase services after the Contractor has submitted fabrication plans and design parameters for the overhead sign structures.
- Draft specifications for the overhead sign structures will be provided by NHDOT.

## 1. Preliminary Plans Submittal

- a. Interdisciplinary Coordination: The design team for the MAAR Bridge work and Overhead Sign Structures will coordinate with other design disciplines as required to advance the project.
- b. Conference calls: Two project update calls with NHDOT are assumed.
- c. Progress / Working / Review Meetings: One meeting at NHDOT is assumed
- d. MAAR Bridge
  - i. Site Visit, Data Collection & data Review: Review existing bridge as-built plans and computations. Two HNTB team members will complete a site visit to review existing bridge condition and configuration and to collect bridge data and photos.
  - ii. Existing and Preliminary Proposed Load Rating:
    - (1) Evaluate the load capacity of the existing bridge to determine how much additional load can be safely added to the structure.
    - (2) Based on the results of the load capacity evaluation, determine the maximum pavement amount that can be added to the bridge together with the required concrete barrier. The use of lightweight metal barrier will be evaluated if required based on limited bridge capacity.
    - (3) Given the bridge capacity, coordinate with the design team and NHDOT to determine an appropriate roadway profile and cross section.
    - (4) Coordinate with NHDOT regarding the proposed wearing surface type, barrier type, and joint modifications to be included in the Contract documents.
  - iii. Design Memorandum: Prepare a brief design memorandum in cooperation with highway design team members outlining the findings of the preliminary bridge load assessment. The memo will also outline the recommended roadway profile and cross slope for the ORT lanes, the limits and nature of any proposed bridge wearing surface modifications, and any proposed bridge transverse joint modifications required to accommodate the planned bridge typical section modifications.
  - iv. Detailing & Plan Development Including Bridge Cross Section: Prepare preliminary details illustrating proposed changes to bridge cross section to accommodate the proposed ORT lanes.
  - v. Deliverables will include design memorandum and preliminary bridge plan and cross section illustrating the proposed bridge modifications.
- e. Sign Foundations
  - i. Preliminary Review & Coordination:

- (a) Review existing and proposed highway plans to locate proposed sign foundations for each structure. Complete site visit to review sign locations prior to completion of geotechnical explorations.
  - (b) Coordinate with design staff to develop anticipated sign surface area to be supported at each sign bridge location.
  - (c) Where existing sign bridges are present HNTB will review the as-built and original design information for the existing structure to determine each structure's suitability for reuse. Findings will be reviewed with NHDOT to determine whether the existing structure(s) will be reused or replaced. This scope of work has been developed assuming as-built plans and design information will be available and provided by NHDOT.
  - (d) Coordinate with the client for approval regarding each proposed sign location.
  - (e) Communicate final sign locations to geotechnical team lead so geotechnical explorations can be scheduled and completed.
- ii. Deliverables will be limited to providing proposed foundation locations to the geotechnical design lead, no contract plans will be developed for this submittal.

## 2. Slope and Drain

- a. Interdisciplinary Coordination: The design team for the MAAR Bridge work and Overhead Sign Structures will coordinate with other design disciplines as required to advance the project.
- b. Conference calls: No design team coordination calls with the client are anticipated for this phase.
- c. Progress/Working/Review Meetings: No design team meetings at NHDOT are anticipated for this phase.
- d. MAAR Bridge:
  - i. Coordination with NHDOT: Coordinate and respond to review comments.
  - ii. Refine Bridge Plans:
  - iii. Continue development of plans and details for bridge wearing surface modifications and barrier installation.
  - iv. Start preparation of details for transverse expansion joint modifications to accommodate the revised bridge cross section and profile.
  - v. Deliverables will include 60% plans illustrating the general line and grade of the proposed bridge work.
- e. Sign Foundations:
  - i. Review geotechnical boring data

- ii. Preliminary Design & Analysis
- iii. Complete preliminary foundation design
- iv. Evaluate proposed foundation locations to determine if temporary earth support structures or shoring will be required during construction.
- v. Preliminary Detailing & Plan Development: Start progression of sign foundation details and plans.
- vi. Deliverables will include 60% plans showing proposed sign foundation locations and geometry.

### 3. Preliminary PS&E

- a. Interdisciplinary Coordination: The design team for the MAAR Bridge work and Overhead Sign Structures will coordinate with other design disciplines as required to advance the project.
- b. Conference calls: Two project update calls with NHDOT are assumed.
- c. MAAR Bridge:
  - i. Coordination with NHDOT: Coordinate and respond to review comments.
  - ii. Refine Bridge Plans: Continue progression of bridge plans and details.
  - iii. Deliverables will include preliminary PS&E plans illustrating proposed bridge work and details.
- d. Sign Foundations:
  - i. Coordination with NHDOT: Coordinate and respond to review comments.
  - ii. Refine Plans: Continue progression of sign foundation details and plans.
  - iii. Deliverables will include preliminary PS&E plans showing proposed sign foundation locations with details.

### 4. PS&E

- a. Interdisciplinary Coordination: The design team for the MAAR Bridge work and Overhead Sign Structures will coordinate with other design disciplines as required to advance the project.
- b. Conference Calls: No design team coordination calls with the client are anticipated for this phase.
- c. Progress / Working / Review Meetings: One meeting at NHDOT is assumed.
- d. MAAR Bridge:
  - i. Coordination with NHDOT: Coordinate and respond to review comments.
  - ii. Refine Bridge Plans: Continue progression of bridge plans, details, quantities and specifications.
  - iii. Final Load Rating: Finalize revised bridge load rating and Form 4.

- iv. Quantities and Engineer's Estimate: Prepare draft quantities and Estimate.
  - v. Deliverables will include preliminary PS&E plans, quantities, specifications and engineer's estimate. The final load rating computations and Form 4 will also be submitted.
- e. Sign Foundations:
- i. Coordination with NHDOT: Coordinate and respond to review comments.
  - ii. Refine Plans: Continue progression of sign foundation details and plans.
  - iii. Quantities and Engineer's Estimate: Prepare draft quantities and Estimate.
  - iv. Deliverables will include preliminary PS&E plans for the preliminary foundation locations and designs, quantities, and engineer's estimate for the work.

## 5. Contract Plans/Mylars

- a. Interdisciplinary Coordination: The design team for the MAAR Bridge work and Overhead Sign Structures will coordinate with other design disciplines as required to advance the project.
- b. Conference Calls: No design team coordination calls with the client are anticipated for this phase.
- c. Progress/Working/Review Meetings: No design team meetings at NHDOT are anticipated for this phase.
- d. MAAR Bridge:
  - i. Coordination with NHDOT: Coordinate and respond to review comments.
  - ii. Refine Bridge Plans: Complete final bridge plans and details.
  - iii. Quantities and Engineer's Estimate: Finalize quantities and Estimate.
  - iv. Deliverables will include final contract plans, quantities, specifications, and Engineer's Estimate.
- e. Sign Foundations:
  - i. Coordination with NHDOT: Coordinate and respond to review comments.
  - ii. Refine Plans: Complete preliminary foundation plans and details.
  - iii. Quantities and Engineer's Estimate: Finalize quantities and Estimate.
  - iv. Deliverables will include preliminary PS&E plans for the preliminary foundation locations and designs, quantities, and engineer's estimate for the work.

## 6. Construction Services

- a. MAAR Bridge:
  - i. Respond to questions and RFI's.

ii. No additional deliverables are anticipated for this phase of work.

b. Sign Foundations:

- i. Final Foundation Design: Final foundation design will be completed after the Contractor has submitted the proposed sign structure designs.
- ii. Respond to questions and RFI's.
- iii. Deliverables will include final plans and quantities for sign foundations.

**E. Toll Plaza**

The existing toll plaza will be modified to add highway speed tolling. This effort includes removal of six toll lanes and five existing toll booths and the associated portions of the overhead canopy. One new toll booth and toll lane will be added to the east side of the existing facility. A structural roadway slab will be added at the new booth and the canopy will be extended to provide coverage over the new booth and lane. The existing plaza does not include approach slabs and none will be added to the existing or widened portions of the plaza.

The installation of conduits from the ORT toll zone will likely disturb a significant portion of the slab in two of the cash toll lanes. Complete replacement of the slabs in these areas is anticipated.

Plans illustrating the proposed concrete slab, concrete bumper, concrete booth enclosure, tunnel modifications, canopy framing, monorail extension, and canopy sign supports will be generally copied from the Hooksett ORT Conversion Contract (NH State Project Number 15803). Minimal revisions to the original details and notes are expected to be required. As requested by NHDOT, the proposed scope of work includes minimal design and analysis of the proposed plaza. The sizes, shapes, configurations, and framing details of the various proposed toll plaza components will be dimensioned, detailed and annotated similarly to those developed for the 2012 Hooksett ORT Conversion Contract (NH State Project Number 15803). The proposed scope of work does not include an evaluation of design loads, structural analysis, design and detailing of the proposed plaza extension, or the structural evaluation of the existing toll plaza to remain.

NHDOT will provide drawings and specifications for new toll booths

**1. Preliminary Plan**

- a. Interdisciplinary Coordination: The design team will coordinate between the various design disciplines as required to advance the project.
- b. Conference calls: Four project update calls with NHDOT are assumed.
- c. Progress / Working / Review Meetings: One meeting at NHDOT is assumed.
- d. Electrical: No work anticipated this phase.
- e. Mechanical: No work anticipated this phase.

f. Structural:

- i. Site Visit, Data Collection & data Review: Review existing as-built plans, inspection reports and previous rehabilitation and maintenance contracts. Two HNTB team members will complete a site visit to review existing toll plaza condition and configuration and to collect toll plaza data and photos.
- ii. Canopy Modifications: The canopy will be extended to cover the new toll booth and new support columns will be added at the new toll island. The canopy extension will be detailed to mimic the current framing system, geometry, and member sizes. The extension of the existing canopy sign support structure support shall also be detailed to mimic the current framing system, geometry, and member sizes. When, in the judgment of the engineer, the nature of the proposed modifications warrants an engineering evaluation, an evaluation of the proposed condition will be completed. However, this scope of work has been developed assuming the required effort to complete these evaluations will be as shown in the fee proposal. The canopy modifications will include the two following major work tasks:
  - (1) Design & Analysis
  - (2) Detailing & Plan Development
- iii. Concrete Island, Bumper, Slab and Tunnel Modifications: The existing tunnel will not be extended and no new stairs connecting into the existing tunnel are necessary. New tunnel openings will be detailed for the booth utilities. The proposed additions shall be detailed to mimic the geometry, details and reinforcing details used at the Hookset ORT plaza. When, in the judgment of the engineer, the nature of the proposed modifications warrants an engineering evaluation, an evaluation of the proposed condition will be completed. However, this scope of work has been developed assuming the required effort to complete these evaluations will be as shown in the fee proposal. The island, bumper, slab and tunnel modifications will include the two following major work tasks:
  - (1) Design & Analysis
  - (2) Detailing & Plan Development
- iv. ORT Roadway Slab: Plans and specifications for a concrete roadway extending from gantry to gantry in the area of the proposed ORT lanes will be copied from Hooksett. A portion of the ORT Roadway will require non-steel reinforcement to avoid conflicts with the toll equipment. When, in the judgment of the engineer, the nature of the proposed modifications warrants an engineering evaluation, an evaluation of the proposed condition will be completed. However, this scope of work has been developed assuming the required effort to complete these evaluations will be as shown in the fee proposal. The ORT roadway slab will include the two following major work tasks:
  - (1) Design & Analysis

(2) Detailing & Plan Development

v. Overhead Gantry: Plans for the tolling gantry and foundations will be developed in accordance with NHDOT and AASHTO design criteria. The plans will detail a monotube gantry and associated support brackets for tolling equipment. Foundation elements are assumed to be comprised of spread footings. This scope of work has been developed assuming both gantries will have identical designs and details and that the design and details will be similar to the final gantry design provided for the Hooksett ORT project. The scope has also been developed assuming the design criteria and final mounting details approved by Telvent/Caseta at the Hooksett ORT plaza will be acceptable for use on this project. The overhead gantry will include the two following major work tasks:

(1) Design & Analysis

(2) Detailing & Plan Development

vi. Design Coordination: Structural team members will coordinate with other design disciplines as required to advance the project design.

g. Toll Systems: No work anticipated this phase.

**2. Slope and Drain**

a. Interdisciplinary Coordination: The design team will coordinate between the various design disciplines as required to advance the project.

b. Conference calls: Two project update calls with NHDOT are assumed.

c. Progress/Working/Review Meetings: No design team meetings at NHDOT are anticipated for this phase.

d. Electrical: No work anticipated this phase.

e. Mechanical: No work anticipated this phase.

f. Structural:

i. Address Client Review Comments

ii. Canopy Modifications: The design team will continue to progress the design and details for this component including:

(1) Design & Analysis

(2) Detailing & Plan Development

iii. Concrete Island, Bumper, Slab and Tunnel Modifications: The design team will continue to progress the design and details for this component including:

(1) Design & Analysis

(2) Detailing & Plan Development

iv. ORT Roadway Slab: The design team will continue to progress the design and details for this component including:

- (1) Design & Analysis
- (2) Detailing & Plan Development
- v. Overhead Gantry: The design team will continue to progress the design and details for this component including:
  - (1) Design & Analysis
  - (2) Detailing & Plan Development
- vi. Design Coordination: Structural team members will coordinate with other design disciplines as required to advance the project design.
- g. Toll Systems: We assume the ORT integrator is Telvent/Caseta and the required infrastructure to support the toll system will be similar to the Hooksett ORT Project. HNTB will detail the location and the required conduits for items, such as the treadle, patron fare display and traffic island lights, based on coordination with the cash toll system vendor. For the ORT lanes, HNTB will detail the required conduits and junction boxes in the vicinity of the ORT concrete roadways based on coordination with the ORT system vendor. Conduits and/or raceways will be detailed extending into the existing tunnel and ultimately to the existing toll plaza administration building.

### 3. Preliminary PS&E

- a. Interdisciplinary Coordination: The design team will coordinate between the various design disciplines as required to advance the project.
- b. Conference calls: Two project update calls with NHDOT are assumed.
- c. Progress / Working / Review Meetings: One meeting at NHDOT is assumed.
- d. Electrical: HNTB will contract with Bartlett Engineering, Inc. to provide professional electrical and communication design services for the toll booth addition, demolition and toll systems. This includes items such as power, lighting, electricity (including low and high voltage), communication, and lightning protection system for the ORT system. Plans will be prepared to show proposed systems required for booth additions and demolition, and alterations in the tunnel as well as in the ORT roadway and islands. HNTB will prepare plans and specifications under the direction of Bartlett Engineering. This task will include the following major work tasks:
  - i. Detailing & Plan Development: HNTB anticipates the design of a lightning suppression system that is more robust than the system designed and installed at the Hooksett ORT project.
  - ii. Design Coordination: Design team members will coordinate with other disciplines as required to advance the project design.
- e. Mechanical: HNTB will contract with Mechanical Systems Engineering, Inc. to provide professional mechanical design services for the toll booth addition, demolition and toll systems. This includes items such as HVAC and plumbing. Plans will be prepared to show proposed systems required for booth addition and

demolition, and alterations in the tunnel as well as in the ORT roadway and islands. HNTB will prepare plans and specifications under the direction of Bartlett Engineering. This task will include the following major work tasks:

- i. Detailing & Plan Development
  - ii. Design Coordination: Design team members will coordinate with other disciplines as required to advance the project design.
- f. Structural: The design team will continue to progress the structural design and details for the toll plaza modifications including:
- i. Address Client Review Comments
  - ii. Canopy Modifications
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
  - iii. Concrete Island, Bumper, Slab and Tunnel Modifications
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
  - iv. ORT Roadway Slab
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
  - v. Overhead Gantry
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
  - vi. Design Coordination: Design team members will coordinate with other disciplines as required to advance the project design
- g. Toll Systems: The design team will continue to progress the toll systems design and details for the toll plaza modifications including:
- i. Detailing & Plan Development.
    - (1) Further develop plans
    - (2) HNTB will prepare prosecution of work special provisions and incentive/disincentive special provisions that outline how the work should be phased and when work needs to be completed to allow for adequate testing prior to opening.
  - ii. Design Coordination. This work will be coordinated with NHDOT and the toll vendors for their concurrence.

#### 4. PS&E

- a. Interdisciplinary Coordination: The design team will coordinate between the various design disciplines as required to advance the project.
- b. Conference calls: One project update call with NHDOT is assumed.
- c. Progress / Working / Review Meetings: One meeting at NHDOT is assumed.
- d. Electrical: The design team will continue to progress the electrical systems design and details including:
  - i. Address Client Review Comments
  - ii. Design & Analysis
  - iii. Detailing & Plan Development
  - iv. Design Coordination
- e. Mechanical: The design team will continue to progress the mechanical systems design and details including:
  - i. Address Review Comments
  - ii. Design & Analysis
  - iii. Detailing & Plan Development
  - iv. Design Coordination
- f. Structural: The design team will continue to progress the structural design and details including:
  - i. Address Client Review Comments
  - ii. Canopy Modifications
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
  - iii. Concrete Island, Bumper, Slab and Tunnel Modifications
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
  - iv. ORT Roadway Slab
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
  - v. Overhead Gantry
    - (1) Design & Analysis
    - (2) Detailing & Plan Development
- g. Design Coordination: Design team members will coordinate with other disciplines as required to advance the project design.
- h. Quantities & Engineer's Estimate

- i. Special Provisions
  - j. Toll Systems
    - i. Address Client Review Comments
    - ii. Design & Analysis
    - iii. Detailing & Plan Development
    - iv. Design Coordination
- 5. Contract Plans/Mylars**
- a. Interdisciplinary Coordination: The design team will coordinate between the various design disciplines as required to advance the project.
  - b. Conference calls: One project update calls with NHDOT is assumed
  - c. Progress/Working/Review Meetings with NHDOT are not anticipated for this project phase.
  - d. Electrical: The design team will continue to progress the electrical design and details including:
    - i. Address Client Review Comments
    - ii. Design Coordination
  - e. Mechanical: The design team will continue to progress the mechanical design and details including:
    - i. Address Client Review Comments
    - ii. Design Coordination
  - f. Structural: The design team will continue to progress the structural design and details including:
    - i. Address Client Review Comments
    - ii. Design Coordination
  - g. Toll Systems: The design team will continue to progress the toll systems design and details including:
    - i. Address Client Review Comments
    - ii. Design Coordination

**6. Construction Services**

The HNTB team will provide construction engineering support services during construction. This effort will generally include the following:

- a. Electrical: Respond to submittals, questions & RFIs
- b. Structural: Respond to submittals, questions & RFIs
- c. Mechanical: Respond to submittals, questions & RFIs
- d. Toll Systems: Respond to submittals, questions & RFIs

**Appendix A**

**Preliminary Drawing List**

A summary of the plan sheets anticipated to be required for this project is outlined below.

<b>Description</b>	<b>No. of Sheets</b>
Title Sheet	1
Index of Sheets and General Notes	1
Standard Symbols	2
Typical Sections	15
Summary of Quantities	15
Miscellaneous details	9
Sign Details	4
Sign Text Layout	3
Overhead Sign Structure Cross Sections	10
Key Plan	1
General Plan	12
Drainage Notes	3
NB ORT Profiles	4
SB ORT Profiles	4
Access Ramp Profile	1
Curbing, Barrier and Pavement Layout	12
Pavement Marking and Signing	15
Traffic Control	12
Toll Plaza Structure	20
Toll Gantry Details	5
Electrical and Mechanical	19
M.A.A.R. Bridge Details	3
NB Cross Sections	80
SB Cross Sections	80
Maintenance Ramp Cross sections	10
<b>Total # of Sheets</b>	<b>341</b>

**Appendix B**

**Anticipated Project Schedule**

The anticipated design schedule for this project is provided below. Final project deliverable dates will be coordinated with the client following contract award:

- Signed Contract - Notice To Proceed      February, 2016
- Preliminary Plans      April 2016
- Slope and Drain      August 2016
- Preliminary PS&E Plan      October 2016
- PS&E      December 2016
- Contract Plans (Mylars)      January 2017
- Construction Complete      Summer 2018

*Attachment 1*

**CERTIFICATION WITH REGARD TO THE PERFORMANCE OF  
PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO  
THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS**

The CONSULTANT  X , proposed subconsultant \_\_\_\_\_, hereby certifies that it has  X , has not \_\_\_\_\_, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Order 11246 and that it has  X , has not \_\_\_\_\_, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

HNTB CORPORATION

(Company)

By:  

Vice President

(Title)

Date:  March 2, 2016

**Note:** The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by consultants and proposed subconsultants only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts that are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally, only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime consultants and subconsultants who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such consultant submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

(Revised: June, 1980) **NOTE:**  TO BE COMPLETED BY CONSULTANT WHEN SIGNING AGREEMENT.

*Attachment 2*

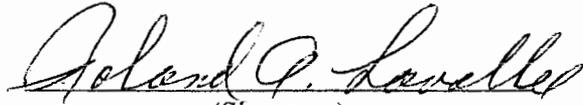
**CONSULTANT DISCLOSURE STATEMENT  
FOR PREPARATION OF  
ENVIRONMENTAL EVALUATIONS**

I hereby affirm that I have read and reviewed the Council on Environmental Quality (CEQ) regulation [40 CFR 1506.5(C)] and related guidance issued by CEQ and that pursuant thereto this firm has no financial or other interest in the outcome of this project.

I further hereby affirm that the information provided herein is true and correct and acknowledge that any knowingly false statement or false representation as to any material part contained herein may subject me to a fine and/or imprisonment, pursuant to pertinent provisions of the United States Code.

March 2, 2016

(Date)

  
Roland P. Lavelle

(Signature)

Attachment 3

CERTIFICATION OF CONSULTANT/SUBCONSULTANT

I hereby certify that I am the Vice President and duly-authorized representative of the firm of HNTB CORPORATION, and that neither I nor the above firm I here represent has:

- (a) employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other than a bona fide employee working solely for me or the above CONSULTANT) to solicit or secure this Contract,
- (b) agreed, as an express or implied condition for obtaining this Contract, to employ or retain the services of any firm or person in connection with carrying out the Contract, or
- (c) paid, or agreed to pay, to any firm, organization or person (other than a bona fide employee working solely for me or the above CONSULTANT) any fee, contribution, donation or consideration of any kind for, or in connection with, procuring or carrying out the Contract:

I/WE do also, under penalty of perjury under the laws of the United States, certify that, except as noted below, the company or any person associated therewith in the capacity of (owner, partner, director, officer, principal investigator, project director, manager, auditor, or any position involving the administration of Federal funds): (a) is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency; (b) has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past three years; (c) does not have a proposed debarment pending; and (d) has not been indicted, convicted or had a civil judgment rendered against (it) by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

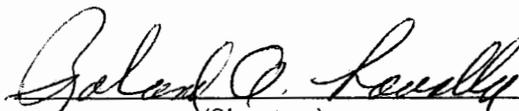
except as here expressly stated (if any):

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate below to whom it applies, the initiating agency, and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

I acknowledge that this certificate is to be furnished to the State Department of Transportation and the Federal Highway Administration, U. S. Department of Transportation, in connection with this Contract involving participation of Federal-aid highway funds, and is subject to applicable State and Federal laws, both criminal and civil.

March 2, 2016

(Date)

  
(Signature)

CERTIFICATION OF STATE DEPARTMENT OF TRANSPORTATION

I hereby certify that I am the DEPUTY COMMISSIONER of the Department of Transportation of the State of New Hampshire, and the above consulting firm or its representatives has not been required, directly or indirectly, as an express or implied condition in connection with obtaining or carrying out this Contract, to:

- (a) employ or retain, or agree to employ or retain, any firm or person, or
- (b) pay, or agree to pay, to any firm, person, or organization, any fee, contribution, donation, or consideration of any kind:

except as here expressly stated (if any):

3/23/16  
(Date)

  
(Signature)

*Attachment 5*

**CERTIFICATION FOR FEDERAL-AID CONTRACTS  
EXCEEDING \$100,000 IN FEDERAL FUNDS**

The prospective participant certifies, by signing and submitting this agreement, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower-tier subcontracts which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

Attachment 9

IN WITNESS WHEREOF the parties hereto have executed this AGREEMENT on the day and year first above written.

**Consultant**

WITNESS TO THE CONSULTANT

By: Cherise Butler  
PA

Dated: 3/2/16

CONSULTANT

By: Robert P. Lavallee  
Vice President  
(TITLE)

Dated: March 2, 2016

**Department of Transportation**

WITNESS TO THE STATE OF NEW HAMPSHIRE

By: Michelle Gross

Dated: 3/23/16

THE STATE OF NEW HAMPSHIRE

By: [Signature]

for DOT COMMISSIONER  
Dated: 3/23/16

**Attorney General**

This is to certify that the above AGREEMENT has been reviewed by this office and is approved as to form and execution.

Dated: 4/6/16

By: [Signature]  
Assistant Attorney General

**Secretary of State**

This is to certify that the GOVERNOR AND COUNCIL on \_\_\_\_\_ approved this AGREEMENT.

Dated: \_\_\_\_\_

Attest:  
By: \_\_\_\_\_  
Secretary of State

CERTIFICATION OF AUTHORITY

State of Missouri )

County of Jackson )

I, Craig W. Denson, being first duly sworn according to law, depose and say that I am the Corporate Secretary of HNTB Corporation. The attached is a complete, true and correct copy of a Certificate of Authority certifying that Roland A. Lavalée - Vice President, has been authorized by the Board of Directors of the Corporation to enter into agreements and contracts for usual and customary engineering and planning services with the New Hampshire Department of Transportation, in particular the referenced Beford-Merrimack ORT Conversion Final Design project, 16100, and to incur ordinary and necessary obligations in connection therewith in the name of and on behalf of HNTB Corporation.

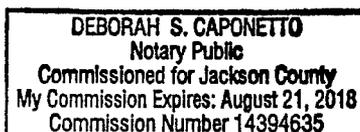
Craig W. Denson  
Corporate Secretary

Date: March 2, 2016

Subscribed and sworn to and before me this 2nd day of March, 2016

Deborah S. Caponetto  
Notary Public

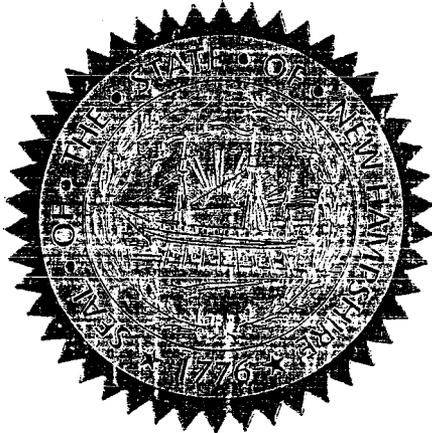
My commission expires:



# State of New Hampshire Department of State

## CERTIFICATE

I, William M. Gardner, Secretary of State of the State of New Hampshire, do hereby certify that HNTB CORPORATION a(n) Delaware corporation, is authorized to transact business in New Hampshire and qualified on January 22, 1993. I further certify that all fees and annual reports required by the Secretary of State's office have been received.



In TESTIMONY WHEREOF, I hereto set my hand and cause to be affixed the Seal of the State of New Hampshire, this 1<sup>st</sup> day of April, A.D. 2016

A handwritten signature in cursive script, appearing to read "Wm Gardner".

William M. Gardner  
Secretary of State



