

SCOPE OF WORK

General Description

The Maine Turnpike Authority (Authority) is soliciting proposals for complete underwater substructure inspection services including the taking of soundings and the use of experienced diving teams and equipment necessary to inspect the structural elements and waterways of the Turnpike bridges.

The Consultant shall be responsible for the thorough understanding of the requirements pertaining to the services required. All services provided by the Consultant shall be in strict conformance with the Authority's Engineering Consultant General Conditions, unless detailed otherwise in this Scope of Work. The Consultant shall become familiar with the Authority's procedures, presentation and coordinating requirements necessary for the effective performance of these services.

It will be the responsibility of the Consultant to bring to the attention of the Authority any errors, omissions and non-compliance discovered in the Scope of Work.

Definitions

Consultant: An individual or firm, who is contracted to furnish services outlined in this scope of work.

Consultant Manager/Principal: The consultant's representative responsible for supervising its firm's personnel assigned to Maine Turnpike projects.

Contractor: An individual or firm, which has been awarded a Construction Contract

Project: Any unit of work or study for which a Consultant selection is made and a contract is entered into.

Task/Project Order: A form letter providing the consultant with authorization to commence work on a project or projects. This document outlines the duties, the timeframe within which to complete, and the maximum amount that can be expended for the work ordered without additional approval by the Authority. In addition it identifies the Consultant key personnel working on the project and the name of the Authority's Representative to whom the Consultant will report.

Scope of Work

The Consultant will provide qualified professionals to conduct underwater inspection services for the Turnpike bridges listed in Table 1 below. Substructure inspections and channel soundings shall be completed as noted in the table. A project report shall be provided that details the general conditions of the substructure, channel and waterway, identifies areas of damage and deterioration and outlines required corrective action. The report shall be signed and stamped by a registered professional engineer.

TABLE 1: Structures for Inspection

Mile Marker	Structure Name	Structure Type	City/Town	Substr. Insp.	Channel Soundings
5.2	York River Bridges (NB & SB)	2 - 13 span bridges	York	Y	Y
21.4	Merriland River	Concrete Arch Culvert	Wells	Y	Y
25.0	Mousam River (NB & SB)	2 – 3 span bridges	Kennebunk	N	Y
26.4	Ward Brook	Single cell box culvert	Kennebunk	Y	Y
27.2	Kennebunk River Bridges (NB & SB)	2 - single span bridges	Kennebunk	Y	Y
27.8	Duck Brook	Single cell box culvert	Arundel	Y	Y
33.0	Saco River Bridges (NB & SB)	2 - 6 span bridges	Biddeford	Y	Y
43.4	Nonesuch River	Concrete Arch Culvert	Scarborough	Y	Y
46.7	Stroudwater River (NB & SB)	2 – 4 span bridges	Portland	N	Y
51.8	Presumpscot River Bridges (NB & SB)	2 - 2 span bridges	Falmouth	Y	Y
71.1	Royal River (NB & SB)	2 – 1 span bridges	New Gloucester	N	Y
78.9	Androscoggin River Bridges (NB & SB)	2 - 6 span bridges	Lewiston	Y	Y
85.2	Sabattus River Bridges (NB & SB)	2 - 2 span bridges	Sabattus	Y	Y
96.6	Potters Brook	Double cell box culvert	W. Gardiner	Y	Y
99.2	Cobbosseecontee Stream Bridges (NB & SB)	2 – 4 span bridges	W. Gardiner	Y	Y
107.0	Vaughan Brook	Two cell box culvert	Hallowell	Y	Y
FS1.1	Presumpscot River Bridges (EB & WB)	2 – 4 span bridges	Falmouth	Y	Y

The Authority may elect to have an authorized representative act on its behalf throughout the project with particular duties entrusted to him. All references to the Consultant are defined as the successful firm performing the work described herein.

The previous underwater inspection program was performed in 2006.

Where underwater inspections are not required (due to low-water levels or the absence of pier substructures), the Consultant shall note the presence, location and approximate dimensions of areas of scour located near the structure in the inspection logs as well as in the project report. When water levels are high enough such that the mudline cannot be visually observed around the substructure unit, the Consultant shall notify the Authority of such occurrences.

The Consultant shall be responsible for accessing the project site in a safe manner. Vehicles used to complete work along the Maine Turnpike shall have a flashing beacon or strobe light installed on the vehicle and shall be parked beyond the edge of pavement. All vehicles that will be parked within the Turnpike Right-of-way for an extended period of time shall be located beyond the

roadway clear zone (e.g. parked behind, or fully protected by, a bridge endpost, guardrail, etc.) All workers shall wear Class III safety vests while adjacent to the Maine Turnpike mainline. The use of Maine Turnpike crossovers by the Consultant is strictly prohibited. Additionally, all field work shall be completed in accordance with the Maine Turnpike Authority's Safety Checklist (Exhibit A).

Where required, all temporary lane closures will be provided by the Authority. The availability of temporary lane closures are limited in areas of high traffic volume, are subject to approval by the Authority, may be cancelled at the Authority's discretion, and are not allowed during periods of inclement weather.

The Consultant shall notify the Authority of their proposed inspection schedule at least one week before beginning operations.

The Consultant is hereby notified that the Authority has awarded a contract for the rehabilitation of the Presumpscot River Bridge with construction scheduled through October 2011. The Consultant shall coordinate its work with the Contractor, T Buck Construction of Auburn, Maine, in order to safely complete the underwater inspection. The underwater inspection of the substructure units at the Presumpscot River Bridge will become the baseline inspection.

A. Diving Inspector Qualifications and Safety Standards

All divers shall be registered professional engineers, or shall have a minimum of five years experience in bridge inspection assignments in a responsible capacity. All divers shall be certified commercial divers holding ADCI certification cards. Additionally, all inspection teams shall meet the requirements established in the FHWA National Bridge Inspection Standards, 23 CFR 650, Subpart C.

B. Inspection

All inspections shall be completed in accordance with FHWA National Bridge Inspection Standards, 23 CFR 650, Subpart C. All diving operations shall be performed in accordance with the applicable Occupational Safety and Health Administration (OSHA) Standards, 29 CFR 1910, Subpart T, as well as all local and state safety standards.

All portions of all faces of all underwater structural elements, including the portion of these elements subjected to periodic submersion, shall be inspected. Members that cannot be examined because of debris, vegetation, or other reasons should be cleaned if it can be done with the use of hand tools. Scuba or surface supplied diving equipment shall be used for the inspection of all underwater structural elements.

The inspection techniques used shall be sufficient to yield information necessary to make a general condition assessment of the structural elements being investigated. Any areas of mechanical or structural damage, as well as areas of deterioration, shall be identified and an assessment made of the reasons for this damage or deterioration. During the course of the inspection, the diver(s) shall have all tools necessary for probing, measuring and recording the conditions found. Concrete structures shall be

struck with a hammer to gauge the concrete strength and detect any softness that might be present. Only non-destructive methods of inspection shall be employed.

Deficiencies shall be described in enough detail to allow rates of change to be monitored over consecutive inspections. This requires liberal use of size and location dimensions, sketches and photographs (See Section C). The criteria for numerical condition ratings (NCR) shall conform to Items 60, 61, 62, 71 and 113 of the FHWA publication "Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges – Revision of Dec. 1995" and all modifications and updates thereto.

All spalled areas of concrete shall be measured on a square foot basis. The depth of spalled areas shall be measured in inches. The exact location of damage and/or deterioration shall be accurately recorded utilizing sketches and photographs (See Section C).

Cracks shall be measured on a linear foot basis. Crack width and depth shall be recorded in inches. The exact location of damage or deterioration shall be accurately recorded utilizing sketches and photographs (See Section C).

Areas of exposed reinforcing steel shall be documented and recorded as to exact location.

C. Scour and Channel Investigations

Scour inspections shall conform to Chapter 11 of FHWA publication No. FHWA NHI 01-001: "Evaluating Scour at Bridges, Fourth Edition, May 2001" (also known as Hydraulic Engineering Circular, HEC 18) and all modifications and updates thereto. As part of this work, soundings of the channel bottom shall be taken at all submerged piers and abutments in a radial pattern. Cross sections of the river bottom shall be taken along each fascia line and along lines 50', 100', 150', and 200' offset from (upstream and downstream), and parallel to, each fascia. Where terrain obstructions prevent soundings, the Consultant shall document such occurrences. Additional soundings shall be taken where necessary to ensure the soundings are accurate and representative of actual conditions. All soundings shall reference a known point or elevation on or near the structure.

Scoured areas at the base of bridge supports shall be measured in feet and inches. The depth, width and length of these areas shall be recorded. In addition, the penetration of scour beneath the substructure shall be recorded where present. Sketches and photographs shall be made of these areas.

The sounding results shall be submitted on cross sectional drawings, at scales approved by the Authority. The Consultant shall also provide native electronic copies (e.g. AutoCAD files) of these drawings to the Authority. The sections shall show the streambed elevations compared with pier footing elevations. A plan view shall be included showing sufficient detail so that comparable measurements can be made during future inspections.

Three pint-size soil samples shall be taken at each bridge substructure unit, or at the openings of culverts, and labeled according to their respective location. Samples shall be placed in containers with screw-on lids, and shall be labeled by the Structure, Date, and Location of Sample. Samples shall be submitted to Authority on a routine basis, within an interval not to exceed one week. Where river cobbles or riprap stones are observed, the size and extent (plan area) of the stones shall be recorded. Cobble and stone samples need not be taken.

Mudline probes shall be taken at 5-ft intervals around bridge substructure units using a #3 steel reinforcing bar. Probes shall be taken along the face of the substructure in attempt to locate the top of the footing, and radially from the substructure at a distance of 10-ft to determine the softness and composition of the waterway. Depths of the probes shall be recorded in feet. If no refusal is encountered (whether footing or stiff substrata), the data shall be recorded as such. A brief description of the mudline soil composition shall be recorded.

Debris lodged in front or alongside bridge substructure units; situated along sloped embankments; or wedged at the opening of culverts, shall be recorded, photographed, and quantified.

D. Photographs

Underwater color digital photographic equipment shall be used to document areas of significant deterioration and distress. Also, when deficiencies have a NCR of 4 or less, at least one photograph illustrating a typical example should be provided and include a scale, such as a ruler or common hand tool. The essential features of the deficiency shall be emphasized by making arrows or dimensions directly on the photograph where necessary. The date and time of day the photograph was taken, as well as the bridge name, shall be clearly and permanently marked on the front of the photograph. A clear water box filled with clear water shall be used in areas of low visibility water.

E. Report

A project report shall be prepared and submitted by the Consultant. The report shall be signed and stamped by a Professional Engineer licensed in the State of Maine. Five signed and stamped copies of the report shall be submitted to the Authority. Each report shall contain color photographs, and scaled drawings no larger than 11x17. In addition, the Consultant shall also provide native electronic copies (e.g. AutoCAD files, MS Word files, JPEG files, etc.) of all drawings, photographs, and details used in the report to the Authority.

The project report shall detail the general condition of the bridge and culvert foundations, channels and waterways and identify areas of damage and/or deterioration to these areas. The licensed engineer who participated in the bridge inspections shall be directly involved in preparing the Report.

To ensure uniform content, the report shall contain the following standard sections for each inspected bridge and culvert, arranged in the indicated sequence:

1. Condensed Inspection Report
2. Report of Deficiencies
3. Recommended Corrective Action

1. Condensed Inspection Report (CIR)

The purpose of the condensed inspection report is to provide abbreviated documentation of individual substructure, channel and waterway elements and to minimize inspection and clerical effort while providing a complete assessment of the general condition of the underwater substructure and channel.

The NCR, as previously described, shall be used and a specific rating assigned to each element in the Substructure, Channel and Channel Protection, Culverts and Waterway Adequacy sections of the structural inventory and appraisal (SI&A) form shown in Exhibit B. When deficiencies exist in an element that warrant a written description or sketch in the Report of Deficiencies section of the report, an asterisk shall be typed in the blank along with the numerical condition rating NCR. An overall NCR must be determined for the Substructure, Channel and Channel Protection and Waterway Adequacy sections of the CIR. The overall rating shall be governed by elements of greatest structural significance, particularly when these elements have the lowest ratings.

2. Report of Deficiencies

This section shall contain a description of deficiencies that are significant. Descriptions shall provide all details with as few words as possible. The cause of deficiencies shall also be identified where possible.

Deficiencies shall be reported in the same numerical order as they appear in the Condensed Inspection Report and shall be indexed by element number.

In addition, the report shall include comment and/or conclusions on the significance of the streambed profiles and soils and the degree of scour present. It shall also include observations on any dikes, jetties, rip-rap or other flood control devices or conditions affecting the flow of the river under the bridge.

3. Recommended Corrective Action

The identity of deficiencies requiring maintenance, repair or rehabilitation (corrective action) shall be contained in this section including the methods, quantities, and approximate costs of such action. Of all deficiencies identified, only those requiring corrective action shall be contained in this section. The bridge name and inspection date should be listed under this section followed by subheadings with element title and number. Structural deficiencies serious enough to cause a current or imminent traffic safety hazard must be flagged in the left margin with the word "CRITICAL" in capital letters adjacent to the element number.

F. Critical Conditions

The Consultant shall immediately contact the Authority when structural deficiencies serious enough to cause a current or imminent traffic safety hazard are detected.

G. Meetings

The Consultant performing the underwater bridge inspection shall attend all meetings scheduled in connection with this inspection when required by the Authority.

H. Reference Data

As-Built drawings of all bridges are available at the Maine Turnpike Authority's Engineering Department. Viewing of as-built drawings is by appointment only and can be scheduled by telephoning Scott Lachance of the Maine Turnpike Authority at (207) 871-7771, Ext. 370. Reference documents for the structures being inspected will be provided to the successful Consultant by the Authority.

Prosecution and Progress

The Consultant, by itself or through the use of other subconsultants, is expected to furnish all manpower, equipment, material, supplies and other resources required to complete the work within the terms of the contract.

Subletting Assignment or Transfer

Except as agreed and noted in writing at the time of execution of this contract, neither this contract nor any portion thereof shall be transferred, assigned or sublet without the prior written consent of the Authority.

Notice to Proceed

The Task/Project Order will be the Consultant's formal notice to proceed; the letter will include the following information:

- Contract Number
- Project Number and Location
- Anticipated duties
- Start date
- Estimated duration
- Consultant's key personnel.
- Negotiated compensation method and amount.
- The name of the individual to whom the Consultant will report.

Coordination and Administration of Services

The Consultant will coordinate its activities with assigned Authority personnel throughout the course of this contract. Early on, the Consultant will establish a means of coordinating and reporting its activities with the designated project liaison to ensure an expeditious exchange of information.

The Consultant shall immediately notify the Authority when the percentage of fee earned exceeds the project percent complete, as detailed in the Engineering Consultant General Conditions. Failure to do so will put the Consultant at risk of having to absorb any and all costs incurred by the Consultant beyond the authorized fee.

The Consultant's Manager/Principal and Project Manager of any Task/Project Order shall not be removed from the project without prior written approval from the Authority's Chief Operations Officer or his representative. The Consultant shall also present for Authority approval the appropriate person to be assigned for the position vacated.

Reimbursement for Mileage and Lodging and Tolls

The Authority will reimburse for mileage when:

- a. There is authorized mileage incurred between the Consultant's permanent residence or their regular reporting location, whichever is the shorter distance to the Project Location,
- b. There is travel incurred between the Project and the source of material for the Project, or other Project related business as authorized by the Authority.
- c. The Consultant assigned to multiple locations incurs authorized mileage traveling from one to another.

Mileage must be recorded on a daily basis and submitted monthly along with other allowable expenses incurred.

The Authority may pay lodging in lieu of mileage if it is more economical. Reimbursement for lodging shall be the lesser of the actual cost of the lodging or the per diem lodging rate as evidenced by a receipt. Lodging per diem is a maximum not to exceed amount, rates are established for specific locations in the continental United States, a link for the GSA rates can be found at <http://www.gsa.gov>. A standard per diem rate will also be established which will apply to any location not specified.

The Authority will only reimburse up to the Federal Maximum Lodging Allowance. If accommodations cannot be arranged within this allowance the Consultant must request, in advance and in writing, written approval from the Authority. Lodging must be submitted monthly along with other allowable expenses incurred.

Non-revenue passes will be provided to Consultants working in the field and selected for a contract, which need to be presented to a toll attendant at the time of travel.

Method of Payment

The method of payment for all services rendered under this contract shall be based on the Consultant's cost proposal. Final compensation method and amount shall be negotiated and

determined by the Authority and Consultant. Invoice submittals and payments shall be in conformance with this contract and the Engineering Consultant General Conditions.

The Authority shall reserve the right to question and/or reject any invoice item which is unreasonable. All invoices and time records shall contain a statement that the CONSULTANT certifies, under the pains and penalties of perjury, that all work for which payment is requested has been performed and such performance is in full compliance with the provisions of this contract.

List of Exhibits

Exhibit A Safety checklist for fieldwork completed along the Maine Turnpike

Exhibit B Sample SI&A Bridge Rating Form