

Evaluating the AASHTO LRFD Bridge Design Specifications for Redundancy, Ductility and Robustness

Scope of Work

AASHTO Committee on Bridges and Structures

Purpose

Develop a framework and implementation plan for the AASHTO Committee on Bridges and Structures (COBS) for including robustness in bridge designs. The framework shall consider inclusion of redundancy, importance, ductility, service life design, and durability. This effort to incorporate robustness is anticipated to occur in two phases. The first phase, covered through this contract, will include reviewing existing research on these topics, identifying and prioritizing areas needing revisions in the AASHTO LRFD Bridge Design Specifications (BDS) and other AASHTO publications, making recommendations on the best approach to include robustness in design, construction, and inspection, and developing an implementation roadmap with a timetable and high level cost estimate. The second phase (a future contract) will implement the recommendations of phase one and will occur later as funding becomes available and be performed under a separate contract.

Background

Since the creation of the BDS, the code has included provisions for redundancy, ductility, and operational importance. These factors are included as load modifiers in Equation 1.3.2.1-1 of the BDS. Despite the inclusion of these considerations, the detail of their application is extremely limited. The original authors acknowledged the importance of these items in design provided for their application in design, but only included basic parameters to evaluate for these items. The collapse of the pedestrian bridge in Florida has put a renewed interest in the need to have a thorough process for evaluating redundancy in bridge designs. This was reinforced with the National Transportation Safety Board (NTSB) recommendations to the Federal Highway Administration (FHWA).

In July of 2020, FHWA organized a redundancy workshop that brought together experts from around the world to discuss this topic. One of the main recurring themes from the workshop was on the need to reevaluate how the BDS addresses redundancy and urged a shift to focus on robustness in lieu of only considering redundancy. Robustness was defined as the ability to withstand or overcome adverse conditions. It is evident that both qualities are important in the design of bridges and play into decisions that owners need to be making. Based on some of the presentations made by experts in other countries, much of the world is moving in the direction of considering robustness and resiliency in their bridge designs.

Key Work Activities and Deliverables

Phase I

- 1) Review of existing research on redundancy, ductility and robustness, importance, and durability.
- 2) Review presentations from FHWA sponsored redundancy conference held in July 2020.
- 3) Review of the bridge design codes of a few foreign countries that have progressed in this area to learn what approach they have taken.
- 4) Make a recommendation on the best framework, including how to incorporate these items into the BDS and other relevant AASHTO documents.
- 5) Review existing AASHTO's BDS and other relevant AASHTO documents to determine impacted chapters.
- 6) Meet with impacted technical committees to get feedback on recommendation and impacted areas of the code.
- 7) Develop a final report including recommendations on changes to AASHTO documents, a road map on what further research might be needed, an implementation plan, a timeline, and a high level cost estimate.

A. CONTRACT ADMINISTRATION DATA

These provisions will be made a part of the contract when it is fully executed.

Payment and Progress Reports

The Contractor shall prepare and submit monthly invoices for each calendar month indicating labor charges (including dates worked, hours worked billed in half hour increments, and hourly totals for the month), other direct costs as approved, and travel as approved. The Contractor must submit supporting cost detail, including receipts, to receive reimbursement for costs incurred. Invoices received by AASHTO more than 90 days after the work completion date may not be paid. It is the Contractor's responsibility to ensure that all work completed is invoiced within the allowed billing period.

The invoice shall be accompanied by a written progress report indicating:

- A clear and complete account of the work performed each month that is organized by Task number,
- An outline of the work to be performed the next month,
- A description of any problems incurred or anticipated that will affect completion of the work within the time and fiscal constraints set forth in this agreement with recommended solutions to such problems; or, a statement that no problems were encountered, and

- A tabulation of the current and cumulative costs expended by month versus budgeted costs, including cost share if applicable.

All invoices and expense vouchers shall be submitted to Ms. Patricia Bush at pbush@ashto.org and formally addressed to AASHTO, attention of Patricia Bush, Program Manager for Bridges and Design, at 555 12th Street NW, Suite 1000, Washington, DC 20004. In addition, progress reports shall be submitted electronically to Ms. Bush at pbush@ashto.org. Payment to the Contractor in fulfillment of this agreement shall be subject to acceptance of all assigned services by AASHTO, and shall be subject to final audit by AASHTO of the time sheets and expense records reflecting services rendered. If accepted, AASHTO will remit payment within 60 calendar days of receipt of each invoice or voucher. If final audit has not been conducted within 90 days of delivery of the entire performance required by this agreement, AASHTO shall make final payment.

Travel and Per Diem

Travel and Per Diem authorized under this subcontract must be invoiced in accordance with the Government Travel Regulations currently in effect. Current per diem rates are listed at <http://www.gsa.gov/portal/category/21287>.

Travel requirements under this contract shall be met using the most economical form of transportation available. If economy class transportation is not available, higher class transportation shall be approved in advance by the AASHTO Contracts Manager, and the request for payment voucher must be submitted with justification for use of higher class travel indicating dates, times and flight numbers. All travel shall be scheduled sufficiently in advance to take advantage of offered discount rates, unless authorized by the AASHTO Contracts Manager.

B. CONTRACTOR TECHNICAL PROPOSAL CONTENT

The contractor's technical proposal shall be no more than 10 pages (Size 12 Font and 1" Margins) and include the following information:

1. Introduction- Firm's name and contact information. Description of the firm's interest and commitment to provide the services being requested.
2. Personnel- Listing and one paragraph biographies of personnel with a focus on their knowledge and experience. Table delineating the roles and responsibilities of personnel.
3. Approach- Description of the contractor's approach to performing each task.
4. References- Contact information for two appropriate transportation sector references familiar with your work.

C. COST PROPOSAL

The contractors cost proposal shall be no more than 2 pages (Size 12 Font and 1" Margins) and include the following information:

1. Introduction- Firm's name and contact information, cost summary and principal's signature.
2. Labor and Other Direct Costs- Excel spreadsheet for each task showing breakdown and totals for person hours, labor costs (including base salary, overhead, fringe and profit, if any), and any anticipated other direct costs.
3. Cost Control and Invoicing- Firm's approach for controlling cost and insuring timely submission of invoices.

Schedule and Budget

Completion of items above is anticipated to take no more than twelve months, with a budget not to exceed \$200,000. If the COBS elects to implement some or all of the recommendations, this will be advertised as Phase II, after Phase I is complete.

As part of cost proposal, provide phasing schedule and estimated cost for phase one.

D. PROPOSAL RANKING/SELECTION CRITERIA

The following criteria will be used to make award to the successful bidder in descending order of importance:

1. Technical Approach
2. Qualifications and Experience of Managers and Professionals
3. Cost

E. QUESTIONS AND SUBMISSIONS

AASHTO invites offerors (bidders) to submit offers (bids) in response to this Request for Proposals for LRFD Construction Specification Support Services with anticipated performance from February 1, 2021 to January 31, 2022.

Questions of a technical or contractual nature about the contents of this RFP are due no later than 4 pm December 17 to the attention of Mr. Strat Cavros, AASHTO Manager, Acquisitions, Contracts & Business Development at scavros@ashto.org. AASHTO will strive to answer questions and post those answers on the AASHTO website (and by email to prospective offerors) as an Amendment to the RFP by COB December 21, 2020.

Offers (proposals) must be sent by email to Mr. Strat Cavros NLT 12PM EDT, January 8, 2021. It is expected that AASHTO, will make an award to the selected bidder by January 29, 2021.

AASHTO contemplates entering into a time and material contract for acquiring services on the basis of direct labor hours at specified fixed hourly rates that include wages, fringe, overhead, profit (if any) and any actual other direct costs for travel and materials.