

# ***Request for Proposals:***

## **Guide to Bridge Hydraulics, Third Edition**

*Issued: June 16, 2022*

*Deadline for proposal submission: 13:00 ET, July 8, 2022*

### **A. INTRODUCTION**

Floods and erosion are important causes of bridge damage and failures worldwide, and are a key consideration in bridge design, construction and maintenance. In some jurisdictions, concern over the safety of bridges against the action of water has led to extensive re-evaluation of existing foundations and premature replacement.

TAC's *Guide to Bridge Hydraulics* outlines the factors to be considered in the siting, layout, hydraulic design, evaluation and operation/maintenance of bridges, and suggests criteria and procedures for doing so. It helps bridge design, construction and maintenance professionals to account for hydraulic and hydrologic considerations. The Guide is relevant and applicable to national regulatory authorities, bridge owners, and hydrotechnical experts. While it does not represent a standard, it is referenced directly in the discussion of hydraulic and hydrologic design related to bridge infrastructure in the *Canadian Highway Bridge Design Code*. It is the only national guideline in this area of expertise.

The original *Guide to Bridge Hydraulics* was published in 1973, followed by a Metric Revision Supplement in 1980 and a Second Edition in 2001. At its meeting in the fall of 2020, TAC's Structures Committee approved the description of a pooled-fund project to create the *Guide to Bridge Hydraulics, Third Edition*.

### **B. SCOPE AND APPROACH**

This project will build on TAC's *Guide to Bridge Hydraulics, Second Edition* by including provisions related to climate change, and by incorporating research and best practice updates that have occurred over the last 20 years. These changes will make the Guide a more practical tool for bridge and hydrotechnical engineers. It is expected that the structure of the Second Edition will generally remain intact.

It is expected that climate change will have lasting impacts on our infrastructure, including bridge structures. It is important to design and construct resilient structures that are adaptable to the surrounding environment and future climate. The bridge engineering community requires guidance in this particular area, since, as stated above, no other national guidelines exist. The unprecedented flooding in British Columbia during November 2021 clearly highlights the importance of, and the need to update, this document.

Climate change is mentioned twice in the Second Edition, and in a cautionary sense only. The Third Edition will be more robust in this area, and will include the following updates and enhancements:

- Projections of intensity-duration-frequency (IDF) curves to reflect current data and climate change parameters, including relevant greenhouse gas emission scenarios
  - Guidance on updating IDF parameters for smaller watersheds, identifying associated uncertainties
  - Guidance on updating flood modeling parameters for larger watersheds, identifying the level of uncertainties associated with the modelling procedures
- Guidance on permafrost issues in the North and the impacts it may have
- Hydrotechnical issues related to forest fires or other land use changes
- Hydrological issues like the timing of spring freshet and increased snow melt
- Coastal related hydrotechnical issues such as wave run up and tidal changes (sea level rise)
- Guidance on ice thickness, strength, loadings and ice jams
- Other issues related to hydrotechnical design and climate change provisions

This project will feature the following key tasks:

- Review relevant research that has occurred in the areas of hydrotechnical design (including but not limited to research by FHWA, USGS, NCHRP and NRC), and document key findings
- Conduct a Canadian jurisdictional scan of local practices, and document key findings
- Update environmental considerations to reflect current industry best practices and regulatory requirements
- Update methodologies for determining hydrotechnical design parameters
- Review the use of risk and consequence in determining appropriate design parameters (e.g. road importance, AADT, detour length, stakeholder impacts, replacement costs)
- Update design provisions for hydrotechnical or hydrological design, based on the research review and jurisdictional scan
- Update design provisions for scour mitigation
- Provide guidance on incorporating climate change provisions in hydraulic and hydrologic models

## C. DELIVERABLES

The main project deliverable will be a complete *Guide to Bridge Hydraulics, Third Edition* that documents the results of the key tasks listed above (see Section B). It will contain an executive summary, table of contents, list of figures, list of tables, and main body chapters (each with references and bibliography). Any additional project documentation (e.g. summary of research review and jurisdictional scan) will be submitted under separate cover.

Other project deliverables will include:

- A technical memorandum that concisely summarizes key findings of the research review and jurisdictional scan
- A table that summarizes comments arising from the Project Steering Committee (PSC) review of interim deliverables, specifying who submitted each comment and how it was addressed; this table will be updated after each commenting period
- Progress reports on task/schedule status and any perceived challenges, to be circulated to Project Steering Committee members and presented at project meetings
- A summary PowerPoint deck describing the work undertaken and report contents, to be presented by the consultant team leader to TAC's Structures Committee and Infrastructure & Asset Management Council during TAC's online Spring Technical Meetings in 2024 (the deck is to be circulated in advance to the

Project Steering Committee, inclusive of presenter’s notes)

- A short primer to be published by TAC as a free introductory publication
- A PowerPoint deck suitable for a 30-minute presentation in a TAC webinar, and delivery of the webinar by the consultant after the project is completed
- A summary of key changes to the Second Edition

The consultant will provide:

- Microsoft Word/PowerPoint/Excel and PDF versions of the deliverables
- Separate source files for figures that contain text, making the text accessible and editable by TAC; exceptions include where original-source French-language graphics are provided in parallel, or where TAC agrees that the technical content should remain in English
- Credits for images drawn from other sources, with evidence of written permission from the rights holder to reproduce them

The deliverables identified above are a suggested minimum; however, the successful consultant may include additional items as they deem suitable. Deliverables must be submitted in English, and TAC will provide an electronic Word template with preset report headings and styles to which consultants must adhere, with any variations subject to TAC approval. Moreover, the selected proponent must adhere to TAC’s *Publication Guidelines*<sup>1</sup> and *Guidelines for Pooled-Fund Projects*<sup>2</sup>.

#### D. SCHEDULE

The consultant should propose a project schedule that enables high-quality deliverables, and varies from the following milestones only where a supporting rationale is provided:

- Contract award .....August 2022
- PSC Meeting #1 (online) – project kickoff, discussion of proposed work plan and schedule .....August 2022
- Submission of 20% draft report (annotated outline) plus draft technical memorandum on research review and jurisdictional scan..... November 2022
- PSC Meeting #2 (online) – discuss 20% draft report and technical memorandum..... December 2022
- Submission of 50% draft report and final technical memorandum ..... March 2023
- PSC Meeting #3 (online) – discuss 50% report ..... April 2023
- Submission of 90% draft report .....August 2023
- PSC Meeting #4 (in person, in Ottawa) – discuss 90% report..... September 2023
- Submission of 100% draft report and draft summary deck..... November 2023
- PSC Meeting #5 (online) – discuss 100% draft report and deck..... December 2023
- Submission of final report, final summary deck and primer ..... January 2024
- PSC Meeting #6 (online) – PSC approval of final report ..... February 2024
- Presentation to Structures Committee and Infrastructure & Asset Mgmt Council (online) ..... April 2024
- TAC webinar delivery ..... TBD

<sup>1</sup> [https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/projects/docs/tac\\_publications\\_guidelines\\_2015-01-01\\_en.pdf](https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/projects/docs/tac_publications_guidelines_2015-01-01_en.pdf)

<sup>2</sup> <https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/projects/docs/pfp-guidelines.pdf>

The Project Steering Committee will comprise about 10 representatives of project funding partners. Its members will review and comment on all deliverables, with the consultant maintaining a detailed log of comments and resulting actions for each deliverable. Generally, a minimum of 15 working days is required for Project Steering Committee members to review deliverables before meetings. The consultant's team leader must attend the meetings noted above (including the in-person meeting in September 2023), and may be asked to attend other online meetings.

## E. BUDGET

This project's maximum budget is **\$140,000** for all fees and expenses (including travel), not including applicable taxes. Proposals are expected to be fixed-price, and price is not a factor in their evaluation; however, proposals exceeding the maximum budget will be disqualified. A detailed cost breakdown is requested as part of the proposal, and TAC will not accept invoices for cost overruns (fees or expenses) associated with the original scope of work.

Invoices must link billing amounts to the percentage of completion of major tasks. TAC will retain a 10% holdback from each payment until the final deliverables have been accepted by TAC and approved by TAC's Chief Engineers Panel. All work conducted in the 12 months leading up to March 31 of each year must be invoiced by that date.

## F. PROPOSAL REQUIREMENTS

Proposals should provide the following information:

- *Project understanding.* Demonstrate a clear understanding of the project's scope and objectives, describe challenges that might be encountered in its execution, and propose measures to resolve them.
- *Consulting team.* Identify a project leader and team members including subconsultants, describe their roles, and identify their experience on similar or otherwise relevant projects as well as any experience with TAC projects and processes.
- *Methodology.* Describe major tasks, resources to be applied, major information sources, planned analyses, possible revisions to the document, and possible limitations. Although the working language for this project is English, the consultant will be expected to review literature and communicate with stakeholders in French, as required.
- *Schedule and resources.* Show the proposed person-hours for each team member by task, total fees broken down by task and team member, any expenses, and a schedule with key milestones and project deliverables.
- *References.* Identify three organizations for which senior members of the consulting team have conducted similar or relevant projects, including the organization's address and the name and telephone number of an individual familiar with the proponent's work. TAC reserves the right to request additional references.
- *Conflicts of interest.* Disclose possible financial or organizational conflicts of interest in conducting the project; for example, the proponent's ownership, relationships or proprietary rights and interests could be perceived as jeopardizing its objectivity. Identify mitigating strategies for any such circumstances.

Proposals should include:

- A covering letter (not more than two pages long)
- Table of contents
- Main body (not more than 10 pages long, with 12-point single-spaced text and one-inch margins)

- Additional pages for:
  - Project cost breakdown (one page)
  - Project schedule (one page)
  - Project team organization chart (one page)
  - References
  - Conflict of interest declaration
- Team member résumés (each not more than four pages long)

Note that any material in excess of these scope and length parameters will be deleted from proposals before evaluation.

## G. PROPOSAL SUBMISSION

TAC’s Project Manager (see Section I, below) must receive a PDF version of the proposal by email **no later than 13:00 ET on July 8, 2022**.

Email any questions regarding this Request for Proposals to TAC’s Project Manager (see Section I, below) **by June 27, 2022**. Addenda with responses will be posted to the RFP page on TAC’s website as soon as possible, but **not later than June 30, 2022**. Note that proponents are responsible to check for addenda.

## H. PROPOSAL EVALUATION

Proposals will be evaluated using the criteria in the following table. TAC reserves the right to conduct telephone or online interviews of proponents.

Evaluation Criteria	Weight
Understanding of project scope, objectives and desired deliverables	20
Demonstrated qualifications, experience and competence of the project team:	
• Project leader	5
• Other team members	15
• Climate change experience	10
General approach and methodology	30
Adequacy of work plan, schedule and resources to ensure quality and timeliness of deliverables	15
Team member experience with TAC projects and processes	5
<b>TOTAL &gt;</b>	<b>100</b>

## I. PROJECT ADMINISTRATION

A contract for consulting services will be established before work can begin. TAC's Project Manager will be the liaison between the consultant and Project Steering Committee for this project, and will work with the Project Steering Committee to review project deliverables and ensure objectives are met.

The working language for this project is English. TAC will be responsible for recording and distributing meeting minutes, and maintains a secure online collaborative platform for sharing documents.

For more information, contact:

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