

SCOPE OF WORK (SOW)
Retaining Wall and Sound Wall Inspection and Asset Management Services
Colorado Department of Transportation

I. GENERAL

The goal of this project is the continuance of the development of a risk-based inspection program for retaining walls and Sound walls, inventory and inspect the retaining walls and Sound walls on Colorado's state highway system, report the conditions of the individual walls to the Colorado Department of Transportation (CDOT), Staff Bridge, utilize a web-based data management to gain efficiency in collecting and distributing data. Retaining walls and Sound walls will be referred to as "structures" hereafter in this Scope of Work (Scope). The Colorado Department of Transportation will be referred to as the "Owner" hereinafter in this Scope.

The purpose of this scope is to update the inventory, conduct inspections and report the findings to the Owner on the state's structures in accordance with the most current version of the Recording and Coding Guide for the Inventory and Inspection of Colorado's Retaining Walls and Sound Walls.

It is anticipated that four (4) task orders will be written to this contract to perform the following work:

- A. Updating of the CDOT Recording and Coding Guide for the Inventory and Inspection of Colorado's Retaining Walls and Sound Walls as required.
- B. Continued maintenance and update of the web-based data management system, mobile application, and user guides. Integration with other databases may be required as identified in the individual task orders.
- C. Continued maintenance and update of a risk-based inspection program for retaining walls and Sound walls.
- D. Continued analysis of inspection data to develop and update the risk-based asset management plan for retaining walls and Sound walls.
- E. Inventory and inspection of the retaining walls and Sound walls on Colorado's state highway system.

II. DEFINITIONS

- A. **AASHTO** – American Association of State Highway and Transportation Officials.
- B. **ELECTRONIC DATA FILES** - Electronic files containing inventory and inspection data for each structure in a database format as specified by the CDOT Project Manager. Electronic sketches of structures in a MicroStation

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compatible format as needed. PDF files of all inspection report documents including any additional documents required for the reports, i.e., tally sheets, inspection sketches, JPG files of structure photographs, etc.

- C. **ENGINEER** – CDOT Bridge Inspection Engineer or his/her designee.
- D. **FHWA** – Federal Highway Administration.
- E. **FY** – Fiscal Year
- F. **MUTCD** – Manual on Uniform Traffic Control Devices
- G. **NEW STRUCTURES** – Structures not previously inspected such as newly constructed structures requiring initial inspection or structures found to be qualifying and without prior inspections.
- H. **NHS** – National Highway System.
- I. **EI** – Element Inspection form. A structure inspection form found within the inspection tab of AASHTOWARE BrM, on which the applicable structure element condition states and comments are reported for each structure inspected.
- J. **SI&A** – Structure Inventory and Appraisal form. An inventory and appraisal form found within the AASHTOWARE BrM program that contains information about a structure.
- K. **STRAHNET** – Strategic Highway Network

III. INSPECTION STANDARDS

The work shall be carried out in accordance with the following documents and revisions thereto:

- A. Retaining and Sound Wall Inspection and Asset Management Manual
- B. AASHTO Manual for Bridge Evaluation
- C. Bridge Inspection Reference Manual
- D. Other documents as defined by individual task orders.

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IV. CONSULTANT QUALIFICATIONS

The consulting firm shall be pre-qualified to conduct Bridge Inspection (BI) work for the State of Colorado, Department of Transportation.

The project manager, the inspection team leader, and the bridge inspectors shall meet the qualifications as stated in the Code of Federal Regulations, 23 CFR, 650.309.

V. PROJECT MANAGEMENT AND COORDINATION

The Contract Administrator for the work is:

Michael Collins, P.E.
State Bridge Engineer
Colorado Department of Transportation
2829 W. Howard Pl.
Denver, Colorado 80204
(303) 757-9309

The Bridge & Structures Inspection Engineer for the work is:

Lynn E. Croswell, P.E.
Bridge & Structures Inspection Engineer
Colorado Department of Transportation
2829 W. Howard Pl.
Denver, Colorado 80204
(303) 757-9188

The Project Manager for the work is:

Josh Dunbar
Structures Inspection Coordinator
Colorado Department of Transportation
2829 W. Howard Pl.
Denver, Colorado 80204
(720) 340-2368

VI. PROJECT LOCATION

The project location will be statewide. The structures to be inspected will be identified by a risk-based selection and listed within the individual task orders.

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VII. PROJECT QUANTITIES AND DURATION

The work shall commence on the date specified in the TO Notice To Proceed and shall be completed by the date specified in the individual TOs. Completion is defined as (1) having submitted all structure reports in the required format to the CDOT Engineer for review, (2) the CDOT Engineer having reviewed and approved the reports for distribution to the owners, and (3) the presentation of the final reports to CDOT.

The maximum term for this agreement shall be for five years. The term shall be divided into periods as follows:

- Period 1 (FY2023): October 1, 2022 through December 31, 2023
- Period 2 (FY2024): July 1, 2023 through December 31, 2024
- Period 3 (FY2025): July 1, 2024 through December 31, 2025
- Period 4 (FY2026): July 1, 2025 through December 31, 2026

Task orders may be written as follows:

- Period 1: Approximately 750 +/- Routine Structure Inspections
 Approximately 100 +/- Initial or Special Inspections

- Period 2: Approximately 750 +/- Routine Structure Inspections
 Approximately 100 +/- Initial or Special Inspections

- Period 3: Approximately 750 +/- Routine Structure Inspections
 Approximately 100 +/- Initial or Special Inspections

- Period 4: Approximately 750 +/- Routine Structure Inspections
 Approximately 100 +/- Initial or Special Inspections

The list of Structures to be inspected during each period will be identified in the TO. The list of Structures to be inspected will be attached to the Project Cost Worksheet (PCW) request for each TO. The CDOT Project Manager may also direct the consultant to inspect other Structures, as necessary.

Additional TOs may be written as directed by the CDOT Project Manager.

VIII. CONSULTANT RESPONSIBILITY

- A. The Consultant shall be responsible for updating the Retaining and Sound Wall Inspection and Asset Management Manual.

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- B. The Consultant shall be responsible for the continued maintenance and update of a web-based data management system compatible other databases as identified in the individual task orders.
- C. The Consultant shall be responsible for the further development and management of the risk-based inspection program for retaining walls and Sound walls.
- D. The consultant will support CDOT Staff Bridge and Transportation Asset Management programs with implementation of risk-based asset management for walls. The work for this contract will update future inventory development, data management, risk analysis, and documentation for the wall asset management plan. The plan will recommend and document:
 - objectives and measures,
 - inventory and condition,
 - performance gap identification,
 - life cycle cost and risk management analysis,
 - financial planning, and
 - investment strategies.

This contract will further develop the existing wall asset management plan consistent with current MAP 21 regulations, CDOT asset management efforts, and with emerging national research in transportation asset management. Based on prior development work, the current asset management document will be revised or updated to present the final wall asset management process. The proposed work activities shall emphasize risk, as defined by the uncertainty measured by probability and consequence, in each outcome.

Consultant shall develop wall replacement and rehabilitation candidate lists based on the wall asset management plan.

- E. The Consultant shall be responsible for the complete, timely inspection and reporting of all structures identified in individual task orders.
- F. The Consultant shall furnish all electronic equipment such as computers, laptops, tablets compatible with the mobile and web base system application or other as necessary to complete the work.
- G. The Consultant shall submit completed inspection reports to the CDOT Project Manager.
- H. The Consultant shall conduct the work in accordance with all governing safety rules and regulations applicable to the work.

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- I. The Consultant shall provide for their traffic control, working with the appropriate maintenance sections and Region Traffic Engineers to request close lanes when required. A list of contacts will be provided to the Consultant upon request.
- J. The Consultant will provide all necessary inspection and testing equipment, personal protective equipment (PPE), vehicles for transport and access to properly and adequately perform the work described herein.

IX. INSPECTION REQUIREMENTS

- A. Inspections and structure evaluations will be performed via normal and customary visual means as defined by the following references and will include evaluation of all accessible structure components within reason unless noted otherwise to identify changes from previously recorded conditions, and to determine their physical and functional condition. All inspectors shall utilize the mobile inspection application developed for these inspections. Inspectors shall be familiar with the mobile application and the desktop data management system. All structure coding items shall be completed per the requirements of the NBIS and CDOT in accordance with the most recent editions of the following:
 1. AASHTO Manual for Bridge Evaluation
 2. Retaining and Sound Wall Inspection and Asset Management Manual
 3. Other documents as defined by individual task orders.
- B. Inventory digital color photographs are required for each structure as defined by individual task orders.
- C. Supplemental digital color photographs and sketches shall be taken and/or developed as necessary to give a clear understanding and documentation of distressed conditions.
- D. Digital cameras shall be a minimum of 2-megapixel resolution capabilities and be Global Positioning System (GPS) enabled. Photos shall be submitted in the Joint Photographic Experts Group (jpg) format. The photos shall be submitted on a compact disk (CD), DVD, flash drive or other method as directed by the CDOT Project Manager.
- E. The EI condition states, comments, and SI&A items shall be reported using the report format as directed by the CDOT Project Manager. The EI and

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SI&A information shall be revised, if necessary, to reflect the actual elements, quantities, comments, and items found in the structure.

- F. Completed inspection reports shall be submitted to the CDOT Project Manager within 90 days of the inspection date or at the end of the Task Order period whichever is earlier.
- G. The consultant shall report any condition identified and an Essential Repair Finding or Critical Inspection Finding to CDOT within the timeframes and as defined by the CDOT Project Manager.

X. UNDERWATER INSPECTIONS

- A. Underwater inspections shall consist of any appropriate method, short of employing diving or remote submersibles, to evaluate the structure below the waterline. For water depths up to 3 feet, the consultant shall investigate the foundation conditions by probing and/or feeling for undercutting of the foundation or other problems such as deterioration of foundation elements.
- B. All structures with typical water depths more than 3' throughout the year shall be recorded in the inspection notes in the report and a list shall be provided to the CDOT Project Manager.

XI. REPORTING

- A. All inspection data shall be submitted electronically.
- B. Completed inspection reports containing EI and SI&A information shall be submitted to the CDOT Project Manager.
- C. All forms shall include the inspector's original or electronic signature and the appropriate date.
- D. As necessary, supplemental sketches, photos, plans, etc. shall be prepared and included as part of the final report to document the structures condition.
- E. Electronic report shall be submitted on a CD in the CDOT AASHTOWare BrM version 5.x database format as specified by the CDOT Project Manager and compatible with IBM PC microcomputer systems. Alternately, electronic files may be e-mailed. In lieu of submitting separate CDs, all information can be included on a single CD, DVD, flash drive or other method as directed by the CDOT Project Manager.

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XII. SERVICES AND MATERIALS AVAILABLE FROM CDOT

The following services and materials will be available to the consultant from CDOT:

- A. CDOT Staff will be available for reference on coding, or other related concerns.
- B. Most current designated STRAHNET and NHS routes (identified in the database).

XIII. FINAL REVIEW

- A. Each electronic structure folder will be reviewed by the CDOT Project Manager for completeness and consistency. Each incomplete or inconsistent report will be returned to the consultant for review and for corrections
- B. The consultant shall hold a final report presentation meeting, at the end of each task order, with CDOT when all inspection work is completed, and reports have been accepted by the CDOT Project Manager. This presentation shall occur no later than 60 days from the date that the final reports are accepted by the CDOT Project Manager.
- C. The CDOT Project Manager may accompany the consultant during field inspections or visit the office of the consultant to review procedures and inspection reports and to verify billings.

XIV. METHOD OF PAYMENT

These contracts will be paid for on a cost-plus fixed fee basis. The consulting firms will bill for their actual costs, incurred while performing the work, using the negotiated rates. Consultants will bill monthly and include a project status update with each billing.