

Colorado Department of Transportation  
Scope of Work for Statewide Signs and Signal Inspections

**I. GENERAL**

The goal of this project is to update the inventory and inspect the overhead signs, signal mast-arms, and high-mast lights on Colorado's state highway system, and to report the conditions of the individual structures to the Colorado Department of Transportation (CDOT), Staff Bridge. These signs and signals 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 and conduct inspections on the state's structures in accordance with the requirements of the most current version of the Signs and Signals Coding Guide and to report the findings to the Owner (see attached). The state currently has over 5,000 known structures and it is anticipated that these will be inspected over the next four fiscal years.

The structures to be inspected during fiscal year 2009 are identified in Exhibit A. The Bridge Inspection Engineer may also direct the consultant to inspect other structures as necessary.

**II. DEFINITIONS**

- A. **AASHTO** – American Association of State Highway and Transportation Officials.
- B. **ELECTRONIC DATA FILES** - Electronic files containing inventory and inspection data for structures in the latest version of AASHTO Pontis.
- C. **ENGINEER** – CDOT Structure Design and Management Branch Engineer or designee.
- D. **ENTITY STRUCTURE MAPS** – County or other entity maps that are used to graphically record structure locations.
- E. **FHWA** – Federal Highway Administration.
- F. **FY** – Fiscal Year
- G. **NEW STRUCTURES** – Structures not previously inspected such as newly constructed structures requiring initial inspection or structures found without prior inspections.
- H. **NHS** – National Highway System.

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**III. INSPECTION STANDARDS**

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

- A. CDOT Pontis Structure Inspection Manual,
- B. AASHTO Manual for Condition Evaluation of Structures,
- C. Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Structures (Report No. FHWA-PD-96-0010)
- D. CDOT Signs and Signals Coding Guide

**IV. SIGN STRUCTURE TYPES**

Sign structure types shall be designated according to the types shown and specified within the Sign and Signal Coding Guide.

**V. STRUCTURE NUMBERING AND SIGN ORIENTATION**

The project manager or his designee shall assign structure numbers for new sign structures. Signal mast arm structure numbers shall be assigned according to The Signs and Signals Coding Guide.

**VI. CONSULTANT QUALIFICATIONS**

The Consulting firm shall be pre-qualified to conduct structure inspection work for the State of Colorado, Department of Transportation.

The individual in charge of the organizational unit, in charge of the inspection team, and the structure inspectors, shall meet the qualifications as stated in the Code of Federal Regulations, 23 CFR, 650.307. The one exception to this regulation is that the individual in charge of the organizational unit must be a registered professional engineer in the state of Colorado.

**VII. PROJECT MANAGEMENT AND COORDINATION**

The contract administrator for the work is:

Mark A. Leonard, P.E. (303-757-9309)  
Structure Engineer  
Colorado Department of Transportation  
4201 East Arkansas Ave.  
Room 330  
Denver, Colorado 80222

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The bridge inspection engineer and project manager for the work is:

Jeff Anderson, P.E.  
Bridge Inspection Engineer  
Colorado Department of Transportation  
4201 East Arkansas Ave.  
Room 330  
Denver, Colorado 80222  
(303) 757-9188

**VII. PROJECT DURATION**

- A. The work shall commence on the date specified in the Notice to Proceed. The contract will be terminated upon the completion of the work identified in the specific task orders. The anticipated duration of the contract is four years.
- B. Completion is defined as (1) having submitted all structure reports in the required format to the bridge inspection engineer for review, and (2) the bridge inspection engineer having reviewed and approved the reports.

**VIII. CONSULTANT RESPONSIBILITY**

- A. The consultant shall be responsible for the complete inspection and reporting of the structures.
- B. The consultant shall follow the procedures specified in Appendix A of the Scope when a critical structure condition is encountered.
- C. The consultant shall submit completed inspection reports to the owner.
- D. The consultant shall conduct the work in accordance with all governing safety rules and regulations applicable to the work.
- E. The consultant shall provide for their own lane closures, working with the appropriate maintenance sections to close lanes when required. A list of contacts will be provided to the consultant upon request.

**IX. INSPECTION REQUIREMENTS**

- A. 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. The FHWA manual Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Structures, December 1995 (Federal Coding Guide), except that English Units shall be recorded,

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2. The CDOT Structure Inventory Coding Guide, and
3. The CDOT Pontis Bridge Inspection Coding Guide. The condition states and comments for the Pontis elements applicable to a structure shall be reported in the Pontis inspection module.
4. Signs and Signals Coding Guide (August 23, 2002)

All of the above material will be supplied to the Consultant by CDOT upon request.

- B. A minimum of one color photograph from digital cameras are required for each structure. The photograph shall show the complete structure in an elevation view. An electronic copy of the photographs shall be supplied to the owner.
- C. Supplemental photographs and sketches shall be taken to give a clear understanding and documentation of distressed structure conditions.
- D. Completed inspection reports shall be submitted to the bridge inspection engineer within 30 days after completing a county or at the end of the contract period whichever is earlier.

**XIII. FRACTURE CRITICAL STEEL STRUCTURES**

Fracture critical members are those defined by the FHWA in their manual titled *Inspection of Fracture Critical Structure Members* and shall be identified and inspected in accordance with that document. Since the signs and signals are supported by fracture critical details, they are by nature fracture critical structures. Fracture Critical Members (FCM), or member components, are non-redundant tension members or tension components of members whose failure would be expected to result in collapse of the structure.

**XV. REPORTING**

- A. The consultant shall use Pontis Inspection Module for reporting Pontis inspection and NBIS inventory information. The consultant shall provide final reports to the bridge inspection engineer in a PDF format. The electronic data files shall be provided to the bridge inspection engineer through PDI's.
- B. Signatures for all of the inspected structures shall be kept on file.
- C. As necessary, supplemental sketches, photos, plans, etc. shall be prepared and included as part of the final report to document structure condition.
- D. Final PDF's ,PDI's and photos shall be supplied to the bridge inspection engineer on CD's.

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**XVI. SERVICES AND MATERIALS AVAILABLE FROM CDOT**

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

- A. Setting up of Pontis software and sign database.
- B. PDF of Pontis user manual, CDOT Sign and Signal Coding Guide
- C. CDOT Staff will be available for reference on coding, computer use, or other related concerns.
- D. Most current designated STRAHNET and NHS routes (identified in the database).

**XVII. FINAL REVIEW**

Each report will be reviewed by the bridge inspection engineer for completeness and consistency as resources allow. Each incomplete or inconsistent report will be returned to the consultant for review and for corrections

**XVIII. METHOD OF PAYMENT**

Cost plus fixed fee as negotiated for each applicable task order.

**APPENDIX A**  
**IDENTIFICATION OF CRITICAL STRUCTURE CONDITIONS**

- A. PURPOSE: This appendix establishes the procedures of the Colorado Department of Transportation, Staff Bridge, regarding the general subject of critical structure inspection findings. The term “critical” as contained within these procedures is intended to mean a condition involving grave uncertainty,; i.e., a hazardous or precarious condition.

Deficiencies that are such as to compromise the ability of the structure to safely remain in place are deemed to be critical inspection findings (CIF) requiring immediate identification, notification, correction, and follow-up.

- B. TYPICAL CONDITIONS: The following represents typical but not all inclusive inspection findings which are considered to be a CIF:

- 1. Tension Members

- Tension members identified as fracture critical members within the Structure File Data and which are damaged by natural or impact forces.

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2. Steel Structures

- a. Trusses with misalignment of a top chord member in an amount that exceeds half the width of the member.
  - b. One element of a two element bottom chord truss member being severed.
  - c. Bottom chord truss members with over 30% section loss.
  - d. Cracks in tension members and welds resulting from fatigue loading.
  - e. Impact damage.
  - f. Loose or missing connection bolts.
- C. It shall be the responsibility of the structure inspection team leader performing an inspection to be alert for conditions other than identified above which may also be considered a CIF. Such a finding shall be reported to the bridge inspection engineer upon return from the inspection or, if deemed necessary, immediately by e-mail or by telephone.
- D. The criticality of the deficiency will result in one or more of the following actions with an importance described as follow:
1. Immediate removal.
  2. Urgent repairs to be accomplished within a time period as determined by the bridge inspection engineer.
- E. SPECIAL ACTIONS REQUIRED OF THE INSPECTION TEAM LEADER:
1. The team leader shall notify the bridge inspection engineer by phone or by e-mail when the actions identified above are appropriate. He should describe the unsafe condition and recommend immediate steps to be taken to insure safety to the travelling public.
  2. The team leader shall provide written confirmation to the bridge inspection engineer for any action required by 1 above.
  3. The consultant shall notify the bridge inspection engineer in writing of Type 2 deficiencies within one week. This notice should include comments relative to an appropriate repair. This does not mean that the consultant must provide a design for the repair. The bridge inspection engineer will notify the region when a critical deficiency, is reported. He will also refer the structure to the appropriate design engineer within Staff Bridge.

**NOTE:**

**The consultant will need to pick up the following information directly from the CDOT Agreements Office:**

- **Exhibit A – List of sign and signals to be inspected**