

# Statewide NPS Scope of Work for Project Support of Bridge Load Rating Services

## **Contract Administration:**

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According to the National Bridge Inspection (NBI, 23 CFR 650 Subpart C) and Federal National Tunnel Inspection (NTI, 23 CFR 650, Subpart E) programs, and requirements from the Federal Highway Administration (FHWA) for the new legal load ratings of specialized hauling and emergency vehicles, all of the state's on and off-system major bridges and tunnels (with traffic on top) need a rating for live load capacities to ensure that they are safe for the traveling public. Therefore, Colorado Department of Transportation (CDOT) has a need to update load ratings on existing structures in accordance with the American Association of State Highway and Transportation Officials (AASHTO) and CDOT policies.

CDOT Staff Bridge has identified structure Load rating tasks at locations throughout Colorado where additional resources may be needed. These tasks include, but are not limited to, the following:

### Load Rating Major Structures:

1. Conventional Load Ratings for existing bridges (Estimated total contract = 75-80%).
2. Complex Load Ratings for existing bridges (Estimated total contract = 10-15%).
3. Load Ratings for existing buried culverts and tunnels (Estimated total contract = 5-10%).
4. Load Ratings using field investigation and load test for existing bridges without structural plans (Estimated total contract = 0-5%).

## **I. GENERAL REQUIREMENTS**

### **WORK DURATION**

The time period for the work described in this scope will be 5 years from the execution of the contract. Work shall be in office and field.

### **AUTHORIZATION TO PROCEED**

Work shall not commence until the consultant receives the written Notice to Proceed for each task order. Work shall be completed within the allotted task order time.

**ROUTINE REPORTING AND BILLING**

The consultant shall provide the following on a routine basis:

- Monthly billing reports in formats suitable to the Contract Administrator for all contract activities performed by the Consultant's personnel authorized to perform work on this project.
- Periodic reports and billings as requested.

**QUALIFICATION**

The Consultant shall include a Colorado Registered Professional Engineer. The Consultant will also need a comprehensive knowledge of CDOT manuals, guidelines, policies, procedures, FHWA policies, and AASHTO codes. The Contract Administrator will approve all Consultant personnel task-specific qualifications.

All tasks assigned to the Consultant must be conducted by a person on the Consultant team that is qualified and has specific expertise in that task. The qualified person is a professional with the necessary education, registrations and licenses, skills, experience, qualities, or attributes to complete a particular task. See below for specific required qualifications.

At a minimum, bridge rating tasks must be directed, completed, or overseen by a Colorado professional Engineer with significant experience in bridge rating.

The Raters and Checkers shall be familiar with the AASHTO codes, Manual for Bridge Evaluation (MBE) and the CDOT Bridge Rating Manual (BRM).

Individuals performing load rating shall have the most up-to-date AASHTOWare BrR software version, or other AASHTO compliant software approved in advance by the Contract Administrator.

Individuals performing Non-Destructive Testing (NDT) on girders to determine load capacities shall be qualified in accordance with the current edition of the American Society for Nondestructive Testing Recommended Practice No. SNT-TC-1A. Only individuals qualified for American Society for Nondestructive Testing (ASNT) Level II or better may perform the testing.

**DELIVERABLES**

Deliverables for each task will be defined in the individual task orders.

**II. GENERAL TASK DESCRIPTIONS:****LOAD RATING MAJOR AND MINOR STRUCTURES**

The contractor must be capable of:

1. Conventional Load ratings for existing bridges in accordance with the CDOT Bridge Rating Manual utilizing AASHTOWare BrR program.
2. Complex Load ratings for existing bridges when AASHTOWare BrR is unable to be used by utilizing programs such as CSI Bridge, SAP2000, LARSA, MDX, LEAP, BRASS, MathCad, MS Excel, or other as approved by the Contract Administrator.

3. Load ratings for existing buried culverts in accordance with the CDOT Bridge Rating Manual utilizing CANDE (Culvert ANalysis and DEsign) program.
4. Load ratings for structures without plans with using field investigation for steel and timber structures, or physical inspection / non-destructive test loading for concrete bridges.

### III. REFERENCES

#### **AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS**

**(AASHTO) and OTHER FEDERAL PUBLICATIONS** (using latest approved versions):

- A. Standard Specifications for Highway Bridges
- B. Load and Resistance Factor Design (LRFD) Specifications
- C. Guide Specifications for Design and Construction of Segmental Concrete Bridges
- D. Guide Specifications for LRFD Seismic Bridge Design
- E. Guidelines for Steel Girder Bridge Analysis
- F. LRFD Bridge Construction Specifications
- G. LRFD Bridge Design Specifications
- H. Manual for Bridge Evaluation
- I. CFR – Code of Federal Regulations
- J. FHWA Highway Performance Monitoring System Field Manual
- K. FHWA Inspection of Fracture Critical Bridge Members
- L. NCHRP Report 575 - Legal Truck Loads and AASHTO Legal Loads for Posting
- M. NCHRP Synthesis 474 - Service Life of Culverts

**COLORADO DEPARTMENT OF TRANSPORTATION PUBLICATIONS** (using latest approved versions):

- A. Bridge Rating Manual
- B. Design Guide (all volumes)
- C. Bridge Design Manual
- D. Bridge Inspection Manual
- E. Field Materials Manual
- F. Standard Plans, M & S Standards
- G. Standard Specifications for Road and Bridge Construction and Supplemental Specifications

### IV. DEFINITIONS

Note: For other definitions and terms, refer to Section 101 of the CDOT Standard Specifications for Road and Bridge Construction and the CDOT Design Guide.

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| AASHTO | American Association of State Highway & Transportation Officials   |
| ADT    | Average two-way 24-hour Traffic in Number of Vehicles  |
| BrR    | AASHTOWare Bridge Rating software  |
| CA     | Contract Administrator – The CDOT Manager responsible for the satisfactory completion of the contract by the consultant. |
| CANDE  | Culvert ANalysis and DEsign software   |

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|------------------------|--|
| CBC                    | Concrete Box Culvert   |
| CDOT                   | Colorado Department of Transportation  |
| CDOT/PM                | Colorado Department of Transportation Project Manager – The CDOT Engineer responsible for the day to day direction and CDOT Consultant coordination of the design effort (as defined in Section 2 of this document)  |
| CEQ                    | Council on Environmental Quality   |
| COG                    | Council of Governments   |
| CONSULTANT             | Consultant for the project   |
| CONTRACT ADMINISTRATOR | Typically a Region Engineer or Branch Head. The CDOT employee directly responsible for the satisfactory completion of the contract by the Consultant. The contract administration is usually delegated to a CDOT Project Manager (as defined in Section 2 of this document). |
| C/PM                   | Consultant Project Manager – The Consultant Engineer responsible for combining the various inputs in the process of completing the project plans and managing the Consultant design effort.  |
| DRCOG                  | Denver Regional Council of Governments   |
| D&RGW                  | Denver & Rio Grande Western Railroad   |
| ESAL                   | Equivalent Single Axle Load  |
| FEMA                   | Federal Emergency Management Agency  |
| FHPG                   | Federal Aid Highway Policy Guide   |
| FHWA                   | Federal Highway Administration   |
| FIR                    | Field Inspection Review  |
| FONSI                  | Finding of No Significant Impact   |
| GPS                    | Global Positioning System  |
| MAJOR STRUCTURES       | Bridges and culverts with a total clear span length greater than twenty feet. This length is measured along the centerline of roadway from abutment face to abutment face for bridges and culverts.  |
| MINOR STRUCTURES       | Bridges and culverts with a total clear span length of four feet to twenty feet. This length is measured along the centerline of roadway from abutment face to abutment face for bridges and culverts.   |
| NICET                  | National Institute for Certification in Technology   |
| PE                     | Professional Engineer registered in Colorado   |
| PM                     | Program Manager  |
| PROJECT                | The work defined by this scope   |
| ROW                    | Right-of-Way: A general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to a highway   |

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|-------|----------------------------------|
| ROWPR | Right-of-Way Plan Review         |
| RTD   | Regional Transportation Director |
| SH    | State Highway Numbers            |