

R2B2 DESIGN BUILD

FBR R200-266 (23558) (Grant)

FBR R200-267 (23559) (Non-Grant)

14.0 SIGNING AND PAVEMENT MARKING

The Contractor shall provide and be responsible for the design and installation of the Project permanent signing and pavement marking within the limits of the Project and shall be completed in accordance with the Contract Documents.

14.1. Administrative Requirements**14.1.1 Standards**

The Contractor shall design and construct the Project in accordance with the requirements of the standards in the documents listed in Table 14-1 and those referenced in Book 3. The Contractor shall use the latest adopted edition at the time of the Proposal Due Date.

Table 14-1. Standards

| Author or Agency | Title |
|---|--|
| American Association of State Highway and Transportation Officials (AASHTO) | <i>A Policy on Geometric Design of Highways and Streets (PGDHS)</i> |
| AASHTO | <i>Roadside Design Guide</i> |
| AASHTO | <i>Standard Specifications for Highway Bridges</i> |
| Colorado Department of Transportation (CDOT) | <i>Standard Specifications for Road and Bridge Construction (CDOT Standard Specifications)</i> |
| CDOT | <i>Retroreflective Sheetting Materials Guide</i> |
| CDOT | <i>Sign Design Manual</i> |
| CDOT | <i>M&S Standard Plans</i> |
| CDOT | <i>The Colorado Supplement to the Federal Manual on Uniform Traffic Control Devices</i> |
| Federal Highway Administration (FHWA) | <i>Manual on Uniform Traffic Control Devices (MUTCD)</i> |
| FHWA | <i>Standard Highway Signs (with supplements)</i> |

14.2 Design Requirements**14.2.1 Submittals**

All submittals shall be prepared, reviewed, and submitted in accordance with the requirements set forth in Book 2, Section 3.

14.2.2 Temporary Traffic Control

All requirements for temporary traffic control, including, signing, and striping for the Work, are found in this Section and in Book 2, Section 16.

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14.2.3 Permanent Signing and Striping

The Contractor shall provide permanent signing, pavement marking, delineation, and other traffic control devices that facilitate safe travel flow through the completed Project elements.

The Contactor shall submit to CDOT signage and pavement marking plans to CDOT for Acceptance prior to the RFC Documents submittal.

14.3.3.1 Signing Design

The Contractor shall prepare signing plans for all necessary guide, warning, supplemental, and regulatory signs for the Project. The plans shall also include additions, removals, or modifications to existing signs and appurtenances.

Signing design shall comply with the requirements of the most current publications of the CDOT *Standard Specifications for Road and Bridge Construction (CDOT Standard Specifications)*, *M&S Standard Plans*, and *Sign Design Manual*; and the FHWA *Manual on Uniform Traffic Control Devices (MUTCD)*, as modified by the Colorado Supplement, as well as all Interpretation issued by FHWA. The requirements of the MUTCD shall include both the standard requirements and the guidance recommendations of the manual. Unless stipulated otherwise by CDOT in writing, all MUTCD “should” and “shall” standards and guidance recommendations are to be assumed Project Technical Criteria and as part of the Work. MUTCD standards take precedence over any Request for Proposal (RFP) exhibit or preliminary design.

Signing plans shall provide layouts showing the locations of ground-mounted and overhead signs. Signs created for use in the CDOT ROW shall meet current CDOT and MUTCD specifications.

New mile markers shall be field-measured from the previous undisturbed existing mile marker to provide precise placement and location of the new markers at 1-mile intervals.

These plans shall be a component of all Released for Construction Documents where any signing and pavement marking is required for the Work. No material, part, or attachment of any equipment shall be substituted or applied contrary to the manufacturer’s recommendations and standard practices.

The Contractor shall provide permanent signing, pavement marking, delineation, and other permanent traffic control devices that facilitate safe flow of traffic through the completed Project elements of the Project.

All signing shall be replaced inside the Project limits.

The Contractor shall submit plans for all Class III and regulatory and guide signs to CDOT for Approval 90 days prior to issuance of Released for Construction Documents. These plans shall identify the location and legend for each sign. Sign legends shall be consistent with the CDOT Sign Design Manual. The Contractor shall submit sign layouts for all special signs of any size to CDOT for Approval 90 days prior to issuance of Released for Construction Documents.

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Sign structures shall be designed in accordance with CDOT Standard S-614-50.

The Contractor shall use P1 or P2 tubular steel posts per CDOT S-Standard Plans for all Class I and Class II ground signs. Double posting of signs shall be required as per CDOT M&S Standards. Wood posts for mounting ground signs shall not be used. All delineators shall have flexible posts and conform to the requirements of Section 612, of the CDOT *Standard Specifications*, and CDOT S Standard S-612-1.

All ground signs shall include breakaway devices per CDOT S-Standard Plans.

Sign panel materials shall conform to CDOT Standard Specifications Section 713. Sheeting shall be Type IV and Type XI as defined in the CDOT *Retroreflective Sheeting Materials Guide*, and shall conform to Subsections 713.04 and 713.06 when applicable. For all permanent signs, the legend, borders, and background shall be Type XI.

The Contractor shall not reuse any existing sign structures, ground signs, delineators or their components. All removed sign structures, ground signs and their components shall become the property of the Contractor.

14.2.3.2 Pavement Marking Design

The Contractor shall prepare pavement marking designs and plans for roads affected by the construction of the Project and shall submit the plans to CDOT for Approval 60 days prior to issuance of Released for Construction Documents. These plans shall include, but not be limited to, all striping required for center lines, edge lines, lane lines, intersection markings, delineation, and other striping, as well as any modifications required for transitions to existing pavement markings.

Pavement marking design for CDOT facilities shall comply with the requirements of the most current publications of the CDOT *Standard Specifications for Road and Bridge Construction* and *M & S Standard Plans*, and the FHWA MUTCD. The requirements of the MUTCD shall include both the standard requirements and the guidance recommendations of the manual.

14.2.3.2.1 Materials

Pavement markings shall conform to the requirements specified herein and the Project Special Provisions, Standard Special Provisions, Standard Specifications, M&S Standards, MUTCD and the Local Agency Standard Specifications.

The Contractor shall use the following pavement marking materials at each location:

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Table 14-2

| Pavement Marking | Type |
|----------------------------|--|
| Edge lines and Centerlines | Modified Epoxy Pavement Marking (Inlaid) |
| Lane Lines | Preformed Plastic Pavement Marking (Type I) (Inlaid) |
| Stop Bars | Preformed Thermoplastic Pavement Marking (Inlaid) |

14.3 Construction Requirements

No Material, part, or attachment of any Equipment shall be substituted or applied contrary to a manufacturer’s recommendations and standard practices.

14.3.1 Permanent Signing

Sign posts shall be installed plumb. Vertical deviation shall not exceed 0.5 inch in 10 feet.

14.3.2 Pavement Marking Removal

Removal of existing markings and temporary markings shall be hydroblasted or other approved method by CDOT, prior to placing permanent markings.

14.3.3 Temporary Signalization

Refer to Book 2, Section 16, for temporary signal requirements for construction operations.

14.4 Deliverables

The Contractor shall submit the following to CDOT for review, Approval or Acceptance:

| Deliverable | Review, Acceptance or Approval | Schedule |
|--|--------------------------------|---|
| Sign layouts for all special signs of any size | Approval | 90 Days prior to issuance of Released for Construction Documents |
| Signage and Pavement Marking Plans | Acceptance | 60 Days prior to issuance Issued <u>as part</u> of Released for Construction Documents |

All deliverables shall also conform to the requirements of Section 3 - Quality Management.