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| REVIEW OF NEW SPECIFICATION OR SPECIFICATION CHANGE | | | | 614-19 (modified) |
| **Specification Section No.:** 614 and 713 | | | **Item:** Sign Panel Sheeting | |
| **Originating Office:** Traffic and Safety Branch | | | **By:** Roybal/Matthews | |
| **Date Sent For Review:** June 2, 2016 | | | **Date Comments Due: June 23, 2016** | |
| Submit response to: STANDARDS AND SPECIFICATIONS UNIT, DIVISION OF PROJECT SUPPORT 4TH FLOOR, CDOT HEADQUARTERS | | | | |
| **Vote**  **/N** | **Concurrent Reviews – Others Commenting** | | The attached Draft Specification is submitted for your review and comments. If not returned by Date Comments Due, the draft specification will be considered to be approved unless the Standards and Specifications Unit of the Project Development Branch [(303) 757-9474, (303) 757-9402] is advised otherwise.  **REMARKS:**  If these proposed modifications are approved, our unit will delete the standard special provision, Revision of Section 713, Sign Panel Backgrounds, and will replace it with this new standard special provision.  This modified version resulted from the need to delete arbitrary and redundant language from Section 713 the text of the proposed standard special. | |
|  | **Spec Committee Members:** | **✓** |
|  | Co-Chairman: Lacey |  |
|  | Region 1: Quirk |  |
|  | Region 1: Stratton |  |
|  | Region 2: Ferguson |  |
|  | Region 3: Necessary |  |
|  | Region 4: Boespflug |  |
|  | Region 5: Valentinelli |  |
|  | Project Development: Vacant |  |
|  | Specifications: Brinck |  |
|  | Bridge: Hasan |  |
|  | Contracts & Market Analysis: Eddy |  |
|  | Materials: Schiebel |  |
|  | Traffic Engineering: Matthews |  | REVIEWER COMMENTS:  ( ) Approved ( ) Disapproved ( ) Modified  If disapproved or modified, give reason why and show any modifications on the attached draft copy:    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_  Name/Signature Date | |
|  | Maintenance: Weldon |  |
|  | FHWA: Feery |  |
|  | Attorney General: Milan |  |
|  |  |  |
|  | **Others:** |  |
|  | Colorado Contractors Assoc.: Moody |  |
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|  | **Technical Committees:** |  |
|  | PDAC |  |
|  | Drainage Advisory Committee (DAC) |  |
|  | Water Quality Advisory Committee (WQAC) |  |

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| **COLORADO DEPARTMENT OF TRANSPORTATION** **SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE** | | | Log No. (Assigned by Standards and Specifications Unit)  614-19 (modified) | |
| TO: Standards and Specifications Unit, Project Development, Suite 290 | | FROM:  TSM&O Safety and Traffic  (Region, Branch or Technical Committee) | | |
| SPECIFICATION SECTION NO.  614 and 713 | ITEM  Retroreflective Sign Sheeting | | | Priority  Routine Fast |
| Reason for this new or changed specification:   * Non material specs housed in 713.06 were moved to 614.04. Sign Panels. References were updated and the digital manufacturing process was added.   + Sign panels shall be produced in accordance with the retroreflective sheeting manufacturer’s recommendations.   + Layout and font design shall conform to the “Standard Highway Signs” published by FHWA. Font selection for guide sign legends shall conform to the most recent version of the “CDOT Sign Design Manual”.   + Silk screen and digital process figures shall be in accordance with the plans and series figures described in the current editions of “Standard Highway Signs”, published by the FHWA, and the “Colorado Supplement to Standard Highway Signs”. * Table 713-1 incorporates the 11-6-14 standard special, Revision of Section 713, Sign Panel Backgrounds, by adding the ASTM designations and revising footnote 1. The Standard Special will be deleted.   + ~~“The aluminum sign blanks shall receive a chemical treatment conforming to ASTM B 449, Class 2 or ASTM B921 prior to placement of reflective sheeting.”~~ * 713.04. “Sign Message Materials” combines standard special “Sign Panel Backgrounds” was combined with the remainder of 713.06 “Legends and Borders” * Proprietary language was removed from the specification:   + ~~713.06. For overhead signs, the legend and borders shall be VIP~~   + For Class III overhead signs, the legend and borders, shall be ASTM D4956 Type XI. | | | | |
| New or Revised Specification:  Attached | | | | |
| Note: See Procedural Directive 513.1 for a description of appropriate specification development procedures. | | | | |

**CDOT Form 1215 10/01**

**614.04 Sign Panels.** Sign panel materials shall conform to Section 713 and to the details shown on the plans.

Sign panels shall be produced in accordance with the retroreflective sheeting manufacturer’s recommendations.

Layout and font design shall conform to the “Standard Highway Signs” published by FHWA. Font selection for guide sign legends shall conform to the most recent version of the “CDOT Sign Design Manual”. Sign layouts for special signs shall be in accordance with the detailed sign layouts proved in the plans or by the Engineer.

Silk screen and digital process figures shall be in accordance with the plans and series figures described in the current editions of “Standard Highway Signs”, published by the FHWA, and the “Colorado Supplement to Standard Highway Signs”.

All exposed lockbolt fastener heads on the faces of the sign panels shall be covered with material matching the background of the panel.

All sign panels shall be identified with the month and year that the sign was manufactured. The date shall be located on the lower right side of the back of the sign panel and shall be approximately ¼ inch high. The date shall be stamped or adhered onto the sign panel material for a permanent record. This work will be paid for as part of the Item.

**713.01 Signs-General.**  Aluminum or steel used for traffic control shall conform to Table 713-1.

**Table 713-1**

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|  | **Aluminum** | | **Steel** |
| **Application** | **ASTM Designation** | **Allow No.** | **ASTM Designation** |
| Sign panels | B 449 Class 21  B 9211 | 6061-T6  5052-H36  5052-H38 | A 6532 |
| Traffic controller cabinets | B 209 | 6061-T6 | A 709  Grade 36 |
| Clip bolts | B 211 | 2024-T4 |  |
| Locknuts or steel nuts and bolts | B 211 | 2014-T4 | A 307 |
| Clips and backing angles | B 221 | 6061-T6 |  |
| 1aluminum sign blanks shall receive a chemical treatment prior to the placement of retroreflective sheeting.  2 Steel sheets shall have a Z600 zinc coating in accordance with ASTM A 653 and a light phosphate coating. Phosphate coating of 3.5 oz./sq. ft. will be required for application with reflective sheeting. Nuts and bolts shall be galvanized or cadmium plated. | | | |

**713.04** **Sign Message Materials.** The legend, border, and overlay shall be used in accordance with the sheeting manufacturer’s recommendation. Retroreflective sheeting background material shall be approved in the Department’s Approved Product List; and the retroreflective sheeting background material shall be the type as specified on the plans. At a minimum, ASTM 4956 Type IV shall be used for ground mount signs. ASTM D4956 Type XI shall be used for Class III overhead signs.

For Class III overhead signs, the legend and borders shall be ASTM D4956 Type XI sheeting.

All reflective sheeting shall be sealed at the seams and edges as recommended by the manufacturer.

1

REVISION OF SECTIONS 614 AND 713

SIGN PANEL SHEETING

Sections 614 and 713 of the Standard Specifications are hereby revised for the project as following:

Delete subsection 614.04 and replace with the following:

**614.04 Sign Panels.** Sign panel materials shall conform to Section 713 and to the details shown on the plans.

Sign panels shall be produced in accordance with the retroreflective sheeting manufacturer’s recommendations.

Layout and font design shall conform to the “Standard Highway Signs” published by FHWA. Font selection for guide sign legends shall conform to the most recent version of the “CDOT Sign Design Manual”. Sign layouts for special signs shall be in accordance with the detailed sign layouts proved in the plans or by the Engineer.

Silk screen and digital process figures shall be in accordance with the plans and series figures described in the current editions of “Standard Highway Signs”, published by the FHWA, and the “Colorado Supplement to Standard Highway Signs”.

All exposed lockbolt fastener heads on the faces of the sign panels shall be covered with material matching the background of the panel.

All sign panels shall be identified with the month and year that the sign was manufactured. The date shall be located on the lower right side of the back of the sign panel and shall be approximately ¼ inch high. The date shall be stamped or adhered onto the sign panel material for a permanent record. This work will be paid for as part of the Item.

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REVISION OF SECTION 614 and 713

SIGN PANEL SHEETING

Delete Table 713-1 and replace with the following:

**Table 713-1**

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|  | **Aluminum** | | **Steel** |
| **Application** | **ASTM Designation** | **Allow No.** | **ASTM Designation** |
| Sign panels | B 4491  B 9211 | 6061-T6  5052-H36  5052-H38 | A 6532 |
| Traffic controller cabinets | B 209 | 6061-T6 | A 709  Grade 36 |
| Clip bolts | B 211 | 2024-T4 |  |
| Locknuts or steel nuts and bolts | B 211 | 2014-T4 | A 307 |
| Clips and backing angles | B 221 | 6061-T6 |  |
| 1In lieu of ASTM treatment, aluminum sign blanks shall receive a Class 2 anodized coating prior to the placement of retroreflective sheeting.  2 Steel sheets shall have a Z600 zinc coating in accordance with ASTM A 653 and a light phosphate coating. Phosphate coating of 3.5 oz./sq. ft. will be required for application with reflective sheeting. Nuts and bolts shall be galvanized or cadmium plated. | | | |

Delete subsection 713.04 and replace with the following:

**713.04** **Sign Message Materials.** The legend, border, and overlay shall be used in accordance with the sheeting manufacturer’s recommendation. Retroreflective sheeting background material shall be approved in the Department’s Approved Product List; and the retroreflective sheeting background material shall be the type as specified on the plans. At a minimum, ASTM 4956 Type IV shall be used for ground mount signs. ASTM D4956 Type XI shall be used for Class III overhead signs.

For Class III overhead signs, the legend and borders shall be ASTM D4956 Type XI sheeting.

All reflective sheeting shall be sealed at the seams and edges as recommended by the manufacturer.

Delete subsection 713.06 and replace with the following:

**713.06 (unused)**