SP02910 (Special Provisions for the 2024 Book) (Bidding on or after: 027-01-276
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This Section isR required when sign panels require anti-graffiti coating.)

SECTION 02910 - SIGN MATERIALS

(Follow all instructions and make all edits with "Track Changes" turned on. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the Project. Delete all purple text before preparing the final document. All other modifications to this Section will require ODOT Technical Resource and State Specifications Engineer approval.)

Comply with Section 02910 of the Standard Specifications modified as follows:

02910.10 Aluminum - Replace the paragraph that begins "The aluminum Materials shall…" with the following paragraph:

Furnish new aluminum Materials meeting the following requirements:

Replace the paragraph that begins "Aluminum to be color coated shall…" with the following paragraph:

Furnish aluminum to be color coated consisting of an alloy that is compatible with the coating and the application process. Furnish color-coated aluminum having a temper that, after coating and aging, provides an ultimate strength of 30,000 psi and a yield strength of 25,000 psi.

Replace the paragraph that begins "Fabricate sheet aluminum signs …" with the following paragraph:

Fabricate sheet aluminum signs from aluminum alloy 6061-T6, 5052-H38, 5154-H38, or approved equal. Give a chromate treatment according to ASTM B449, Class 2 or a titanium-based coating according to ASTM B921. Provide certified test reports for all heats of aluminum products furnished to the Agency. Furnish signs with a thickness shown in Table 02910-1 unless otherwise indicated.

02910.11 Plywood - Replace this subsection, except for the subsection number and title, with the following:

(a) General - Construct all plywood signs for permanent signing from 3/4-inch high-density overlay plywood. Construct plywood signs for temporary signs from either 3/4-inch high-density overlay plywood or 3/4-inch medium-density overlay plywood. Furnish Douglas fir plywood, Grade B-B exterior or better, according to *Product Standard PS-1 for Douglas Fir Plywood* published by the U. S. Department of Commerce.

(b) Overlay - Furnish black or buff high-density and medium-density overlay unless otherwise shown or specified. Furnish high-density and medium-density overlays that meet the *Product Standard PS-1 for Douglas Fir Plywood*.

(c) Plywood Sealer - Fill all voids in top or sides of panel with caulking compound after cutting plywood to size. Apply an approved plywood edge sealer tinted to match the color of the panel overlay material. Use a medium oil alkyd primer sealer.

02910.20 Retroreflective Sheeting - Replace this subsection, except for the subsection number and title, with the following:

(a) General - Use retroreflective sheeting from the QPL and the following:

(1) Perforation - If required for application, the sheeting may be pre-perforated with holes not greater than 0.02 inch in diameter. Perforate the holes approximately 0.4 inch apart in rows approximately 1.5 inches apart.

(2) Surface - Furnish sheeting and adhesive compatible with non-reflective permanent cut-out legend.

(b) Acceptance - Provide a quality compliance certification according to 00165.35, certifying that the reflective sheeting furnished meets the above requirements.

02910.21 Nonreflective Sheeting for Sign Background: Replace this subsection, except for the subsection number and title, with the following:

(a) General - Furnish nonreflective sheeting that is durable, weather resistant, gloss plastic film, and has a protected, precoated adhesive backing.

(b) Color - Use color for the nonreflective sheeting according to 00940.10. Submit for testing a 4-inch by 4-inch sample of the background color for each color of nonreflective sheeting shown.

(c) Adhesive - Adhere the nonreflective sheeting by a mildew and vandal resistant precoated adhesive that has no staining effect on the sheeting.

(d) Film:

(1) General - Furnish nonreflective sheeting that is flexible and easily cut to shape. The minimum tensile strength of the sheeting is 5 pounds per inch width.

(2) Surface - Clean according to the manufacturer's recommendations. Furnish a smooth and flat sheeting surface that:

- Facilitates cleaning and wet performance.
- Is readily processed.
- Is compatible with recommended transparent and opaque process inks.
- Permits cutting and color processing at minimum temperatures of 60 °F.
- Is heat resistant and permits force curing of applied sheeting at temperatures up to 150 °F.
- Is solvent resistant.

(e) Durability - For non-reflective sheeting for a sign background, process and apply according to the manufacturer's recommendations. Furnish weather resistant Material that

shows no discoloration, cracking, crazing, blistering or dimensional change following cleaning.

Furnish a sheeting surface capable of being readily refurbished when cleaned and clear over-coated according to the manufacturer's recommendations.

(f) Acceptance - Provide a quality compliance certificate according to 00165.35, certifying that the nonreflective sheeting furnished meets all the above requirements.

Add the following subsection:

02910.23 Digital Printing -

(a) Digitally Printed Ink Systems - Provide digitally printed ink systems from the QPL that meet the following requirements:

- Produce traffic signs using components, and processes that comply with the retroreflective sheeting manufacturer's recommendations.
- Meet and comply with daytime and nighttime chromaticity (color standards) as recognized in ASTM D4956 *Standard Specification for Retroreflective Sheeting for Traffic Control*.
- Meet 70% for type XI standards of the initial retroreflectivity specifications of each respective reflective film color as found in ASTM D4956.

(b) Retroreflective Sheeting - Furnish retroreflective sheeting that:

- Consists of white or colored sheeting having a smooth outer surface and that has the property of a retroreflector over its entire surface.
- Conform to all requirements of the current version of ASTM D4956. Designate the retroreflective sheeting as type XI ASTM D4956 classification.
- Has a Class 1 pressure-sensitive adhesive, as defined by ASTM D4956, protected by an easily removable liner. Fabricate finished traffic signs and traffic sign faces using retroreflective sheeting of Type XI ASTM D4956 classification.

(c) Protective Overlay Film – Fabricate permanent traffic signs printed with digital ink systems with a full sign protective overlay film designed to provide a smooth surface needed for retroreflectivity, and to protect the sign from fading and UV degradation. Comply with the retroreflective sheeting manufacturer's recommendations for the overlaminate to ensure proper adhesion and transparency. Meet the reflective film durability as identified in the warranty requirements.

02910.32 Retroreflective Removable Legend - Replace this subsection, except for the subsection number and title, with the following:

(a) General - Furnish letters and numerals for all removable legend according to the design of the FHWA *Standard Rounded Capital Letter Alphabets*. Furnish letters and numerals for removable legend for all freeway and expressway signs according to the design of Series "E" modified from the FHWA *Standard Rounded Capital Letter Alphabets*.

Provide mounting holes within the frames to permit the use of the mounting hardware specified in the Specifications. Provide a sufficient number of mounting holes to ensure a

firm attachment of the frames to the sign and meet the requirements of 00940.45(b). This requires a minimum of four mounting holes at each joint in the border.

(b) Retroreflective Sheeting Legend - Fabricate removable legend with sheeting according to 02910.20 that is permanently adhered to a flat aluminum frame.

Furnish letters, numerals, symbols and borders a minimum of 0.032-inch-thick aluminum according to ASTM B209, alloy 3003-H14. Degrease and etch the aluminum, or treat with a light, tight amorphous chromate type coating.

Apply the reflective sheeting to the prepared aluminum according to the sheeting manufacturer's recommendations.

Furnish letters, numerals, symbols and borders that are clean-cut and sharp, and have a nearly plane surface.

(c) Acceptance - Acceptance of retroreflective removable legend is based on a mill test certificate from the aluminum manufacturer attesting to the correct alloy, temper, and material thickness of the metal supplied. The Engineer may reject damaged or non-specification materials regardless of the test certification provided.

02910.33 Permanent Legends - Replace this subsection, except for the subsection number and title, with the following:

(a) General – Permanent legends consist of white retroreflective screened, red retroreflective screened, black screened or cut-out white retroreflective sheeting. Meet the design of the FHWA Standard Rounded Capital Letter Alphabets for the letters and numerals of all permanent legends.

(b) Retroreflective White Screened Legend - Use transparent paste materials for the reverse screening of retroreflective white legends and for the screening of retroreflective red legends according to the recommendations of the manufacturer of the reflective sheeting.

(c) Retroreflective Cut-out Legend - Use Material for retroreflective cut-out legend according to the requirements of 02910.20.

(d) Nonreflective Black Screened Legend - Furnish Material for nonreflective black screened legends that is compatible with the sign sheeting, as recommended by the sign sheeting manufacturer.

(e) Nonreflective Black Cut-out Legend - Use Material for nonreflective cut-out legend according to 02910.21.

(f) Digitally Printed Sign - Use processes and Materials for digitally printed signs according to the requirements of 02910.23.

02910.40 Hardware - Replace this subsection, except for the subsection number and title, with the following:

Furnish aluminum alloy, stainless steel, or hot-dip galvanized steel bolts, nuts, and washers to fabricate and erect signs. Furnish aluminum for bolts and nuts according to ASTM B211, alloys 2024-T4 or 6061-T6 as the Contractor elects. Furnish aluminum washers according to ASTM B209, alloy Alclad 2024-T4. Furnish stainless steel for bolts, nuts, and washers that are Type 304 or Type 316. Furnish galvanized steel bolts, nuts, and washers that are medium carbon steel. Galvanize steel hardware according to AASHTO M 232 (ASTM A153).

Use nylon washers supplied by the sheeting manufacturer as shown or directed.

Furnish mounting hardware of the design and type shown, or if not shown of such sizes and kinds as approved by the Engineer.

Furnish 1/8-inch diameter, 1/4-inch head diameter, domed head, aluminum alloy according to ASTM B316. Aluminum alloys 5052 and 5056 are acceptable alloys. Furnish anodized blind rivets that are the same color as the sign background that are used to attach sign panels to closure strips or wind beams.

02910.60(a) General - Replace this subsection, except for the subsection number and title, with the following:

Furnish electronically cuttable films consisting of durable, transparent, colored films coated with a transparent pressure sensitive adhesive protected by a removable liner. Furnish films designed to be cut on knife-over-roll (sprocket fed or friction fed) and flat bed electronic cutting machines. Furnish films available in standard traffic colors, be dimensionally stable, and be designed to optimally cut, weed, lift and transfer. Use electronically cuttable films from the QPL.

(Use subsection .70 when sign panels require anti-graffiti coating.)

Add the following subsection:

02910.70 Anti-Graffiti Coating for Signs:

(a) General - Use anti-graffiti coating from the QPL. Apply anti-graffiti coating over both the background and legend sheeting, per the manufacturer's recommendation.

(b) Acceptance - Provide a quality compliance certificate according to 00165.35, certifying that the anti-graffiti coating used is an acceptable product on the QPL.

02910.75 Manufacturer Warranty - Replace the paragraph that begins "Furnish a manufacturer warranty …" with the following paragraph:

Provide a manufacturer warranty that unconditionally warrants to the Agency the retroreflective sheeting products, sheeting with applied electronic cuttable film products, and installation under this Section against failure, according to this Subsection and 00170.85(c)(1). Use Agency-supplied warranty forms, available from the Engineer.