

SECTION 02513 – STAINLESS STEEL REINFORCEMENT

(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.)

Replace Section 02513 of the Standard Specifications except for the Section number and title with the following:

Description

02513.00 Scope - This Section includes the requirements for stainless steel reinforcement bars, mechanical splices, chairs and supports, inserts, dowels, and tie wire.

Materials

02513.10 Deformed Bar Reinforcement - Furnish deformed bar reinforcement meeting the requirements of ASTM A955 except for Section 6, Chemical Composition and Section 15, Finish. Acceptable alloys are listed by Uniform Numbering System for Metals and Alloys (UNS) designation in Table 02513-1 and Table 02513-2. Finish the surface according to Table 02513-1 and the requirements of ASTM A380.

Table 02513-1**Allowable Stainless Steel Alloys for Reinforcing Bars and Dowels**

<u>UNS Designation</u>	<u>S31653</u>	<u>S31803</u>	<u>S20910</u>	<u>S24100</u>	<u>S32304</u>
<u>AISI Type</u>	<u>316LN</u>	<u>2205</u>	<u>XM-19</u>	<u>XM-28</u>	<u>2304</u>
<u>Common or Trade Name</u>	<u>Type 316 Low Carbon Nitrogen Added</u>	<u>Type 2205 Duplex</u>	<u>Nitronic 50</u>	<u>Nitronic 32 Enduramet 32 18-Cr-2Ni-12Mn</u>	<u>Type 2304 Duplex SAF 2304 Fe-23Cr-4Ni-0.1N</u>
<u>Required Condition</u>	<u>As rolled</u>	<u>As rolled</u>	<u>As rolled</u>	<u>As rolled</u>	<u>As rolled</u>
<u>Required Finish</u>	<u>Descaled and white pickled</u>	<u>Descaled and white pickled</u>	<u>Descaled and white pickled</u>	<u>Descaled and white pickled</u>	<u>Descaled and white pickled</u>

Table 02513-1**Stainless Steel Alloys Mechanical Properties**

<u>Grade and UNS</u>	<u>S316 53</u>	<u>S316 53</u>	<u>S318 03</u>	<u>S318 03</u>	<u>S209 10</u>	<u>S209 10</u>	<u>S241 00</u>	<u>S241 00</u>	<u>S323 04</u>	<u>S323 04</u>
----------------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------

<u>Designation</u>	<u>GR 60</u>	<u>GR 70</u>	<u>GR 60</u>	<u>GR 75</u>	<u>GR 60</u>	<u>GR 75</u>	<u>GR 60</u>	<u>GR 75</u>	<u>GR60</u>	<u>GR75</u>
<u>Minimum Tensile Strength (ksi)</u>	<u>90</u>	<u>95</u>	<u>90</u>	<u>95</u>	<u>90</u>	<u>95</u>	<u>90</u>	<u>95</u>	<u>90</u>	<u>95</u>
<u>Minimum Yield Strength (ksi)</u>	<u>60</u>	<u>75</u>	<u>60</u>	<u>75</u>	<u>60</u>	<u>75</u>	<u>60</u>	<u>75</u>	<u>60</u>	<u>75</u>
<u>Minimum Elongation in 2 inches (%)</u>	<u>25</u>	<u>20</u>	<u>25</u>	<u>20</u>	<u>25</u>	<u>20</u>	<u>25</u>	<u>20</u>	<u>25</u>	<u>20</u>

02513.20 Mechanical Splices - Mechanical splices for reinforcing bars are systems that connect the bars without raising their temperature above 1,300 °F.

- Furnish mechanical splices that develop at least 90 percent of the specified minimum ultimate strength of the reinforcing bars in compression and in tension. Where bars of different sizes or strengths are connected, match the strength of the smaller or weaker bar.
- Do not allow the spliced reinforcing bars to slip more than 0.040 inch, measured between gauge points clear of the splice sleeve, when the reinforcing bars are loaded in tension to 67 percent of the specified minimum yield strength of the reinforcing bar.
- Fabricate the splice sleeve and connection hardware from an alloy listed in Table 02513-1. Finish the surface according to Table 02513-1 and the requirements of ASTM A380.

02513.35 Concrete Inserts - Furnish concrete inserts fabricated from an alloy listed in Table 02513-1. Finish the surface according to Table 02513-1 and the requirements of ASTM A380. Furnish concrete inserts with closed-back ferrule threaded to receive UNC threaded bolts or rods of the size shown. Furnish concrete inserts with the following minimum lengths and safe working loads:

<u>Bolt or Rod Diameter (Inches)</u>	<u>Insert Length (Inches)</u>	<u>Safe Working Load in Shear or Tension (Pounds)</u>
<u>3/4</u>	<u>4 1/2</u>	<u>4,000</u>
<u>1</u>	<u>5 1/2</u>	<u>6,000</u>
<u>1 1/4</u>	<u>7 1/2</u>	<u>10,000</u>
<u>1 1/2</u>	<u>9 1/2</u>	<u>16,000</u>

02513.50 Dowels - Furnish dowels meeting the requirements of ASTM A955 except for Section 6, Chemical Composition and Section 15, Finish. Acceptable alloys are listed by Uniform Numbering System for Metals and Alloys (UNS) designation in Table 02513-1. Finish the surface according to Table 02513-1 and the requirements of ASTM A380.

02513.60 Ties and Supports - Furnish 16 gauge tie wire and supports from Type 304 or Type 316 stainless steel according to *CRSI Manual of Standard Practice*.

02513.70 Acceptance - Stainless steel reinforcement is accepted according to 00165.35 and this Section.