

**4150000 REINFORCING FOR CONCRETE
COMMENTS FROM INTERNAL/INDUSTRY REVIEW**

Dan Hurtado

Comments: (12-3-15)

415-3.1 and 415-3.2 provide (with the exception of UV protection) the same requirements for steel and FRP reinforcing, only worded slightly differently. Could we combine these two subsections into one? 415-5.13 - Since we don't have a standard for the coatings on metal bar supports, why not just mandate that FRP rebar only be supported by plastic bar supports or precast concrete blocks? You could just strike the last proposed sentence in 415-13.1 and add a sentence to 415-13.2 saying, "Do not use metal bar supports to support FRP reinforcing bars." 415-7.1 - Recommend changing the first sentence to read, "The quantity to be paid for will be the plan quantity, in pounds of reinforcing steel, stainless reinforcing steel, or low-Carbon Chromium reinforcing steel..." 415-7.4 Recommend revising the method of measurement to conform with other items, "The quantity to be paid for will be the plan quantity linear feet of bar incorporated into the work and accepted. The quantity will not include the FRP bar in any item of work for which the basis of payment includes the FRP bars." (Then, strike the last two suggested sentences).

Response:

Juan Castellanos
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Comments: (12-4-15)

What is FRP, Fiber Reinforced Polymer? This acronym should be defined at the beginning of the section, in article 415-1.

Response:

Art Berger
FDOT, Legal

Comments: (12-7-15)

1. The specification makes frequent reference to the "Plans," and I would want to make sure everyone is comfortable that by making reference to the "Plans" all the needed dimensions will be found in the Plans or in other indexes or manuals that are expressly incorporated and made a part of the Plans.

Steel Bar Reinforcement	931-1.1
Steel Welded Wire Reinforcement.....	931-1.2
FRP Bar Reinforcement.....	932-3

415-3 Protection of Material.

415-3.1 Steel Reinforcing: Store steel reinforcement above the surface of the ground, upon platforms, skids, or other supports, and protect it from mechanical injury and surface deterioration. Ensure that the steel reinforcement is free from loose rust, scale, dirt, paint, oil, and other foreign material prior to incorporation into the work.

415-3.2 FRP Reinforcing: Store FRP reinforcement above the surface of the ground, upon platforms, skids, or other supports, and protect it from mechanical injury and direct exposure to UV light and mechanical injury. When placing FRP reinforcement in the work, ensure that the FRP reinforcement is free from dirt, paint, oil, and other foreign material.

415-4 Bending, Splicing, and Cutting.

415-4.1 Steel Reinforcing: Fabricate reinforcing bars as prescribed in the CRSI Manual of Standard Practice. Shop bend the reinforcement cold to the shapes indicated in the Plans. Do not bend the reinforcement to shape in the field. Minor bending adjustments may be performed in the field with the approval of the Engineer.

Do not hot bend or straighten, weld, or thermal cut reinforcing steel.

415-4.2 FRP Reinforcing: No field fabrication of FRP reinforcing bars is permitted except tying and field cutting per ACI-440.5 Do not bend or straighten, couple, or thermal or shear cut FRP reinforcing bars.

2.

Response:

Dee Kane
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Comments: (12-9-15)

415-1: Recommend you put parentheses around the FRP and spell it out. So it would read, (FRP) Fiber Reinforced Polymer 415-1: Is it clear where anyone can get the "Department's Production Facility Listing"? Possibly a link to this material would help. General Comment: Throughout this spec the word "steel" has been struck through, but other places in the spec it has "steel reinforcing". Not sure this would be clear to the Contractor / Designer?

Response:

D5 Construction Operations

Comments: (12-15-15)

415-3.2 FRP Reinforcing: When placing FRP reinforcement in the work, ensure that the FRP reinforcement is free from (delete "for") dirt, paint, oil, and other foreign material.

Response:

D5 Construction Operations

Comments: (12-15-15)

415-1 Description: Fiber Reinforced Polymer (FRP) should be stated in the beginning of the specification what FRP stands for. The spec uses FRP numerous times but if you aren't familiar with the term, it is not understood.

Response:

awkward sentence
as written

Wendy McLellan (via Deborah Ihsan)
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Comments: (12-17-15)

415-3.2 FRP Reinforcing: Store FRP reinforcement above the surface of the ground, upon platforms, skids, or other supports, and protect it from mechanical injury and direct exposure to UV light and mechanical injury. When placing FRP reinforcement in the work, ensure that the FRP reinforcement is free for dirt, paint, oil, and other foreign material. 1) This statement should be free from not free for...I believe.

Response:

Chad Rucks (via Deborah Ihsan)
FDOT, D4
772-429-4938

Comments: (12-23-15)

Suggest defining the term FRP in the beginning of the document. This is done later in the document, but in the first instance I would spell the term out.

Response:

Beginning in section 415-5.13.3 the term "Plastic Bar Supports" is used. I suggested revising to be "FRP Bar Supports".

Response:

Katie Bettman
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Comments: (12-23-15)

Recommend the following language for the last sentence of 415-3.2 FRP Reinforcing: "Ensure that the FRP reinforcement is free from dirt, paint, oil, and other foreign material prior to incorporation into the work." Current language has "for" instead of "from."

Response:

Pat McCann
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Comments: (12-29-15)

415-1: Suggest "FRP" be replaced with full name as this is the first appearance of the abbreviation.

Response:

John Busel
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Comments: (12-30-15)

415-7.1 General Reinforcing Steel: The quantity to be paid for will be the plan quantity, in pounds, of reinforcing steel incorporated into the completed work and accepted, subject to any changes approved by the Engineer. The quantity will not include the reinforcing steel in any item of work for which the basis of payment **already** includes the steel reinforcement. (add "already")

Response:

415-7.4 ~~Fiber Reinforced Polymer Reinforcing Bar~~ **FRP Reinforcement Bar:** The quantity to be paid for will be by linear foot of bar entering into the completed structure or item of work and accepted. The quantity will not include the FRP bar in any item of work for which the basis of payment **already** includes (delete "Fiber Reinforced Polymer Reinforcing Bar", replace with "FRP Reinforcement Bar". Also, add "already")

Response:

415-5 could be worded more clearly... "Do not bend or straighten, couple , or thermal or shear cut FRP reinforcing bars" .. The word "thermal" seems to be a poor choice... does that mean "torch"?

Response:

In section 415-5.9 .. "... and space the additionally required bolsters at not more than 4 feet". .. perhaps we should draw attention to spacing bolsters a bit closer for GFPR bars... say at 3ft. Maybe there should be a sentence to recommend spacing supports for FRP bars at 3/4" the spacing requirements for steel.

Response:

415-8 Basis of Payment. Price and payment will be full compensation for all work specified in this Section, including all welding, all clips, spacers, ties, mechanical couplers, etc., and wire or other material used for fastening the reinforcement in place. If spliced bars are used when full length bars might reasonably be required, the weight paid for will be only that which would be obtained if full length bars were used, with no allowance for lap. Payment will be made under:

Item No. 415- 1- Reinforcing Steel - per pound. **(Delete this item no mention in 415)**

Item No. 415- 2- Stainless Reinforcing Steel - per pound. **(Delete this item no mention in 415)**

Item No. 415- 3- Low -Carbon Chromium Reinforcing Steel - per pound.

Item No. 415- 10- ~~Fiber Reinforced Polymer Reinforcing Bar~~ **FRP Reinforcement Bar** - linear foot. (delete "Fiber Reinforced Polymer Reinforcing Bar", replace with "FRP Reinforcement Bar")

Response: