

4150513 REINFORCING STEEL-BAR SUPPORTS
RESPONSE TO INTERNAL/INDUSTRY REVIEW COMMENTS

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Comment (Internal Review): This specification specifies that the supports withstand certain loads; however, it never specifies how the loads are to be applied.

The Bar Supports and Spacers “shall be able to withstand a 50 pound concentrated load without bar slippage...” Is this load applied axially to the bar or perpendicular to the bar over the support/spacer? The drilled shaft support/spacer/bolster load application specifications are identically vague.

Response: There are many variations as to how loads are applied to spacers. The direction of the load will be as per discussions between the supplier and the State Materials Office based on the specific type and geometry of the spacer. The following language has been added to clarify, “applied as directed by the State Materials Office.”

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Comment (Internal Review): In the first line, third paragraph, 415-5.13.1. Suggest the deletion of **both chair and bolster**

415-5.13.1 General: Provide reinforcing steel bar supports manufactured in accordance with all requirements of the CRSI Manual of Standard Practice. Use ~~chairs and bolsters~~ *bar supports* of adequate strength to withstand a 300 pound concentrated load without permanent deformation or breakage, with the deformation under a 300 pound load being less than 5% of the support height.

Ensure that no more than 5% of the reinforcing steel bar supports exhibit unsatisfactory performance, breakage, or permanent deformation during rebar tying and/or concrete placement operations. If a bar support does not achieve this level of performance, reduce the average spacing between bar supports by 15%, or remove that product from use on the job.

Ensure that bar supports, ~~both chair and bolster~~, do not move during concrete placing operations. To prevent movement, tie supports to the reinforcing steel.

Response: Agree to both suggestions. These changes were made prior to industry review.

Geoff Scales

Comment: (12-15-09)

This rewrite is fine, but how about addressing the fact (as raised in the last Structures Specifications Committee meeting) that 415-5.5.1, 415-5.8.1 and 415-5.9.1 etc. direct a particular type of spacer for different structural elements, with no apparent rhyme or reason. E.g., 415-5.8.1 directs that wall steel can only be spaced from the form face using 2x2" 'hog-apples'.

These requirements are rarely actually enforced, but when they are they make life unnecessarily difficult.

Response: Agree. This issue will be addressed once these latest changes are implemented and should be in place for the January 2011 release of the spec. No changes at this time.

Barry Smith
414-4776

Comment: (12-18-09)

1. Are plastic spacers and plastic wheel spacers a different type product? I know the application is different but they function fundamentally the same way. Should the terms be the same?

Response: No, they are the same product, but spacers come in many different shapes: Wheels, triangles, pyramids, at the end of a hook. In drilled shaft applications we only want to use wheels because any other shape would dig into the wall of the shaft causing soil to fall to the bottom. No, the terms will be different because of the required use of wheel spacers for drilled shafts. No changes made.

2. Could the “non-stacking” limitation stated on the QPL be placed into this modification?

Response: Yes. “Non-stackable” has been added to 455-5.13.3.

3. Does moisture absorption need to be addressed in 415-5.13.4 as in 415-5-13.3?

Response: Yes it needs to be. Same language added 415-5.13.4.

4. Height references in 415-13-5.13.3 are unclear. Does this mean the sizes mentioned are required and other sizes are optional?

Response: This language will be reviewed and addressed as needed as part of future changes to this Section. No changes at this time.

5. Terminology in 415-5.13.4 for the wheel spacer is unclear. Slip-on indicates solid wheels that are placed over the end of the rebar and would consequently not have a need for the concentrated load testing. A two piece wheel spacer or folding (wraparound) would need the testing done on both sides at the juncture of the two pieces. Could the designation be made using other terms like, two piece locking or split with mechanical lock, etc along with Slip-on? The two piece types will need the concentrated load test. Using terminology to differentiate the two would also be helpful to the applicant/manufacturer. Wording describing the location of the applied load for wheel spacers could also be cleared up by using the descriptions above indicating the surface juncture. The current concentrated load vector description “INSERTION OPENING” could be taken to mean the central hole and applying the load perpendicularly to the long axis of the wheel, not outward toward the juncture of the two halves.

Response: I agree that the language needs to be clarified as there have been multiple interpretations during the internal review and industry review. The direction of the load will be as per discussions between the supplier and the State Materials Office based on the specific type and geometry of the spacer. The following language has been added to clarify, “applied as directed by the State Materials Office.”

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Comment: (1-11-09)

1. 415-5.13.1 Bar Supports. As I understand this section, ALL Bar Supports (metal, plastic, precast concrete, etc.) need to meet these requirements.

Response: Correct.

2. 415-5.13.2 Metal Bar Supports. Reference should be made in this section (similar to plastic) about meeting requirements of 415-5.13.1. Suggest adding a third item under “Certify that all metal bar supports meet the following requirements:” add “(3) That they meet the concentrated load requirements of 415-5.13.1”. Currently, FDOT is not getting a comparable metal product.

Response: Metal bar supports are currently required to meet Article 415-5.13.1. The Department has not received any feedback indicating metal bar support performance issues. No changes made.

3. 415-5.13.3 Plastic Bar Supports and Spacers. I am of the opinion that the performance requirements for the spacers should be in “415-5.13.1 Bar Supports” with only specific plastic requirements in this section.

Response: Article 415-5.13.3 specifies the requirements for plastic bar supports and spacers only. Article 415-5.13.1 specifies requirements for metal and plastic bar supports. These requirements are different and need to be separate. This will be reviewed in future changes. No changes made at this time.

4. 415-5.13.4 Plastic Bar Supports and Wheel Spacers for Drilled Shafts. (1) Nothing in this section says that only “plastic” can be used. (2) Is metal allowed for Drilled Shafts? (3) Does metal have the same performance requirements? (4) The loads may be a little extreme but I don’t see an issue as long as any type of support (metal, plastic, precast concrete, etc.) has the same requirement.

Response:

(1) Plastic or concrete bar supports and spacers may be used in drilled shaft applications but not metal. The requirements for concrete spacers are in subarticle 415-5.2. Subarticle 415-5.13.4 addresses the requirements for plastic bar supports and spacers as the title indicates. No changes made.

- (2) No.
- (3) Metal cannot be used.
- (4) The requirements for concrete spacers are in 415-5.2 which exceed the loading requirements in 415-5.13.4. No changes made.

5. 415-5.13.5 Qualified Products List. There should also be a listing of Metal Bar Supports that meet the requirements of 415-5.13.1. FDOT needs to be careful that the requirements for products performing the same function are not different.

Response: Even though there is not a requirement for metal bar supports to be listed on the QPL, the performance requirements for metal and plastic bar supports are the same. The Department has a long history successfully using metal bar supports. In addition, the wire material, size, and geometry for metal bar supports must be in accordance with the CRSI Manual of Standard Practice whereas the dimensions and geometry of the plastic bar supports are not specified. No changes made.
