



## Florida Department of Transportation

**RICK SCOTT**  
GOVERNOR

605 Suwannee Street  
Tallahassee, FL 32399-0450

**STEPHANIE KOPELOUSOS**  
SECRETARY

January 5, 2011

Monica Gourdine  
Program Operations Engineer  
Federal Highway Administration  
545 John Knox Road, Suite 200  
Tallahassee, Florida 32303

Re: Office of Design, Specifications  
Section 415  
Proposed Specification: 4150510 Reinforcing Steel - Supports.

Dear Ms. Gourdine:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

These changes were proposed by Steven Plotkin of the State Construction Office because the current spec is not clear enough about the use of rebar bolsters that use rails against forms, and to delete the load testing requirement for plastic bar spacers. The Contractor is responsible for using spacers of sufficient strength and quality to provide the proper amount of cover to the vertical steel.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to SP965RP or rudy.powell@dot.state.fl.us.

If you have any questions relating to this specification change, please call Rudy Powell, State Specifications Engineer at 414-4280.

Sincerely,

Rudy Powell, Jr., P.E.  
State Specifications Engineer

RP/cah  
Attachment

cc: Gregory Jones, Chief Civil Litigation  
Florida Transportation Builders' Assoc.  
State Construction Engineer

**REINFORCING STEEL BAR SUPPORTS.****(REV 91-24-1101-15-10) (FA 1-21-10) (7-10)**

SUBARTICLE 415-5.10.1 (Pages 436 – 437) is deleted and the following substituted:

**415-5.10.1 Supports:**

(a) Bottom Mats: In general, support the bottom mats of steel by one row of slab bolsters placed 6 inches from the edge of the slab and by two rows down each panel between beams. *In general, bottom mat slab bolsters may not have rails in contact with removable or stay-in-place forms; however, if the environmental classification is slightly aggressive, bolster rails may be in contact with stay-in-place forms if in compliance with 415-5.13.2 and 415-5.13.3.* Do not allow the spacing between rows to exceed 4 feet, measured center to center.

As an exception, when deemed satisfactory by the Engineer, the Contractor may use concrete blocks in lieu of slab bolsters. Use blocks 2 by 2 inches by clearance dimensions. Space concrete blocks 4 feet on center as a maximum. If at any time, however, the Engineer judges that the concrete blocks do not provide the proper support, he may require using slab bolsters.

(b) Top Mats: Support the top mats of steel by either continuous high chairs or individual high chairs. Support continuous high chairs along both sides of each beam and approximately 6 inches back from the edge of the beam. Place the outside row of high chairs 6 inches from the edge of the slab. If using individual high chairs, space them transversely, as specified for the continuous high chair, and do not allow the longitudinal spacing to be greater than 4 feet.

As an alternate to the above, on prestress beam construction, the Contractor may support the top mat of steel on the shear connectors bent to the proper elevation with one line of high chairs centered between the beams.

(c) Truss Bars: Support truss bars at each end of the top bends by continuous high chairs or by individual high chairs spaced longitudinally at not more than 4 feet.

SUBARTICLE 415-5.13 (Pages 438-439 *of the Supplemental Specifications*) is deleted and the following substituted

**415-5.13 Bar Supports:**

**415-5.13.1 General:** Provide reinforcing steel bar supports manufactured in accordance with all requirements of the CRSI Manual of Standard Practice. Use bar supports of adequate strength to withstand a 300 pound concentrated load applied as directed by the State Materials Office 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 do not move during concrete placing operations. To prevent movement, tie supports to the reinforcing steel.

When using bar supports on corrugated metal stay-in-place forms, use supports specifically designed for the form being used.

For structural elements located in extremely aggressive environments, do not use metal bar supports in contact with forms or floor surfaces to support reinforcing steel.

**415-5.13.2 Metal Bar Supports:** For metal bar supports in contact with steel stay-in-place forms and metal bar supports in contact with boundary surfaces of concrete to be cast, provide supports constructed with molded plastic legs or plastic protected steel legs *or bolster rails*. Do not allow any portion of the bar support other than the molded plastic leg or plastic protected portion of the steel leg *or bolster rail* to be closer than 1/2 inch from the boundary surface of concrete to be cast.

Certify that all metal bar supports meet the following requirements:

(1) That they are manufactured from cold drawn steel wire in accordance with the wire sizes and geometrical dimensions shown in the CRSI Manual of Standard Practice, Chapter 3, Table II.

(2) That the plastic used for protection of the steel legs *or bolster rails* has a thickness of 3/32 inch or greater at points of contact with the form work.

Provide plastic protection by a dipping operation, by adding premolded plastic tips to the legs of the support or by molding plastic to the top wire of the support. Ensure that the plastic material used for protection of steel legs does not chip, crack, deform, or peel under ordinary job conditions. Provide molded plastic legs that have sufficient strength to carry the weight of the supported reinforcing steel in its required position without deformation and relaxation under job conditions.

**415-5.13.3 Plastic Bar Supports and Spacers:** Use non-stackable bar supports and spacers comprised of either reinforced or non-reinforced virgin or recycled plastic. Bar supports shall be able to meet the concentrated load requirements of 415-5.13.1 within a working temperature range of 20 to 150°F. Spacers shall be able to ~~withstand a 50 pound concentrated load applied as directed by the State Materials Office without bar slippage, permanent deformation or breakage within a working temperature range of 20 to 150°F with the deformation under a 50 pound load being less than 5% of the support height.~~ *provide sufficient strength to support reinforcing steel in the required position without deformation and relaxation under job conditions. For drilled shafts, use wheel spacers with a smooth perimeter surface.*

~~All plastic rebar supports shall have a maximum water absorption of 0.5% at 14 days, as per ASTM D 570.~~

*Provide protection* plastic rebar supports from exposure to sunlight until placed in the form ~~and~~ *and* mold plastic rebar supports in a configuration which does not restrict concrete flow and consolidation ~~around and under the rebar support.~~ Do not use ~~continuous legs~~ *bolster* or rails ~~in~~ *direct contact with* concrete surfaces.

~~Due to the wide range of applications and heights, ensure that the manufacturer additionally certifies all plastic bar supports for 2 inch, 3 inch, 4 inch and 4 1/2 inch heights.~~

~~Provide each individual bar support with an identification number unique to the particular model permanently marked on the surface as included in the Qualified Products List.~~

~~**415-5.13.4 Plastic Bar Supports and Wheel Spacers for Drilled Shafts:**~~

~~Bottom bolsters and Wheel spacers shall be able to withstand a 500 pound concentrated load applied as directed by the State Materials Office without bar slippage, permanent deformation or breakage at room temperature with the deformation under a 500 pound load being less than 5% of the support height. *have sufficient strength to support reinforcing steel in the required position without deformation and relaxation under job conditions.* The perimeter surface of the wheel spacers shall be smooth.~~

~~Bottom bolsters shall be able to withstand a 1000 pound concentrated load without permanent deformation or breakage at room temperature with the deformation under a 1000 pound load being less than 5% of the support height.~~

~~All plastic rebar supports shall have a maximum water absorption of 0.5% at 14 days, as per ASTM D 570.~~

*All plastic bar supports and spacers shall have a maximum water absorption of 0.5% at 7 days as per ASTM D 570. Plastic bar supports and spacers made of recycled plastic products must meet the additional requirements of Section 972.*

*Provide to the Engineer independent lab test data and certification that the plastic spacers meet the requirements specified herein.*

~~**415-5.13.5 Qualified Products List:**~~

~~Use plastic bar supports and spacers listed on the Department's Qualified Products List. Manufacturers seeking evaluation of products for inclusion on the Qualified Products List must submit an application in accordance with 6-1 and include certified test reports from an independent laboratory showing that the plastic bar supports and spacers meet all the requirements specified herein.~~

~~All plastic rebar supports and spacers shall have a maximum water absorption of 0.5% at 7 days, as per ASTM D 570.~~

*Provide each individual bar support and spacer with an identification number unique to the particular model permanently marked on the surface as included in the Qualified Products List.*

~~Plastic bar supports and spacers made of recycled plastic products must meet the additional requirements of Section 972.~~

*Manufacturers seeking evaluation of products for inclusion on the Qualified Products List must submit an application in accordance with Section 66-1 and include certified test reports from an independent laboratory showing that the plastic bar supports and spacers meet all the requirements specified herein.*

**REINFORCING STEEL– SUPPORTS.**

(REV 1-4-11)SUBARTICLE 415-5.10.1 (Pages 436 – 437) is deleted and the following substituted:

**415-5.10.1 Supports:**

(a) Bottom Mats: In general, support the bottom mats of steel by one row of slab bolsters placed 6 inches from the edge of the slab and by two rows down each panel between beams. In general, bottom mat slab bolsters may not have rails in contact with removable or stay-in-place forms; however, if the environmental classification is slightly aggressive, bolster rails may be in contact with stay-in-place forms if in compliance with 415-5.13.2 and 415-5.13.3. Do not allow the spacing between rows to exceed 4 feet, measured center to center.

As an exception, when deemed satisfactory by the Engineer, the Contractor may use concrete blocks in lieu of slab bolsters. Use blocks 2 by 2 inches by clearance dimensions. Space concrete blocks 4 feet on center as a maximum. If at any time, however, the Engineer judges that the concrete blocks do not provide the proper support, he may require using slab bolsters.

(b) Top Mats: Support the top mats of steel by either continuous high chairs or individual high chairs. Support continuous high chairs along both sides of each beam and approximately 6 inches back from the edge of the beam. Place the outside row of high chairs 6 inches from the edge of the slab. If using individual high chairs, space them transversely, as specified for the continuous high chair, and do not allow the longitudinal spacing to be greater than 4 feet.

As an alternate to the above, on prestress beam construction, the Contractor may support the top mat of steel on the shear connectors bent to the proper elevation with one line of high chairs centered between the beams.

(c) Truss Bars: Support truss bars at each end of the top bends by continuous high chairs or by individual high chairs spaced longitudinally at not more than 4 feet.

SUBARTICLE 415-5.13(of the Supplemental Specifications) is deleted and the following substituted

**415-5.13 Bar Supports:**

**415-5.13.1 General:** Provide reinforcing steel bar supports manufactured in accordance with all requirements of the CRSI Manual of Standard Practice. Use bar supports of adequate strength to withstand a 300 pound concentrated load without permanent deformation or breakage, with the deformation 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 do not move during concrete placing operations. To prevent movement, tie supports to the reinforcing steel.

When using bar supports on corrugated metal stay-in-place forms, use supports specifically designed for the form being used.

For structural elements located in extremely aggressive environments, do not use metal bar supports in contact with forms or floor surfaces to support reinforcing steel.

**415-5.13.2 Metal Bar Supports:** For metal bar supports in contact with steel stay-in-place forms and metal bar supports in contact with boundary surfaces of concrete to be cast, provide supports constructed with molded plastic legs or plastic protected steel legs or bolster rails. Do not allow any portion of the bar support other than the molded plastic leg or plastic protected portion of the steel leg or bolster rail to be closer than 1/2 inch from the boundary surface of concrete to be cast.

Certify that all metal bar supports meet the following requirements:

(1) That they are manufactured from cold drawn steel wire in accordance with the wire sizes and geometrical dimensions shown in the CRSI Manual of Standard Practice, Chapter 3, Table II.

(2) That the plastic used for protection of the steel legs or bolster rails has a thickness of 3/32 inch or greater at points of contact with the form work.

Provide plastic protection by a dipping operation, by adding premolded plastic tips to the legs of the support or by molding plastic to the top wire of the support. Ensure that the plastic material used for protection of steel legs does not chip, crack, deform, or peel under ordinary job conditions. Provide molded plastic legs that have sufficient strength to carry the weight of the supported reinforcing steel in its required position without deformation and relaxation under job conditions.

**415-5.13.3 Plastic Bar Supports and Spacers:** Use non-stackable bar supports and spacers comprised of either reinforced or non-reinforced virgin or recycled plastic. Bar supports shall be able to meet the concentrated load requirements of 415-5.13.1 within a working temperature range of 20 to 150°F. Spacers shall be able to provide sufficient strength to support reinforcing steel in the required position without deformation and relaxation under job conditions. For drilled shafts, use wheel spacers with a smooth perimeter surface.

Provide protection from sunlight until placed in the form and mold in a configuration which does not restrict concrete flow and consolidation. Do not use bolster rails in direct contact with concrete surfaces.

All plastic bar supports and spacers shall have a maximum water absorption of 0.5% at 7 days as per ASTM D 570. Plastic bar supports and spacers made of recycled plastic products must meet the additional requirements of Section 972.

Provide to the Engineer independent lab test data and certification that the plastic spacers meet the requirements specified herein.

Use plastic bar supports listed on the Department's Qualified Products List. Provide each individual bar support with an identification number unique to the particular model permanently marked on the surface as included in the Qualified Products List. Manufacturers seeking evaluation of products for inclusion on the

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All Jobs

Qualified Products List must submit an application in accordance with Section 6 and include certified test reports from an independent laboratory showing that the plastic bar supports meet all the requirements specified herein.