Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

November 17, 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.**

Dear Ms. Gourdine:

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

These changes were proposed by Steven Plotkin to delete the provision that prohibits the use of rebar bolster rails on stay-in-place forms and prohibits the use of metal bolsters and chairs in contact with stay-in-place forms when the environmental classification is extremely aggressive and the forms are not more than 12’ above mean high water.

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: Calvin Johnson, Chief Civil Litigation
Florida Transportation Builders' Assoc.
State Construction Engineer

REINFORCING STEEL.
(REV *11*~~8~~-17-11)

SUBARTICLE 415-5.10.1 (of the Supplemental Specification) 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, b~~*B*ottom mat slab bolsters may not have rails in contact with removable ~~or stay-in-place~~ forms, *except when the environmental classification is slightly aggressive* ~~*in which case, metal bolster rails may be in contact with removable forms if in compliance with*~~*and the requirements of 415-5.13.2 are satisfied. Molded plastic rails may not be in contact with removable 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 use metal chairs and bolsters on stay-in-place forms when the form bottom elevation is 12 feet or less above mean high water and the environmental classification is extremely aggressive*. 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 Specification) 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 *removable* 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 *removable forms*~~boundary surfaces of~~ *for* concrete to be cast, provide supports constructed with molded plastic legs or plastic protected *metal*~~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 *metal*~~steel~~ leg or bolster rail to be closer than 1/2 inch from the *removable form surface*~~boundary surface of~~ *for* 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 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.

REINFORCING STEEL.
(REV 11-17-11)

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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. Bottom mat slab bolsters may not have rails in contact with removable forms, except when the environmental classification is slightly aggressive and the requirements of 415-5.13.2 are satisfied. Molded plastic rails may not be in contact with removable forms. Do not use metal chairs and bolsters on stay-in-place forms when the form bottom elevation is 12 feet or less above mean high water and the environmental classification is extremely aggressive. 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.

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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 removable forms or floor surfaces to support reinforcing steel.

415-5.13.2 Metal Bar Supports: For metal bar supports in contact with removable forms for concrete to be cast, provide supports constructed with molded plastic legs or plastic protected metal 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 metal leg or bolster rail to be closer than 1/2 inch from the removable form surface for 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 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.