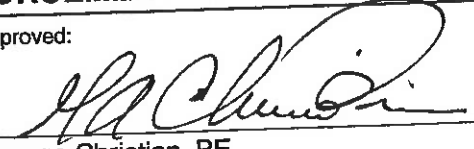


SUPERSEDED BY EB 15-031 EFFECTIVE 9/28/15		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 09-032
Title: SECTION 709 – STAINLESS STEEL REINFORCEMENT			
Distribution: ☒ Manufacturers (18) ☒ Surveyors (33) ☒ Main Office (30) ☒ Consultants (34) ☒ Local Govt. (31) ☒ Contractors (39) ☒ Regions/Agencies (32) _____ ()		Approved:  George Christian, PE, Deputy Chief Engineer (Structures) 10/12/09 Date	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of May 6, 2010.
- This EI does not supersede any other issuance.
- The revisions issued with this EI will be incorporated into the next update of the Standard Specifications.

PURPOSE: The purpose of this EI is to issue revisions to Standard Specifications §556 Reinforcing Steel for Concrete Structures, §709-10 Mechanical Connectors for Reinforcing Bar Splices, §709-13 Stainless Steel Bar Reinforcement, and replace §709-12 Stainless-Clad Bar Reinforcement with a special specification.

TECHNICAL INFORMATION:

- §709-10 and §709-13 are being revised to permit additional alloys of stainless steel.
- §709-12 is being eliminated and replaced with a special specification.
- §556 is being updated with handling requirements for stainless steel.
- The material cost of stainless steel reinforcement is expected to be reduced due to these changes.

IMPLEMENTATION:

- Main Office Design Quality Assurance Bureau will insert the standard specification shelf notes into contract proposals beginning with projects submitted for the letting of May 6, 2010.
- Actions by Designers: For projects scheduled to be let before May 6, 2010 which contain items for stainless steel reinforcement, incorporate changes issued by this EI into the PS&Es. When required, initiate changes to the contract documents by amendment. The attached standard specification shelf note must be submitted to the PS&E Unit with the PS&E transmittal and/or amendment request memo for inclusion in contract proposals.
- For projects scheduled to be let before May 6, 2010 which contain stainless steel clad reinforcement, use the special specification for stainless clad reinforcement. When required, initiate changes to the contract documents by amendment. The attached standard specification shelf note must be submitted to the PS&E Unit with the PS&E transmittal and/or amendment request memo for inclusion in contract proposals.

TRANSMITTED MATERIALS:

Standard Specification Shelf notes for §556 Reinforcing Steel for Concrete Structures, §709-10 Mechanical Connectors for Reinforcing Bar Splices, §709-13 Stainless Steel Bar Reinforcement, and Special Specification 556.02040116 Stainless-Clad Bar Reinforcement. Both US customary and metric shelf notes and special specifications are attached.

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BACKGROUND: The current specifications for stainless steel bar list only two acceptable alloys of stainless steel from which bar can be made. The price of stainless steel in recent years has increased due to the dramatic increases in the prices of alloying materials that give it its corrosion resistance. However, there are other alloys of stainless steel that will provide good performance that have different chemical compositions, some of which cost less. The performance is assured by an ASTM test that was not available when the original stainless reinforcement specification was written.

Stainless Clad Bar Reinforcement is being removed from the Standard Specifications because it is not domestically produced. The special specification is being written to keep it available for use should there be applications for it. The special specification will require PIN approval.

CONTACT: Direct questions regarding this issuance to Duane Carpenter of the Office of Structures at (518) 457-5715 or via e-mail at dcarpenter@dot.state.ny.us.

Make the following changes to Standard Specifications Construction and Materials of May 4, 2006.

Page 347, **Replace** 556-1 with the following:

556-1 DESCRIPTION. The work will consist of furnishing and placing reinforcing steel for concrete structures, or stud shear connectors, in accordance with the contract documents, and in a manner satisfactory to the Engineer.

Reinforcing steel for concrete structures may be uncoated, epoxy-coated, galvanized, or stainless steel, as indicated in the contract documents.

Page 348, **Remove** from 556-2 Materials:
Stainless-Steel-Clad Bar Reinforcement 709-12

Page 348, **Replace** the second paragraph of 556-2.01 with the following:
When forms are to be removed in their entirety, uncoated steel chairs equipped with snug-fitting, high-density, polyethylene tips which provide 6 mm clearance between the metal and any exposed surface may be used, except that uncoated steel chairs shall not be used in contact with stainless steel.

Page 348, **Replace** the title of 556-3.01 B with the following:
B. Handling and Storage

Page 348, under 556-3.01 B **Add** the following:
3. Stainless Steel Bar Reinforcement. Stainless Steel Bar Reinforcement shall be stored separately and shall be handled using tools that are not used on carbon steel.

Page 350, **Remove** 556-3.03 A.4. Stainless-Steel-Clad Bar Reinforcement.
Renumber Section 5. *Stainless Steel Bar Reinforcement* as Section 4.

Page 350, **Add** the following to the end of the second paragraph of 556-3.03.C:
Mechanical connectors for stainless steel shall be stainless. Welding stainless steel will not be permitted unless the proposed welding technique is submitted to and approved by the DCES.

Page 350, **Add** the following to the end of the second paragraph of 556-3.03.D:
Stainless steel reinforcement shall not be in direct contact with uncoated steel reinforcement, nor with galvanized reinforcement. This does not apply to stainless steel wires and ties.

Page 352, under the Payment Section, **Remove:**
556.0204 Stainless-Steel-Clad Bar Reinforcement for Structures Kilogram

Page 808, under §709-10 – Mechanical Connectors for Reinforcing Bar Splices, General, **Replace** the third paragraph with the following:
“Mechanical connectors for Stainless Steel Reinforcement shall be fabricated from any alloy of stainless steel that is on the Approved List for 709-13. Connectors must be made from the same alloy of stainless steel as the bars they are connecting.”

Page 808, under §709-10 – Mechanical Connectors for Reinforcing Bar Splices,

Replace the "Basis of Acceptance" paragraph with the following:

BASIS OF ACCEPTANCE. Mechanical Connectors for Reinforcing Bar Splices will be accepted on the basis of the manufacturer's name and location appearing on the Department's Approved List and a material certification that states the product conforms to this specification or, at the discretion of the Department, based on sampling and testing in accordance with the procedural directives of the Materials Bureau. *Buy America requirements apply.*

Page 809, Replace §709-12 and §709-13 with the following:

709-12 VACANT

709-13 STAINLESS STEEL BAR REINFORCEMENT

SCOPE. This specification covers the material requirements for stainless steel reinforcing bars used in portland cement concrete.

MATERIAL REQUIREMENTS

Material Properties. The stainless steel shall meet the requirements of ASTM A955M and its designated grade, either 420 or 520. Alloys of stainless steel which meet all the testing and process requirements of ASTM A955M but are not listed in ASTM A955M Table 2 are acceptable if they meet the chemical requirements of ASTM A276, are either austenitic or austenitic-ferritic, and have a UNS designation beginning with either 'S2' or 'S3'.

- A) Deformed Bar Reinforcement - Steel reinforcement shall be deformed billet stainless steel bars or deformed billet stainless steel coils meeting the requirements of ASTM A955 and its designated grade, either 420 or 520.
- B) Plain Rounds - Reinforcement when specified for dowels, structural ties, and supports shall be plain billet stainless steel bars or coils meeting the requirements of ASTM A955 and its designated grade, either 420 or 520.
- C) Spirals - Spirals shall be plain or deformed stainless steel bars in coils or cut lengths meeting the requirements ASTM A955 and its designated grade, either 420 or 520.

BASIS OF ACCEPTANCE. Stainless steel bar reinforcement will be accepted on the basis of the manufacturer's name and location and the fabricator's name and location (where required) appearing on the Department's Approved List and a material certification that states the product conforms to this specification or, at the discretion of the Department, based on sampling and testing in accordance with the procedural directives of the Materials Bureau. *Buy America requirements apply.*

ITEM 556.02040116 - STAINLESS STEEL CLAD REINFORCEMENT

DESCRIPTION

This work shall consist of furnishing and installing Stainless Steel Clad Reinforcement in accordance with the contract documents and as directed by the Engineer.

MATERIALS

The stainless clad reinforcement shall conform to AASHTO MP 13M. Acceptance will be based on the manufacturer's certification that the product conforms to this specification, or at the discretion of the Department based on sampling and testing in accordance with the procedural directives of the Materials Bureau. The fabricator of the reinforcement must meet the requirements established by the Materials Bureau to qualify for the Approved List for stainless steel bar fabricators. *Buy America requirements apply.*

CONSTRUCTION DETAILS

Section 556-3 of the Standard Specifications shall apply, including those parts pertaining to stainless steel reinforcement, and the following:

Stainless steel clad bar shall not be flame cut, welded, or connected with mechanical connectors.

When handling stainless steel clad bars, care shall be exercised to avoid damage to the bundles.

Equipment for handling stainless steel clad bar shall have protected contact areas.

Stainless steel clad bar shall be stored off the ground on protective cribbing, and timbers placed between the bundles when stacking is necessary. Space supports sufficiently close to prevent sags in the bundles.

Stainless steel clad bar shall be stored separately from regular steel.

Cut ends of stainless clad bars shall be epoxied and capped according to manufacturer's recommendations with either stainless steel caps or plastic caps. Caps shall be sealed to prevent the intrusion of moisture. In-place stainless steel clad bars shall be inspected for damage prior to placing concrete. Bars which exhibit active corrosion shall be evaluated. Bars which have damage exceeding two percent of the surface area in any 1 foot length shall be replaced.

METHOD OF MEASUREMENT

This work will be measured as the number of pounds of Stainless Steel Clad Reinforcement satisfactorily furnished and installed.

BASIS OF PAYMENT

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

Make the following changes to Standard Specifications Construction and Materials of May 1, 2008.

Page 352, **Replace** 556-1 DESCRIPTION with the following:

556-1 DESCRIPTION. The work will consist of furnishing and placing reinforcing steel for concrete structures, or stud shear connectors, in accordance with the contract documents, and in a manner satisfactory to the Engineer.

Reinforcing steel for concrete structures may be uncoated, epoxy-coated, galvanized, or stainless steel, as indicated in the contract documents.

Page 352, **Remove** from 556-2 Materials:
Stainless-Steel-Clad Bar Reinforcement 709-12

Page 352, **Replace** the second paragraph of 556-2.01 with:

When forms are to be removed in their entirety, uncoated steel chairs equipped with snug-fitting, high-density, polyethylene tips which provide 1/4" clearance between the metal and any exposed surface may be used, except that uncoated steel chairs shall not be used in contact with stainless steel.

Page 352, **Replace** the title of 556-3.01 B with the following:
B. Handling and Storage

Page 353, **Add** the following under Section 556-3.01 B:

3. Stainless Steel Bar Reinforcement. Stainless Steel Bar Reinforcement shall be stored separately and shall be handled using tools that are not used on carbon steel.

Page 354, **Remove** 556-3.03 A.4. Stainless-Steel-Clad Bar Reinforcement.
Renumber Section 5. *Stainless Steel Bar Reinforcement* as Section 4.

Page 355, **Add** the following to the end of the second paragraph of 556-3.03.C:
Mechanical connectors for stainless steel shall be stainless. Welding stainless steel will not be permitted unless the proposed welding technique is submitted to and approved by the DCES.

Page 355, **Add** the following to the end of the second paragraph of 556-3.03.D:
Stainless steel reinforcement shall not be in direct contact with uncoated steel reinforcement, nor with galvanized reinforcement. This does not apply to stainless steel wires and ties.

Page 356, Payment Section, **Remove:**
556.0204 Stainless-Steel-Clad Bar Reinforcement for Structures Pound

Page 849, §709-10 – Mechanical Connectors for Reinforcing Bar Splices, General,
Replace the third paragraph with the following:

"Mechanical connectors for Stainless Steel Reinforcement shall be fabricated from any alloy of stainless steel that is on the Approved List for 709-13. Connectors must be made from the same alloy of stainless steel as the bars they are connecting."

Page 849, §709-10 **Replace** the "Basis of Acceptance" paragraph with the following:

BASIS OF ACCEPTANCE. Mechanical connectors for Reinforcing Bar Splices will be accepted on the basis of the manufacturer's name and location appearing on the Department's Approved List and a material certification that states the product conforms to this specification or, at the discretion of the Department, based on sampling and testing in accordance with the procedural directives of the Materials Bureau. *Buy America requirements apply.*

Page 850 - 851, Replace §709-12 and §709-13 with the following:

709-12 VACANT

709-13 STAINLESS STEEL BAR REINFORCEMENT

SCOPE. This specification covers the material requirements for stainless steel reinforcing bars used in portland cement concrete.

MATERIAL REQUIREMENTS

Material Properties. The stainless steel shall meet the requirements of ASTM A955 and its designated grade, either 60 or 75. Alloys of stainless steel which meet all the testing and process requirements of ASTM A955 but are not listed in ASTM A955 Table 2 are acceptable if they meet the chemical requirements of ASTM A276, are either austenitic or austenitic-ferritic, and have a UNS designation beginning with either 'S2' or 'S3'.

- A) Deformed Bar Reinforcement - Steel reinforcement shall be deformed billet stainless steel bars or deformed billet stainless steel coils meeting the requirements of ASTM A955 and its designated grade, either 60 or 75.
- B) Plain Rounds - Reinforcement when specified for dowels, structural ties, and supports shall be plain billet stainless steel bars or coils meeting the requirements of ASTM A955 and its designated grade, either 60 or 75.
- C) Spirals - Spirals shall be plain or deformed stainless steel bars in coils or cut lengths meeting the requirements ASTM A955 and its designated grade, either 60 or 75.

BASIS OF ACCEPTANCE. Stainless steel bar reinforcement will be accepted on the basis of the manufacturer's name and location and the fabricator's name and location (where required) appearing on the Department's Approved List and a material certification that states the product conforms to this specification or, at the discretion of the Department, based on sampling and testing in accordance with the procedural directives of the Materials Bureau. *Buy America requirements apply.*

ITEM 556.020401 16 - STAINLESS STEEL CLAD REINFORCEMENT

DESCRIPTION

This work shall consist of furnishing and installing Stainless Steel Clad Reinforcement in accordance with the contract documents and as directed by the Engineer.

MATERIALS

The stainless clad reinforcement shall conform to AASHTO MP 13M. Acceptance will be based on the manufacturer's certification that the product conforms to this specification, or at the discretion of the Department based on sampling and testing in accordance with the procedural directives of the Materials Bureau. The fabricator of the reinforcement must meet the requirements established by the Materials Bureau to qualify for the Approved List for stainless steel bar fabricators. *Buy America requirements apply.*

CONSTRUCTION DETAILS

Section 556-3 of the Standard Specifications shall apply, including those parts pertaining to stainless steel reinforcement, and the following:

Stainless steel clad bar shall not be flame cut, welded, or connected with mechanical connectors.

When handling stainless steel clad bars, care shall be exercised to avoid damage to the bundles.

Equipment for handling stainless steel clad bar shall have protected contact areas.

Stainless steel clad bar shall be stored off the ground on protective cribbing, and timbers placed between the bundles when stacking is necessary. Space supports sufficiently close to prevent sags in the bundles.

Stainless steel clad bar shall be stored separately from regular steel.

Cut ends of stainless clad bars shall be epoxied and capped according to manufacturer's recommendations with either stainless steel caps or plastic caps. Caps shall be sealed to prevent the intrusion of moisture. In-place stainless steel clad bars shall be inspected for damage prior to placing concrete. Bars which exhibit active corrosion shall be evaluated.

Bars which exhibit active corrosion shall be evaluated. Bars which have damage exceeding two percent of the surface area in any 300 mm length shall be replaced.

METHOD OF MEASUREMENT

This work will be measured as the number of kilograms of Stainless Steel Clad Reinforcement satisfactorily furnished and installed.

BASIS OF PAYMENT

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.