ORIGINATION FORM
Proposed Revisions to the Specifications

(Please provide all information - incomplete forms will be returned)

Date: 11/03/2020

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Office: State Materials Office (SMC

Specification Section: 967

Article/Subarticle: 967-2 through 967-3

****Will the proposed revision require changes to:**

Publication	Yes	No	Office Staff Contacted and date contacted
Standard Plans Index	○	◉	Rick Jenkins 11/9/20
Traffic Engineering Manual	○	◉	Javier Ponce 11/9/20
FDOT Design Manual	○	◉	Bobby Bull 11/9/20
Construction Project Administration Manual	○	◉	Scott Arnold 11/9/20
Basis of Estimate/Pay Items	○	◉	Melissa Hollis 11/9/20
Structures Design Guidelines	○	◉	Ben Goldsberry 11/9/20
Approved Product List	○	◉	Karen Byram 11/9/20
Materials Manual	○	◉	Tim Counts 11/9/20

**This section must be completed prior to processing proposed revisions.

Will this revision necessitate any of the following:

Design Bulletin ☐ **Construction Bulletin** ☐ **Estimates Bulletin** ☐ **Materials Bulletin** ☐

Are all references to external publications current? **Yes** ◉ **No** ○

If not, what references need to be updated? (Please include changes in the redline document.)

Why does the existing language need to be changed?

The language in the specifications relied on the contractor and manufaturer to deliever material that met the AASHTO and ASTM Specifications. However, upon the launch of the MAC system, it was clear not all material incorporated into the job met AASHTO requirements or could be verified to be from an approved manufacturer. The changes attempt to eliminate

Summary of the changes:

Put the material requirements for guardrail into a table format for easy and quick reference by the manufacturer and Material reviewers. Movd APL items to the front of the specification so they are not hidden behind table. Clariified that all guardrail needs to be stamped, meet AASHTO and Buy America requirements.

Are these changes applicable to all Department jobs? **Yes** ◉ **No** ○

If not, what are the restrictions?

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RON DESANTIS
GOVERNOR

KEVIN J. THIBAULT, P.E
SECRETARY

M E M O R A N D U M

DATE: December 24, 2020

TO: Specification Review Distribution List

FROM: Daniel Strickland, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **9670000 Components for Guardrail**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Tim McCullough from the State Materials Office to eliminate confusion on the order of delivery and ability to verify material prior to installation.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or online at http://fdotewp1.dot.state.fl.us/programmanagement/development/industryreview.aspx . Comments received after **January 21, 2021,** may not be considered. Your input is encouraged.

DS/rf

Attachment

COMPONENTS FOR GUARDRAIL
(REV 12-23-20)

SECTION 967 is deleted and the following substituted:

967-1 General~~Description~~.

This Section covers the material and fabrication requirements for guardrail components. All timber and steel components supplied under this Specification shall be from producers currently on the Department's Production Facility Listing. Producers seeking inclusion on the Department's Production Facility Listing must meet the requirements of Section 105.

967-2 Timber Posts and Timber Offset Blocks~~Materials~~.

~~All timber and steel components supplied under this Specification shall be from producers currently on the Department's Production Facility Listing. Producers seeking inclusion on the Department's Production Facility Listing must meet the requirements of Section 105.~~

~~**967-2.1 Timber:**~~ Timber products must have a minimum stress grade of 1200 psi and meet the material requirements of Section 954. Timber is to be dressed on four sides (S4S) and treated in accordance with the post requirements in Section 955. Timber posts and offset blocks shall be shaped and drilled prior to wood treatment. Posts shall not vary more than 1 inch and offset blocks shall not vary more than 0.25 inches from the specified dimensions shown in the Standard Plans.

967-3 Steel Components

~~**967-2.2 Steel:** Steel guardrail materials must meet the component fabrication requirements in 967-3.~~

Steel materials must meet the requirements of Table 967-1 below.

Production facilities must submit certified mill analyses to the Department for review and approval. Certified mill analyses must be signed by a quality control representative, describe each lot of components, and show compliance with Table 967-1.

All steel components must be melted and manufactured in the United States. The certified mill analysis must show that the included material meets the Buy America, Source of Supply-Steel requirements in Section 6.

Where specified, components must be welded in accordance with the American Welding Society Structural Welding Code ANSI/AWS D1.1 using material conforming to E60XX. Nondestructive testing of welds is not required.

Table 967-1
Material Requirements for Steel Guardrail Components

Product	Standard	Grade / Type	Style	Reportable Properties
Steel Panels	AASHTO M-180	Type 2 Class A (12 Ga.) Class B (10 Ga.)	W-Beam	Heat, Yield, Tensile, Elongation, Class, Type
			Thrie-Beam	
			Thrie-Beam Transition	

Table 967-1 Material Requirements for Steel Guardrail Components				
End Pieces	AASHTO M-180	Type 2 Class A (12 Ga.) Class B (10 Ga.)	All	Yield, Tensile, Class, Type
Steel Posts & Offset Blocks	ASTM A36	36	All	Killed, Yield, Tensile, Elongation
	ASTM A992	50	All	
Rub Rail	AASHTO M-180	Type 2 Class A (12 Ga.) Class B (10 Ga.)	All	Heat, Yield, Tensile, Elongation, Class, Type
Pipe Rail	ASTM A53	A, B	E, S	Grade, Finish
Steel Tube Foundations	ASTM A500	B	Round, Shaped	Composition, Yield, Tensile, Elongation
Brackets & Fixtures	ASTM A36	36	All	Killed, Yield, Tensile, Elongation
Bolts	ASTM A307	A, B	Button-Head Hex Heavy-Hex	Size, Composition, Hardness, Tensile
Nuts	ASTM A563	A, B, C, C3, D, DH, DH3	Heavy Hex	Size, Composition, Proof Load, Hardness
Washers	ASTM F436	1, 3	Circular, Beveled, Clipped, Extra Thick	Size, Hardness

~~**967-3 Fabrication.**~~

~~**967-3.1 Posts:** Posts shall not vary more than 1 inch from the specified length shown in the Standard Plans.~~

~~**967-3.1.1 Timber Posts:** Posts shall be shaped and drilled prior to wood treatment.~~

967-3.1~~.2~~ Steel Posts, Special Steel Posts, Steel Offset Blocks, and Rub Rail: ~~Posts must conform to the requirements of ASTM A6, ASTM A36 or ASTM A992.~~ Posts must be fabricated from rolled sections with cross-sections defined in the American Institute of Steel Construction (AISC) Manual of Steel Construction. Where applicable, p~~P~~osts and plates must be drilled, ~~or~~ punched and welded prior to galvanizing. ~~in accordance with ASTM A123.~~ Galvanize in accordance with ASTM B6, "Prime Western Grade" with a minimum 98.5% zinc composition. Posts shall not vary more than 1 inch and offset blocks shall not vary more than 0.25 inches from the specified dimensions shown in the Standard Plans.

~~**967-3.2 Special Steel Posts:** Posts and plate materials must meet the requirements of ASTM A6 and ASTM A36. Posts and plates must be drilled, punched, and welded prior to galvanizing in accordance with ASTM A123.~~

~~**967-3.3 Offset Blocks:** Offset blocks must not vary more than 0.25 inch from the specified dimensions in the Standard Plans.~~

~~**967-3.3.1 Steel Offset Blocks:** Blocks must meet the requirements for steel posts.~~

~~**967-3.3.2 Timber Offset Blocks:** Blocks must meet the requirements for timber posts.~~

~~**967-3.3.3 Composite Offset Blocks:** Composite offset blocks must be listed on the APL. Manufacturers seeking evaluation of their product for approval must submit an application in accordance with Section 6 and include the following:~~

~~1. Test reports from an independent laboratory showing the product meets all crash test requirements of MASH.~~

~~2. Test reports from an independent laboratory showing the composite material meets the following physical requirements:~~

~~Table 967-1~~		
~~Composite Block~~	~~Test Method~~	~~Requirement~~
~~Durometer Hardness~~	~~ASTM D2240 Shore D~~	~~Minimum 50~~
~~Durometer Hardness after UV exposure~~	~~ASTM D5870~~	~~< 15 points change from initial after exposure per ASTM D4329, 1000 hours, cycle C, type UVB-313 lamps~~

967-3.24 Steel Panels and End Pieces: W-beam, thrie-beam, and thrie-beam transitions~~,~~ must meet the requirements of Table 967-1 for steel panels. T~~t~~erminal connectors, end shoes, end units, and all other compatible components~~panels~~ must meet the requirements of Table 967-1 for end pieces.~~AASHTO M180 (for beams and rails), for either Class shown.~~

Galvanize in accordance with ASTM B6, "Prime Western Grade" with a minimum 98.5% zinc composition. Type II zinc coating is~~will be~~ required on all panels.

All w-beam, thrie-beam, and thrie-beam transition panels must be marked by a pressed stamp showing production lot information (e.g. AASHTO-approved brand registration, lot number, production date, operator, etc.). Upon approval of the certified mill analysis by the Department, each lot will be stored in the Department's database with a reference to the stamped information.

967-3.35 Bolts, Nuts, Washers, and Steel Plates: ~~Hex and button head bolts, including nuts, washers, and other accessories, must meet the material requirements of AASHTO M180, except bolts must be galvanized~~ Galvanize in accordance with ASTM A153.

~~**967-3.6 Barrier Delineators:** Barrier delineators must meet the requirements of Sections 705 and 993 and be listed on the APL.~~

~~**967-3.7 End Delineators:** Retroreflective sheeting is to be yellow, Type IV or greater in accordance with Section 994 and listed on the APL.~~

~~**967-3.8 Steel Plates:** Steel plates must meet the requirements of ASTM A36. Drill holes prior to galvanizing in accordance with ASTM A123.~~

967-3.49 Pipe Rail: Pipe is to be Schedule 40. ~~in accordance with ASTM A53 and,~~ I~~i~~f applicable, weld~~ed~~ prior to galvanizing.

~~**967-3.10 Rub Rail:** Rail materials must meet the requirements of 967-3.4.~~

967-3.5~~11~~ Steel Tube Foundations: ~~Steel tube foundations must meet the requirements of ASTM A500, Grade B.~~ Galvanize steel tube foundations, brackets, and fixtures a~~A~~fter all punching, drilling, stamping, and welding is complete.~~, steel tube foundations are to be galvanized in accordance with ASTM A123~~ Galvanize in accordance with ASTM A153.

~~Brackets and fixtures must meet the requirements of ASTM A36. Foundations must be drilled or punched prior to galvanizing in accordance with ASTM A123.~~

967-4 Barrier Delineators.

Barrier delineators must meet the requirements of Sections 705 and 993 and be listed on the APL.

967-5 End Delineators.

Retroreflective sheeting is to be yellow, Type IV or greater in accordance with Section 994 and listed on the APL.

~~**967-3.12 Approach Terminal Assemblies:** Approach terminals must be listed on the APL.~~

~~Manufacturers seeking evaluation of their product for approval must submit:~~

~~1. A completed application in accordance with Section 6, including product drawings meeting the dimensions of Standard Plans, Index 536-001 and that is signed and sealed by a registered Florida P.E.~~

~~2. Independent test reports indicating that the product meets all crash test requirements of MASH.~~

967-6 Approved Products List.

967-6.1 Approach Terminal Assemblies: Approach terminals must be listed on the APL. Manufacturers seeking evaluation of their product for approval must submit:

1. A completed application in accordance with Section 6, including product drawings meeting the dimensions of Standard Plans, Index 536-001 and that is signed and sealed by a registered Florida P.E.

2. Independent test reports indicating that the product meets all crash test requirements of MASH.

967-6.2 Composite Offset Blocks: Composite offset blocks must be listed on the APL. Manufacturers seeking evaluation of their product for approval must submit an application in accordance with Section 6 and include the following:

1. Test reports from an independent laboratory showing the product meets all crash test requirements of MASH.

2. Test reports from an independent laboratory showing the composite material meets the following physical requirements:

Table 967-2

Composite Block	Test Method	Requirement
Durometer Hardness	ASTM D2240 Shore D	Minimum 50

Table 967-2		
Composite Block	Test Method	Requirement
Durometer Hardness after UV exposure	ASTM D5870	< 15 points change from initial after exposure per ASTM D4329, 1000 hours, cycle C, type UVB-313 lamps