

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: September 12, 2019

Special Provision No. 18-0666

EFFECTIVE DATE: January 1, 2020.

SUBJECT: Guardrail for Culverts.

Alabama Standard Specifications, 2018 Edition, SECTION 630 shall be revised as follows:

SECTION 630 GUARDRAIL AND BARRIER RAIL

630.01 Description.

This Section shall cover the work of the furnishing and installation of complete sections of steel or aluminum beam guardrail, guardrail end anchor systems, and shaped tube type barrier rail, at the locations shown on the plans or designated and in conformity with the detailed requirements of the plans and these specifications. The plans will designate the Class of guardrail to be used and, in the case of steel rail, also the Type to be used. When it is optional as to the choice of either steel or aluminum, the alternate once selected shall be used throughout the contract. Unless specified otherwise, Class A guardrail will be used for roadways and Class B guardrail will be used for bridges.

630.02 Materials.

Materials shall conform to the requirements set forth in Division 800, Materials. Specific reference is made to Section 864, Guardrail and Barrier Rail Materials, and detail drawings provided in the plans. Material will be accepted by Brand Registration and Guarantee, as provided by AASHTO M 180, and List II-17 of Materials, Sources, and Devices with Special Acceptance Requirements. Spot checks will be made for material delivered to the project. The material may be accepted or rejected based on these tests.

If alternate approved end anchors are shown to be allowed on the plans the Contractor shall obtain a copy of the details from the manufacturer prior to installation. The Contractor shall also obtain a certification from the manufacturer that the end anchors meet the "crashworthy" requirements given in the National Cooperative Highway Research Program (NCHRP) Report 350 **or Manual for Assessing Safety Hardware (MASH), 2016, based upon the project requirements**. The Contractor shall furnish a copy of the details and certification to the Engineer upon request.

630.03 Construction Requirements.

(a) Erection of Posts and End Anchors.

1. General.

The Contractor shall place stakes to mark the location where guardrail is required. The Contractor shall not begin the installation of the guardrail posts until the Engineer has approved the staked location of the guardrail.

2. Posts.

Unless otherwise provided by the plans or proposal, the Contractor may use one of the optional type posts shown on the plans; however, once selected, the same type shall be used throughout the contract. Posts shall be erected in such a manner that they shall be vertical with their top inside edges within 1/4 inch {6mm} of their correct position for both vertical and horizontal line. The posts shall be erected to the dimensions shown on the plans and compacted by tamping, puddling, or as directed, to obtain a rigid installation. Where posts are driven, the tops shall be protected by a suitable driving cap and the adjacent area compacted, if deemed necessary by the Engineer. If raising or other movement of the post is required, the earth shall

be compacted to fill any voids caused by such movement. All posts damaged in any way during erection shall be removed and replaced without additional compensation.

3. End Anchors.

The Contractor shall use one of the Type End Anchors provided by the plans, or directed. The anchor assemblies shall be erected to the dimensions shown on the plans, and the area backfilled with suitable material and compacted as provided in Item 2 above. Posts that are attached to the anchor assembly shall be erected to the requirements for individual posts as provided in Item 2 above.

(b) Erection of Rail.

1. All metal except concrete reinforcement shall be fabricated in the shop. No punching, cutting, burning, or welding shall be done in the field. Holes for special details in exceptional cases may be made in the field when approved, after it has been demonstrated that punching will not result in damage to the surrounding metal.

2. The rail may be erected in any manner resulting in a smooth continuous rail closely conforming to the established line and grade of the surface the rail parallels. The top of the rail shall be constructed to the height designated on the plans.

3. Rail shall be erected so that the bolts at expansion joints shall be located at the centers of the slotted holes. Bolts may be rethreaded after galvanizing if necessary. All bolts, except where otherwise required at expansion joints, shall be drawn tight; however, bolts through expansion joints shall be drawn up as tight as possible without being tight enough to prevent the rail elements from sliding past one another longitudinally. Bolts shall be sufficiently long to extend at least 1/4 of an inch {6 mm} beyond the nuts. Except where required for adjustments, bolts shall not extend more than 1/2 of an inch {13 mm} beyond the nuts. Bolts through variable thickness posts shall be cut off 1/4 of an inch {6 mm} beyond the nuts and burred.

(c) Metal Treatments.

1. General.

All steel elements (posts and rail), including all accessories used in the construction of guardrail and barrier rails shall be galvanized, except when otherwise provided by the plans or proposal. Aluminum elements (posts and rail) and accessories will require no special treatment, except where otherwise noted on the plans or proposal.

2. Steel.

a. Galvanized.

Painting of galvanized steel will not be required except that any damage to galvanizing or any bare areas developed during construction shall be painted with two coats of approved galvanizing repair paint, Section 855, or approved zinc spelter paint. However, should any galvanized metal be required by the plans or proposal to be painted, the surface shall be treated with a wash of 8 ounces {60 g} of copper or zinc sulphate dissolved in one gallon {liter} of water prior to the application of the required paint surface.

b. Not Galvanized.

All metal not galvanized shall be cleaned and painted with one primer coat and two coats of paint, Structural Steel Second and Third Coats (Section 855), unless otherwise provided on the plans or in the proposal.

3. Aluminum.

Aluminum elements of guardrail or barrier rail require no special preservative treatment unless otherwise noted on the plans.

(d) Safety of Traveling Public.

At locations where public traffic is adjacent to the guardrail or barrier rail work, all materials required to complete the work at any one location shall be available before beginning the work at that location.

Posts shall be erected only far enough in advance to permit the construction to progress consistently, uniformly, and continuously. All posts shall have the rail attached to them the same

day that the posts are erected. For installations in which neither end adjoins a fixed object, the installation of the rail shall progress in the same direction as the traffic in the adjacent lane.

The intent of this specification is that each guardrail or barrier rail installation erected under traffic be completed, including end anchors and/or attenuating devices, before nightfall of the day on which work on that installation began. In the event that unforeseen conditions prevent the completion of an installation before nightfall, the Contractor will be required, at his expense, to protect and delineate the uncompleted installation by the use of reflectorized devices or other acceptable means. The minimum requirement for this protection and delineation will be one or more reflectorized drums with a Type B warning light on each drum.

If the existing guardrail or barrier rail is to be removed and reset, replaced, or relocated, then only one installation ahead of the placing operation may be removed. At any site where the rail has been removed and the new installation has not been completed, the Contractor will be required at his expense to protect the site with reflectorized drums, with a Type B warning light on each drum, as shown on the plans or directed by the Engineer.

630.04 Method of Measurement.

Posts will not be measured for payment separately. The length of the beam guardrail or barrier rail constructed and accepted will be measured in linear feet {meters} to the nearest 0.1 foot {0.1 m} from the end of each continuous installation, exclusive of designated anchor assemblies along the centerline of the top of the rail posts for guardrail and of the rail element for barrier rail.

Standard guardrail installations cover one rail element, its supports (post) and accessories. When installations are to cover special installations such as **double-faced** rail (two rail elements) mounted on a single post, a separate pay item will be provided and the special condition so noted in the description of the pay item.

End Anchor Assemblies shall be measured separately in individual unit assemblies, complete in place, including all hardware and accessories to complete the type anchor assembly ordered placed in accordance with plan details.

630.05 Basis of Payment.

(a) Unit Price Coverage.

Accepted guardrail or barrier rail, measured as provided above, will be paid for at the contract unit price bid per linear foot {meter} for Beam Guardrail or Barrier Rail which shall be payment in full for excavating, backfill, disposal of surplus material; for furnishing, transporting, erecting of posts and rail; for all incidental material, bolts, brackets, etc., as shown on the plans; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Accepted guardrail end anchor assemblies, measured as provided above, will be paid for at the contract unit price per each, which shall be full compensation for excavating, backfilling, disposal of surplus materials, for furnishing, erecting the anchor assembly, and all incidental materials necessary to install the assembly, complete in place, as shown on the plans, and for all equipment, tools, labor, and incidentals necessary to complete the work.

Accepted steel beam guardrail for culvert, measured as provided above, will be paid for at the contract unit price bid per linear foot {meter} which shall be payment in full for excavating, backfill, and disposal of surplus material; for furnishing, transporting, and erecting of posts and rail; for saw cutting and epoxy coating the parapet; for all bolts, brackets, bases, and hardware including any required drilling for installation; and for all equipment, tools, labor, and incidentals necessary to complete the work.

(b) Payment will be made under Item No.:

630-A Steel Beam Guardrail, Class _____, Type _____ - per linear foot {meter}

630-B Aluminum Beam Guardrail, Class _____ - per linear foot {meter}

630-C Guardrail End Anchor, Type _____ - per each

630-G Steel Beam Guardrail for Culvert, Class _____, Type _____ Case _____ - per linear foot {meter}