

SECTION 32 17 28

TRAFFIC BARRIERS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Three beam metal guardrail (Type A).
- B. W Beam metal guardrail (Type B).
- C. Transition traffic barrier (Type C).
- D. Concrete barriers with chain link fencing (Type D).

1.02 RELATED SECTIONS

- A. Chain link fencing is specified in Contract Specifications Section 32 31 13, Chain Link Fences and Gates.
- B. Concrete formwork, concrete reinforcement, cast-in-place concrete, portland cement concrete, expansion joints, and curing and finishing of concrete are specified in applicable Sections under BART Facilities Standard (BFS), Contract Specifications, Division 3, Concrete.

1.03 MEASUREMENT AND PAYMENT

- A. General: Measurement and payment for traffic barriers will be either by the lump sum method or by the unit price method as determined by the listing of the bid item for traffic barriers indicated in the Bid Schedule of the Bid Form.
- B. Lump sum: If the Bid Schedule indicates a lump sum for traffic barriers, the lump sum method of measurement and payment will be in accordance with Contract Specifications Section 01 20 00, Price and Payment Procedures, Article 1.03.
- C. Unit Price: If the Bid Schedule indicates a unit price for traffic barriers, the unit price method of measurement and payment will be as follows:
 - 1. Measurement:
 - a. Type A and Type B Traffic Barriers:
 - 1) Traffic barriers will be measured for payment by the linear foot complete in place, measured from end to end of the metal beam rail, including off-sets and end sections.
 - 2) Earthwork, concrete, posts, fasteners, and accessories for the traffic barriers will not be measured separately for payment. All costs in connection therewith will be considered as included in the linear foot measurement of traffic barriers.

b. Type C and D Traffic Barriers:

- 1) Traffic barriers will be measured for payment by the linear foot, constructed complete in place, measured along the centerline of the barrier.
 - 2) Earthwork, reinforcing steel and concrete, dowels, expansion joint filler, chain link fence, and electrical grounding will not be measured separately for payment. All costs in connection therewith will be considered as included in the linear foot measurement of the traffic barriers.
2. Payment: Traffic barriers will be paid for at the indicated Contract unit prices for the computed quantities as determined by the measurement method specified in Article 1.03.C.1, herein.

1.04 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO M180 Standard Specification for Corrugated Sheet Steel Beams for Highway Guard rail
- B. American Society for Testing and Materials (ASTM):
1. ASTM A153/ A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 2. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength
 3. ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts
 4. ASTM A780/ A780M Standard Practice for Repair of Damaged Hot-Dip Galvanized Coatings
 5. ASTM C33/ C33M Standard Specification for Concrete Aggregates
- C. State of California, Department of Transportation (Caltrans) Standard Specifications, latest edition:
1. Section 57 Wood and Plastic Lumber Structures
 2. Section 58 Sound Walls
 3. Section 83 Railings and Barriers

1.05 SUBMITTALS

- A. General: Refer to Contract Specifications Section 01 33 00, Submittal Procedures, and Contract Specifications Section 01 33 23, Shop Drawings, Product Data, and Samples, for submittal requirements and procedures.

- B. Shop Drawings:
1. Submit shop drawings of beam-type traffic barrier and all its components. Refer to AASHTO M180 for example requirements.
 2. Submit shop drawings of concrete barrier and all its components. Include locations of expansion and contraction joints.

PART 2 – PRODUCTS

2.01 TYPE A AND B TRAFFIC BARRIERS

- A. Posts: Grade and species of wood posts shall comply with the requirements in accordance with Caltrans Standard Specifications Section 57, of sizes indicated. Fabricate and pressure treat wood posts in accordance with Caltrans Standard Specifications Section 83-2.02B.
- B. Rail Components: AASHTO M180, Type II, Class A. Provide W Beam or Thrie Beam as indicated. Include beam, transition, end, and buffer sections as required for complete and finished installations in accordance with Caltrans Standard Specifications Section 83-2.02B.
- C. Bolts, Nuts, and Washers: Bolts, nuts, and other fittings shall comply with fabrication and galvanizing requirements in accordance with AASHTO M180 and Caltrans Standard Specifications Section 83-2.02B.
- D. Concrete for Post Foundations: Regular concrete, weighing approximately 145 pounds per cubic foot, with a minimum compressive strength at 28 days of 3,000 psi. Maximum aggregate size: 1-inch (ASTM C33/C33M, Sizes Nos. 56 or 57). Maximum slump: 4 inches.
- E. Fabrication:
1. Metalwork shall be fabricated in the shop and be in compliance with Caltrans Standard Specifications Section 83-2.02B and AASHTO M180. Do not punch, cut, or weld in the field. Where holes are required to be made in the field, drill such holes.
 2. Holes shall be slotted as necessary to provide for expansion and contraction and to facilitate construction of traffic barriers.
 3. Galvanize components of bolted assemblies separately before assembly. When necessary to bend or straighten sections after galvanizing, perform such work without damage to the zinc coating.
 4. Galvanized coatings that are damaged by fabrication or assembly, including punching and drilling of holes, shall be restored by field cold galvanizing or galvanizing repair in accordance with ASTM A780/A780M.

2.02 TYPE C AND D TRAFFIC BARRIERS

- A. Formwork: Comply with applicable requirements of Section 03 11 00, Concrete Forming. Provide forms that will produce “smooth form finish” as specified in Contract Specifications Section 03 35 00, Concrete Finishing.
- B. Reinforcing Steel: Comply with applicable requirements of Contract Specifications Section 03 20 00, Concrete Reinforcing. Dowels shall be smooth steel bars or rods as indicated.
- C. Expansion Joint Filler: Comply with applicable requirements of Contract Specifications Section 03 15 00, Concrete Accessories.
- D. Cast-In-Place Concrete: Comply with applicable requirements of Contract Specifications Section 03 30 00, Cast-In-Place Concrete.
- E. Portland Cement Concrete: Comply with applicable requirements of Contract Specifications Section 03 05 15, Portland Cement Concrete. Provide Class 3000 concrete, unless otherwise indicated.
- F. Concrete Repair, Curing, and Finishing: Repair of surface defects, curing, and finishing of concrete shall conform with applicable requirements of Contract Specifications Section 03 35 00, Concrete Finishing. Provide “smooth form finish.” Curing may be by curing compound.
- G. Chain Link Fence: Comply with applicable requirements of Contract Specifications Section 32 31 13, Chain Link Fences and Gates. Provide Type CL-4WV fence. Provide galvanized pipe sleeves and high-strength non-shrink grout for anchoring fence posts in concrete.

PART 3 – EXECUTION**3.01 INSTALLATION OF TYPE A AND B TRAFFIC BARRIERS**

- A. Posts:
 - 1. Posts shall be installed at equal intervals in compliance with the construction requirements listed in Caltrans Standard Specifications 83-2.02C.
- B. Rail Components:
 - 1. Rail element connections and splices shall conform to the construction requirements listed in Caltrans Standard Specifications Section 83-2.02C.
- C. Repair of Damaged Surfaces: Repair damaged galvanized surfaces in accordance with ASTM A780/A780M as herein before specified under Article 2.01E, “Fabrication,” herein.

3.02 CONSTRUCTION OF TYPE C AND TYPE D TRAFFIC BARRIERS

- A. Provide excavation, sub grade preparation, backfill, and compaction as indicated in Contract Drawings and required to complete the Work in accordance with applicable requirements of Contract Specifications Section 31 00 00, Earthwork.
- B. Provide concrete traffic barriers constructed to configuration indicated in Contract Drawings. Comply with requirements herein specified under Article 2.02.
- C. Install chain link fence and barbed wire as indicated and in accordance with applicable requirements of Contract Specifications Section 32 31 13, Chain Link Fences and Gates.

END OF SECTION 32 17 28