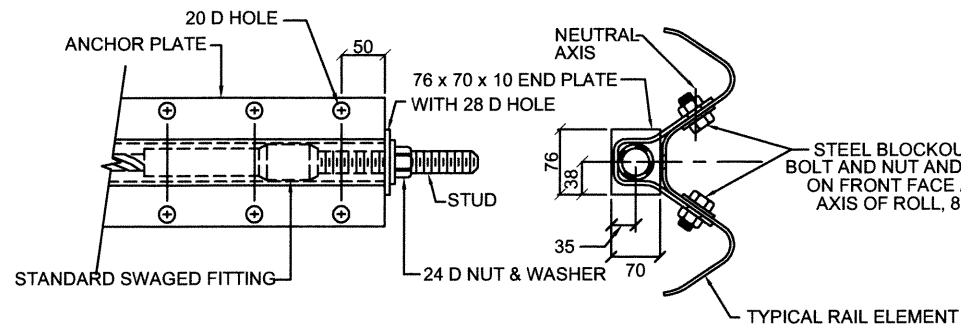
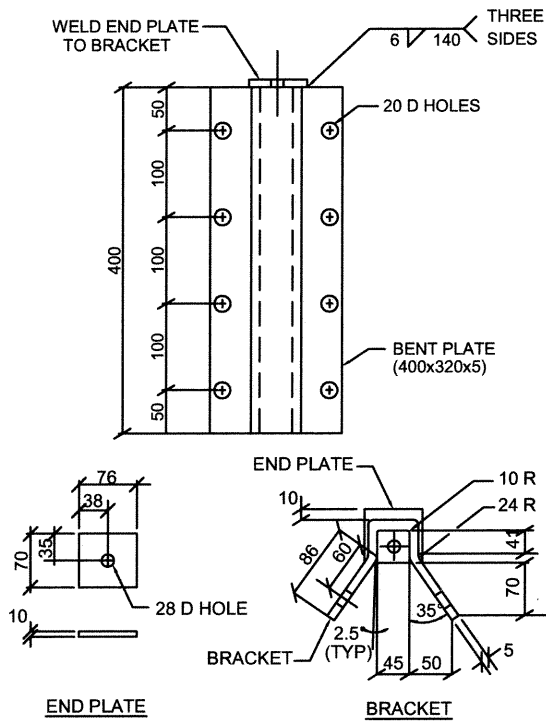


DWG BY: LMARTINEZ 2934

DATE	REVISION	BY
APR. 96	ORIGINAL	
FEB. 97	GENERAL REVISION	
MAR. 96	MELT DELETED	
DATE	REVISION	BY
SEPT. 09	GENERAL REVISION	
DATE	REVISION	BY
DATE	REVISION	BY



ANCHOR PLATE ASSEMBLY DETAILS



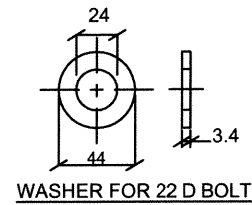
GUARDRAIL ANCHOR BRACKET

I. SPECIFICATIONS

- A. THE CABLE ANCHOR BRACKET AND END PLATE SHALL BE MANUFACTURED FROM AASHTO M270M (ASTM A709M) GRADE 250 STEEL PLATE AND ZINC-COATED ACCORDING TO AASHTO M111 (ASTM A123). NO PUNCHING, DRILLING OR CUTTING IS PERMITTED AFTER THE BRACKET IS ZINC-COATED.
- B. DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE AND ACCEPTED MANUFACTURING PRACTICES.

II. INTENDED USE

- A. THIS BRACKET CAN BE ATTACHED TO W-BEAM USING 8 40-mm BOLTS AND NUTS. THE ANCHOR CABLE FITS THROUGH THE INSIDE OF THE BRACKET AND ATTACHES TO THE END PLATE.



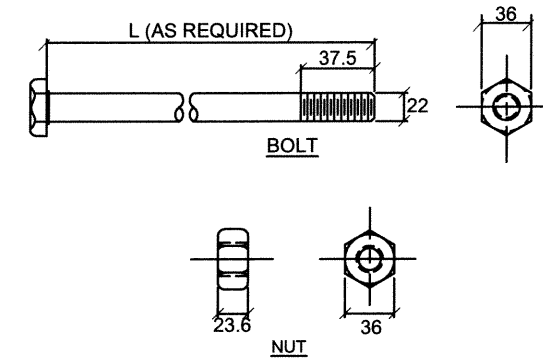
WASHER FOR 22 D BOLT

I. SPECIFICATIONS

- A. HARDENED STEEL WASHERS SHALL BE MANUFACTURED ACCORDING TO THE REQUIREMENTS OF AASHTO M293M (ASTM A436M). ZINC-COATED WASHERS SHALL BE TREATED ACCORDING TO EITHER AASHTO M232 (ASTM A153) FOR CLASS D OR AASHTO M298 (ASTM B695) FOR CLASS 50. NO PUNCHING, DRILLING OR CUTTING WILL BE PERMITTED AFTER GALVANIZING.

II. INTENDED USE

- A. THIS WASHER IS FOR USE WHERE ROUND WASHERS ARE REQUIRED WITH 22 DIAMETER BOLTS IN THE CORRUGATED STEEL BEAM GUARD RAIL AND MEDIAN BARRIER DESIGNS.



22 D HIGH-STRENGTH HEX BOLT

I. SPECIFICATIONS

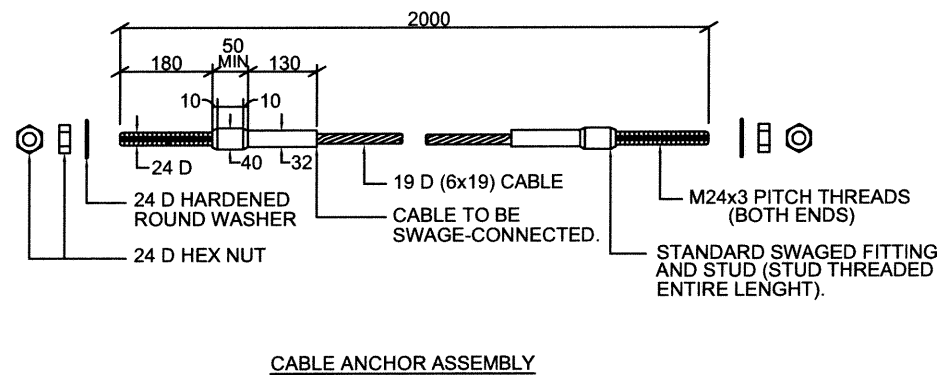
- A. HIGH-STRENGTH STRUCTURAL HEX BOLTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M164M (ASTM A325M) AND SHALL BE MANUFACTURED ACCORDING TO THE GEOMETRIC SPECIFICATIONS INCLUDED IN ANSI B18.2.3.7M. THREADS SHALL CONFORM TO ANSI B1.13M FOR CLASS 6g. MATERIAL FOR ZINC-COATED BOLTS SHALL CONFORM TO AASHTO M164M (ASTM A325M) FOR TYPE 1 BOLTS (800 MPa TENSILE STRENGTH AND 660 MPa YIELD STRENGTH) AND SHALL BEAR THE HEAD IDENTIFICATION MARKING "8S" AND "A-325M." MATERIAL FOR CORROSION RESISTANT BOLTS SHALL CONFORM TO AASHTO M164M (ASTM A325M) TYPE 3 BOLTS AND SHALL BEAR THE HEAD IDENTIFICATION MARK "8S3" AND "A 325M."
- B. HIGH STRENGTH STRUCTURAL NUTS SHALL BE MANUFACTURED ACCORDING TO AASHTO M291M (ASTM A563M) USING THE GEOMETRY OF ANSI B18.2.4.6M. THREADS SHALL CONFORM TO ANSI B1.13M FOR CLASS 6h THREADS. ZINC-COATED NUTS SHALL CONFORM TO AASHTO M291M (ASTM A563M) FOR CLASS 10S NUTS AND SHALL BEAR THE IDENTIFICATION MARK "10S." CORROSION RESISTANT NUTS SHALL COMPLY TO AASHTO M291M (ASTM A563M) FOR CLASS 8S3 NUTS AND SHALL BEAR THE IDENTIFICATION MARK "8S3."
- C. ZINC-COATED BOLTS AND NUTS SHALL BE TREATED ACCORDING TO EITHER AASHTO M232 (ASTM A153) FOR CLASS C OR AASHTO M298 (ASTM B695) FOR CLASS 50.

STRESS AREA OF THREADED BOLT SHANK (mm) ²	MINIMUM BOLT BOLT STRENGTH (kN)
303.0	251.0

- D. DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE AND ACCEPTED MANUFACTURING PRACTICES.

II. INTENDED USE

- A. THIS BOLT IS USED FOR FASTENING GUARD RAIL TRANSITION AT END OF STRUCTURE OR CONCRETE BARRIERS.
L VARIES AS FOLLOWS:
 - 254 AND 280 TRAILING END GUARD RAIL CONNECTION TO CONCRETE BARRIER.
 - 254 LONG FOR TYPE "C" CONCRETE BARRIER TRANSITION.
 - 495 LONG FOR TYPE "A" MEDIAN CONCRETE BARRIER TRANSITION.
 - 300 LONG FOR TRANSITION AT END OF STRUCTURE.



CABLE ANCHOR ASSEMBLY

I. SPECIFICATIONS

- A. THREADS FOR THE STUD SHALL BE MANUFACTURED ACCORDING TO ANSI B1.13M M24x3 CLASS 6g PITCH THREADS. THE CABLE SHALL BE SWAGED INTO THE FITTING. THE STUD SHALL CONFORM TO ASTM F568 CLASS 8.8 MATERIAL AND SHALL BE ZINC-COATED ACCORDING TO EITHER AASHTO M232 (ASTM A153) FOR CLASS C OR AASHTO M298 (ASTM B695) FOR CLASS 50. THE 10 mm SLOT FOR THE LOCKING PIN SHALL BE MILLED INTO THE STUD END PRIOR TO THE APPLICATION OF THE ZINC COATING.
- B. THE SWAGED FITTING SHALL BE MACHINED FROM HOT-ROLLED CARBON STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A576, GRADE 1035 AND ZINC-COATED ACCORDING TO AASHTO M111 (ASTM A123) BEFORE SWAGING. THE MATERIAL SHALL BE ANNEALED SUITABLY FOR COLD SWAGING. A LOCK PIN HOLE TO ACCOMMODATE A 6 mm PLATED SPRING-STEEL PIN SHALL BE DRILLED THROUGH THE HEAD OF THE SWAGED FITTING TO RETAIN THE STUD IN THE PROPER POSITION.
- C. THE WIRE ROPE SHALL BE 19 mm DIAMETER 6x19 WIRE STRAND CORE OR INDEPENDENT WIRE ROPE CORE (IWRC), ZINC-COATED, RIGHT REGULAR LAY WIRE ROPE CONFORMING TO AASHTO M30. THE WIRE ROPE STEEL SHALL BE IMPROVED STEEL WITH A MINIMUM BREAKING STRENGTH OF 190 kN. THE SWAGED FITTING, STUD AND NUT SHALL DEVELOP THE BREAKING STRENGTH OF THE WIRE ROPE.
- D. DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE AND ACCEPTED MANUFACTURING PRACTICES.



COMMONWEALTH OF PUERTO RICO
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
HIGHWAY AND TRANSPORTATION AUTHORITY

DATE: 23/1/09

STANDARD DRAWING APPROVED BY: [Signature]
DEPUTY EXECUTIVE DIRECTOR FOR INFRASTRUCTURE

METAL BARRIER
W-BEAM STRONG POST
HARDWARE

MB-4
SEPTEMBER 2009

ENGINEERING SERVICES AREA ENGINEERING STANDARDS OFFICE