

WOOD BLOCKOUT

HOLE FOR HANDLING DURING GALVANIZING (OPTIONAL)

W150 x 14 DESIGNATION

WOOD BLOCK

HOLE FOR RAIL MOUNTING

DIRECTION OF TRAFFIC

103 47 10 124 150 13 13 75 28 350 175 175 20 mm DIA. HOLE

28 13 124 13 28 28 125 125 50 1750 mm ± 50 mm

FABRICATED STEEL BEAMS OF THE SAME BASIC DIMENSIONS AND BENDING PERFORMANCE WILL BE AN ACCEPTABLE ALTERNATE. ALL HOLES IN STEEL TO BE 19 mm DIAMETER AND SHALL BE PUNCHED OR DRILLED BEFORE GALVANIZING. USE BOLT NO. 5 TO MOUNT RAIL AND BLOCKOUT TO POST. SEE TABLE OF BOLTS ON THIS SHEET FOR DETAILS. POST UNIT TO BE GALVANIZED AFTER FABRICATION. ON INITIAL INSTALLATION, THE BLOCKOUT AND RAIL ELEMENT SHALL BE ATTACHED TO THE POST USING THE SINGLE HOLE IN THE POST AND BLOCKOUT (ONE BOLT IS REQUIRED). OTHER HOLES IN POST ARE FOR FUTURE VERTICAL ADJUSTMENT. BEAM WASHERS ARE NO LONGER USED.

THE CONTRACTOR MAY, AT HIS OPTION, SELECT AND USE ONE OF THE TYPE POSTS SHOWN ABOVE. THIS POST & BLOCKOUT CHOICE MUST BE USED ON THE ENTIRE PROJECT. THE ONLY OBLIGATORY USE OF WOODPOST IS FOR POST NO. 1, AS SHOWN ON ANCHOR UNIT TYPE A. ALTERNATIVE POST & BLOCKOUT COMBINATIONS, INCLUDING RECYCLED MATERIAL, RUBBER, PLASTIC AND COMPOSITE PRODUCTS, MUST BE OF A TYPE WHICH PASSES NCHRP 350, TESTING LEVEL 3, BE SUBMITTED WITH FHWA CERTIFICATION AND BE APPROVED FOR USE BEFORE INSTALLATION.



USE TO ANCHOR SPECIAL END SHOES
TO BRIDGE PIER, BRIDGE CURB, OR
TO CONCRETE PARAPET IN LIEU OF
BOLTS THROUGH THE PARAPET.



USE WHERE CONNECTION IS
MADE TO ROUND PIERS, AS
IN TYPE C, G, OR GE UNIT.

ALTERNATIVE ANCHOR BOLT SYSTEMS MEETING THE MINIMUM STRENGTH REQUIREMENTS, AS SHOWN IN THE SPEC. & DATA TABLE ABOVE, MAY BE USED IN ATTACHMENT APPLICATIONS IN LIEU OF COMPOUND OR THROUGH BOLT ANCHORS IF APPROVED BY THE ENGINEER.

WHERE, T = $U \times L$ = PULL-OUT STRENGTH
U = BOND CAPACITY PER (mm)
L = EMBEDMENT DEPTH IN (mm)



PIECE (150 mm)
CLASS A GALVAN. STEEL W-BEAM 2.67 mm
(0.105 in.) BASE METAL 150 mm LONG
BOLTED DIRECTLY (BEHIND THE RAIL
ELEMENT) TO POST.

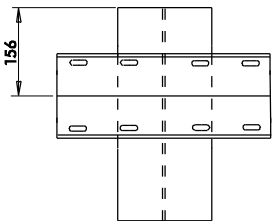
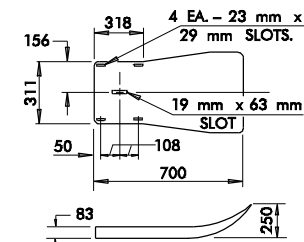


NOTE: WEAKENED CONNECTION TO BE USED WITH GUARDRAIL ANCHOR
UNIT TYPE A. SEE ROADWAY STD. GRAU1-1, SHEET NO. R-132M.



GUARDRAIL SHALL BE LAPPED IN THE DIRECTION OF NEAREST TRAFFIC AT ALL LOCATIONS WHERE SPLICES OCCUR (EXCEPT AT NARROW OR ONE LANE BRIDGE APPROACHES, WHERE LAPS SHALL BE TOWARD THE BRIDGE ON BOTH SIDES OF THE APPROACH ROADWAY).

① ONE ADDITIONAL BLOCKOUT
MAY BE ADDED AND ATTACHED
USING EXTENDED BOLT.

UNIT TO BE GALVANIZED
AFTER FABRICATION

NOTE: GUARDRAIL COMPONENTS SHALL MEET THE APPLICABLE STD'S OF "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" PREPARED AND APPROVED BY THE AASHTO-ARTBA-AGC JOINT COOPERATIVE COMMITTEE, TECHNICAL BULLETIN NO. 268 B.

MATERIALS SHALL MEET THE
REQUIREMENTS OF THE FOLLOWING
SUBSECTIONS OF THE 1999 STD. SPEC'S.

PORTLAND CEMENT CONCRETE	701
REINFORCING STEEL	723
G. RAIL POSTS & SPACER BLOCKS	727 & 732
METAL PLATE STEEL BEAM	732
FITTINGS	732
GALVANIZATION	732

ALL DIMENSIONS ARE SUBJECT TO
MANUFACTURER'S TOLERANCE.

WOOD POSTS SHALL MEET THE REQUIREMENTS OF STRESS GRADE 1200F OF SECTION 727.



NOTE: PRECAST FOOTING (EQUIV. SIZE & DESIGN) MAY BE SUBSTITUTED FOR CAST-IN-PLACE FOOTING, IF APPROVED BY THE ENGINEER.

NOTE: PRECAST FOOTING (EQUIV. SIZE & DESIGN) MAY
BE SUBSTITUTED FOR CAST-IN-PLACE FOOTING, IF
APPROVED BY THE ENGINEER.



TABLE OF BOLTS, NUTS, & WASHERS		
ITEM	ASSEMBLY	NOMENCLATURE & DIMENSIONS
②	BOLT 1	RECESS NUT & SPECIFIED WASHER
②	BOLT 2	RECESS NUT & STEEL WASHER
②	BOLT 3	HEX NUT & LOCK WASHER
②	BOLT 4	RECESS NUT & 16 mm STEEL WASHER
②	BOLT 5	16 mm STEEL WSHR. & ANCH. DEVICE
① ②	BOLT 6	22 mm STEEL WSHR. & ANCH. DEVICE
① ③	BOLT 7	22 mm STEEL WSHR. & 22 mm HEX NUT
⑥	RECESS NUT	
⑥	16 mm HEX NUT	
① ④	22 mm HEX NUT	
⑤	16 mm STEEL WSHR.	
⑤	22 mm STEEL WSHR.	
①	LOCK WASHER	

- ① NOT A STANDARD ITEM IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" TECHNICAL BULLETIN #268-B.
- ② SHALL MEET REQUIREMENTS OF A.S.T.M. A307 & A153.
- ③ SHALL MEET REQUIREMENTS OF A.S.T.M. A325M OR A449 & A153.
- ④ SHALL MEET REQUIREMENTS OF A.S.T.M. A153 & A563M GRADE B OR BETTER.
- ⑤ SHALL MEET REQUIREMENTS OF A.S.T.M. A153 & A.N.S.I. B27.2.
- ⑥ SHALL MEET REQUIREMENTS OF A.S.T.M. A153 & A563M. GRADE A OR BETTER.
- ⑦ SHALL MEET REQUIREMENTS OF A.A.S.H.T.O. M180.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
623.06 (A)	BEAM GUARDRAIL (W-BEAM) SINGLE	METER

APPROVED BY ROADWAY ENGINEER

DATE _____

OKLAHOMA DEPT. OF TRANSPORTATION
ROADWAY STANDARD (METRIC)

GUARDRAIL HARDWARE

1999 SPECIFICATIONS

GRH-3

01M

ALL DIMENSIONS ON THIS SHEET IN MILLIMETERS UNLESS OTHERWISE NOTED.