DESIGN MEMORANDUM NO: 2-82

TO: DESIGN ENGINEERS
DISTRICT GENERAL MANAGERS
ACTIVE CONSULTANTS

FROM: LAWRENCE S. BLEVINS LSB
DIRECTOR, DIVISION OF DESIGN

DATE: JANUARY 25, 1982

SUBJECT: GUARDRAIL CONNECTORS TO BRIDGE ENDS
TYPES A, A-1, E, AND E-1

Attached are copies of revised drawings for the subject bridge end connectors. As can be noted, A-1 and E-1 are additions and notes on the drawings cover both the design requirements and their applications. There is no need to strengthen the connector on the downstream end of bridges on divided roadways, therefore, A-1 and E-1 are for that application.

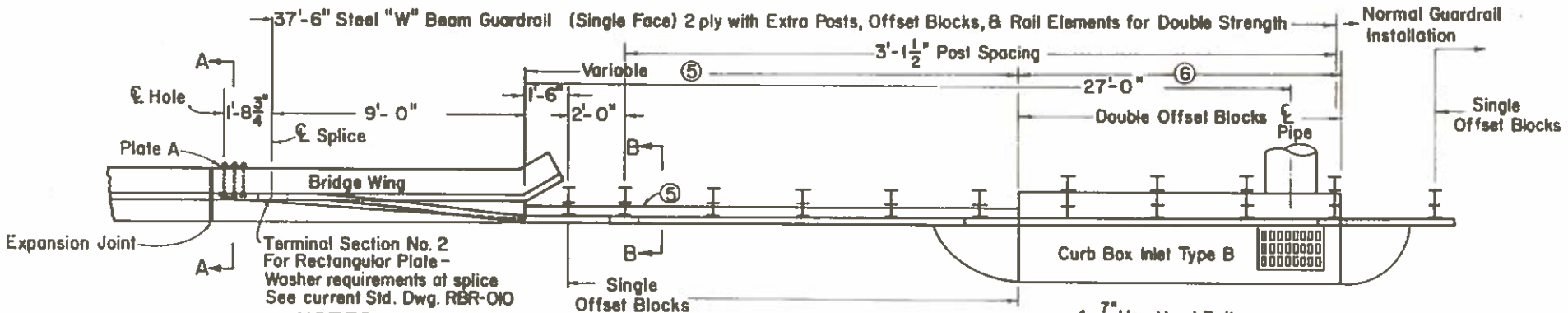
The designs for both Type A and Type E have not changed, however, the warrants for their application have. They are limited to both ends of bridges on two lane roadways and the approach ends of bridges on multi-lane divided highways.

This memorandum is to become effective with the next practical letting and becomes void when its contents are placed in the Design Guidance Manual.

3-26-82 letting

LSB:EBD:caf

Attachment



PLAN VIEW

NOTES

1. GENERAL

a. See current Standard Drawings in the RBB, RBI, RBR, and RPM series for other related Guardrail details and Bridge Plans for Bridge Wing detail.

b. See Current Standard Drawing RDB series for Curb Box Inlet Type B.

c. Guardrail Connector To Bridge End Type A is required on both bridge ends of an undivided highway and only on the approach bridge ends of a divided highway. Guardrail Connector to Bridge End Type A-1 is required on the exit bridge end of a divided highway.

2. MATERIAL REQUIREMENTS

All hardware shall be galvanized. (ASTM A153)

¼" Steel Plate A (ASTM A 36)

⅞" Hex Head Bolts or Steel Threaded Rods (Length as shown)

⅞" Heavy Hex Nuts (⅞" Thick)(ASTM A 325)

⅞" Flat Washers (3/16" Thick)(ASTM A 325)

⅞" Beveled Washers (5/16" Mean Thickness)(ASTM A 325, AASHTO 2.10.3)

Both the Bolt and Threaded Rod shall have a minimum of 50,000 Lbs. tensile strength at their narrowest point.

3. CONSTRUCTION METHODS

a. Back-up Plates are required at all posts except at splices.

b. Eliminate extra Offset Blocks when Curb Box Inlet Type B is not required.

c. Holes to be formed through bridge wing with 1" I.D. Plastic Pipe. The pipe shall remain in place.

d. Eliminate extra posts, offset blocks, one ply of rail elements and other incidentals which are in addition to normal installation of Steel Beam Guardrail used in construction of double strength rail when Guardrail Connector to Bridge End Type A-1 is required.

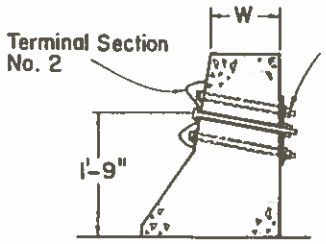
4. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

a. Guardrail Connector To Bridge End Type A shall be paid for at the contract unit price each, and includes: Terminal Section No. 2; all items which are in addition to the normal installation of Steel Beam Guardrail (Extra posts, Offset Blocks, Rail Elements, Hardware, Etc.); and other incidentals necessary to complete the installation as detailed.

b. Guardrail Connector to Bridge End Type A-1 shall be paid for at the contract unit price each, which includes Terminal Section No. 2 and all other incidentals necessary to complete the installation.

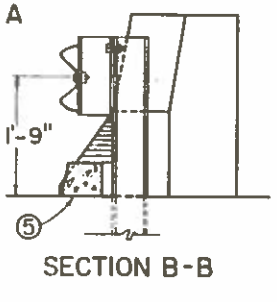
c. The Steel "W" Beam Guard Rail (Single Face) is a separate bid item which is always required. The Integral Curb and Curb Box Inlet Type B are separate bid items that shall be used when required for Bridge End Drainage.

d. The Plastic Pipe and cost of forming shall be included in the unit price bid for bridge superstructure concrete.

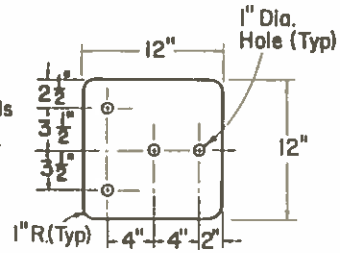


SECTION A-A

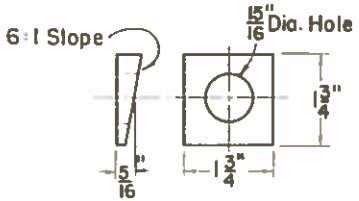
4-⅞" Hex Head Bolts (Length W + 6"), 4 Nuts, 4 Beveled Washers and 4 Flat Washers.
—or—
4-⅞" Steel Threaded Rods (Length W+8"), 8 Nuts, 4 Beveled Washers and 4 Flat Washers



SECTION B-B



¼" STEEL PLATE-A



BEVELED WASHER

⑤ Standard Integral Curb. Transition from Standard Integral Curb shape to shape of curb on Bridge Wing within 7'-3". Length of Curb variable (22'-3" when L = 5') (17'-3" when L = 10') (12'-3" when L = 15') (7'-3" when L = 20').

⑥ 6'-4" when L = 5'-0"
11'-4" when L = 10'-0" ☆
16'-4" when L = 15'-0"
21'-4" when L = 20'-0"

RBC 001-04

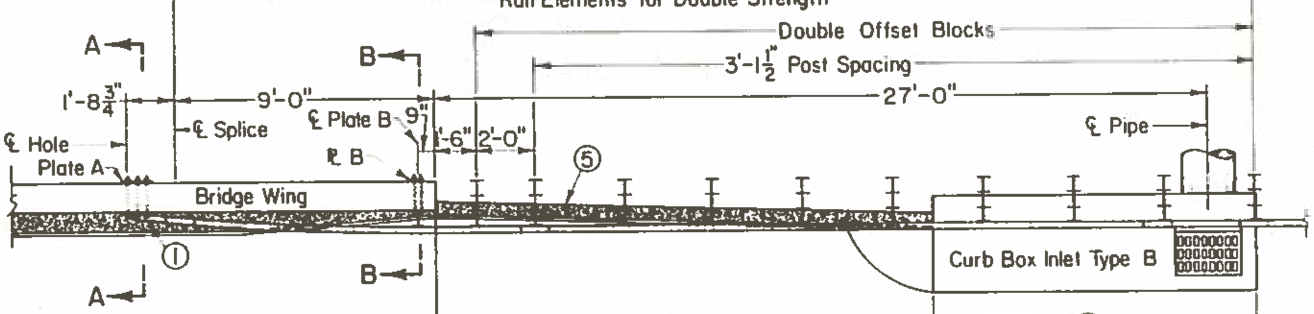
☆10' Length is used most frequently.

METRIC CONVERSIONS
1 FT. = 0.3048 m
1 IN. = 25.4 mm

KENTUCKY BUREAU OF HIGHWAYS

GUARDRAIL CONNECTOR TO BRIDGE END TYPE A & A-1

STANDARD DRAWING
SUBMITTED E.B.D. 2/1/82
DIRECTOR DIVISION OF DESIGN — DATE
APPROVED
STATE HIGHWAY ENGINEER — DATE



Normal Guardrail Installation

Ⓐ 4-⅞" Hex Head Bolts (Length W + 3"), 4 Nuts, 8 Flat Washers.
—or—
4-⅞" Steel Threaded Rods (Length W+4"), 8 Nuts, 8 Flat Washers.

Ⓑ 2-⅝" Hex Head Bolts (Length W+3"), 2 Nuts, 4 Flat Washers.
—or—
2-⅝" Steel Threaded Rods (Length W+4"), 4 Nuts, 4 Flat Washers.

Ⓒ 4-⅞" Hex Head Bolts (Length W+6"), 4 Nuts, 4 Beveled Washers and 4 Flat Washers.
—or—
4-⅞" Steel Threaded Rods (Length W+8"), 8 Nuts, 4 Beveled Washers and 4 Flat Washers.

Ⓓ 2-⅝" Hex Head Bolts (Length W+3"), 2 Nuts, 4 Flat Washers.
—or—
2-⅝" Steel Threaded Rods (Length W+4"), 4 Nuts, 4 Flat Washers.

·NOTES·

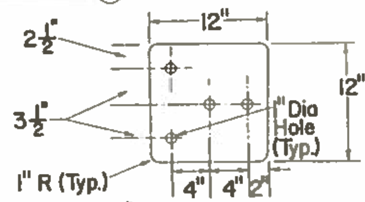
1. GENERAL
   a. See current Standard Drawings in the RBB, RBI, RBR, and RPM series for other related Guardrail details and Bridge Plans for Bridge Wing detail.
   b. See Current Standard Drawing RDB Series for Curb Box Inlet Type B
   c. Guardrail Connector To Bridge End Type E is required on both bridge ends of an undivided highway and only on the approach bridge ends of a divided highway. Guardrail Connector to Bridge End Type E-1 is required on the exit bridge end of a divided highway.

2. MATERIAL REQUIREMENTS
   All hardware shall be galvanized. (AASHTO M 232)
   Steel Plate A and Steel Plate B (ASTM A36)
   Heavy Hex Nuts, Heavy Flat Washers (ASTM A 325)
   Beveled Washers (5/16" Mean Thickness)(ASTM A 325, AASHTO 2.10.3)
   Hex Head Bolts or Steel Threaded Rods, Both the Bolt and Threaded Rod shall have a minimum of 50,000 Lbs. tensile strength at their narrowest point.

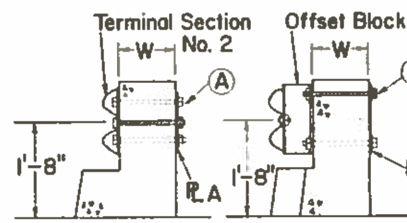
3. CONSTRUCTION METHODS
   a. Back-up Plates are required at all posts except at splices.
   b. Eliminate extra Offset Blocks when Curb Box Inlet Type B is not required.
   c. Holes to be formed through bridge wing perpendicular to the traffic side with 1" I.D. Plastic Pipe. The pipe shall remain in place.
   d. Eliminate extra posts, offset blocks, one ply of rail elements and other incidentals which are in addition to normal installation of Steel Beam Guardrail used in construction of double strength rail when Guardrail Connector to Bridge End Type E-1 is required.

4. METHOD OF MEASUREMENT AND BASIS OF PAYMENT
   a. Guardrail Connector To Bridge End Type E shall be paid for at the contract unit price each, and includes: Terminal Section No. 2; all items which are in addition to the normal installation of Steel "W" Beam Guardrail (Extra posts, Offset Blocks, Rail Elements, Hardware, Etc.), and other incidentals necessary to complete the installation as detailed.
   b. Guardrail Connector to Bridge End Type E-1 shall be paid for at the contract unit price each, which includes Terminal Section No. 2 and all other incidentals necessary to complete the installation.
   c. The Steel "W" Beam Guardrail (Single Face) is a separate bid item which is always required. The Integral Curb and Curb Box Inlet Type B are separate bid items that shall be used when required for Bridge End Drainage.
   d. The Plastic Pipe and cost of forming shall be included in the unit price bid for bridge superstructure concrete.

① Terminal Section No. 2 For Rectangular Plate-Washer requirements at splice See current Std Dwg RBR-010.
⑤ Standard Integral Curb Transition from Standard Integral Curb shape to shape of curb on Bridge Wing within 7'-3".
Length of Curb variable (22'-3" when L=5')(17'-3" when L=10')(12'-3" when L=15'-0")(7'-3" when L=20'-0").

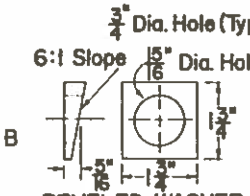


¼" STEEL PLATE "A"

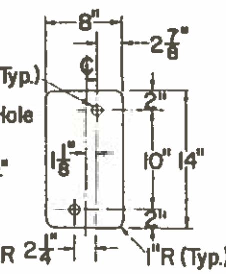


SECTION A-A SECTION B-B

BRIDGES WITH 9" OR LESS BRUSH BLOCK WIDTH



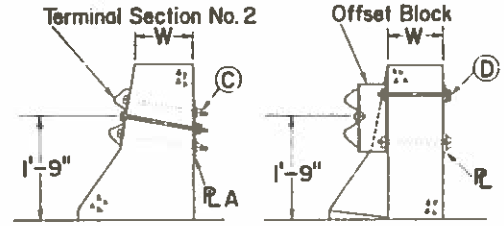
BEVELED WASHER



¼" STEEL PLATE "B"

⑥ 6'-4" when L = 5'-0"
11'-4" when L = 10'-0" ★
16'-4" when L = 15'-0"
21'-4" when L = 20'-0"

★ 10' Length is used most frequentl



SECTION A-A SECTION B-B

BRIDGES WITH N.J. TYPE BARRIER CURB

METRIC CONVERSIONS
1 FT = 0.3048 m
1 IN. = 25.4 mm

KENTUCKY
BUREAU OF HIGHWAYS

GUARDRAIL CONNECTOR TO BRIDGE END TYPE E & E-1

STANDARD DRAWING No. E.B.D. 2/1/82