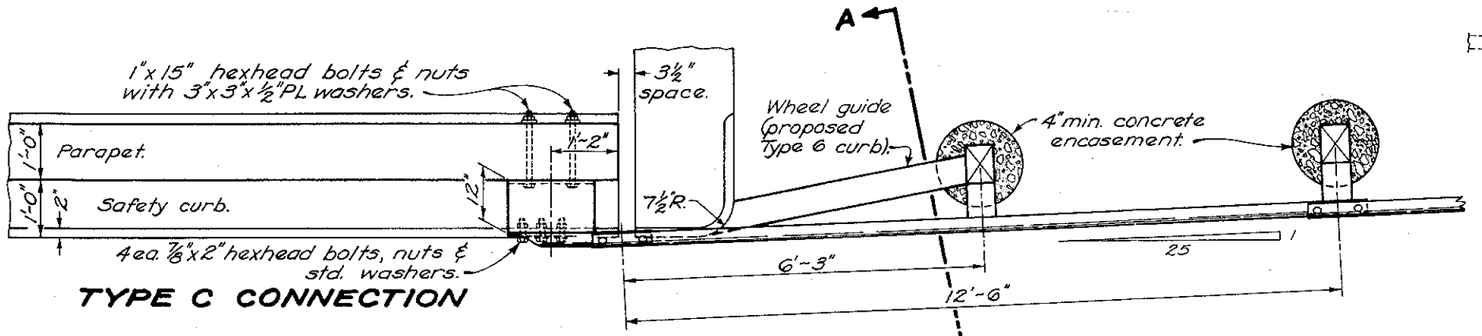
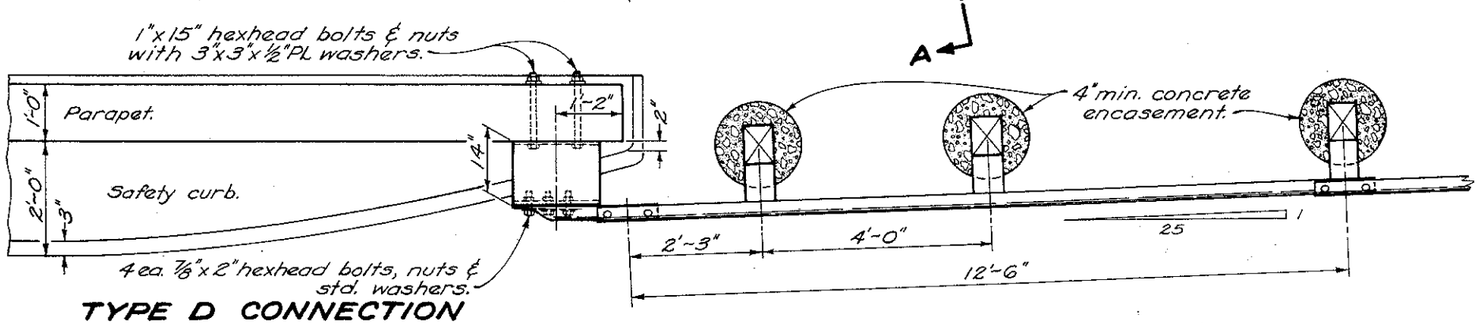
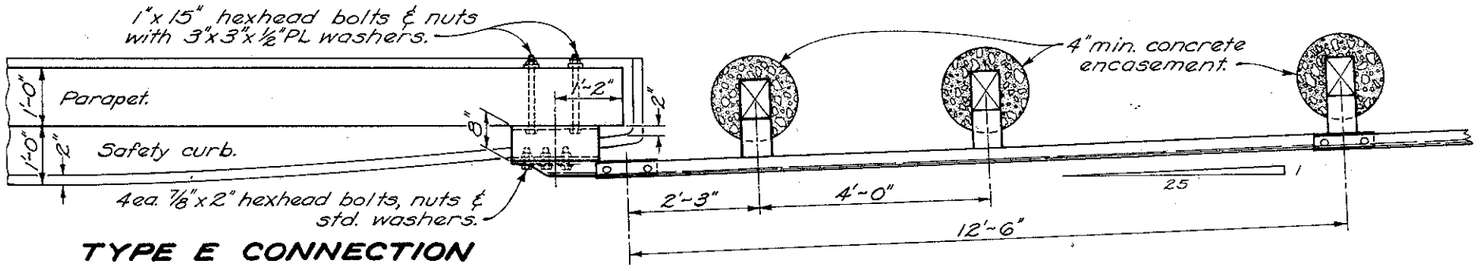
| FED. RD. DIVISION | STATE | PROJECT | |
|---|---|---|---|
| 2 | OHIO | | |




**TYPE C CONNECTION**

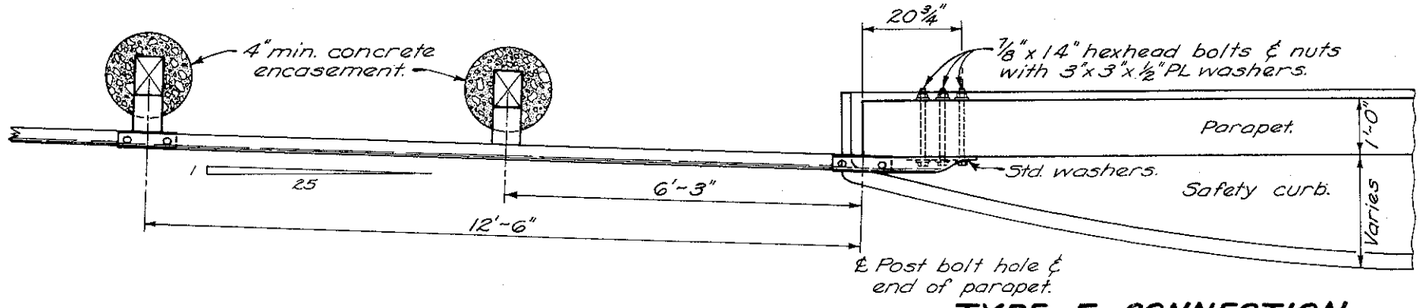



**TYPE D CONNECTION**



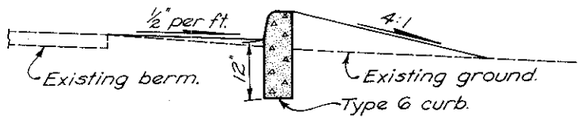

**TYPE E CONNECTION**

## APPROACH ENDS

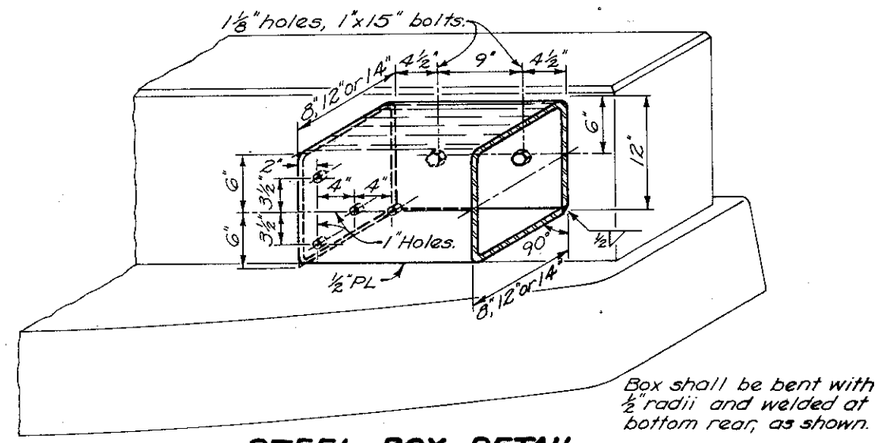



**TYPE F CONNECTION**

## TRAILING END

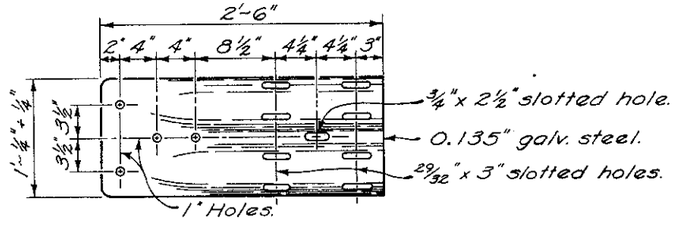



**SECTION A-A**




**STEEL BOX DETAIL**

*A galv. steel box of the appropriate size (see connection type) shall be used on all approaches.*




**SPECIAL END SHOE**

## NOTES

**GENERAL**: *This drawing shall govern where a conflict arises. For details not shown, see Standard Drawings GR-2B & GR-7.*

*All steel parts shall be galvanized in accordance with 710.06 or 710.10, whichever may apply.*

**ANCHORS**: *Self-drilling anchors (of the appropriate size) may be substituted for the 1" and ⅞" hexhead bolts shown in the parapets. Anchors may be of the snap-off chuck-end type or of the flush-end type conforming to Federal Specification No. FF-S-325, Group III, Type 1(a) or (c), or Type 2.*

*Bolts for use with the self-drilling anchors shall be ⅞"x1½" or 1"x2", as required.*

**GUARDRAIL TERMINATION**: *Dimensions locating the horizontal position of the end shoes may be increased either by design or in the field if interference with existing steel in the parapet requires it.*

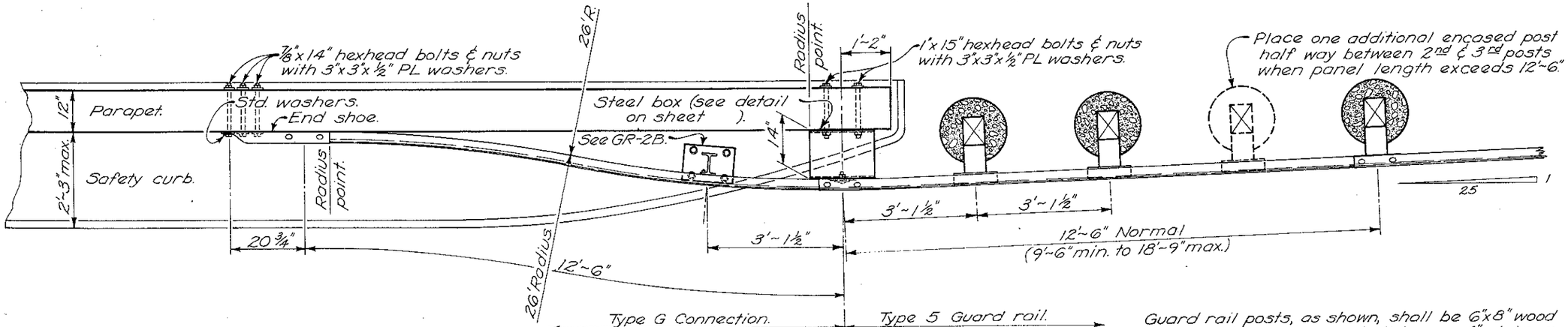
**PAYMENT**: *Price bid for bridge terminal assemblies shall include the additional cost, in excess of normal guardrail cost, for steel posts, concrete encasement, steel boxes, special end shoes, self-drilling anchors, curbing and embankment.*

*Connections shall be paid for as 834 Bridge terminal assembly, Type ——.*

| DATE |
|---|
| 6-8-70 |
| 1-1-71 |

# GUARDRAIL CONNECTIONS TO EXISTING BRIDGES

| FED. RD. DIVISION | STATE | PROJECT | |
|---|---|---|---|
| 2 | OHIO | | |

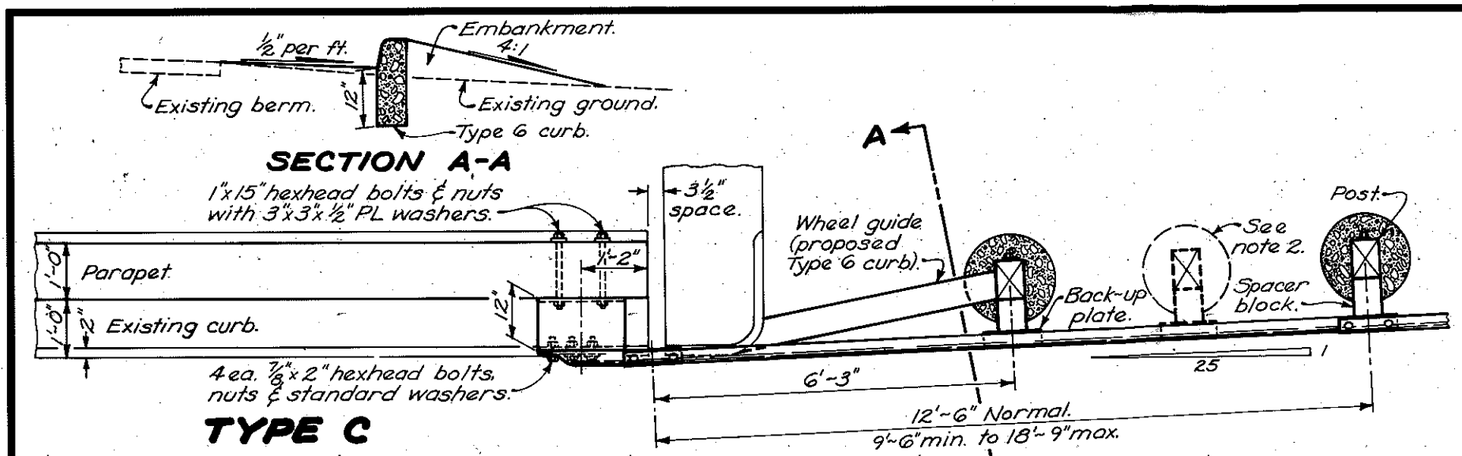



Bolts in panel adjacent to end shoe shall be tightened for expansion, as per section 606.05.

Guard rail posts, as shown, shall be 6"x8" wood or W6x15.5 steel and shall have a 4" minimum concrete encasement. See sheet for pertinent notes.

## TYPE G CONNECTION

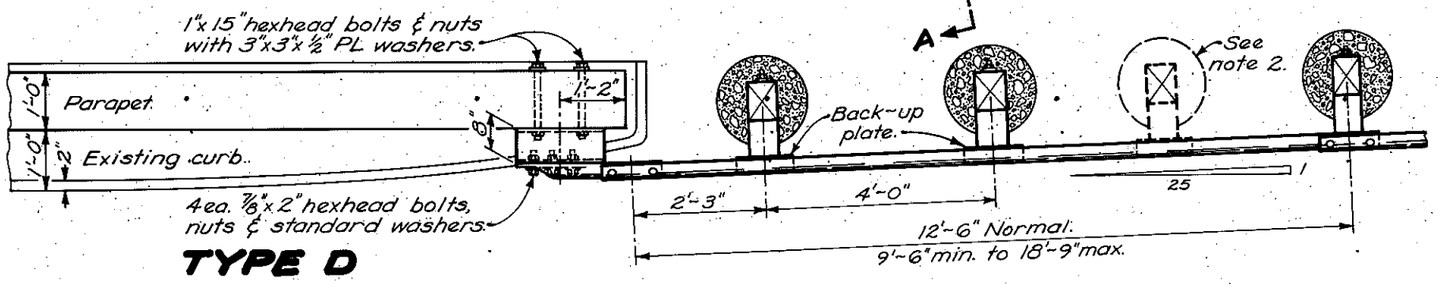
| DATE |
|---|
| 6-5-72 |



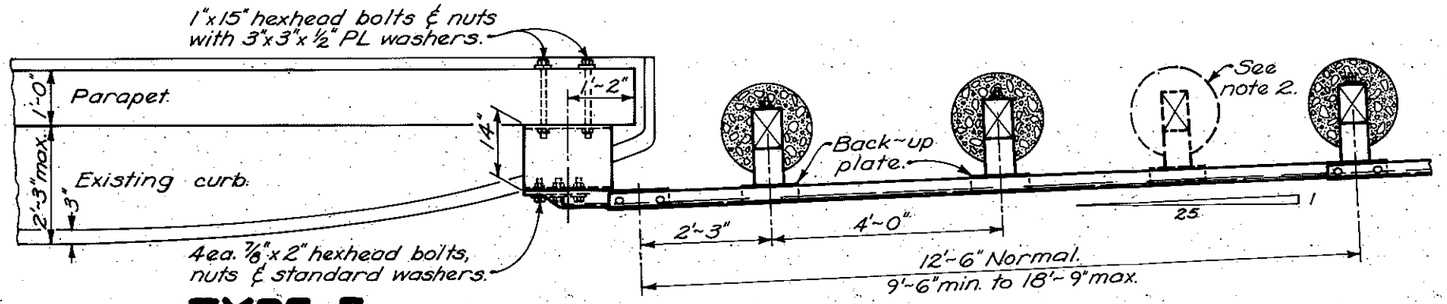

## SECTION A-A



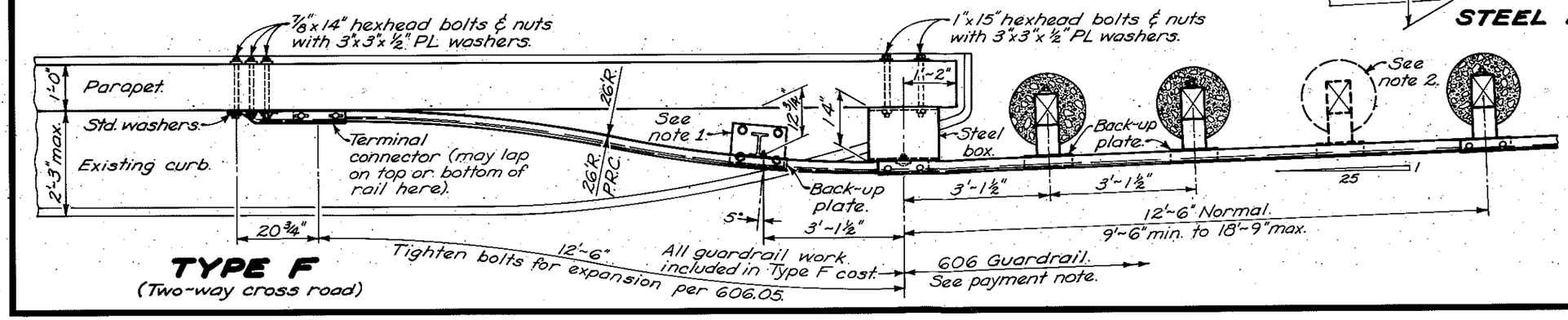

## TYPE C




## TYPE D




## TYPE E




## TYPE F
(Two-way cross road)

## NOTES

**PAYMENT** for item 606, each, Bridge terminal assembly, Type ___, shall include the additional cost in excess of normal guardrail cost, such as: additional or heavier posts, concrete encasement, extra rail, steel box, curb, embankment, terminal connector, anchors and other hardware, etc.

**FOR DETAILS** not shown, see GR-1 and other Standard Construction Drawings pertaining to design of specific guardrail Type.

**GUARDRAIL TERMINATION** as directed by the Engineer. The 12'-6" normal rail section may vary as shown to facilitate connection of or reconstruction of existing approach guardrail. The 1'-2" terminal connector location dimension may be increased to avoid existing parapet steel.

**STEEL BOX** of the appropriate size, galvanized after welding any two opposite corners, shall be mounted on the parapet so the rail top is 27" above the bridge deck.

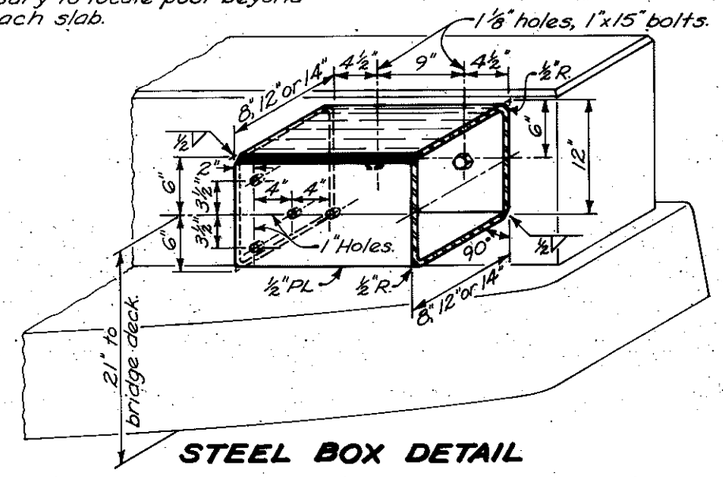
**SPACER BLOCK** size may be increased if necessary to locate post beyond wide approach slab.

**POSTS** shall be 6"x8" wood or W6x15.5 steel (except note 1 post) of the same material type as used on approach guardrail, with 4" minimum concrete encasement.

**NOTE 1**: Use W6x8.5 inlet mounted post as detailed on GR-1 with length to mount rail top 27" above bridge deck.

**NOTE 2**: Place one additional encased post halfway between adjacent posts when the 12'-6" normal rail section is increased.

**SELF-DRILLING ANCHORS** meeting requirements of 712.01 with ⅞"x1½" bolts, or 1" anchors per FF-S-325 Group II, Type 4, Class 1 or 2 with proof load certification per 712.01 may be substituted (in like diameter) for the ⅞" and 1" bolts shown in the parapets. Anchor installations not satisfactory to the Engineer shall be replaced with bolts as shown extending through the parapet or as directed by the Engineer.




## STEEL BOX DETAIL

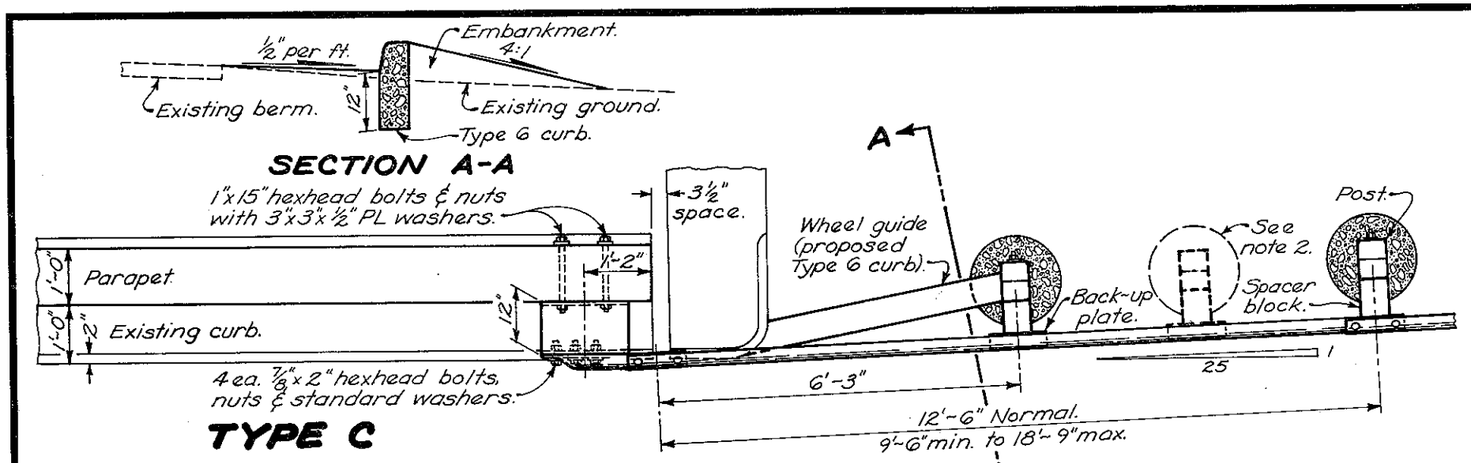
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

# BRIDGE TERMINAL ASSEMBLIES

DATE 12-6-76

STANDARD CONSTRUCTION DRAWING GR-3A

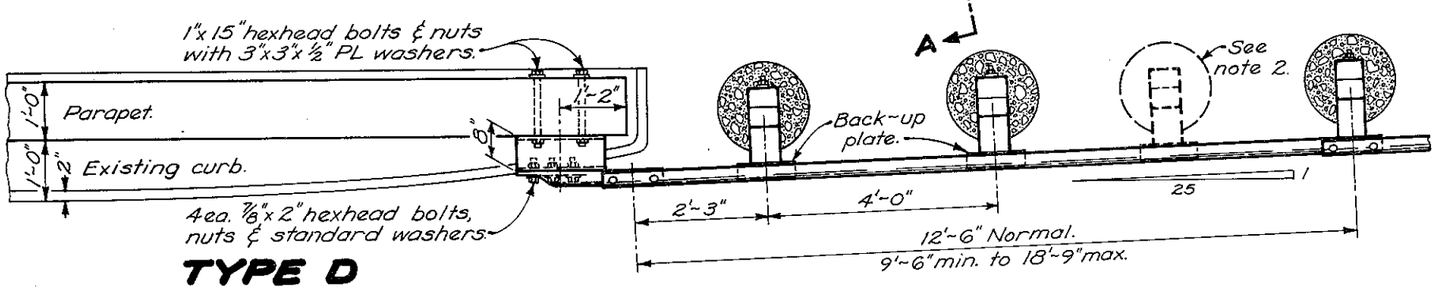
APPROVED M.G. Cunningham ENGR., L. & D.



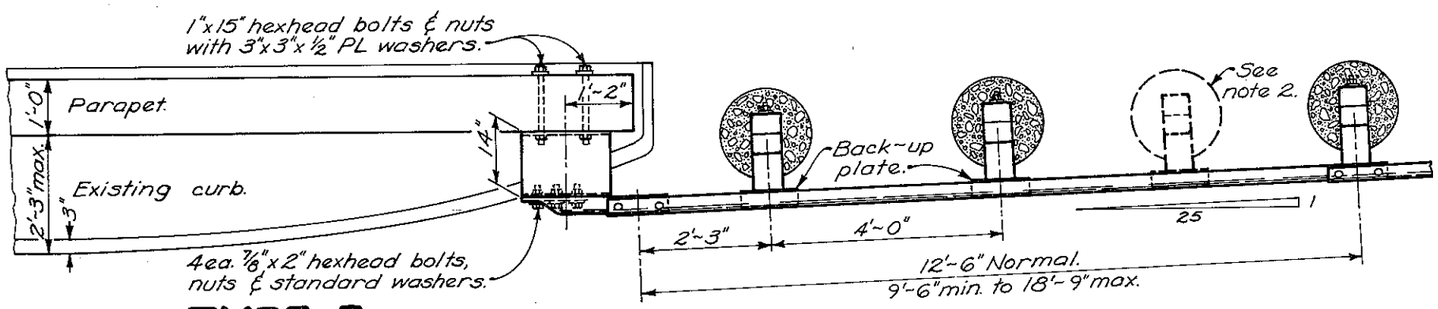

## SECTION A-A



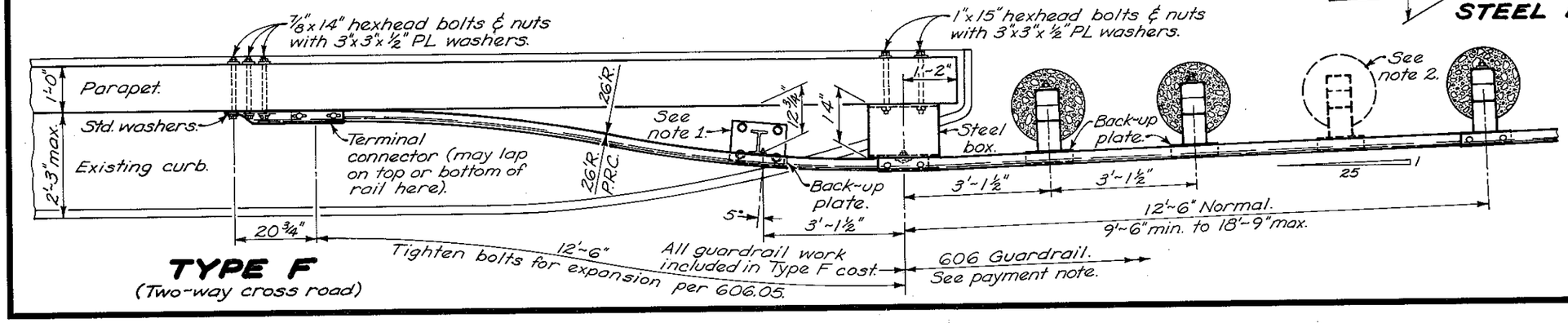

## TYPE C




## TYPE D




## TYPE E




## TYPE F
(Two-way cross road)

## NOTES

**PAYMENT** for item 606, each, Bridge terminal assembly, Type —, shall include the additional cost in excess of normal guardrail cost, such as: additional or heavier posts, concrete encasement, extra rail, steel box, curb, embankment, terminal connector, anchors and other hardware, etc.

**FOR DETAILS** not shown, see GR-1 and other Standard Construction Drawings pertaining to design of specific guardrail Type.

**GUARDRAIL TERMINATION** as directed by the Engineer. The 12'-6" normal rail section may vary as shown to facilitate connection of or reconstruction of existing approach guardrail. The 1'-2" terminal connector location dimension may be increased to avoid existing parapet steel.

**STEEL BOX** of the appropriate size, galvanized after welding any two opposite corners, shall be mounted on the parapet so the rail top is 27" above the bridge deck.

**SPACER BLOCK** size may be increased if necessary to locate post beyond wide approach slab.

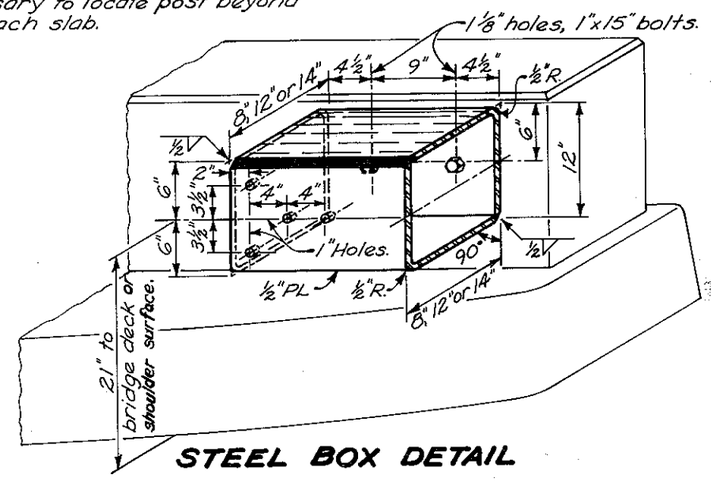
**POSTS** shall be 6"x8" wood or W6x15 steel (except note 1 post) of the same material type as used on approach guardrail, with 4" minimum concrete encasement.

**NOTE 1**: Use W6x9 inlet mounted post as detailed on GR-1 with length to mount rail top 27" above bridge deck.

**NOTE 2**: Place one additional encased post halfway between adjacent posts when the 12'-6" normal rail section is increased.

**SELF-DRILLING ANCHORS** meeting requirements of 712.04, or ~~Group VIII~~ Type 1 anchors per FF-S-325, with ⅞"x1½" bolts with washers may be substituted for the ⅞"x14" bolts shown in the Parapet for Type F.

Anchor installations not satisfactory to the Engineer shall be replaced with bolts as shown extending through the parapet or as directed by the Engineer.




## STEEL BOX DETAIL

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

# BRIDGE TERMINAL ASSEMBLIES

DATE 12-6-76 2-5-82

STANDARD CONSTRUCTION DRAWING GR-3A

APPROVED _____ ENGR., L. & D.