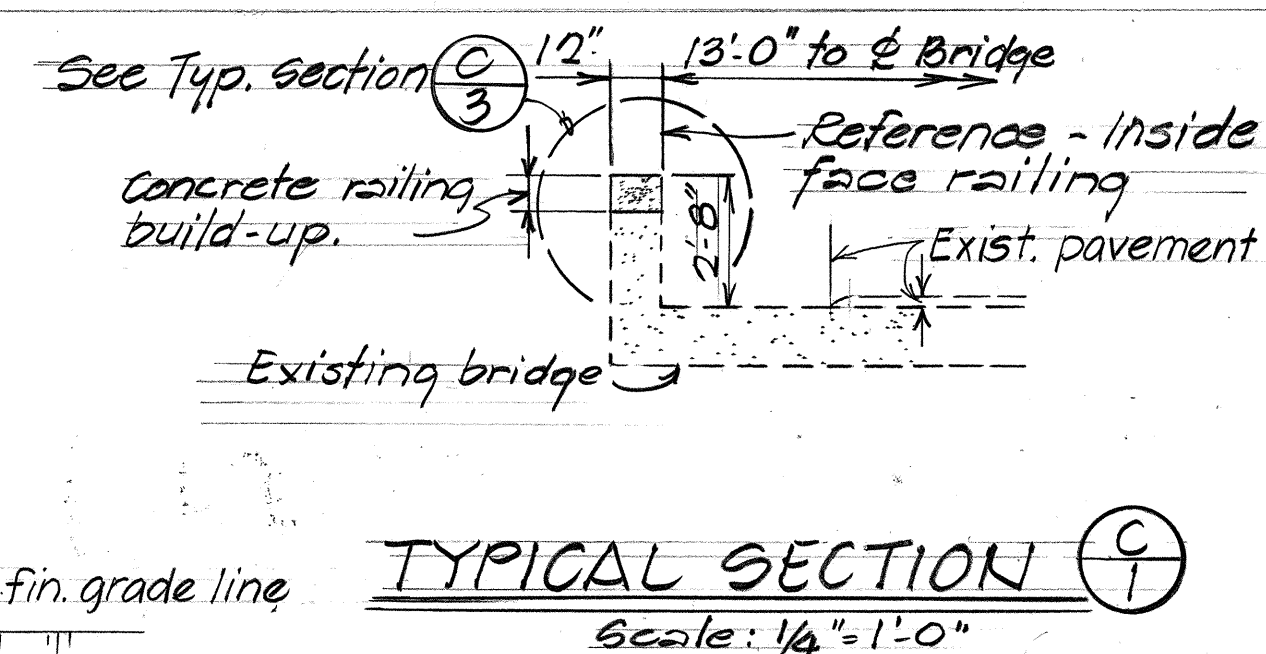
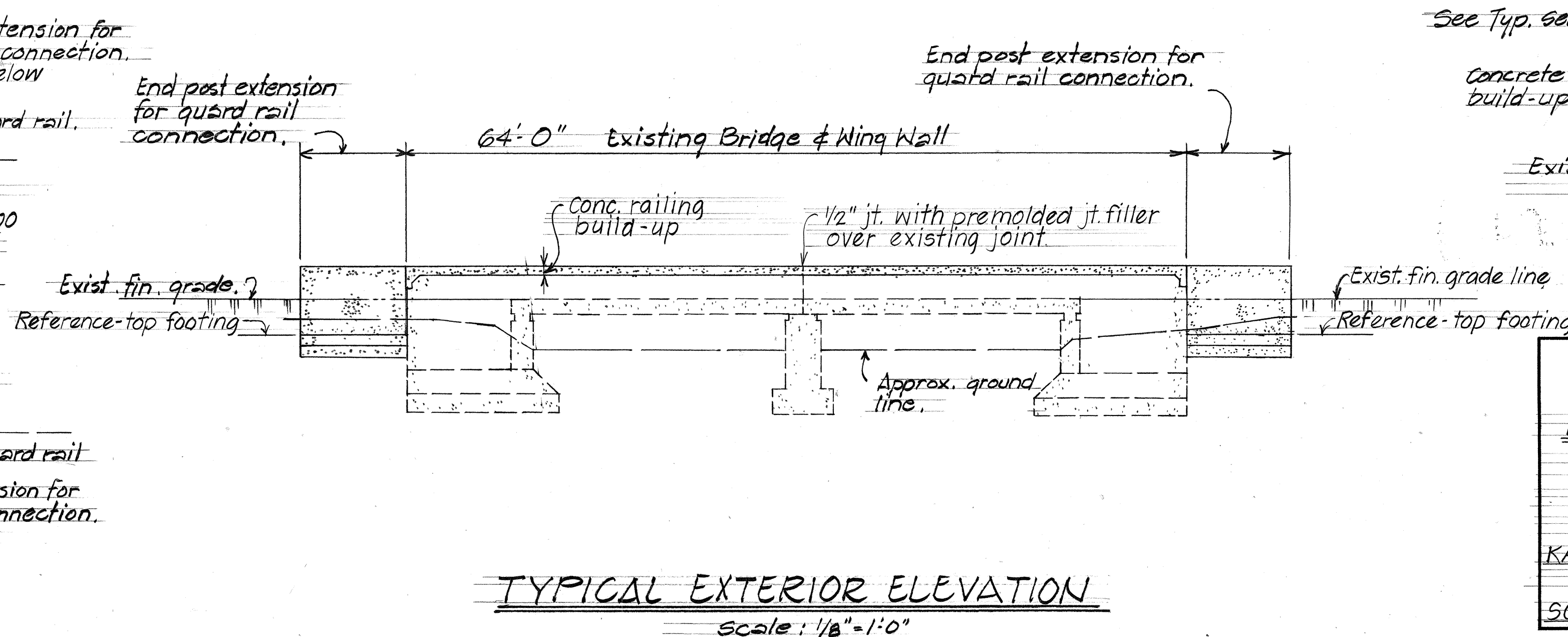
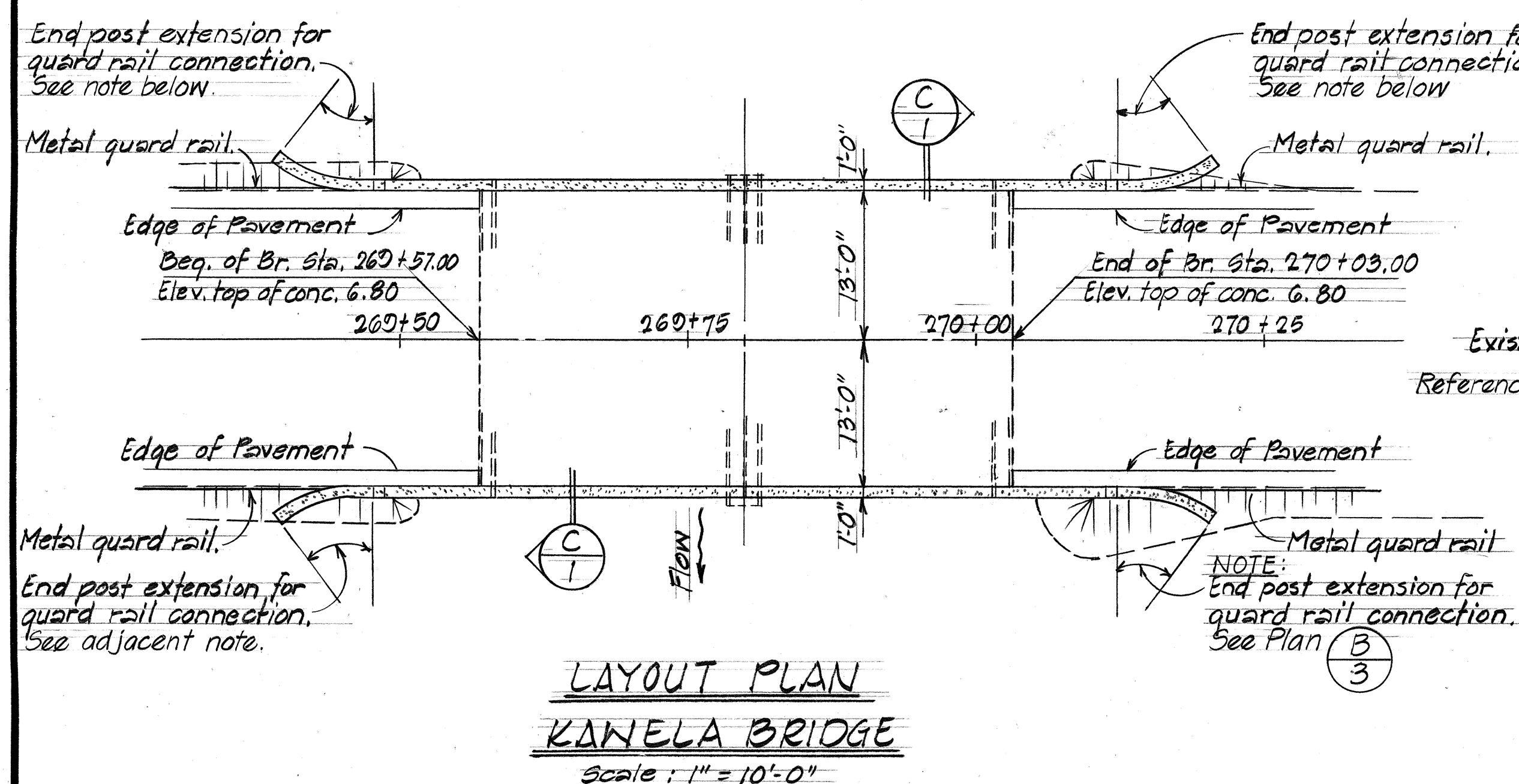
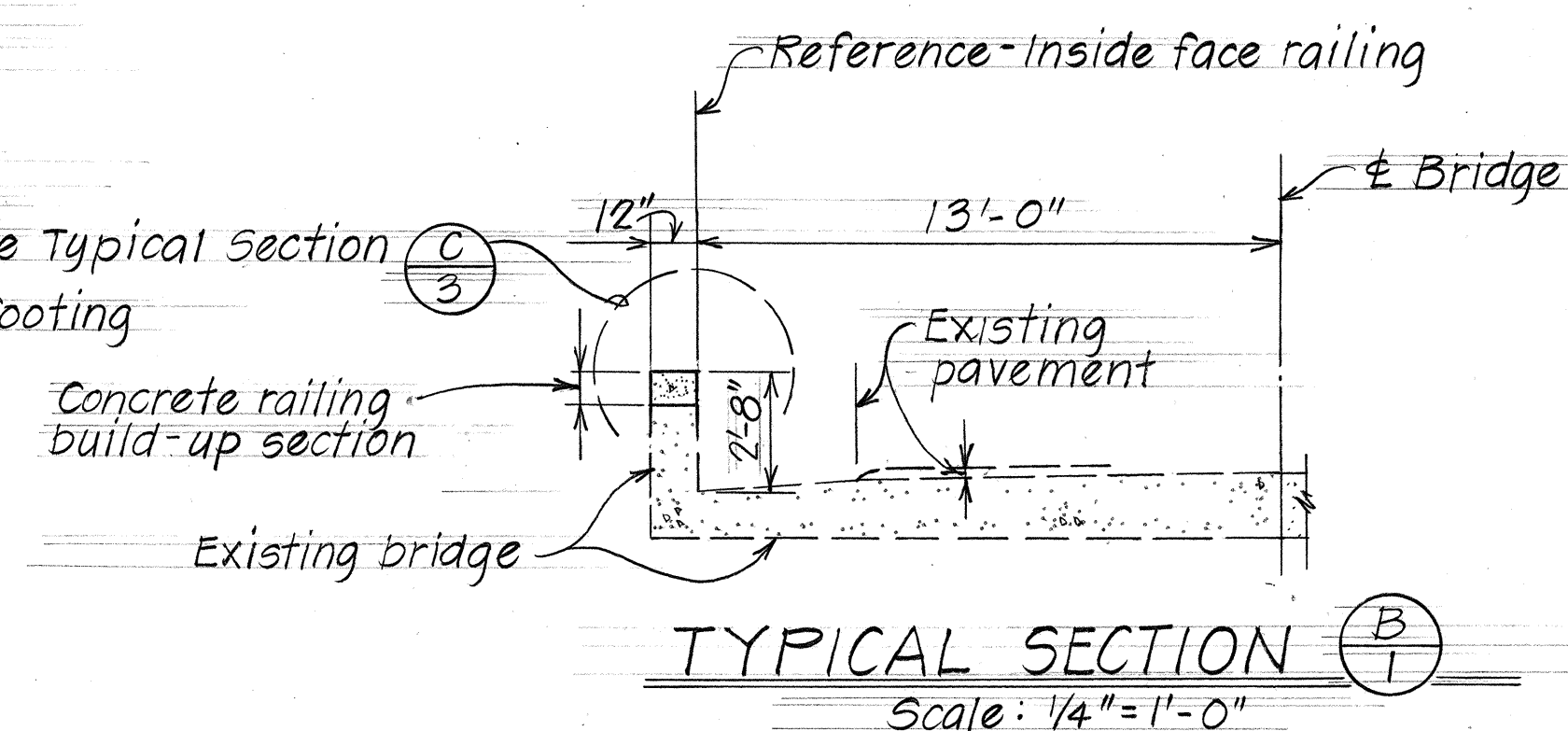
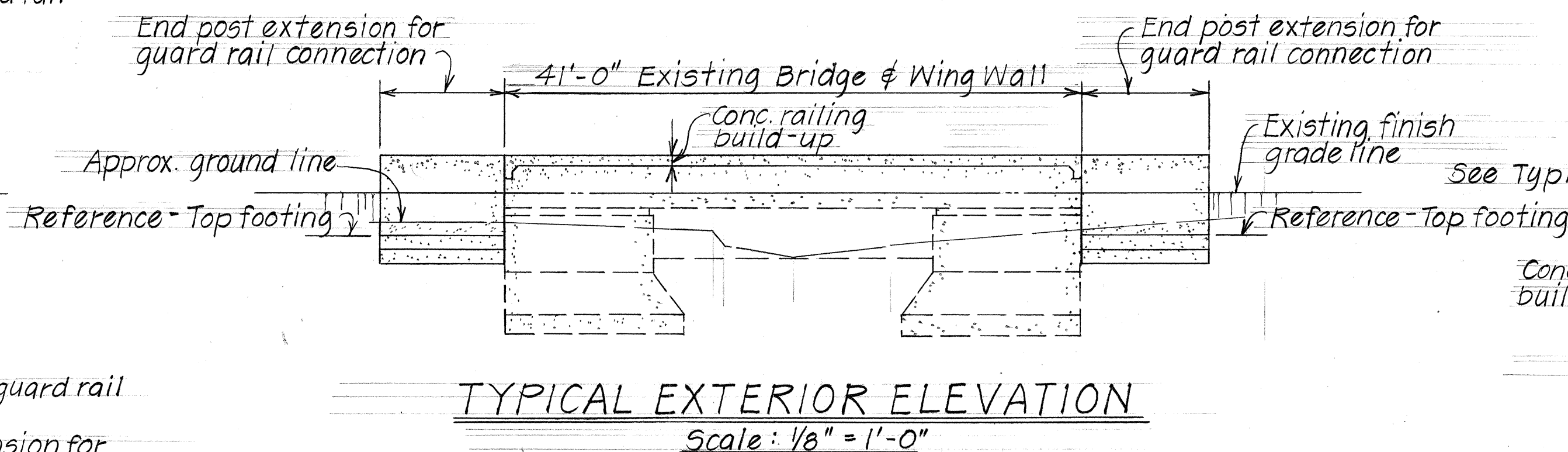
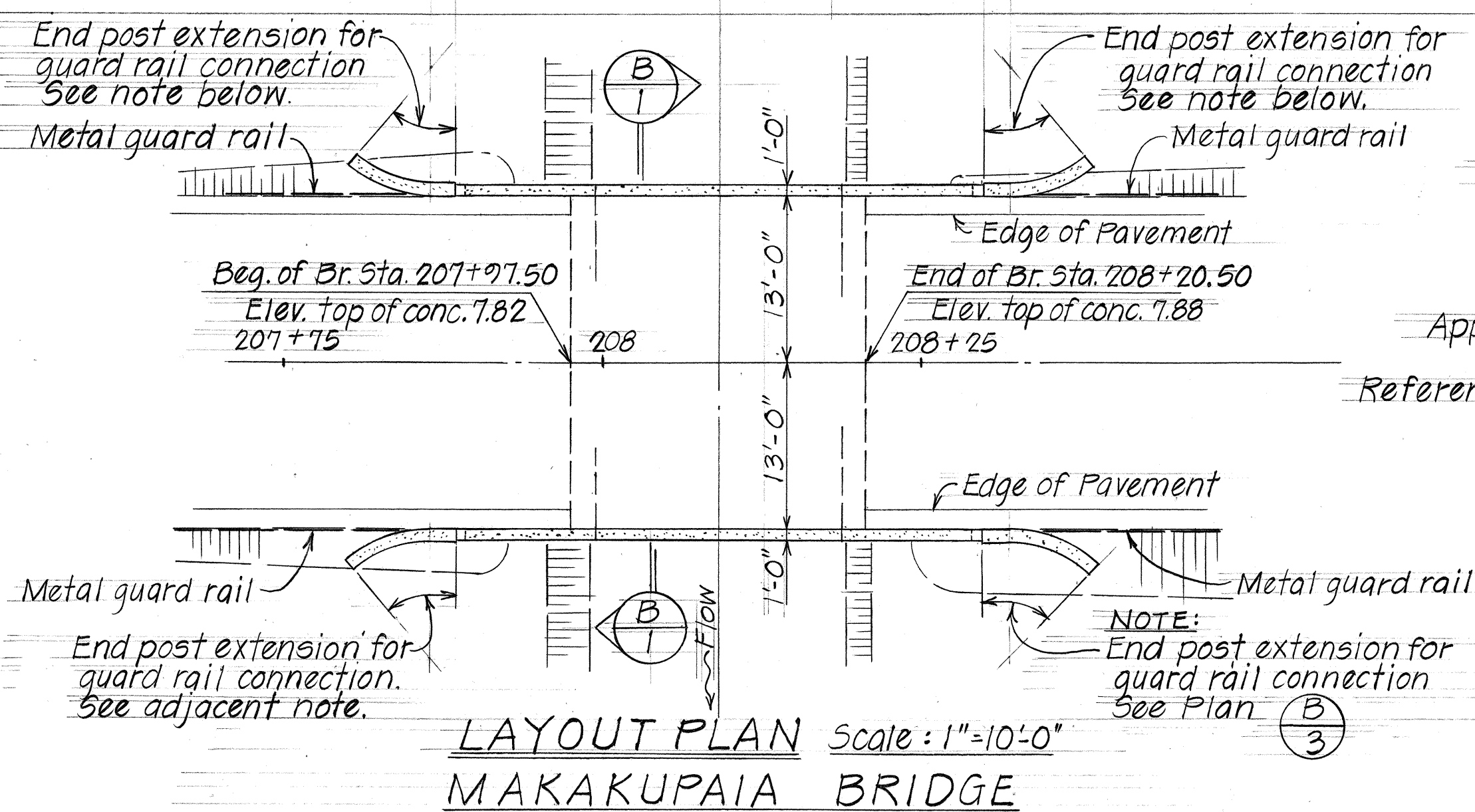
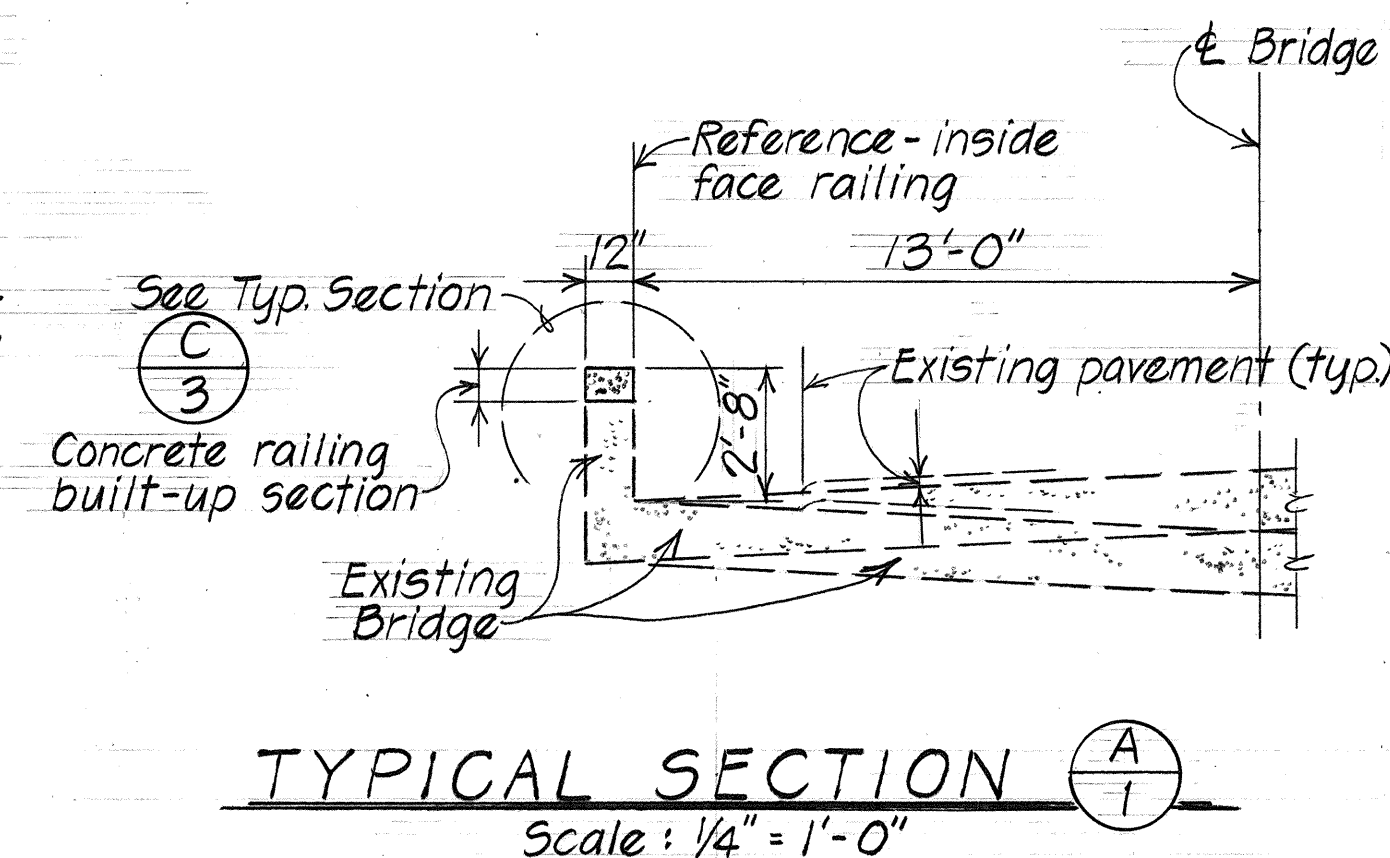
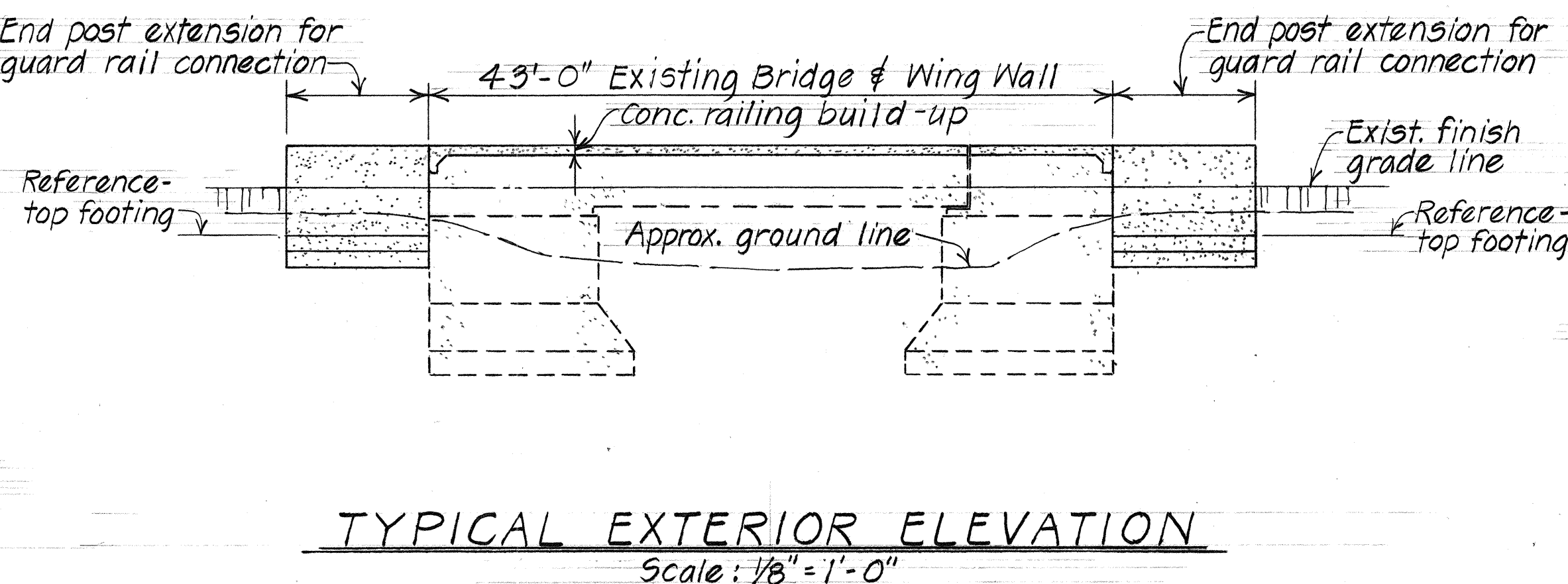
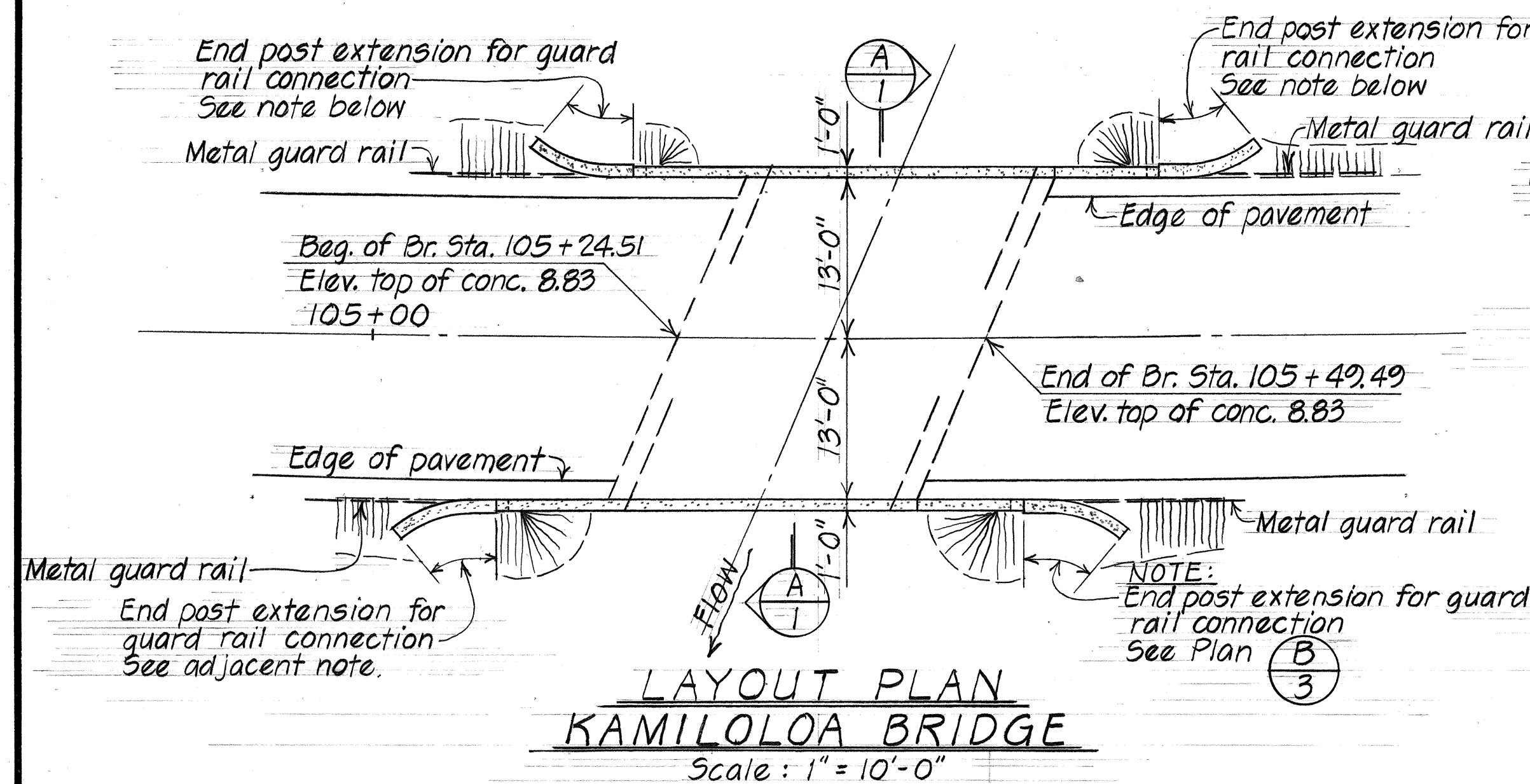


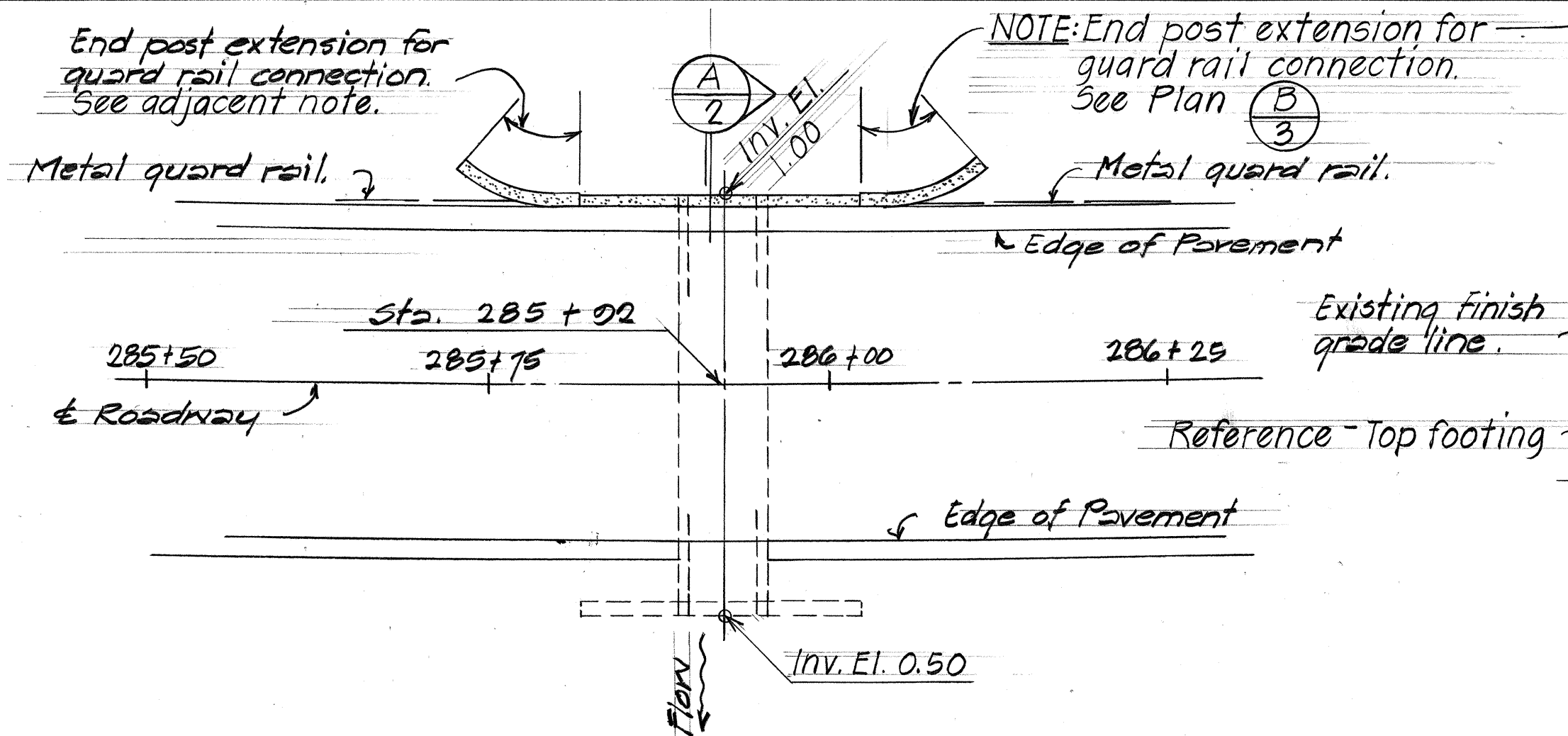
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0450(1)	1979	8	26



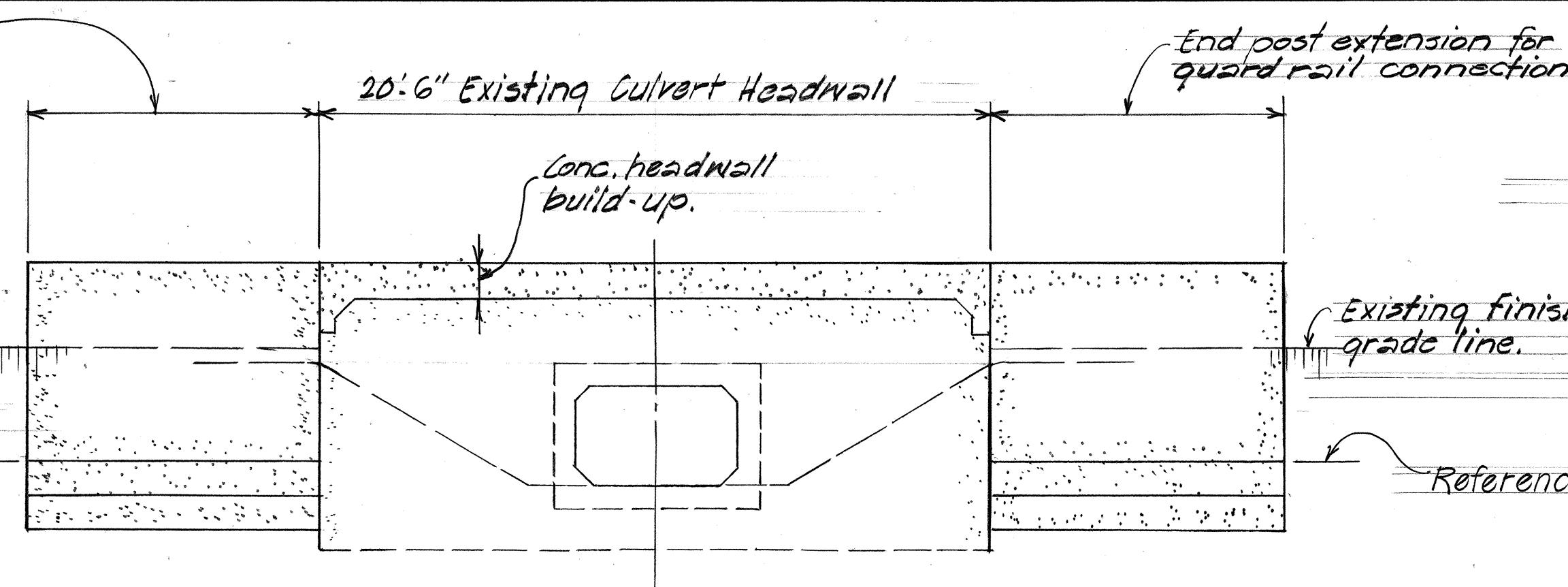
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
**KAMILOLOA, MAKAKUPAIA,
KAWELA BRIDGES**
END POST EXTENSION FOR
GUARD RAIL CONNECTIONS
KAMEHAMEHA V HIGHWAY RESURFACING
F.A. PROJ. NO. RS-0450(1)
SCALE: AS NOTED DATE: MAR. '79
SHEET NO. 1 OF 4 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY G.J.L., L.M.A., S.Y.	3/79
DESIGNED BY T.S.Y., L.M.A.	3/79
QUANTITIES BY S.Y., L.M.A.	3/79
CHECKED BY L.A.	3/79
NO.	

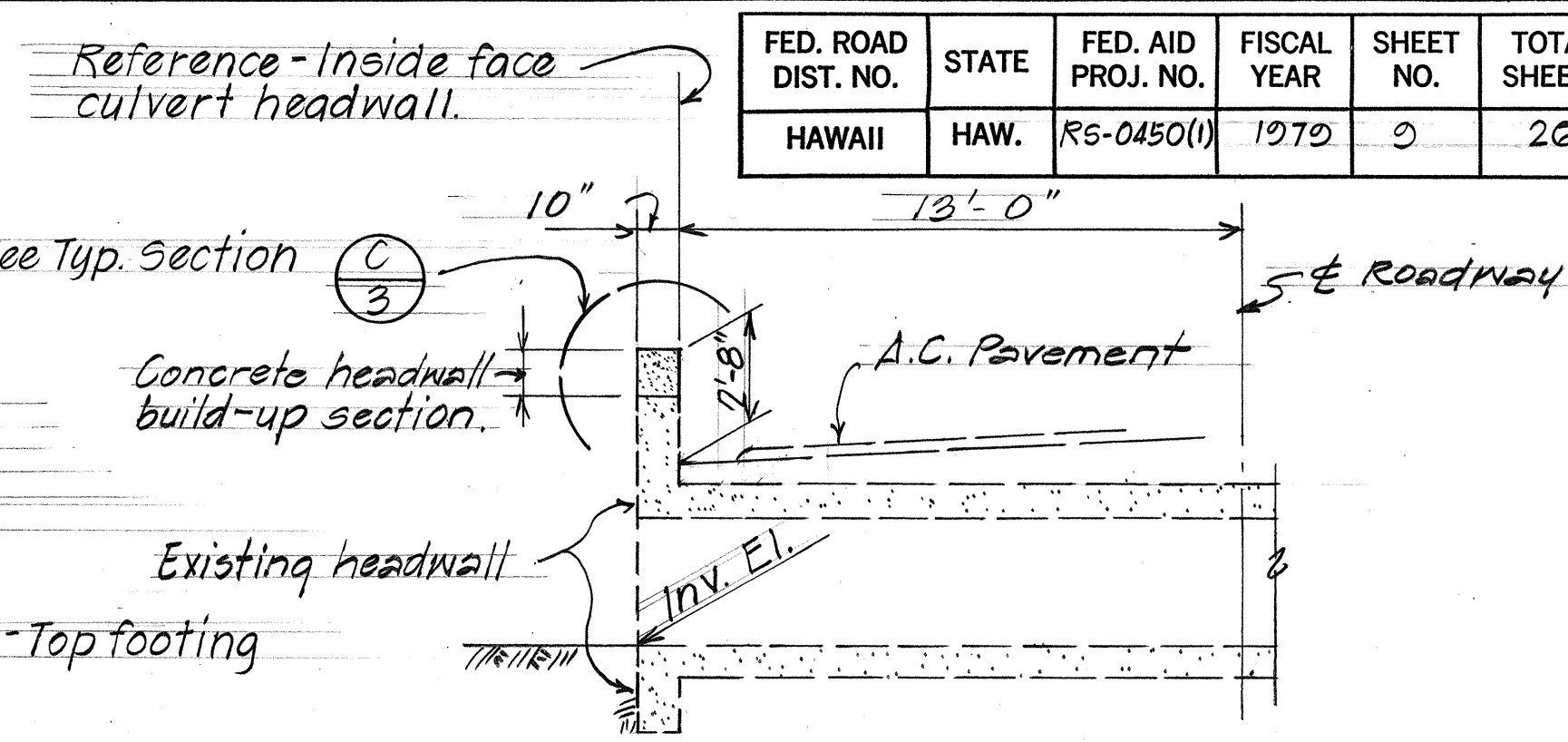
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0450(1)	1979	9	26



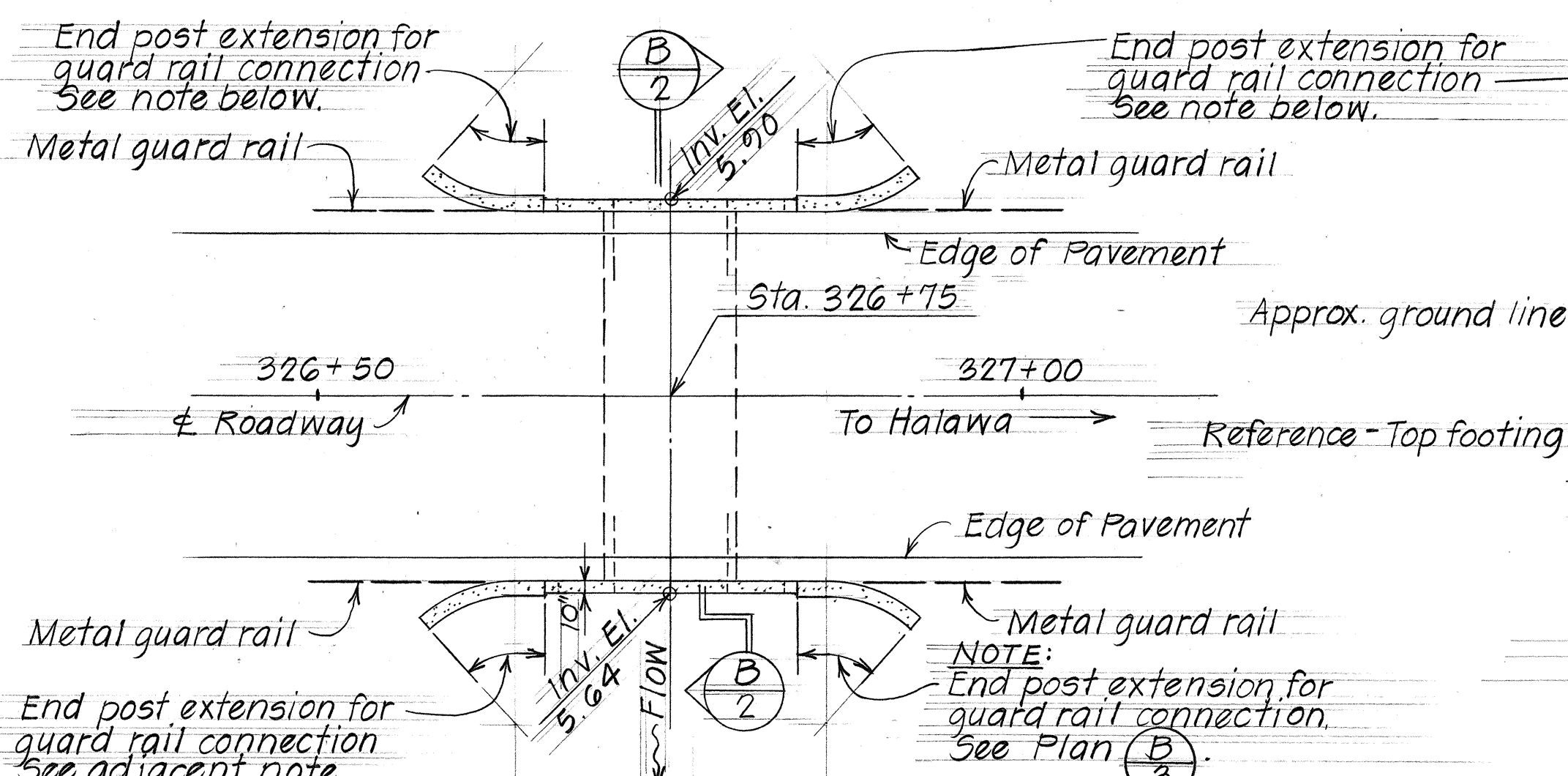
PLAN - EXISTING 5' x 3' BOX CULVERT - STA. 285+92
Scale: 1" = 10'-0"



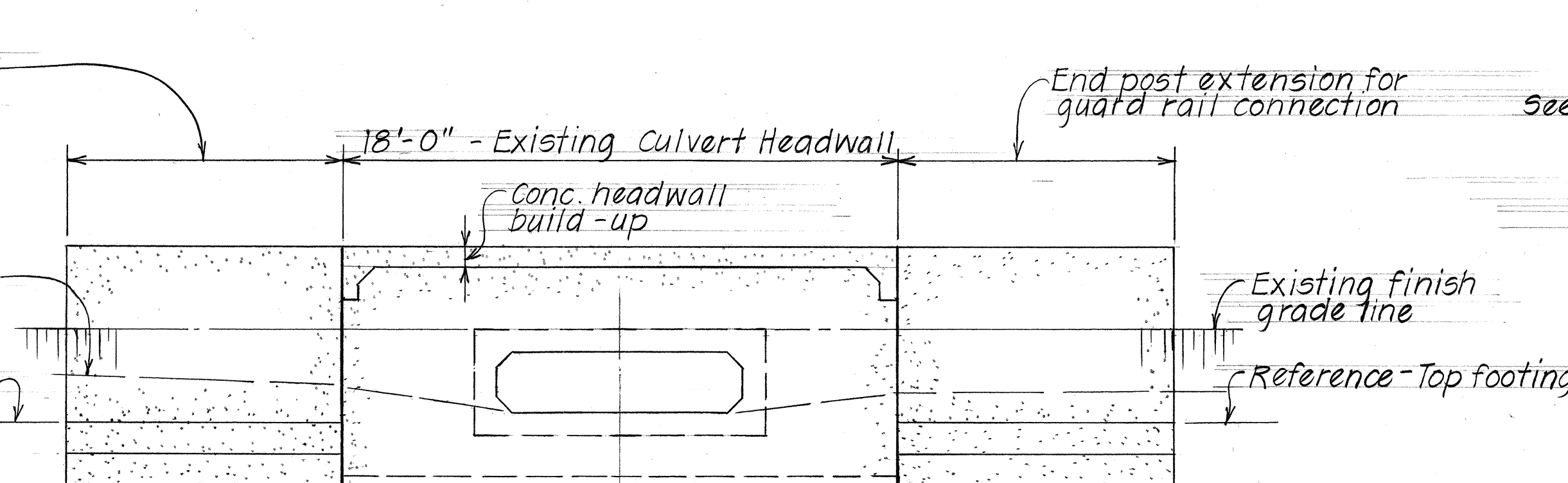
ELEVATION - INTAKE HEADWALL
Scale: 1/4" = 1'-0"



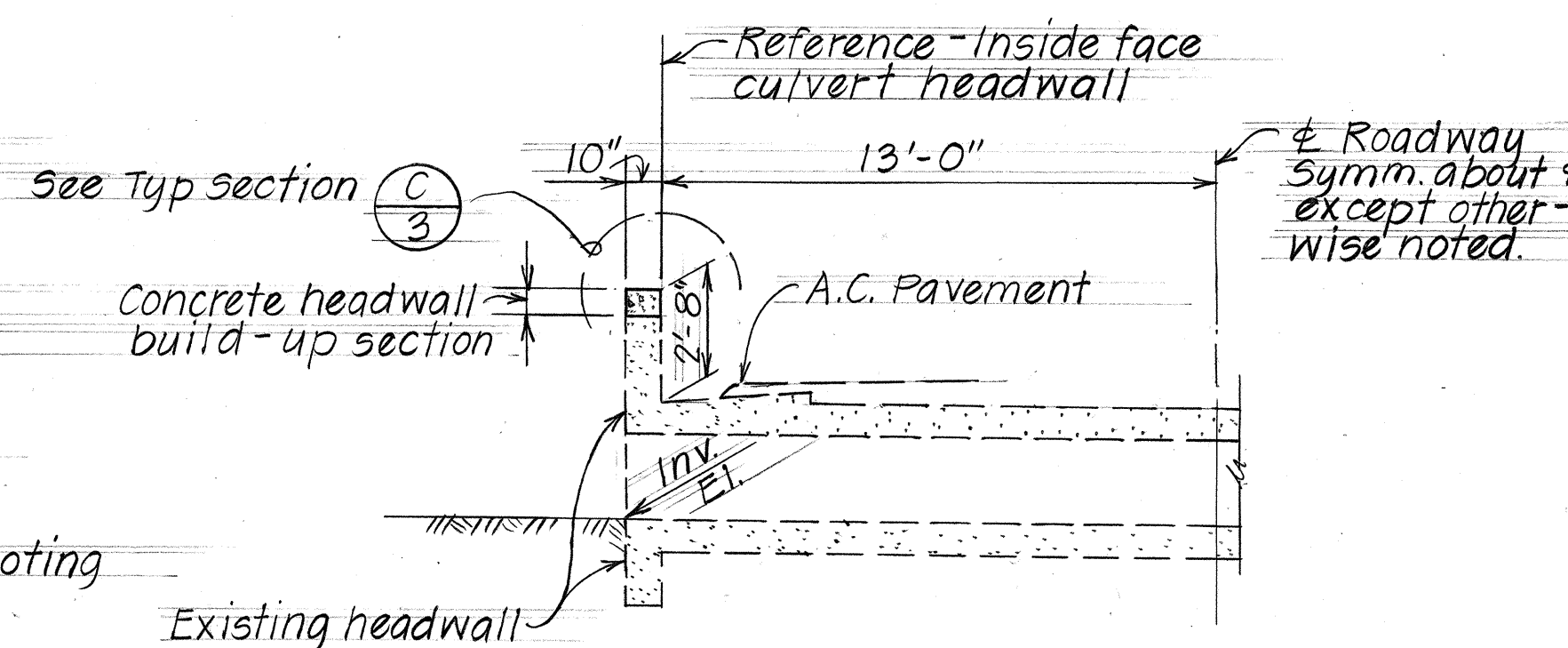
TYPICAL SECTION (A) 2
Scale: 1/4" = 1'-0"



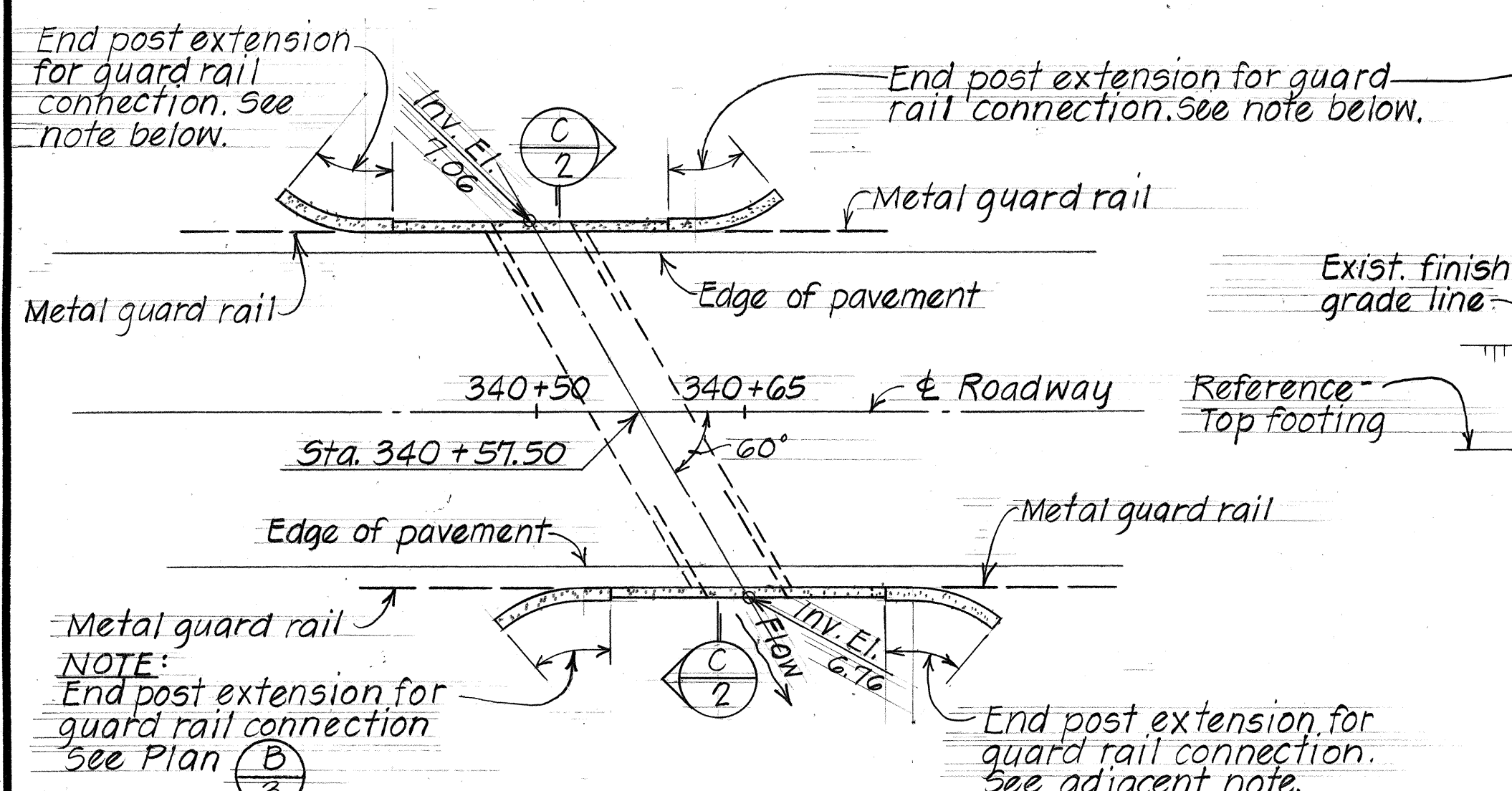
PLAN - EXISTING 8' x 2' BOX CULVERT - STA. 326+75
Scale: 1" = 10'-0"



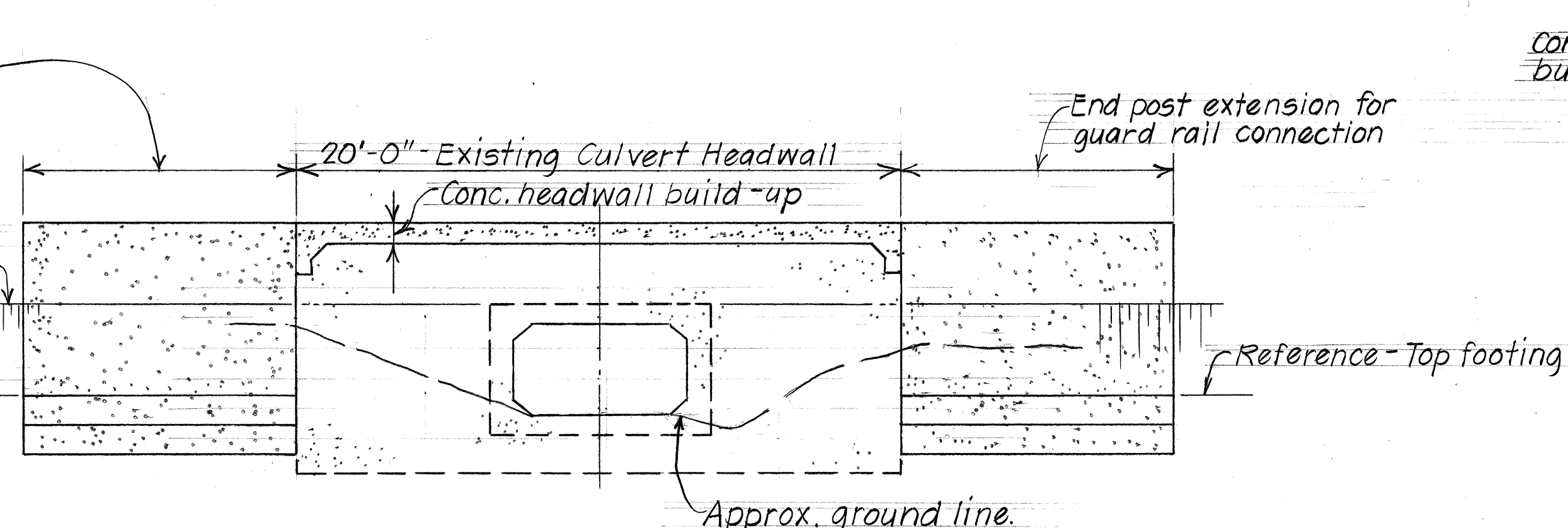
TYPICAL EXTERIOR ELEVATION
Scale: 1/4" = 1'-0"



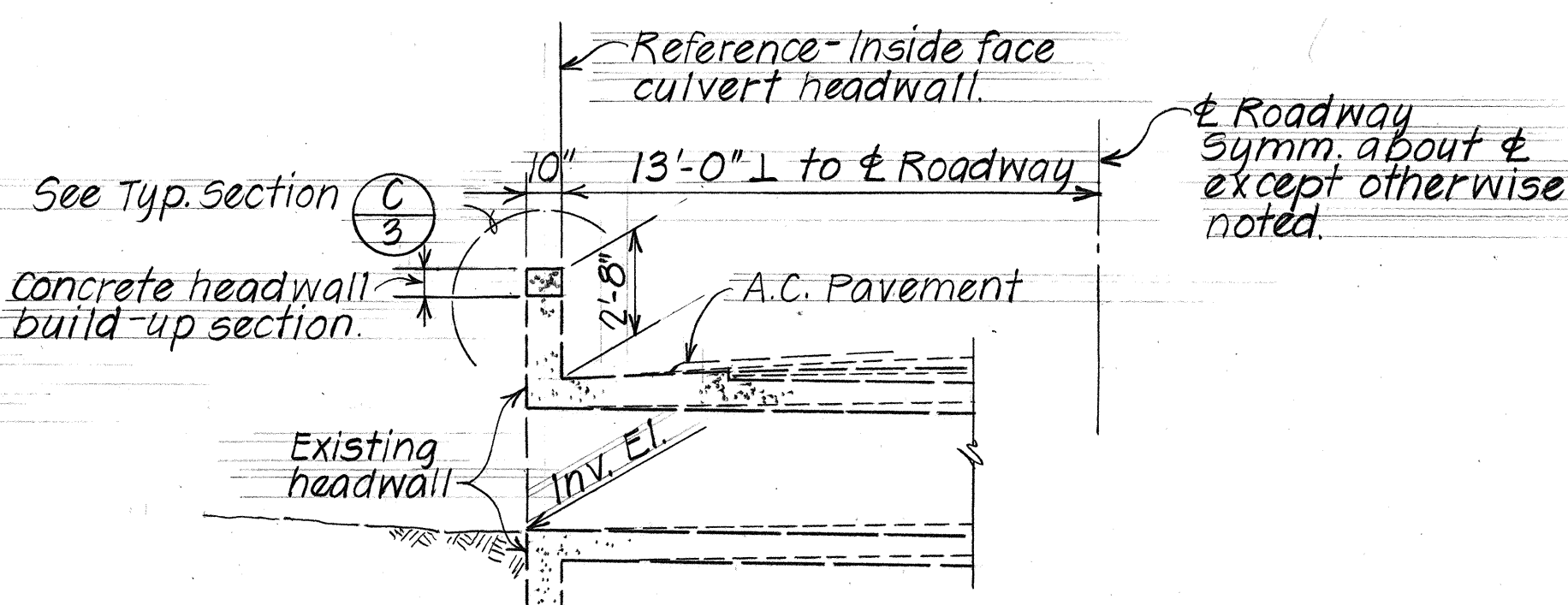
TYPICAL SECTION (B) 2
Scale: 1/4" = 1'-0"



PLAN - EXISTING 5' x 3' BOX CULVERT - STA. 340+57.50
Scale: 1" = 10'-0"



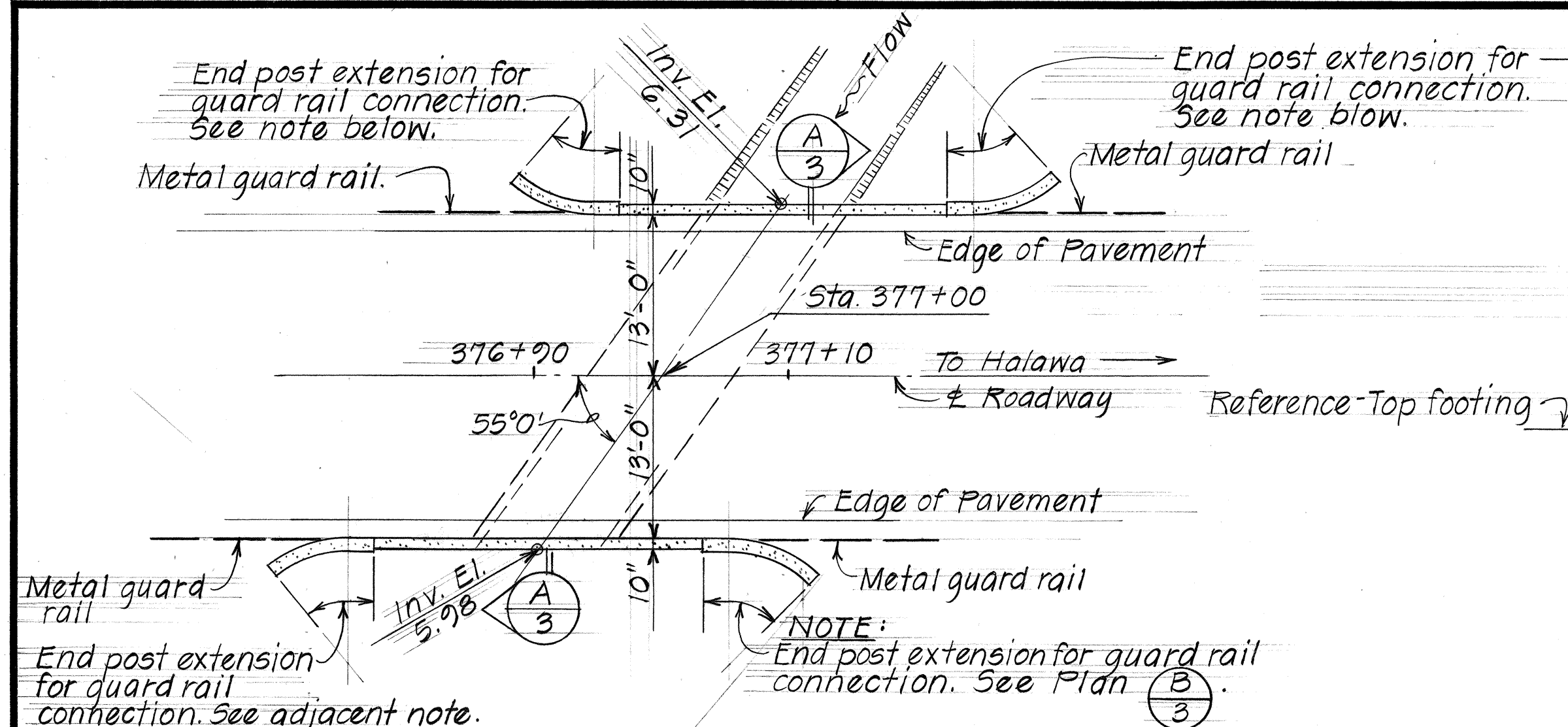
TYPICAL EXTERIOR ELEVATION
Scale: 1/4" = 1'-0"



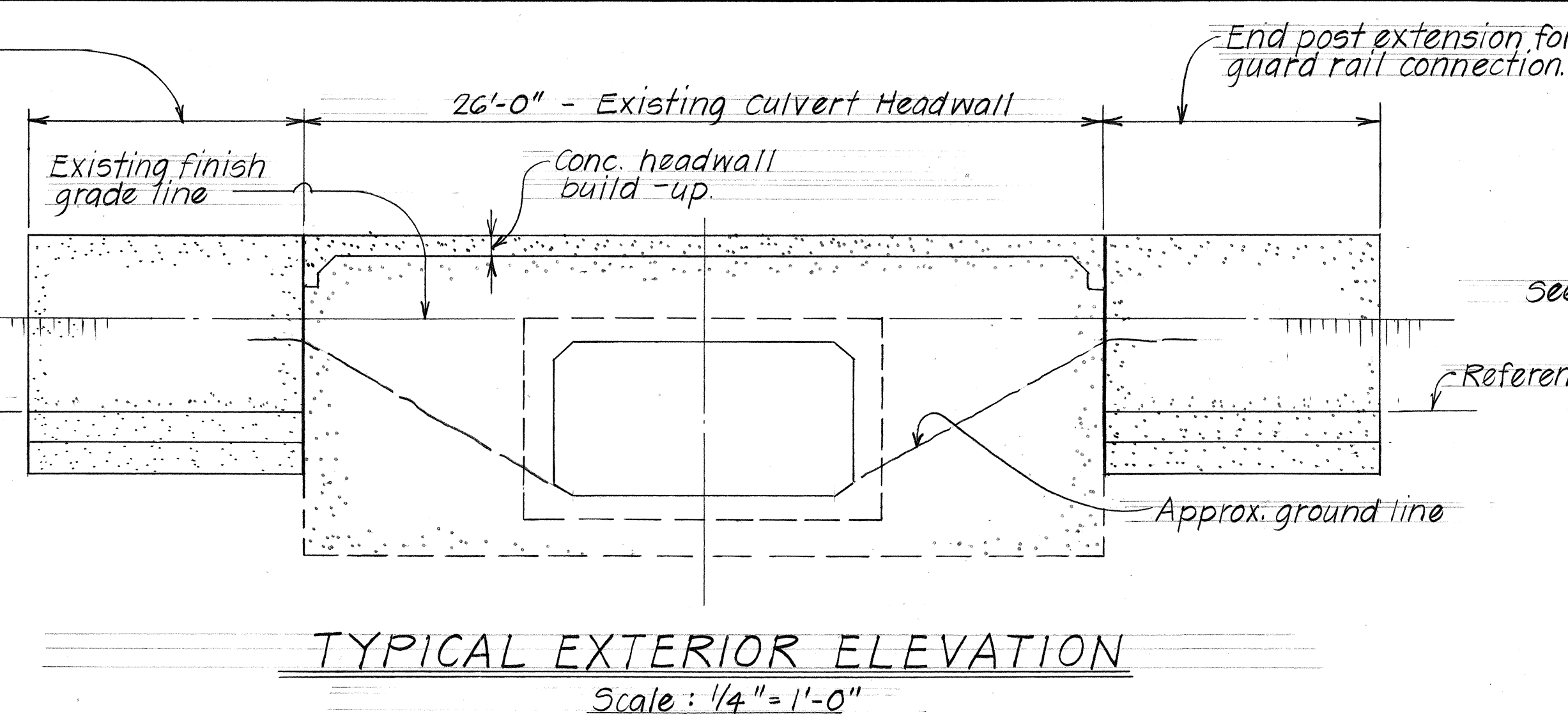
TYPICAL SECTION (C) 2
Scale: 1/4" = 1'-0"

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION					
5' x 3' BOX CULVERT - STA. 285+92					
8' x 2' BOX CULVERT - STA. 326+75					
5' x 3' BOX CULVERT - STA. 340+57.50					
END POST EXTENSION FOR GUARD RAIL CONNECTIONS					
KAMEHAMEHA V HIGHWAY RESURFACING					
FA. PROJ. NO. RS-0450(1)					
SCALE: AS NOTED DATE: MAR. '79					
SHEET NO. 2 OF 4 SHEETS					

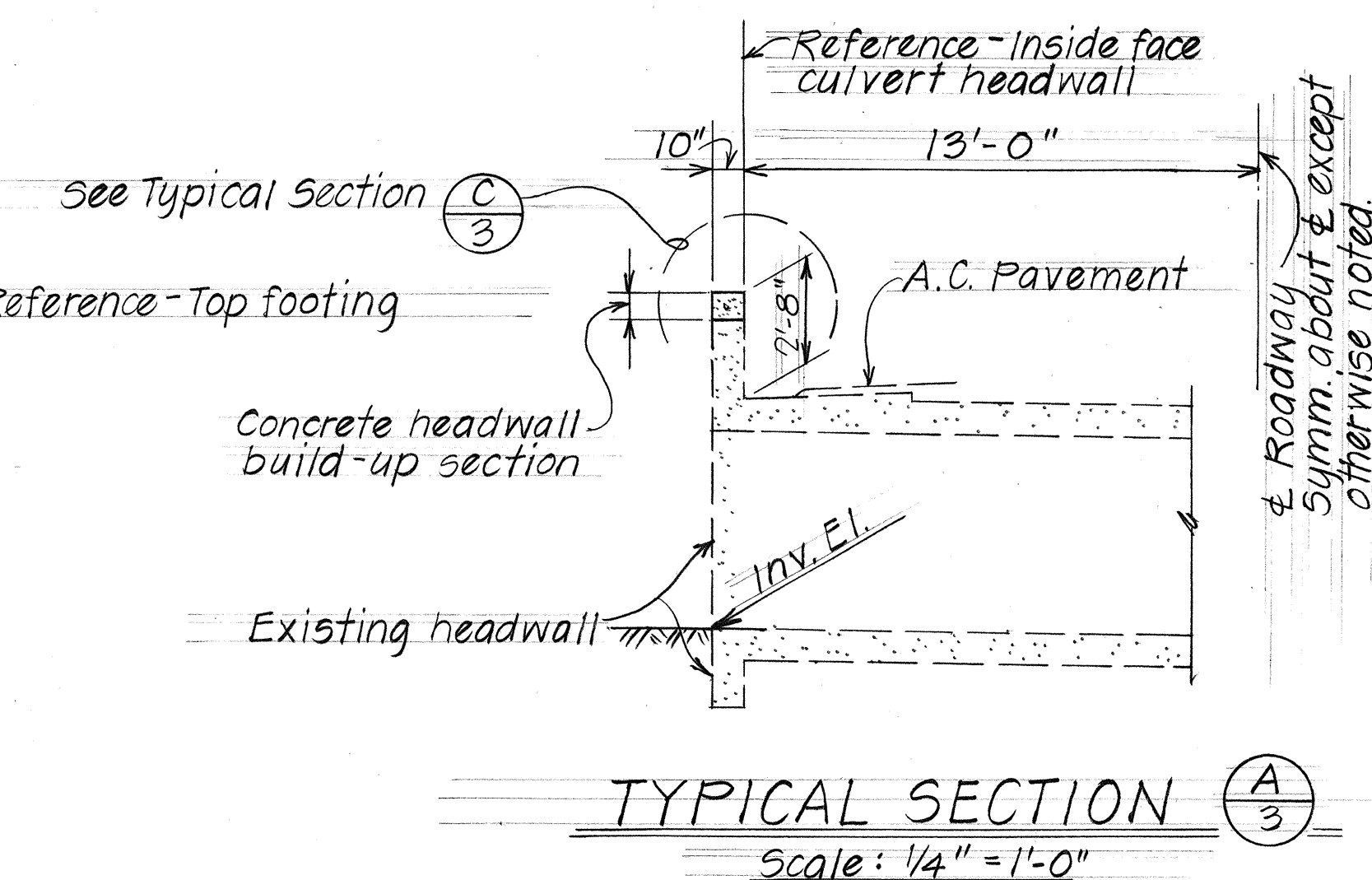
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0450(1)	1979	10	26



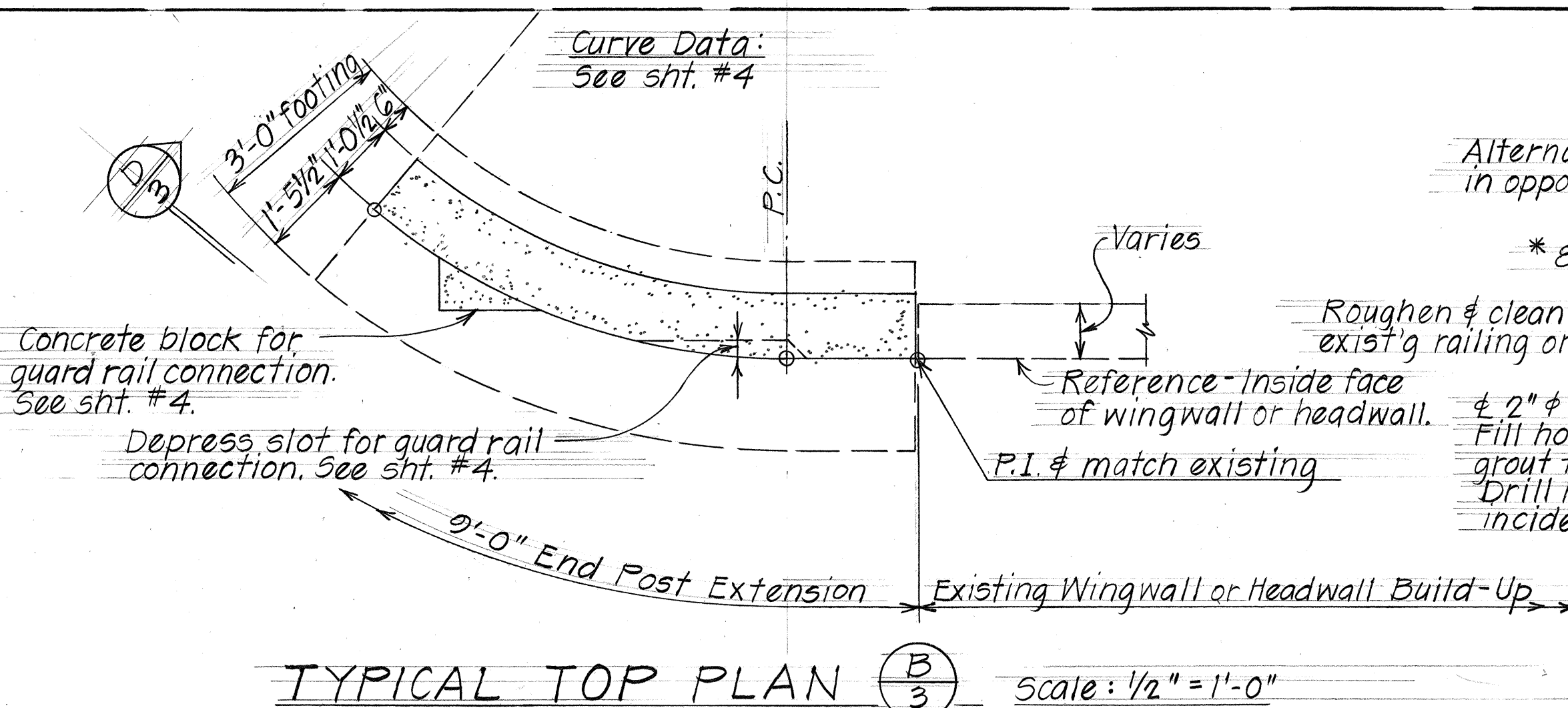
PLAN - EXISTING 8' x 5' BOX CULVERT - STA. 377+00
Scale: 1" = 10'-0"



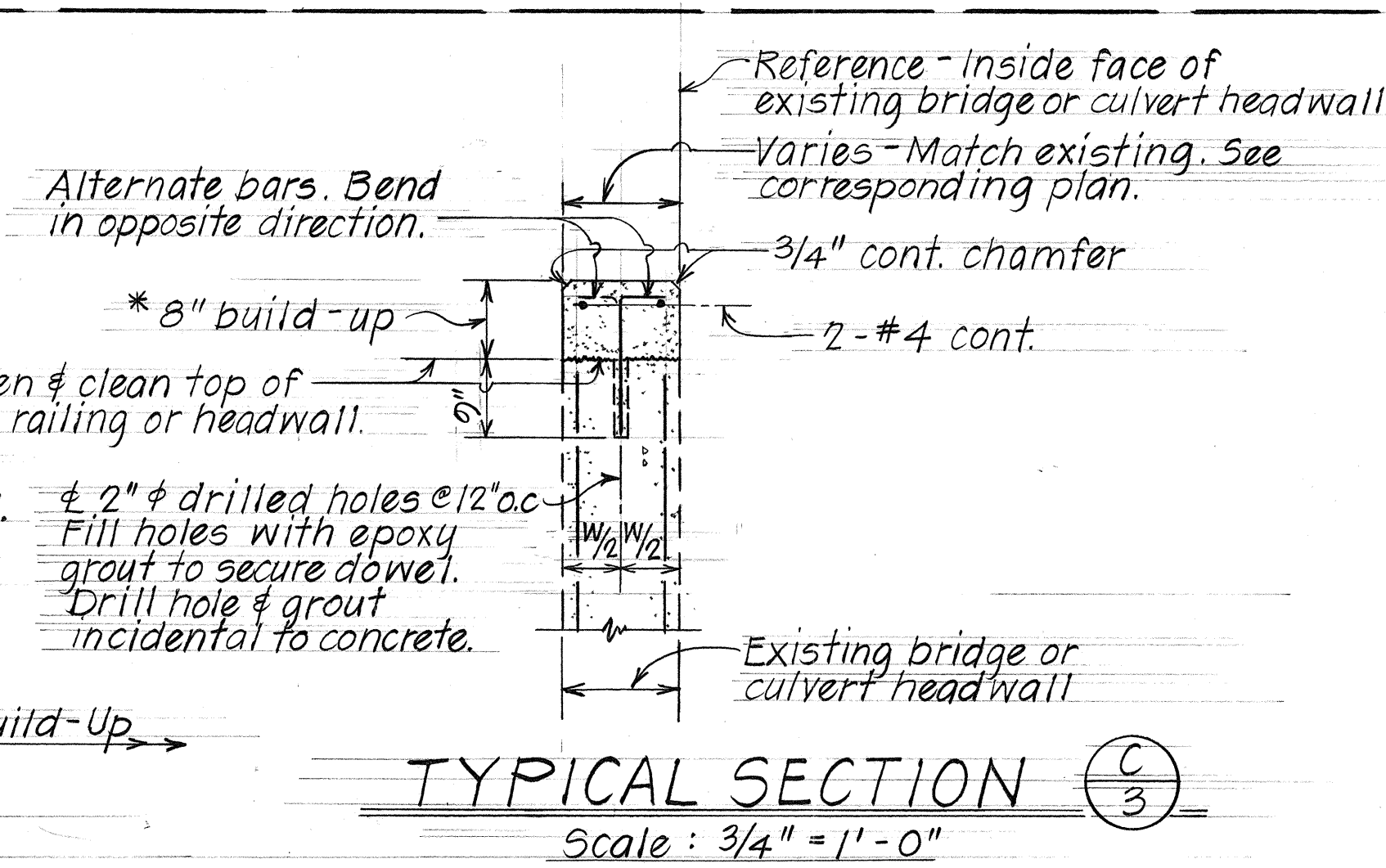
TYPICAL EXTERIOR ELEVATION
Scale: 1/4" = 1'-0"



TYPICAL SECTION
Scale: 1/4" = 1'-0"



TYPICAL TOP PLAN
Scale: 1/2" = 1'-0"



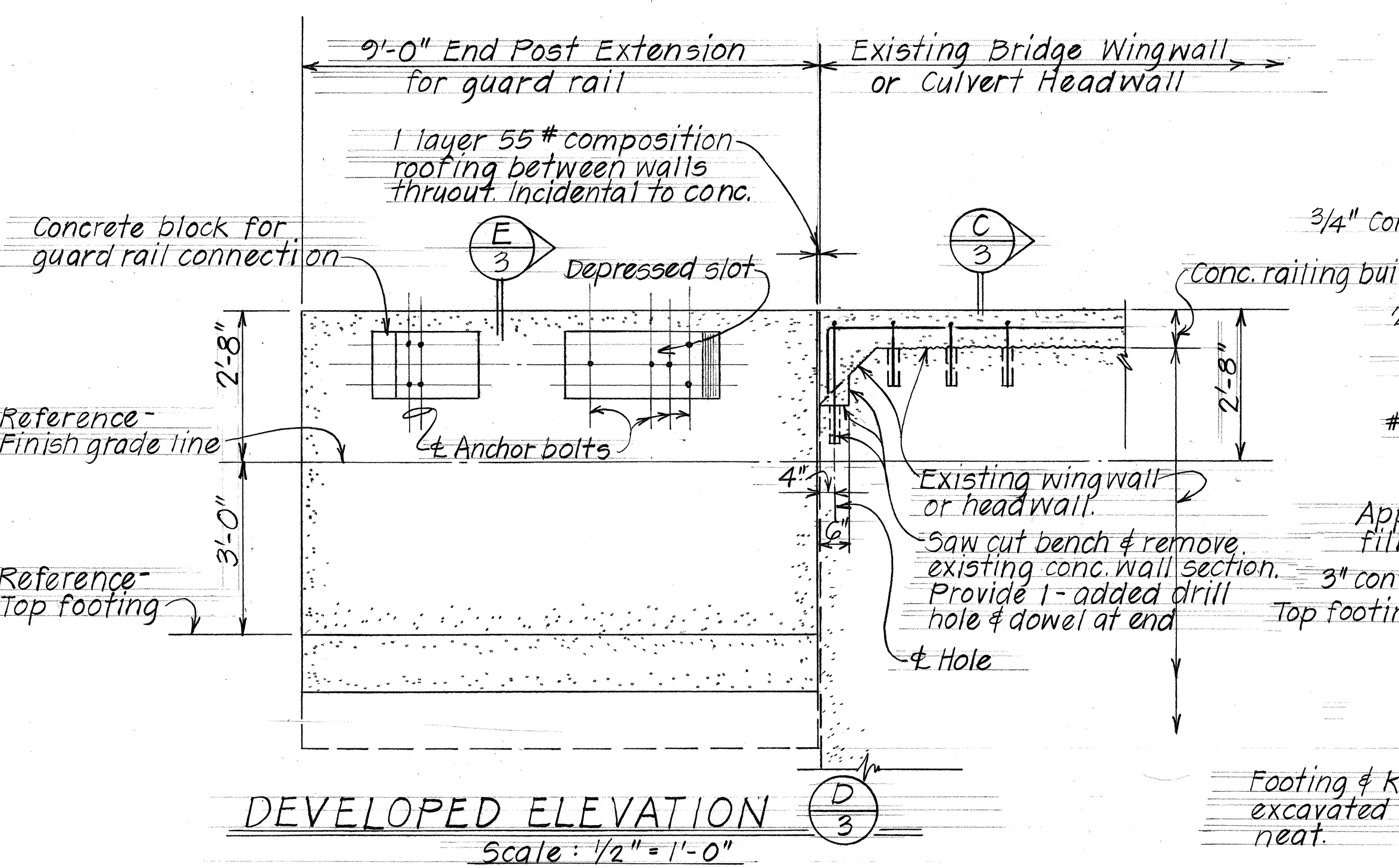
TYPICAL SECTION
Scale: 3/4" = 1'-0"

GENERAL NOTES

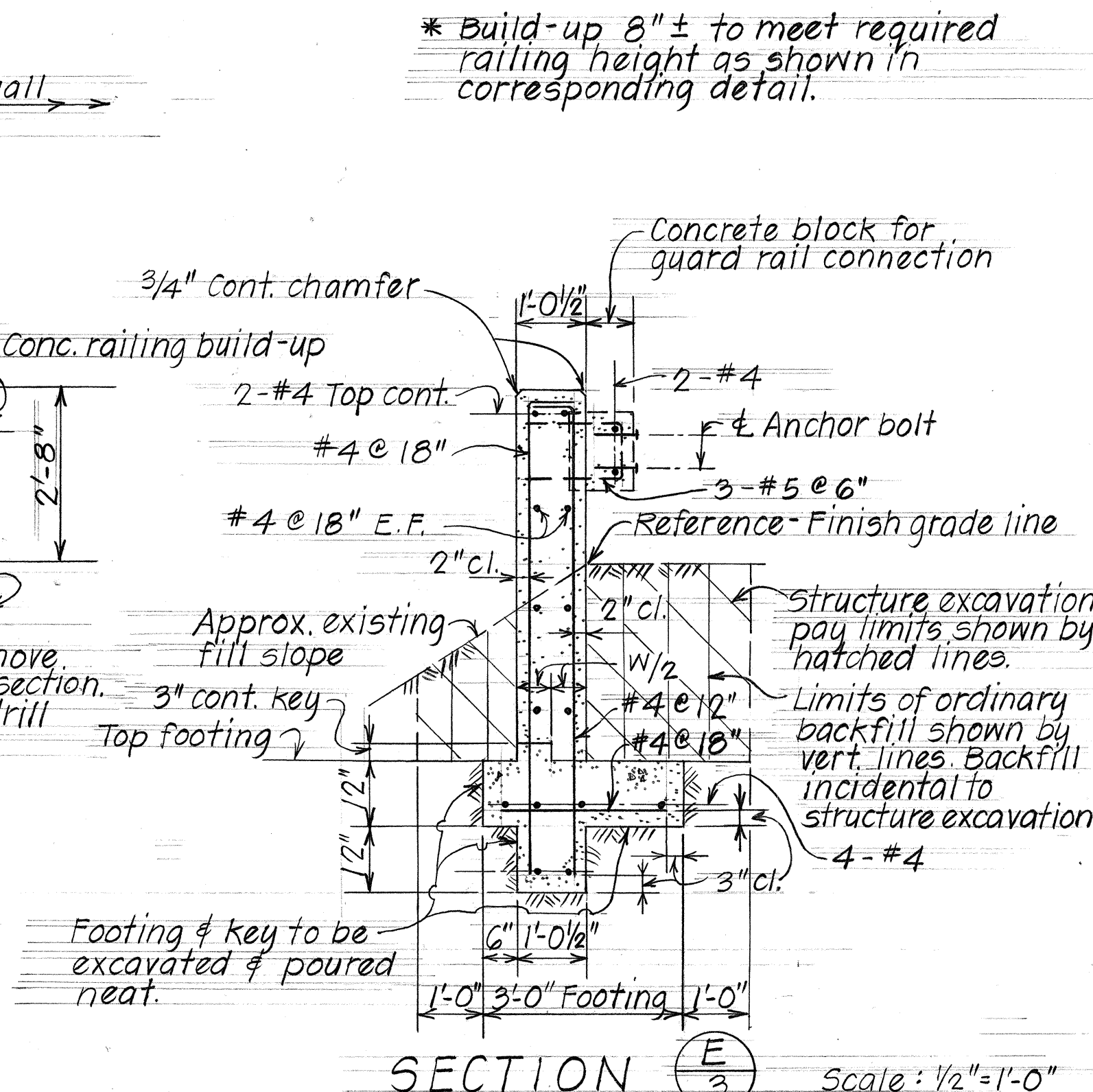
- MATERIALS:**
1. All concrete shall be Class A.
 2. Reinforcing steel - ASTM A615 grade 40.

CONSTRUCTION REQUIREMENTS

1. For removal of existing concrete, saw cut face in a straight and clean line to the plane of the outer edge of reinforcing.
2. Pneumatic type of equipment will not be permitted for drilling.
3. Care shall be taken in removal and drilling operations, and any damage caused by the Contractor's operation will be repaired at his expense to the satisfaction of the Engineer.
4. Unless otherwise noted elsewhere on the plans, all exterior corners in concrete work shall be chamfered 3/4" x 3/4".
5. The Contractor shall erect necessary traffic control devices along the approach area of the guard rail connection installations at the culverts & bridges.



DEVELOPED ELEVATION
Scale: 1/2" = 1'-0"



SECTION
Scale: 1/2" = 1'-0"

ESTIMATED QUANTITIES

ITEM NO.	CLASS A CONCRETE	REINFORCING STEEL	STRUCTURAL EXCAVATION
LOCATION			
KAMILOLOA BRIDGE	L.S. (15.5 C.Y.)	L.S. (1,004 LBS.)	26 C.Y.
MAKAKUPAIA BRIDGE	L.S. (15.4 C.Y.)	L.S. (994 LBS.)	26 C.Y.
KAWELA BRIDGE	L.S. (16.6 C.Y.)	L.S. (1,102 LBS.)	26 C.Y.
5' x 3' BOX CULVERT STA. 285+92	L.S. (7.3 C.Y.)	L.S. (455 LBS.)	13 C.Y.
8' x 2' BOX CULVERT STA. 326+75	L.S. (14.2 C.Y.)	L.S. (887 LBS.)	26 C.Y.
5' x 3' BOX CULVERT STA. 340+57.50	L.S. (14.2 C.Y.)	L.S. (896 LBS.)	26 C.Y.
8' x 5' BOX CULVERT STA. 377+00	L.S. (14.5 C.Y.)	L.S. (926 LBS.)	26 C.Y.
TOTAL	LUMP SUM (97.7 C.Y.)	LUMP SUM (6,264 LBS.)	169 C.Y.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
8' x 5' BOX CULVERT - STA. 377+00
TYPICAL END POST EXTENSION FOR
GUARD RAIL CONNECTION & DETAILS
KAMEHAMEHA V HIGHWAY RESURFACING
F.A. PROJ. NO. RS-0450(1)
SCALE: AS NOTED DATE: MAR. '79
SHEET No. 3 OF 4 SHEETS

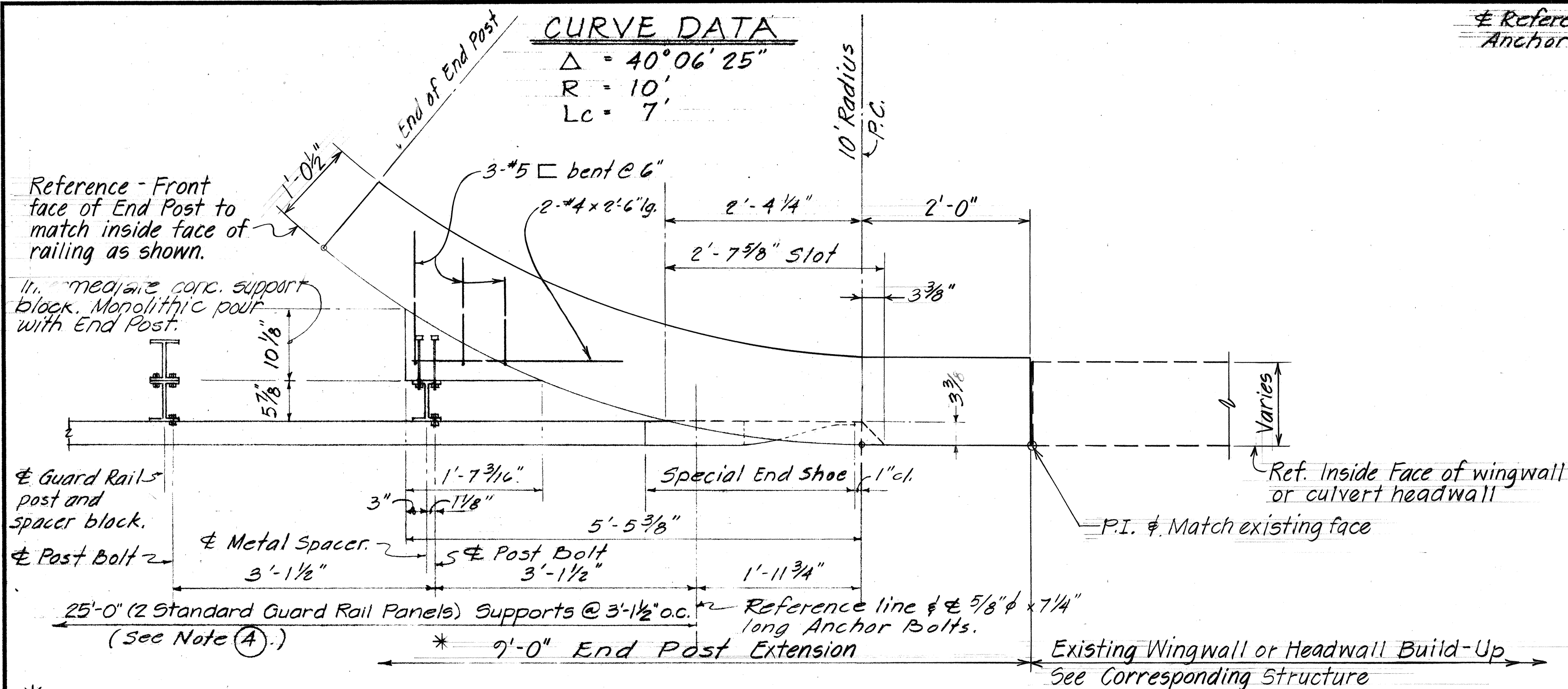
SURVEY PLOTTED BY	DATE
DRAWN BY	2/77
DESIGNED BY	3/77
QUANTITIES BY	3/77
CHECKED BY	3/77
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0450(1)	1979	11	26

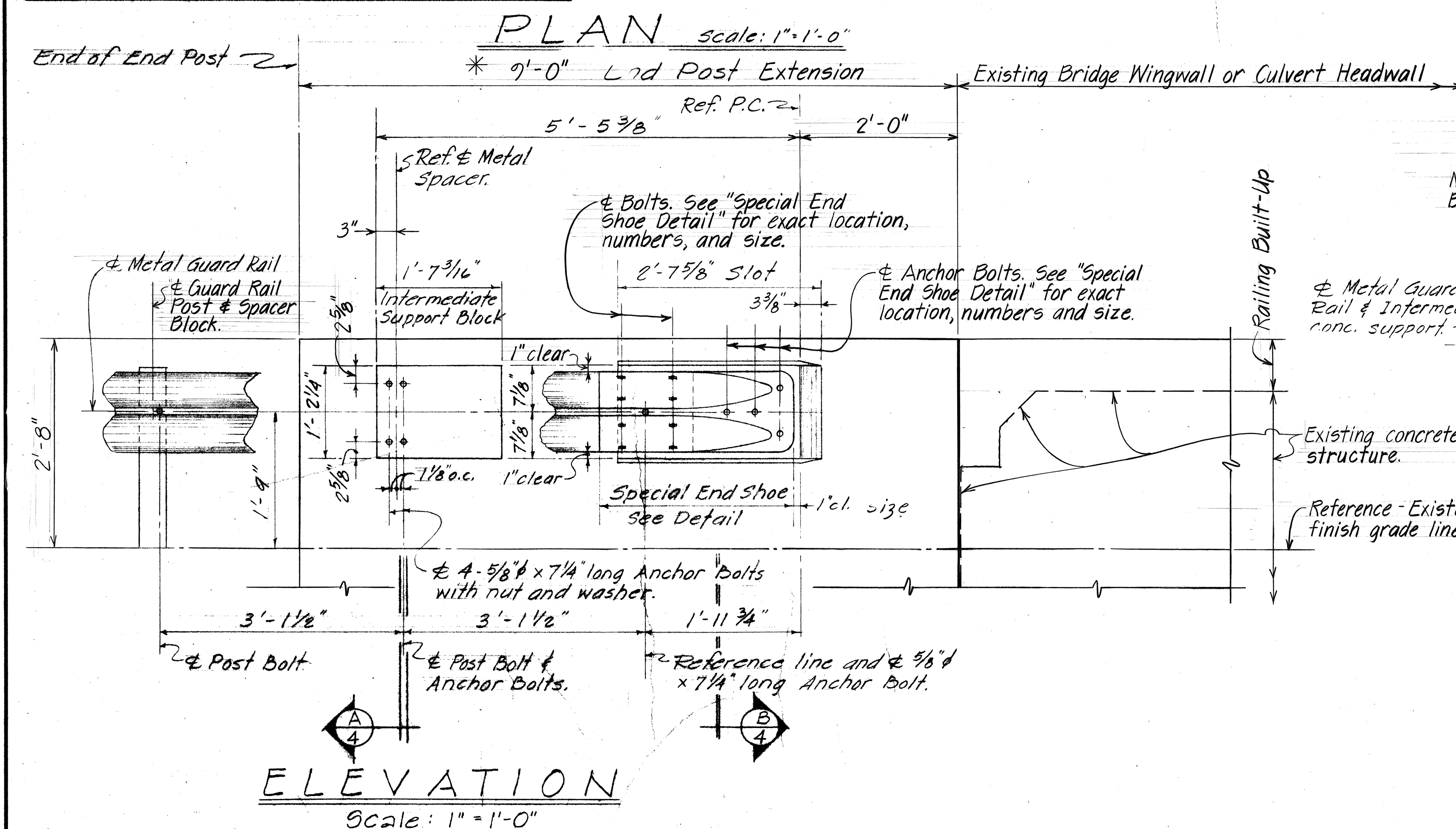
± Reference line and ± 3/4" x 2 1/2" bolt slot for 5/8" x 7 1/4" long Anchor Bolt.

± 3/32" x 3" slots. See "Standard Details Metal Guard Rail" for bolt dimensions.

± 1" holes for 7/8" x 7 1/4" long Anchor Bolts.



SECTION (C) ELEVATION **SPECIAL END SHOE DETAILS** Scale: 3" = 1'-0"



ELEVATION Scale: 1" = 1'-0"

SECTION (A) Scale 1 1/2" = 1'-0"

SECTION (B) Scale 1 1/2" = 1'-0"

- NOTES:**
1. All Anchor Bolts shall be high strength bolts conforming to the requirements of ASTM A-325.
 2. All shoe assembly, including anchor bolts, nuts and washers, shall be galvanized.
 3. Special end shoe shall be fabricated from 10 gage steel conforming to the requirements of AASHTO 180.
 4. First 25'-0" of guard rail adjoining "Special End Shoe" shall be galvanized steel.
 5. Anchor Bolt length given under bolt head.
 6. Special end shoe, metal spacer, anchor bolts & accessories shall be incidental to metal guard rail & will not be paid for separately.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**METAL GUARD RAIL DETAILS
AT BRIDGE OR CULVERT END
POST EXTENSION**

KAMEHAMEHA V HIGHWAY RESURFACING
F.A. PROJ. NO. RS-0450(1)

SCALE: AS NOTED DATE: MAR. '79
SHEET No. 4 OF 4 SHEETS

DESIGNED BY	DATE
DRAWN BY	3/79
CHECKED BY	3/79
APPROVED BY	3/79
NOTED BY	3/79
REVISIONS	
NO.	