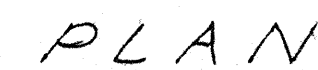


CURVE DATA
 $\Delta = 70^\circ 06' 25''$
 $R = 10'-0''$ (To front face of End Post)
 $L_c = 7'-0''$



Scale: $\frac{1}{2}" = 1'-0"$



Where new conc. end post connection occurs over exist'g structure ft'g, "Section 



Scale: $\frac{1}{2}" = 1'-0"$

- ① For additional information on metal guard rail and special end shoe, see Hwy Drawing
- ② * Where single metal guard rail occur, plumb distance from shoulder grade to $\frac{1}{2}$ metal rail will be 1'-0" and slot width will be 1'-2 $\frac{1}{4}$ ". Reduce number of anchor bolts accordingly.
- ③ Where Type "W" connection conc. end post cannot be installed, use Type "S" connection conc. end post.
- ④ First 25'-0" of guard rail adjoining Special End Shoe shall be galvanized steel.
- ⑤ See Sht# 28 for Type "S" & "W" Estimated Quantities.

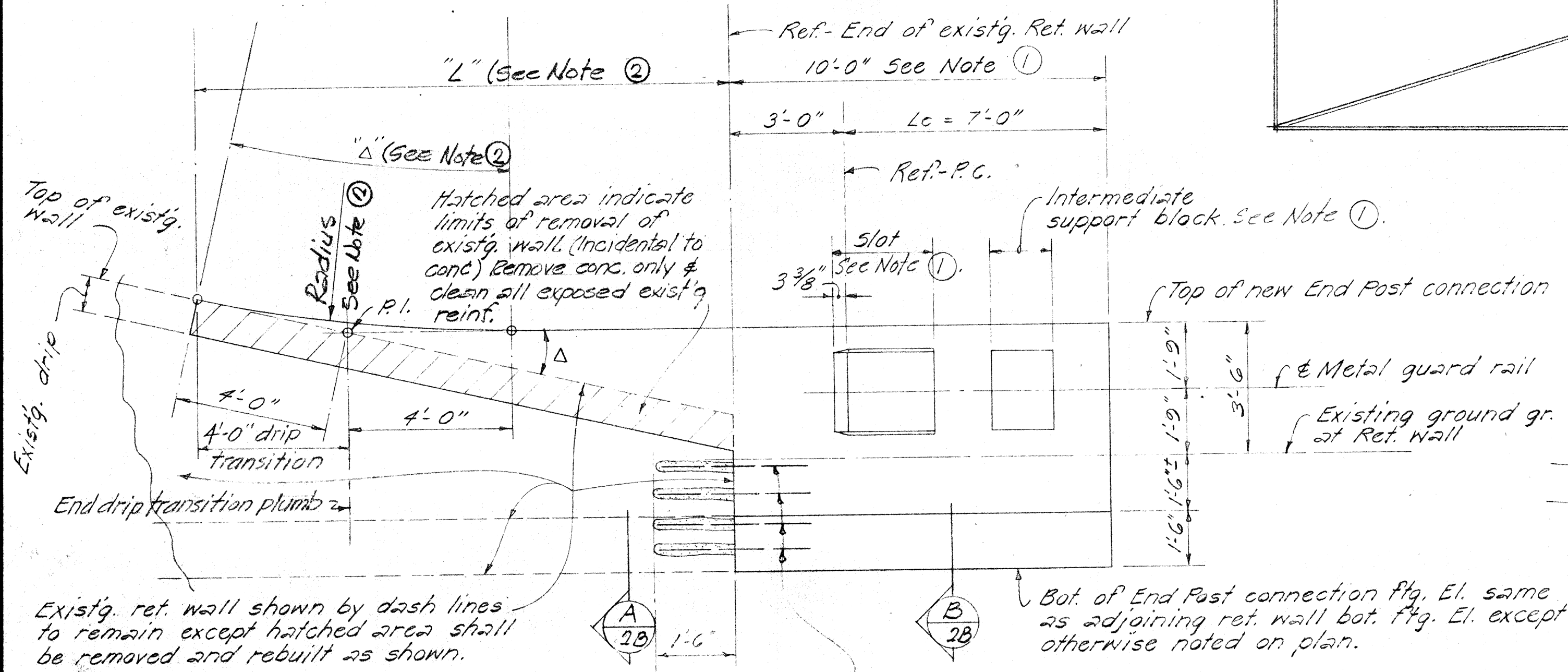
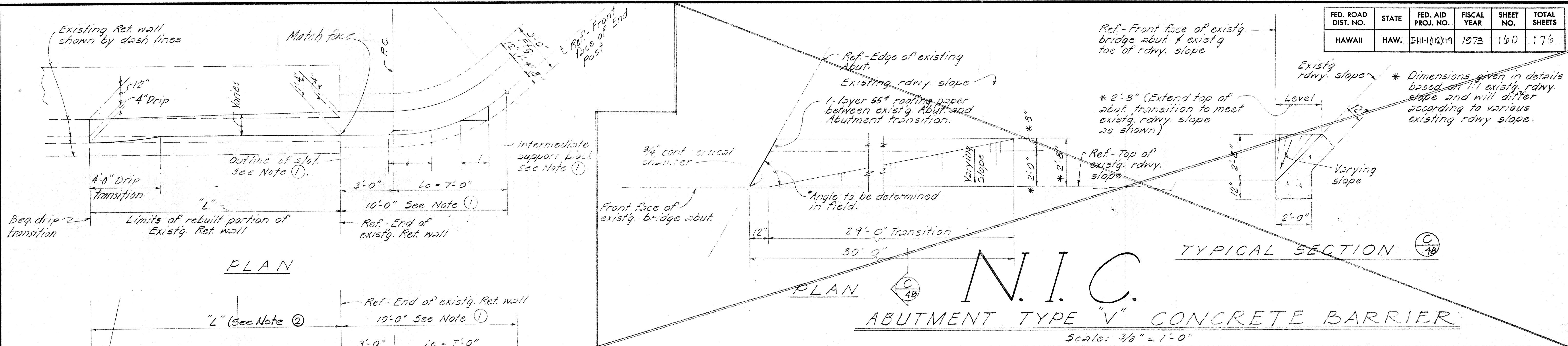


502/e: $\frac{1}{2}'' = 1' - 0''$

Where no existg. fig. occurs below
new end post connection, "Section
to be similar to "Section (A)" shown
above except otherwise noted. (B)

K-E CRYSTALENE
TRACING PAPER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	11-1(112)-1	1973	160	176



NOTE

- See Type "W" Guard Rail Connection Conc. End Post on sht. # 18 for additional concrete and reinf. information.
- "L", "D" & "R" Radius to be determined in field.

CONCRETE BARRIER WALL No 2

Scale: 3/8" = 1'-0"

SECTION A

TYPE "R"

TYPICAL METAL GUARD RAIL CONCRETE END POST CONNECTION AT END OF EXISTING RETAINING WALL

Scale: 3/8" = 1'-0"

SECTION B

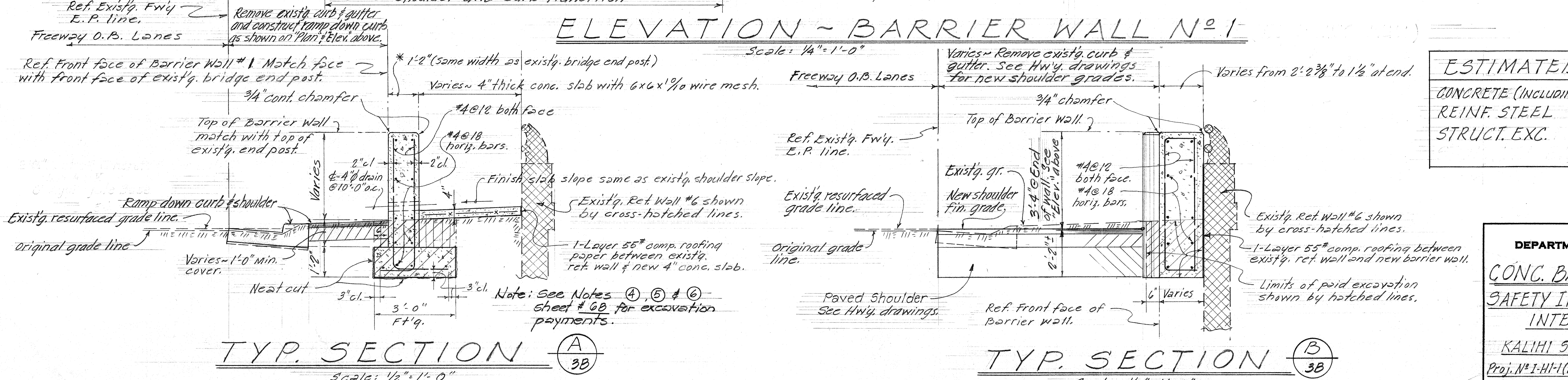
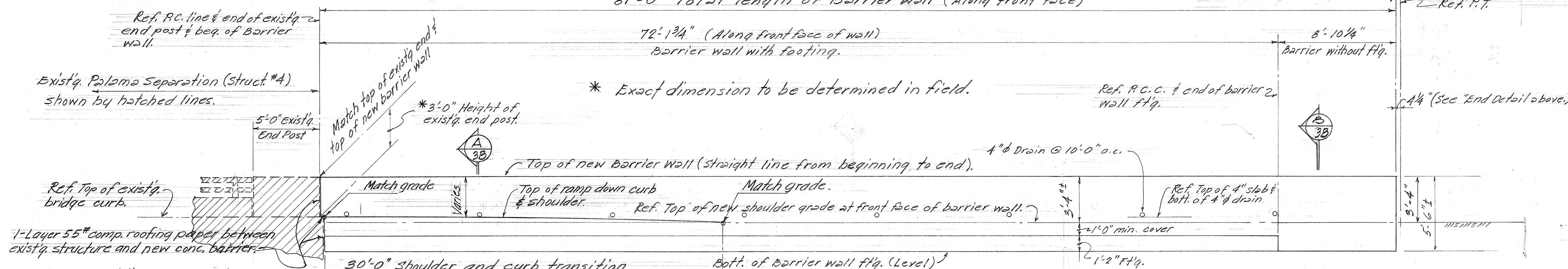
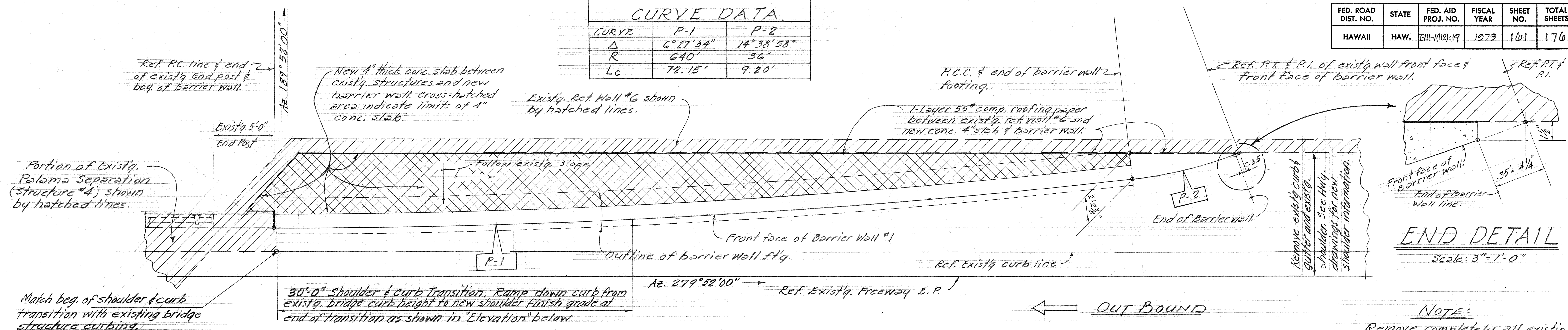
ESTIMATED QUANTITIES	
For TYPE "W", "S" & "R" END CONNECTION	
CONCRETE	114.0 c.y.
REINF. STEEL	3,956.0 lbs.
STRUCTURE EXC.	96.0 c.y.

ESTIMATED QUANTITIES	
For BARRIER WALL No. 2	
CONCRETE (L.S.)	20.0 c.y.
REINF. STEEL (L.S.)	850.0 lbs.
STRUCT. EXC.	18.0 c.y.

STATE OF HAWAII	
DEPARTMENT OF TRANSPORTATION	
HIGHWAYS DIVISION	
TYP. GUARD RAIL CONNECTION	
TYPE "R" & CONC. BARRIER WALL No 2	
SAFETY IMPROVEMENTS ALONG	
INTERSTATE H-1	
KALIHI ST. TO PALI HIGHWAY	
Proj. No. I-H-1(112)-12	Date: April, 1973
SHEET No. 28 OF 168 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	141-112-19	1973	161	176

CURVE DATA		
CURVE	P-1	P-2
Δ	6°27'34"	14°38'58"
R	640'	36'
Lc	72.15'	9.20'



ESTIMATED QUANTITIES		
CONCRETE (INCLUDING 4" SLAB)	27	CY.
REINF. STEEL	1,300	LB.
STRUCT. EXC.	19	CY.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONC. BARRIER WALL N° 1

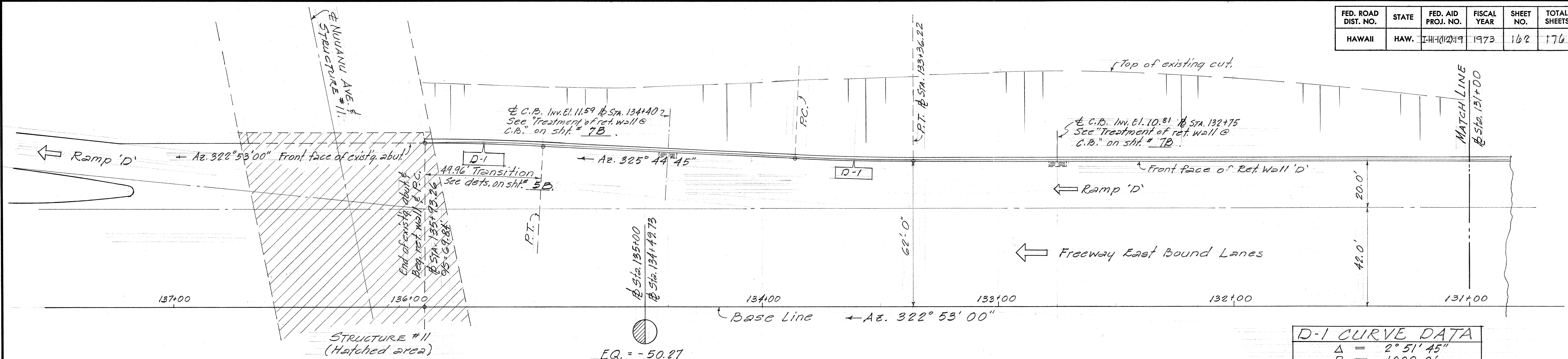
SAFETY IMPROVEMENTS ALONG INTERSTATE H-1

KALIHI STREET TO PALI HIGHWAY
Proj. N° I-H-1(112)-19 Date: April, 1973

SHEET No. 3B OF 16B SHEETS

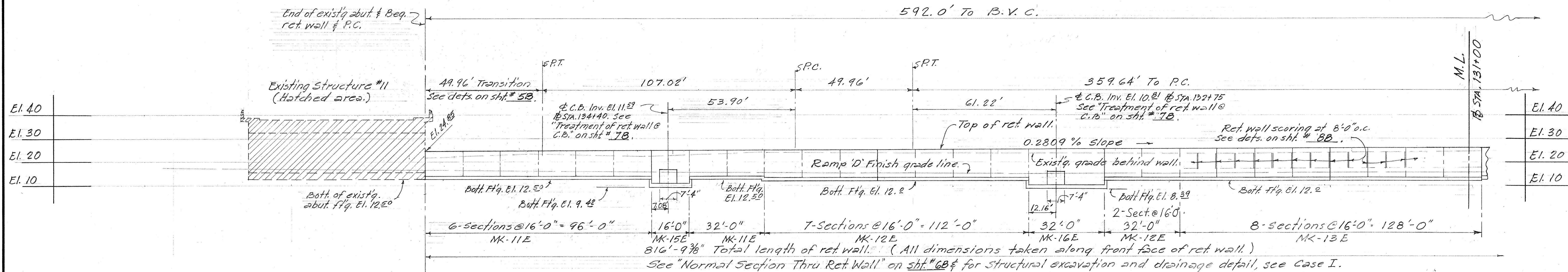
DATE
DRAWN BY
CHECKED BY
DESIGNED BY
QUANTITIES BY
NOTED BY
ORIGINAL PLAN
NOTE BOOK

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(112)19	1973	162	176



PLAN ~ RET. WALL 'D'
Scale: 1" = 20'

D-1 CURVE DATA	
Δ	$= 2^\circ 51' 45''$
R	$= 1000.0'$
T	$= 24.99'$
L_c	$= 49.96'$



ELEVATION ~ RET. WALL 'D'
Scale: 1" = 20'

ESTIMATED QUANTITIES	
CONCRETE	---- Lump Sum 750 C.Y.
REINF. STEEL	---- Lump Sum 64,630 #
STRUCT. EXC. FOR RET. WALL	-- 2,774 C.Y.
FILTER MATERIAL	---- 197 C.Y.
STRUCTURE BACKFILL	---- 1,780 C.Y.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RETAINING WALL 'D'

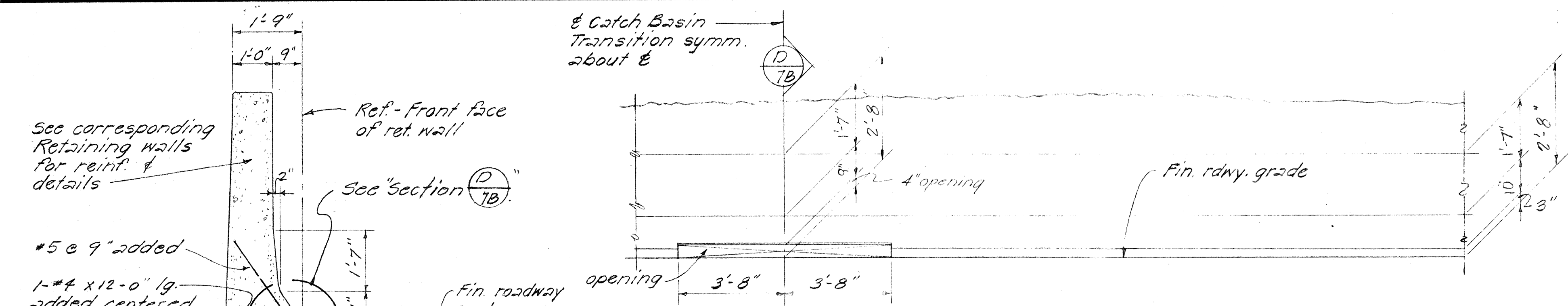
SAFETY IMPROVEMENTS ALONG INTERSTATE H-1 KALIHI ST. TO PALI HIGHWAY

Proj. No. I-H-1(112)19 Date: April, 1973

SHEET No. 46 OF 63 SHEETS

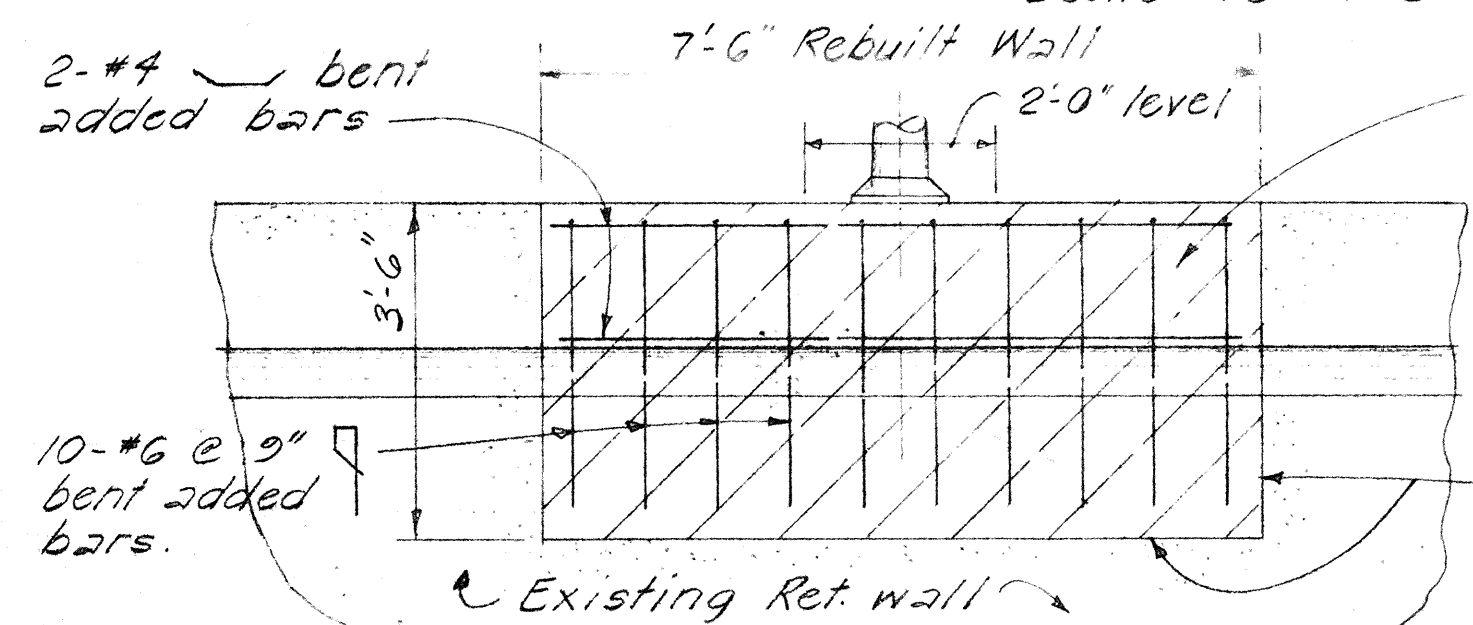
DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1414(112)19	1973	165	176



ELEVATION-RETAINING WALL OPENING AT CATCH BASIN

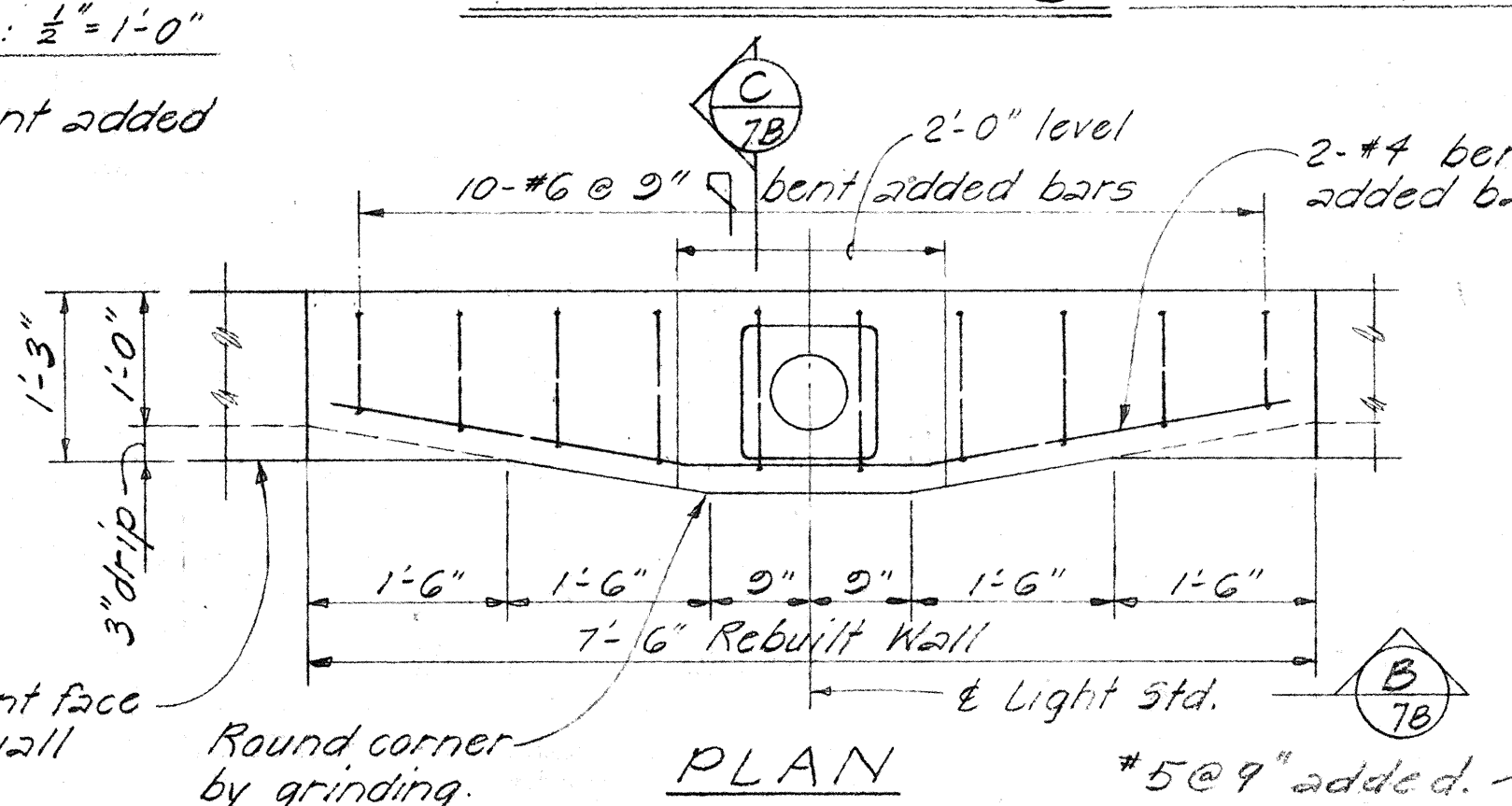
Scale: $\frac{3}{8}$ " = 1'-0"



Limits of removal of existing conc. wall shown in hatched area. Remove conc. only. All existing exposed reinf. to remain and cleaned. Existing reinf. not shown in details.

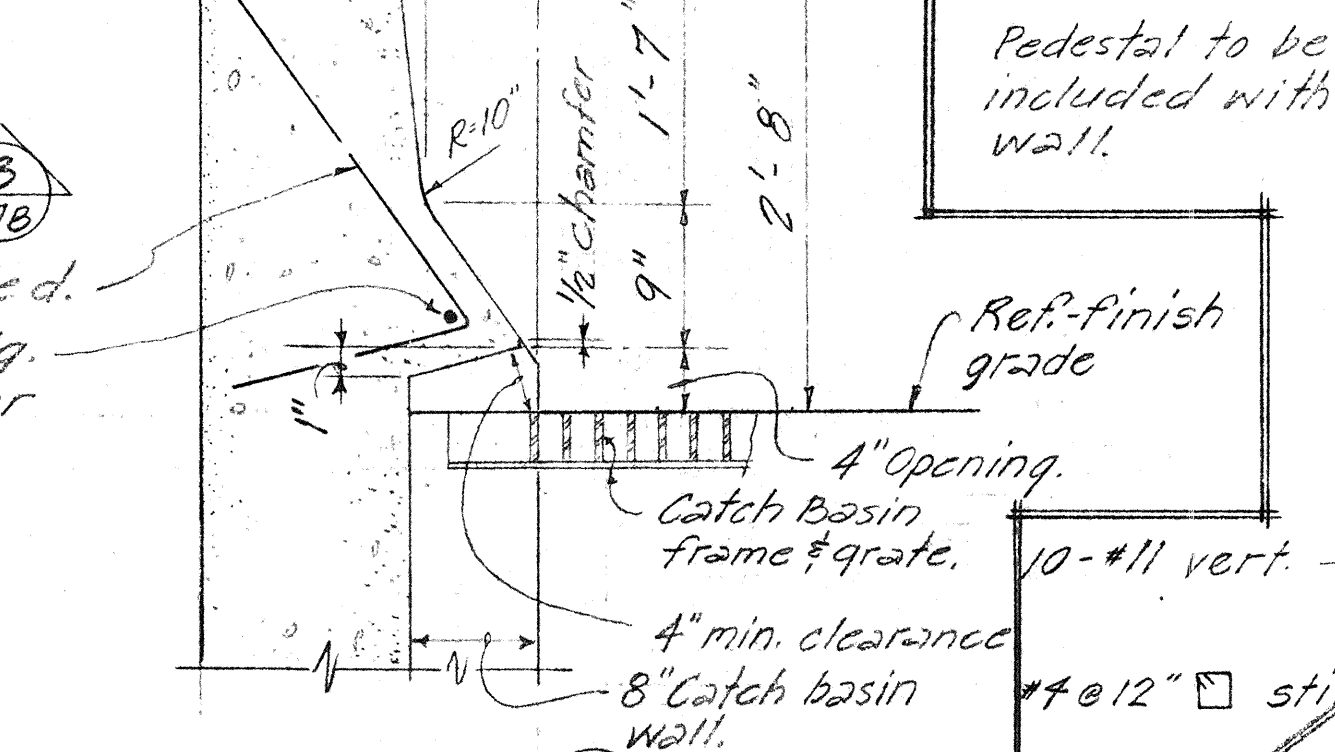
Saw cut top & both faces of existing wall in a straight and clean line to the plane of the outer edge of the reinf.

ELEVATION (B) Scale: $\frac{1}{2}$ " = 1'-0"

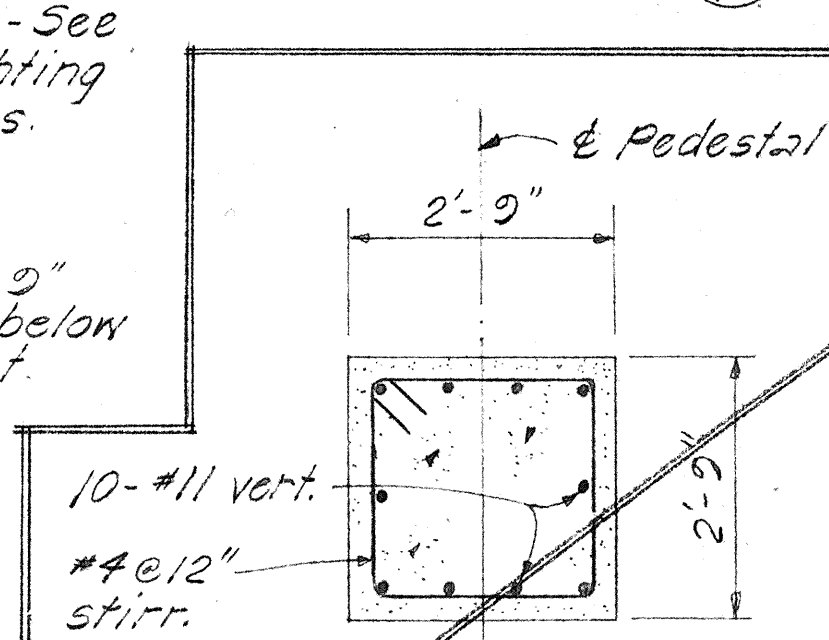


Conc. & reinf. steel for rebuilt wall section will be paid under "Concrete other than in bridges" & "Reinf. other than in bridges" respectively.

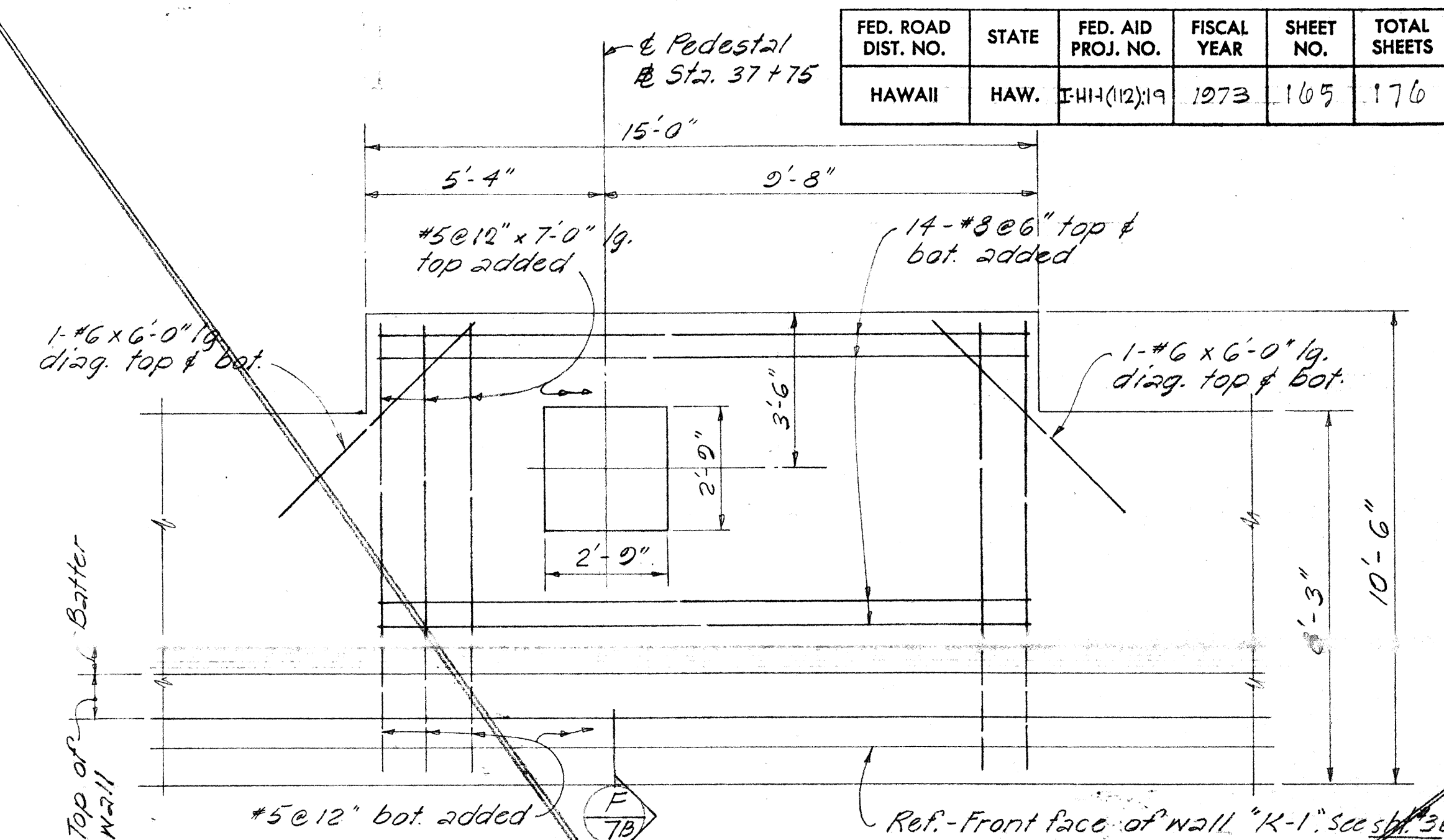
Ref. front face of ret. wall.



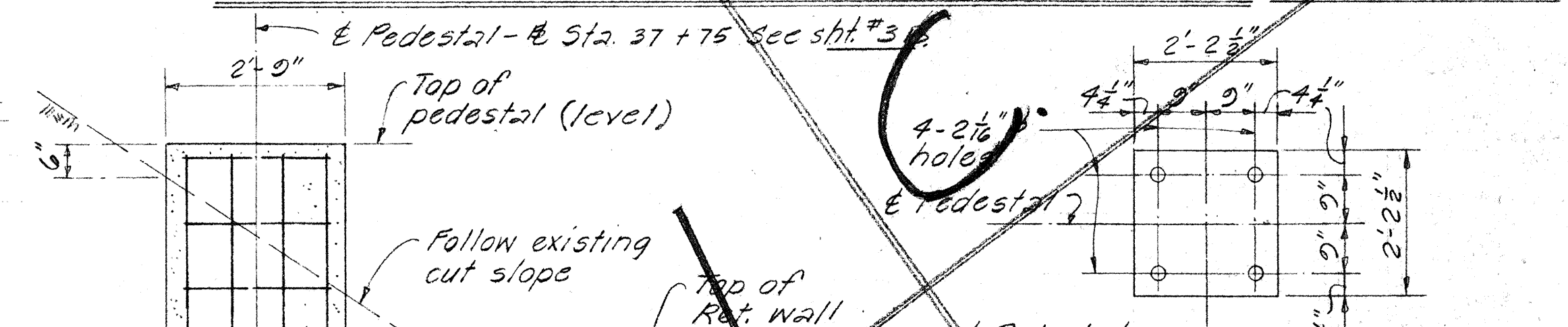
SECTION (D) Scale: $\frac{1}{2}$ " = 1'-0"



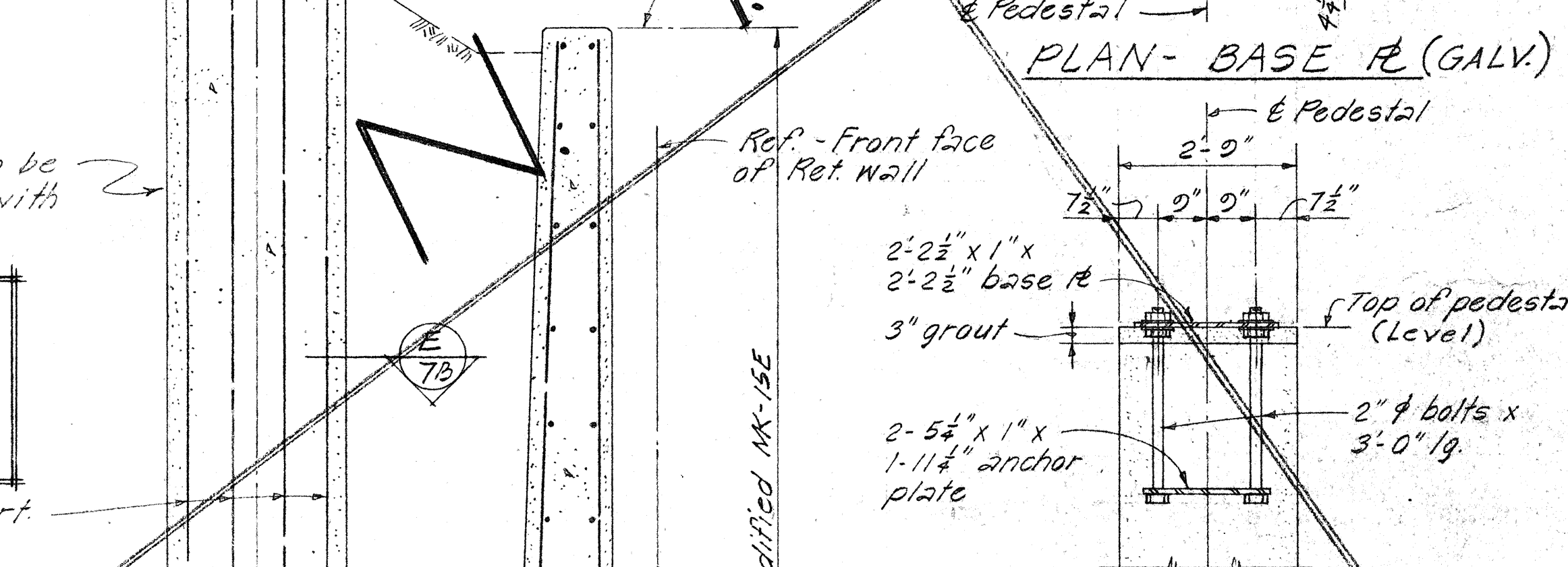
SECTION (E) Scale: $\frac{1}{2}$ " = 1'-0"



PLAN-FOOTING REINFORCEMENT AT MODIFIED MK-15E RETAINING WALL Scale: $\frac{3}{8}$ " = 1'-0"



PLAN-BASE PL. (GALV.)



SECTION

BASE PLATE CONNECTION DETAILS Scale: $\frac{1}{2}$ " = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RETAINING WALL DETAILS

SAFETY IMPROVEMENTS ALONG

INTERSTATE H-1

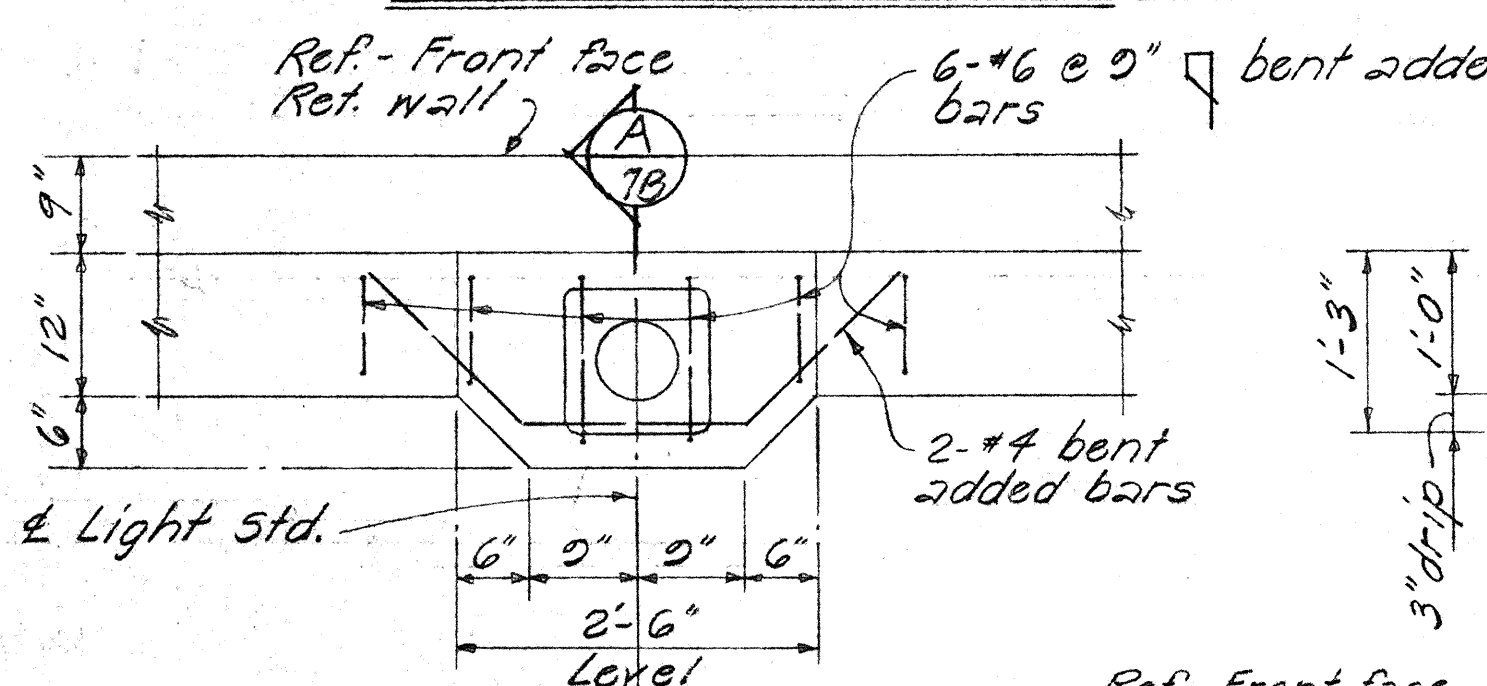
KALIHI ST. TO PALI HIGHWAY

Proj. No. I-H-1(112)19 Date: April, 1973

SHEET No. 78 OF 168 SHEETS

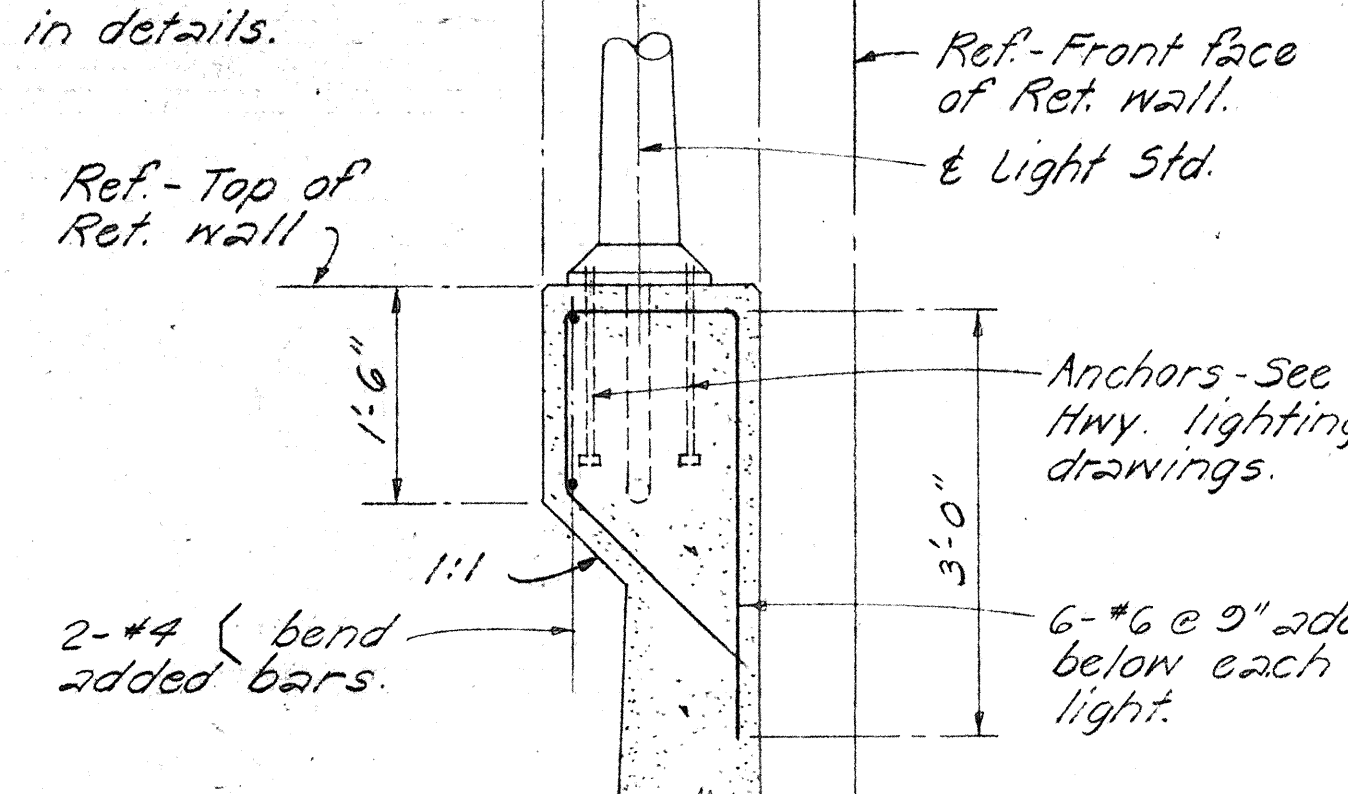
TREATMENT OF RETAINING WALL

AT CATCH BASIN Scale: $\frac{1}{2}$ " = 1'-0"



PLAN

NOTE:
Typ. Ret. wall reinf. not shown in details.



SECTION (A) Scale: $\frac{1}{2}$ " = 1'-0"

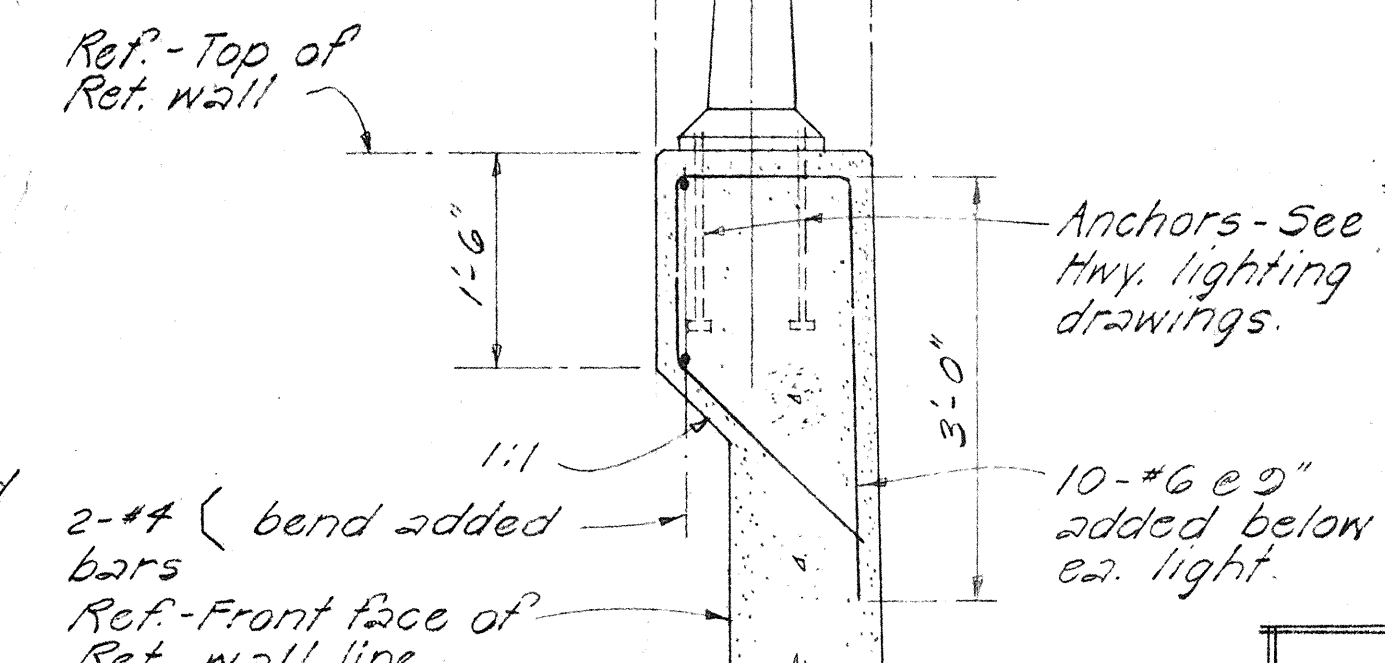
AT NEW WALL

TYPICAL LIGHT STD. DETAILS ON RETAINING WALLS

Scale: $\frac{3}{4}$ " = 1'-0"

AT EXISTING WALL

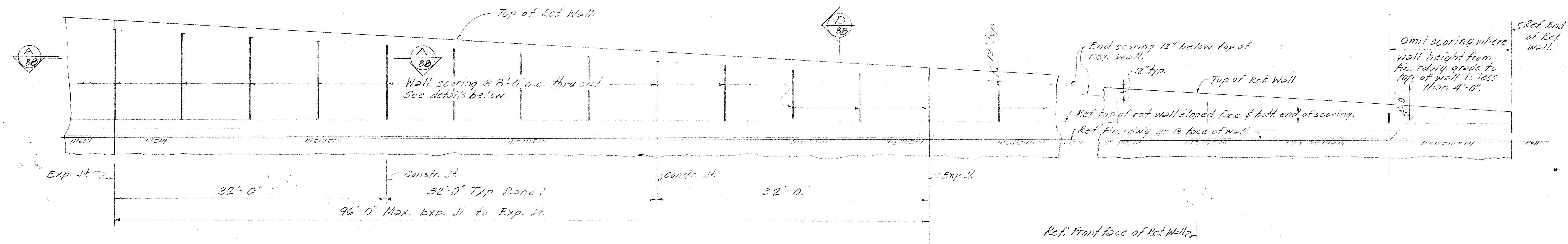
(LIGHT STD. 63 & 65)



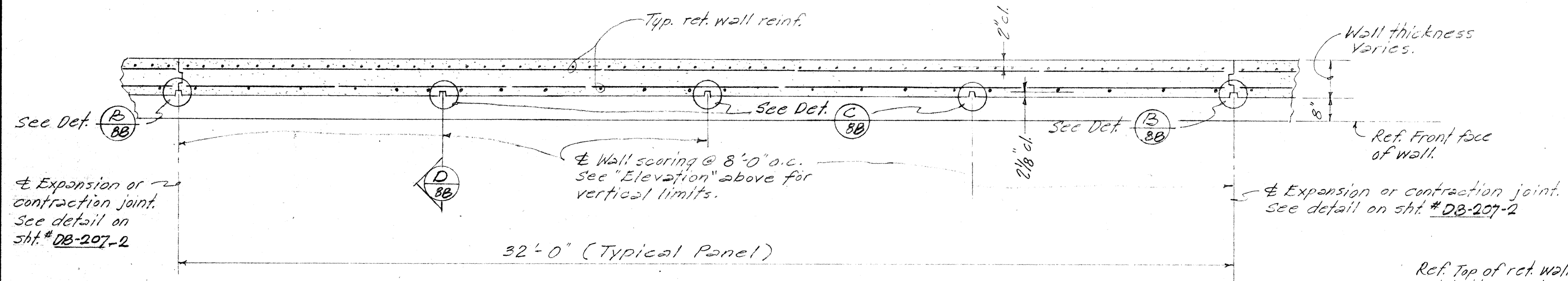
SECTION (C) Scale: $\frac{1}{2}$ " = 1'-0"

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
QUANTITIES BY	_____
NOTE BOOK	_____
NO.	_____

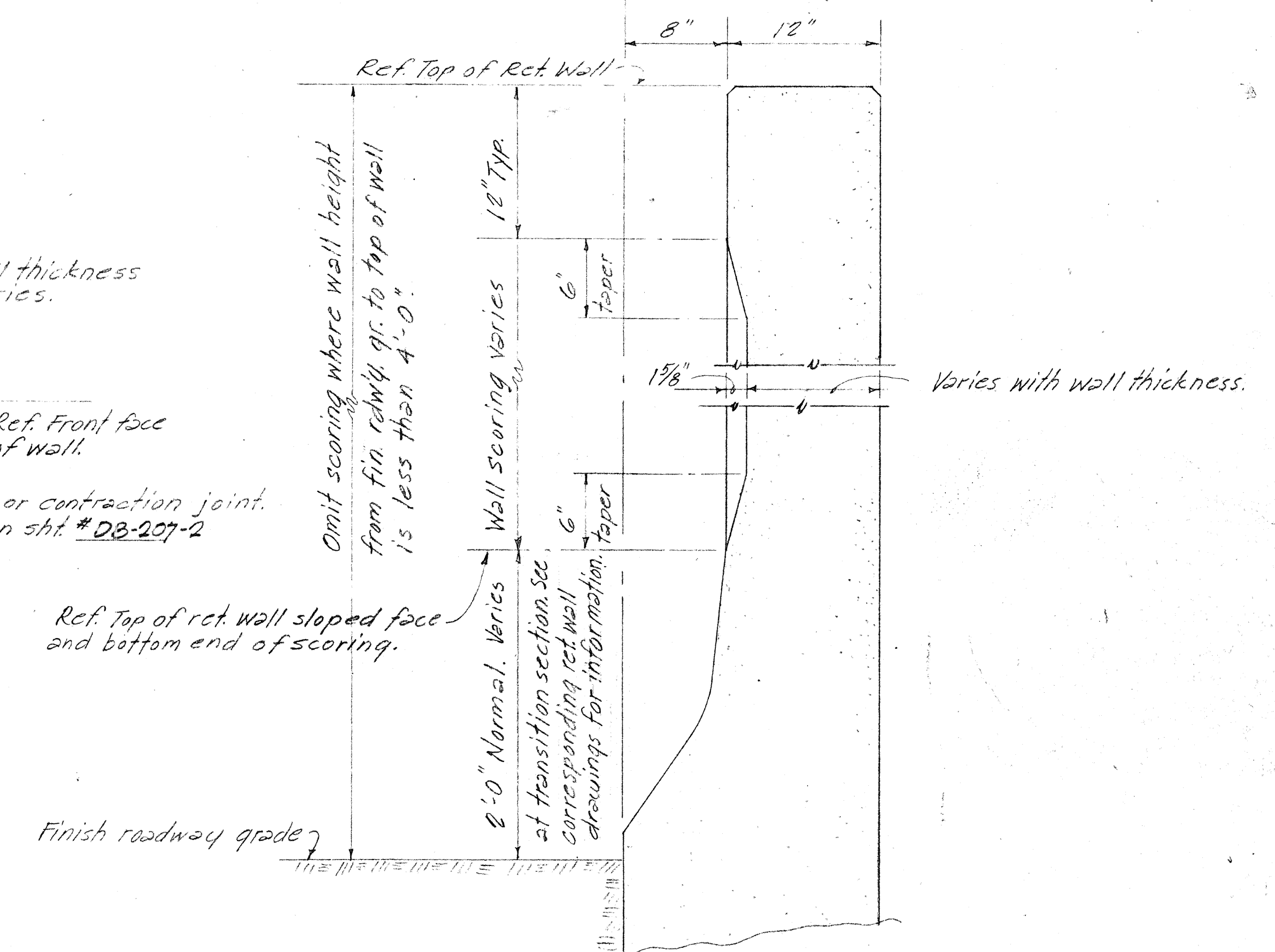
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HI-1(12)-19	1973	166	176



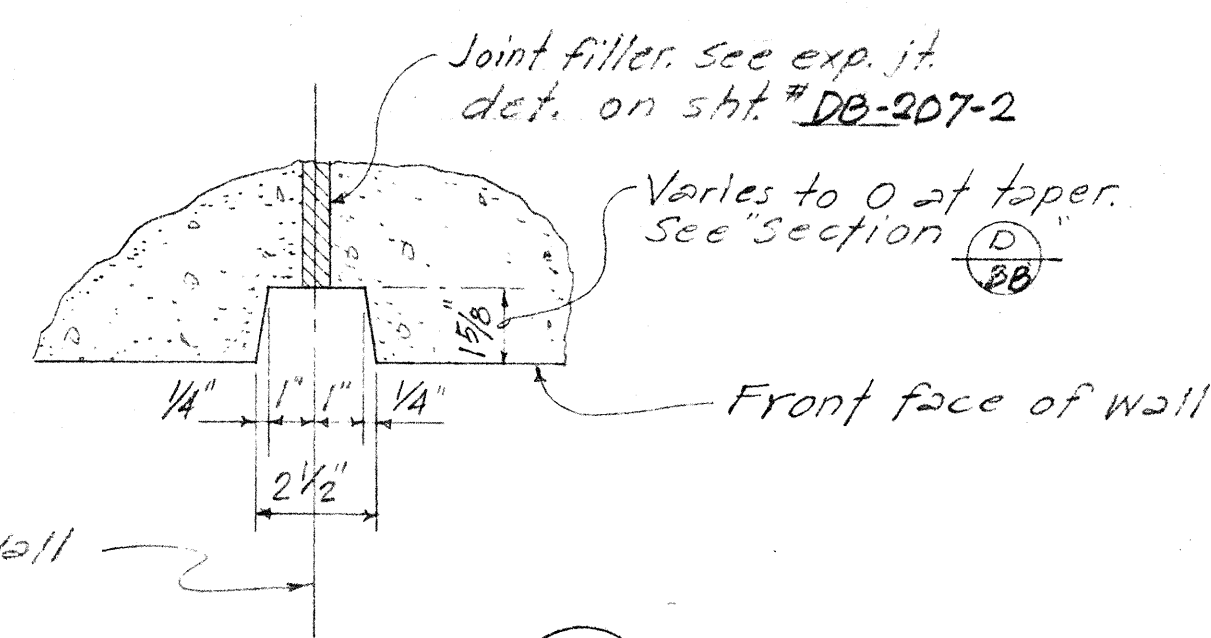
ELEVATION
Scale: $\frac{3}{16}" = 1'-0"$



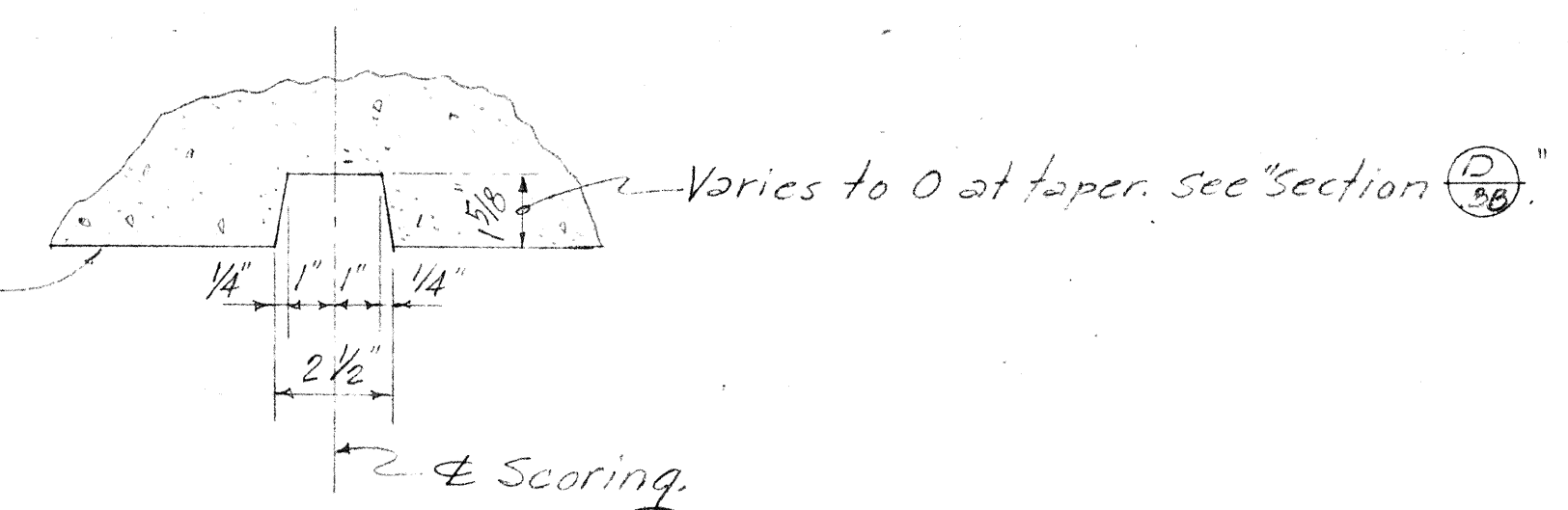
TYP. SECTION (A) THRU RET. WALL
Scale: $\frac{1}{2}" = 1'-0"$



TYP. SECTION (D) THRU RET. WALL AT SCORING
Scale: $\frac{1}{2}" = 1'-0"$



DETAIL (B) 8B
Scale: $3" = 1'-0"$



DETAIL (C) 8B
Scale: $3" = 1'-0"$

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYP. RET. WALL SCORING DETAILS

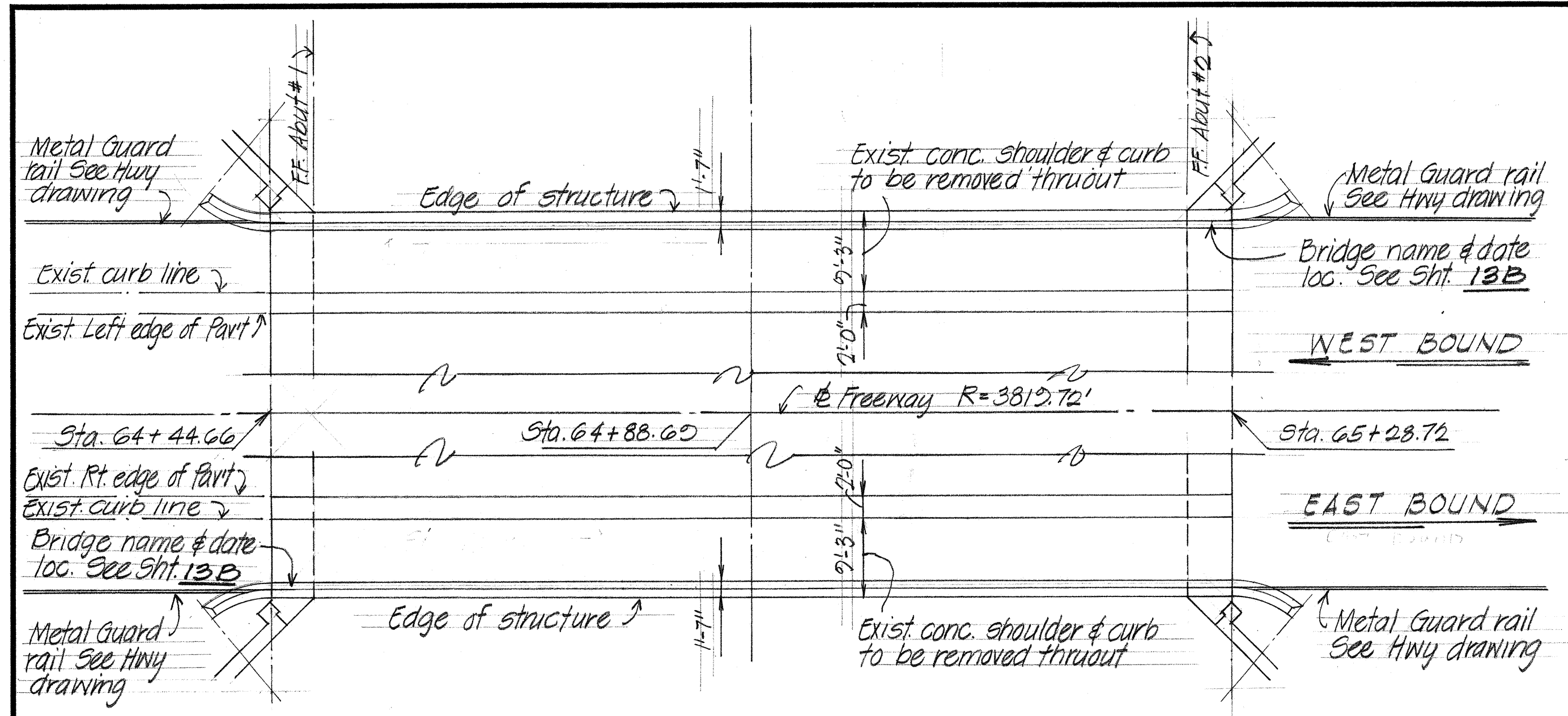
SAFETY IMPROVEMENTS ALONG
INTERSTATE H-1
KALIHI ST. TO PALI HIGHWAY

Proj. No. I-HI-1(12)-19 Date: April, 1973

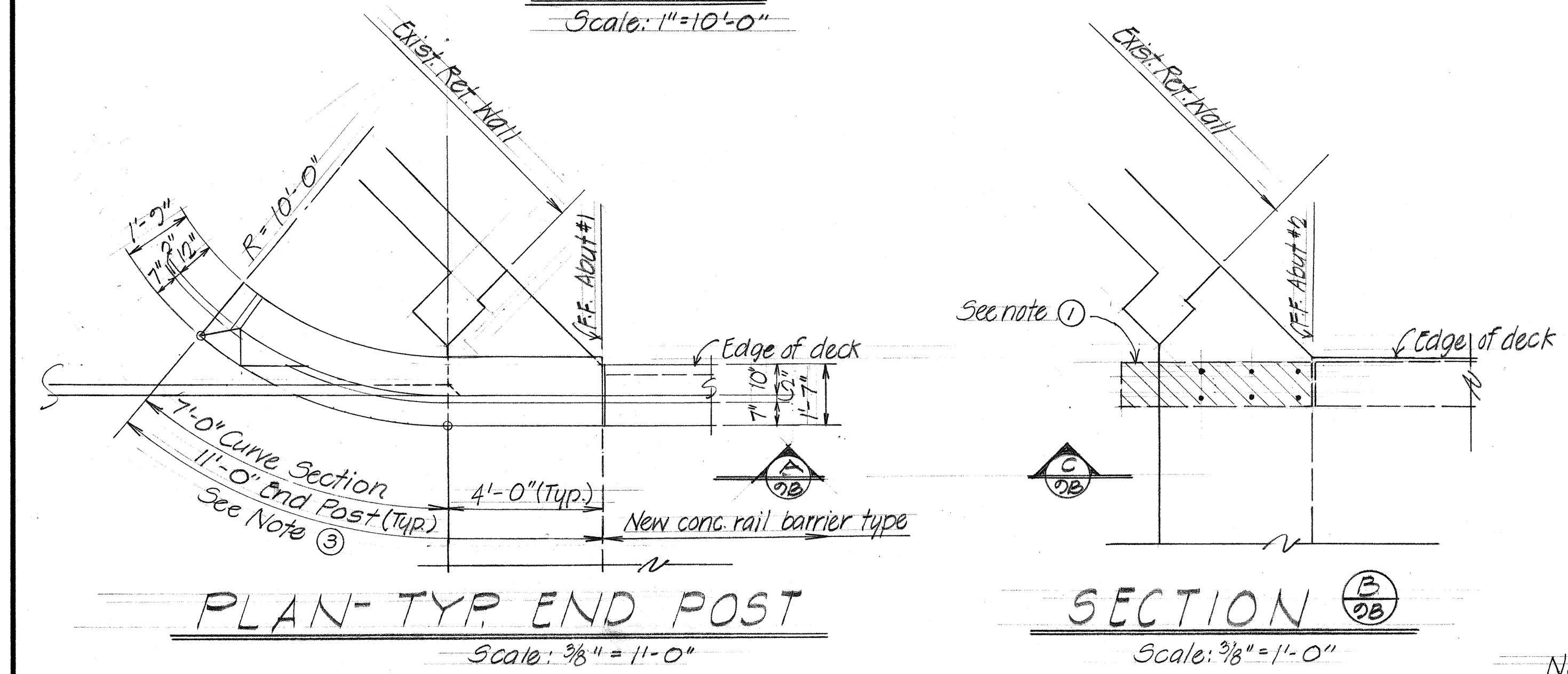
SHEET No. 88 OF 168 SHEETS

DATE	
SURVEY PLANNED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	

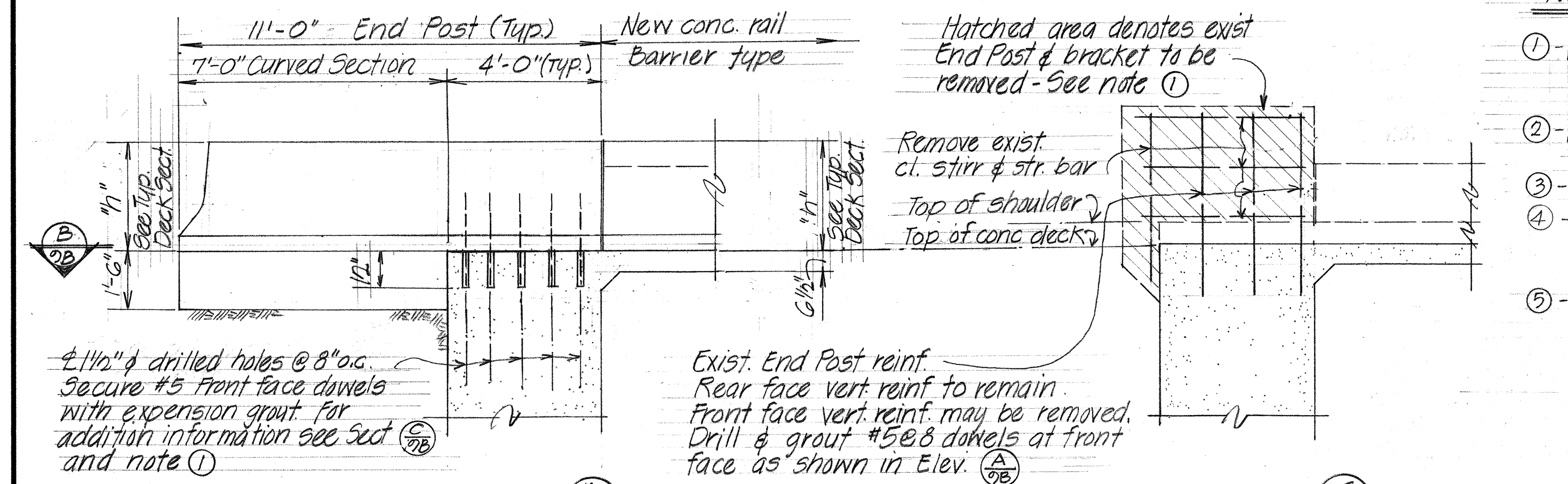
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-1-1(112):10	1979	167	176



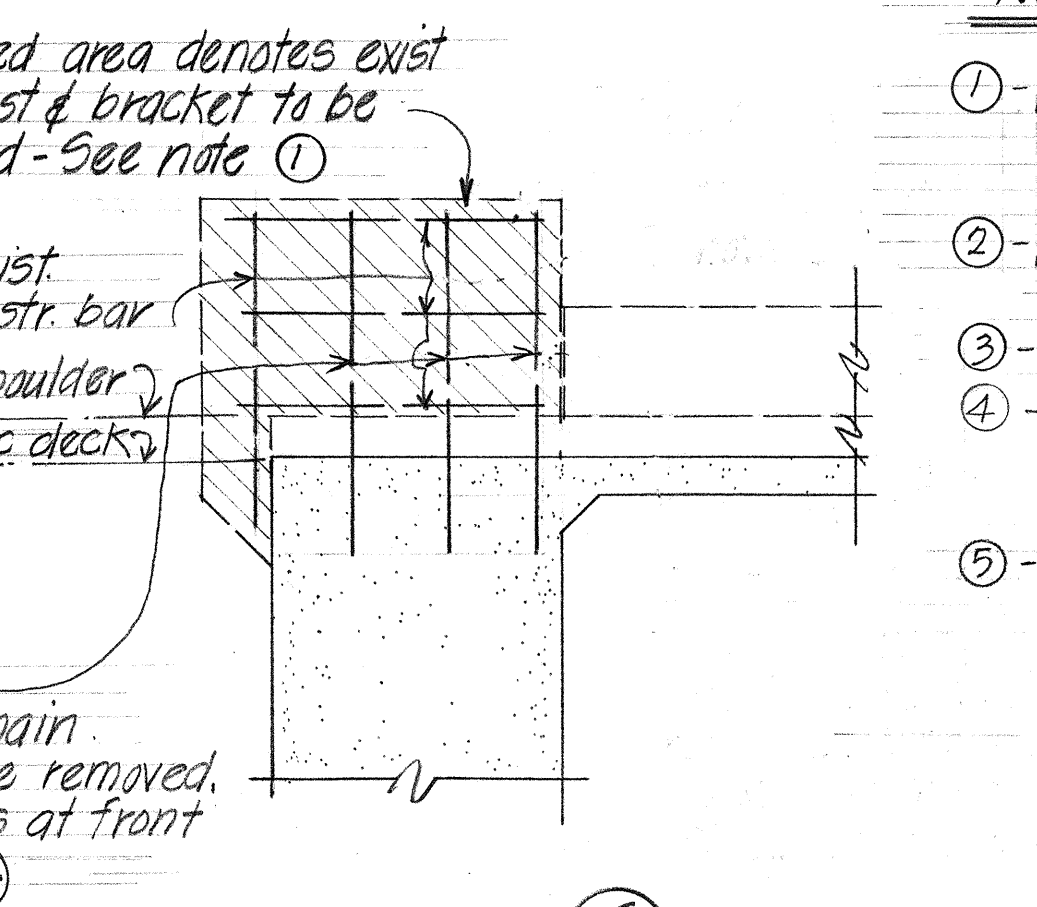
PLAN
Scale: 1"=10'-0"



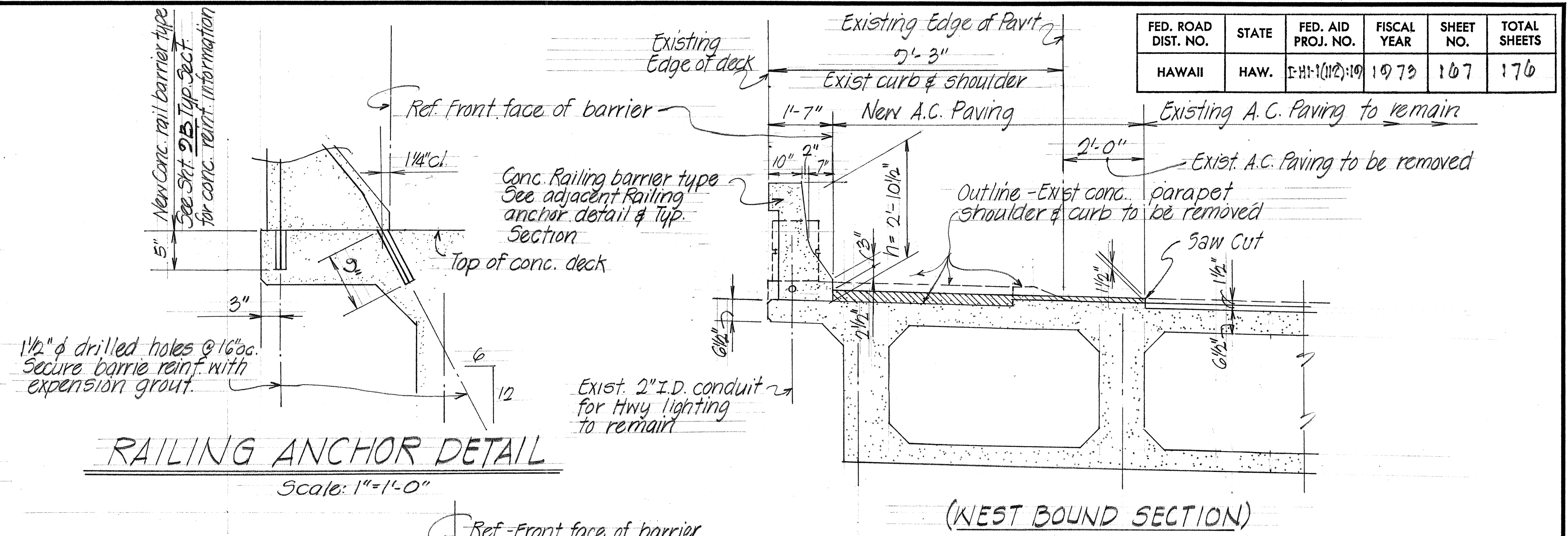
PLAN-TYP. END POST
Scale: 3/8"=1'-0"



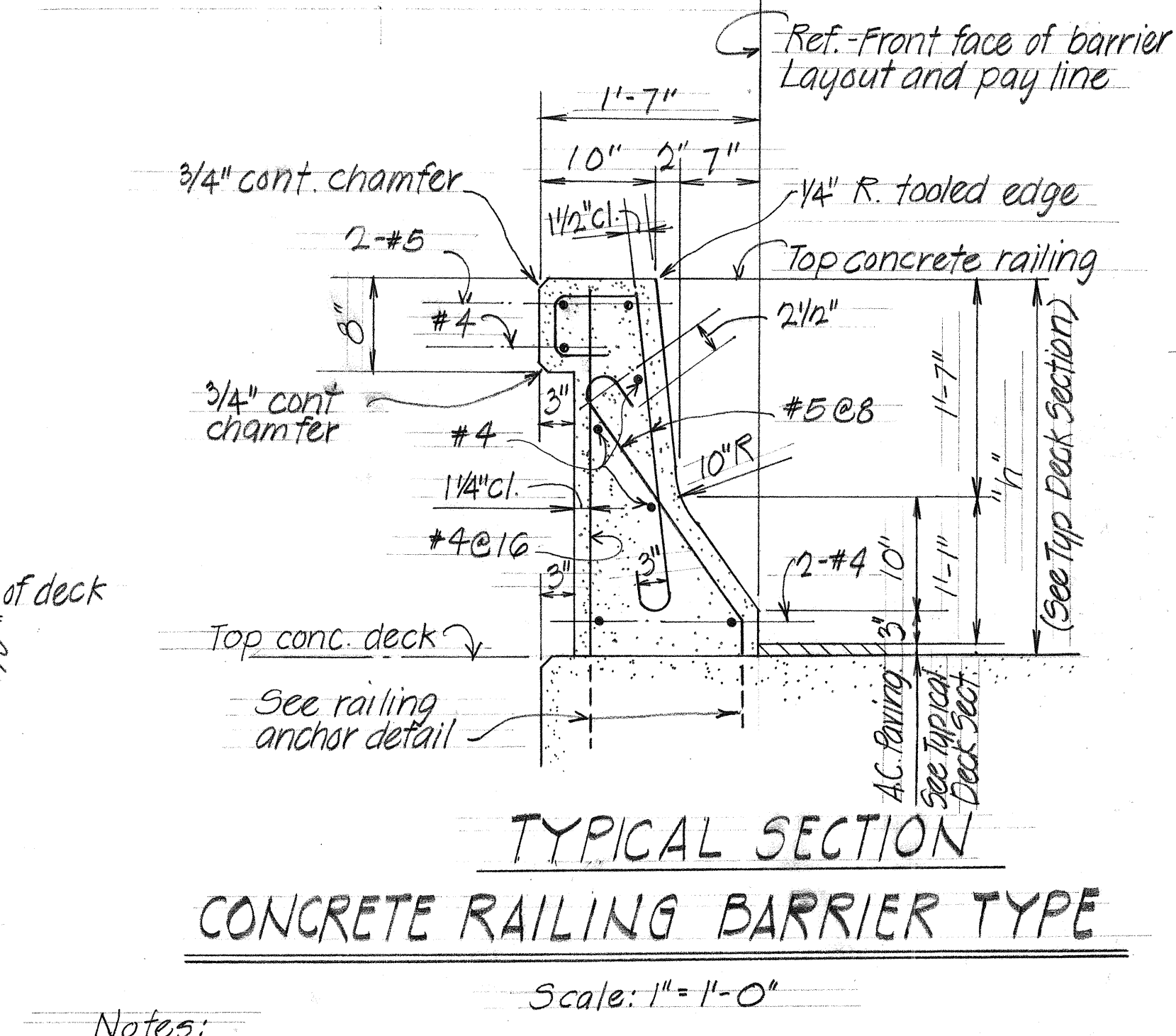
ELEVATION
Scale: 3/8"=1'-0"



SECTION
Scale: 3/8"=1'-0"

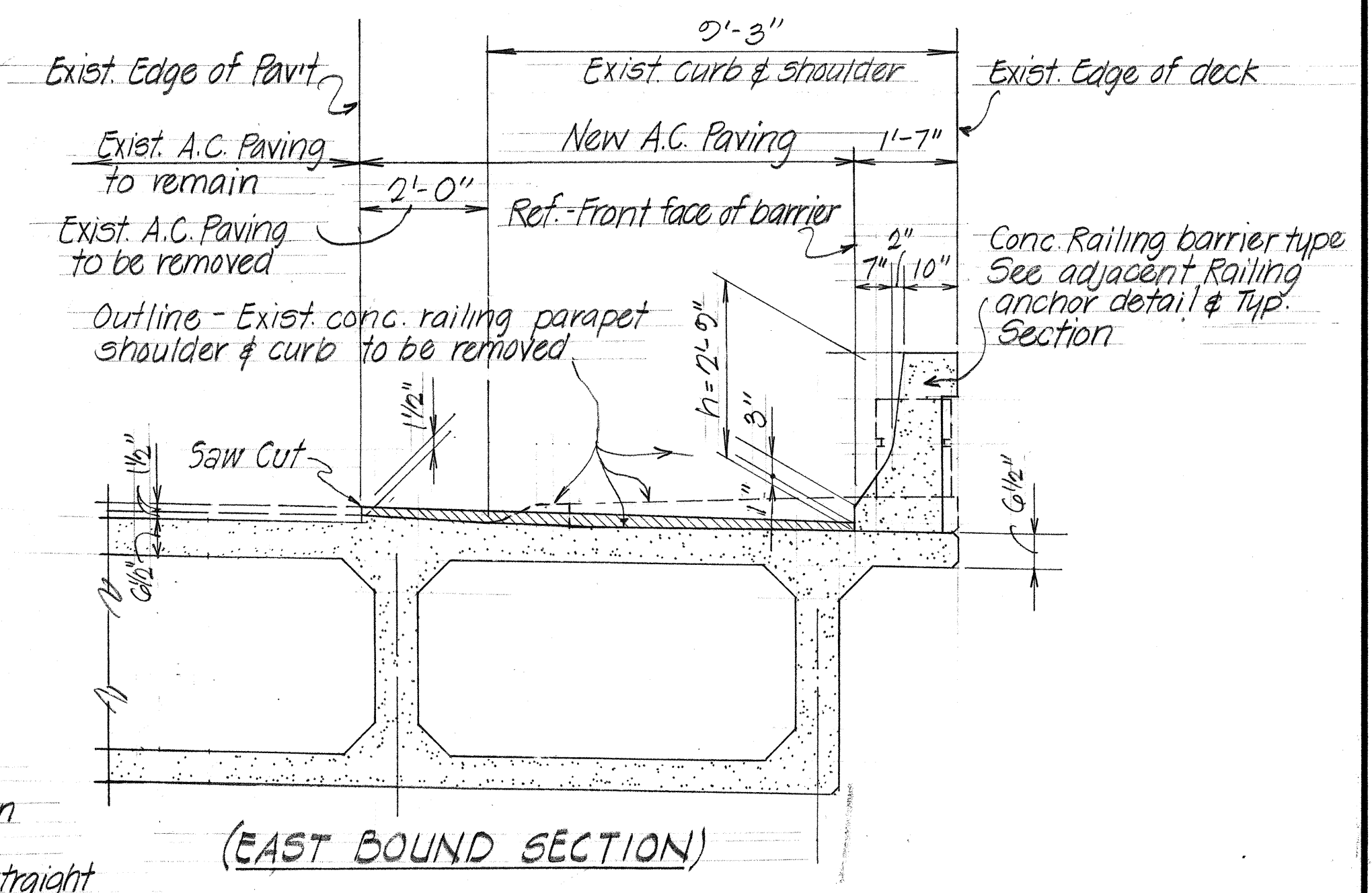


RAILING ANCHOR DETAIL
Scale: 1"=1'-0"



TYPICAL SECTION
CONCRETE RAILING BARRIER TYPE
Scale: 1"=1'-0"

- Notes:
- 1- Limits of removal of existing conc. shown in hatched area. Remove conc. only. All existing exposed reinf. except those noted on detail drawing to remain and cleaned. Bend bars as required.
 - 2- For removal of existing conc. saw cut face of existing wall in a straight and clean line to the plane of the outer edge of the reinf.
 - 3- See Sht. 13B for additional curved end post detail and information.
 - 4- The Contractor shall erect portable concrete guard rails when reconstructing the bridge exterior railing. See sheet 37A for details.
 - 5- Tack Coat shall be applied on exposed concrete surface prior to A.C. paving.



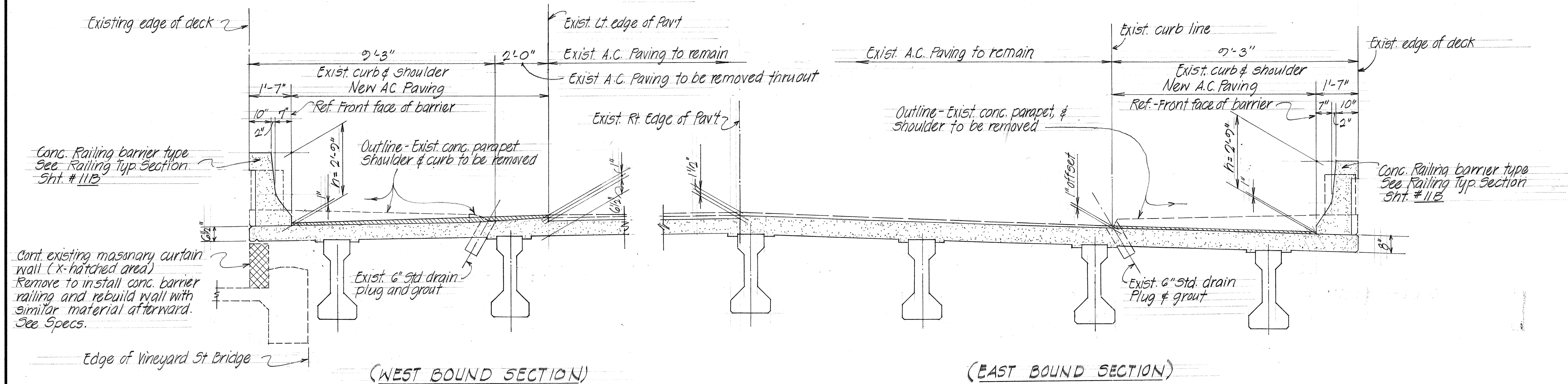
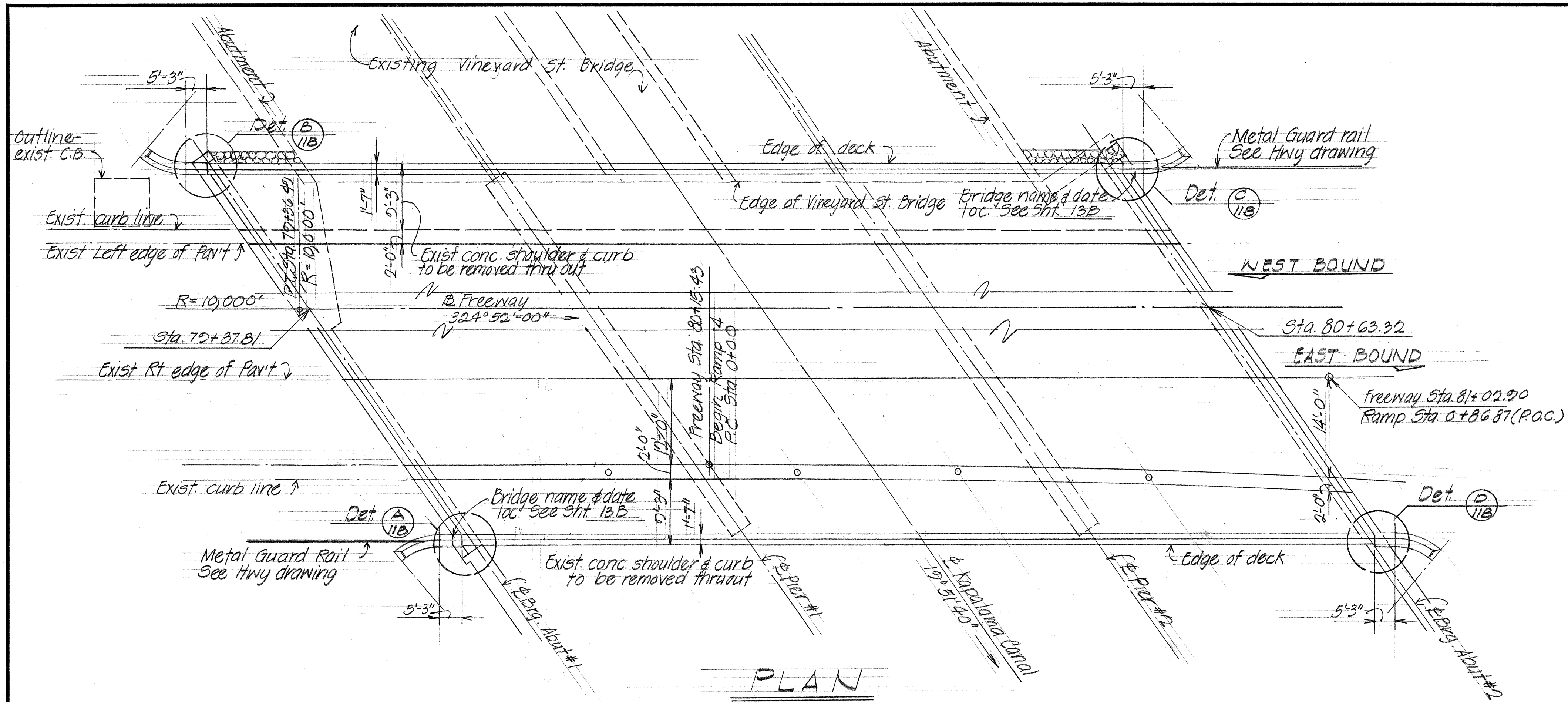
TYP. DECK SECTION
Scale: 1/2"=1'-0"

ESTIMATED QUANTITIES for REMOVAL of EXISTING CONCRETE					
RAILING & CURB AND NEW CONC. BARRIER TYPE RAILING					
ITEM	Removal of Existing Structure	REPLACEMENT	New Conc. Barrier Type Railing		
Location	Conc. Railing & Curb	Masonry Curtain Wall	Masonry Curtain Wall	Drilling for dowels, N° of holes	Railing (E.P. included)
HOUGHTAILING SEP.	180 Lin. Ft.	None	None	380 holes	204 Lin. Ft.
KAPALAM ST. BRIDGE	270 L.F.	20 L.F.	20 L.F.	420 holes	307 L.F.
NUUANU ST. BRIDGE	200 L.F.	None	None	424 holes	215 L.F.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
REPLACEMENT of RAILS
HOUGHTAILING SEPARATION
SAFETY IMPROVEMENT ALONG
INTERSTATE H-1
KALIHI STREET TO PALI HIGHWAY
PROJ. N° I-H-1(112):10 DATE: APRIL 1973
SHEET No. 167 OF 168 SHEETS

DATE	DESIGNED BY	CHECKED BY
PLAN	DESIGNED BY	CHECKED BY
NOTE BOOK	DESIGNED BY	CHECKED BY
No.	DESIGNED BY	CHECKED BY

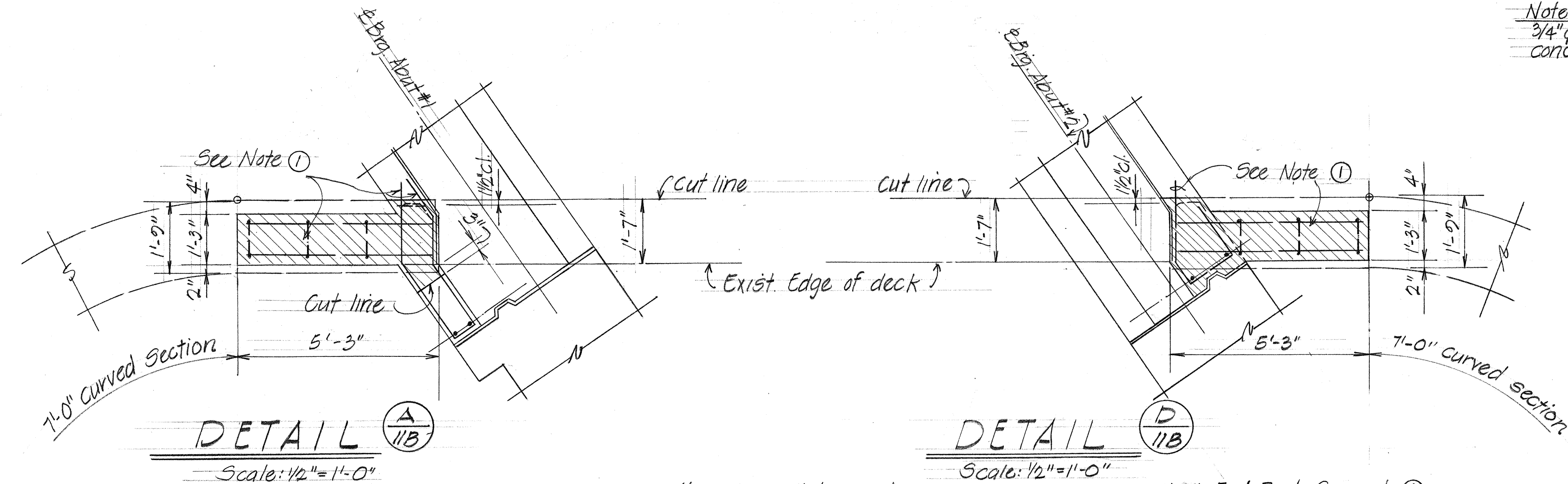
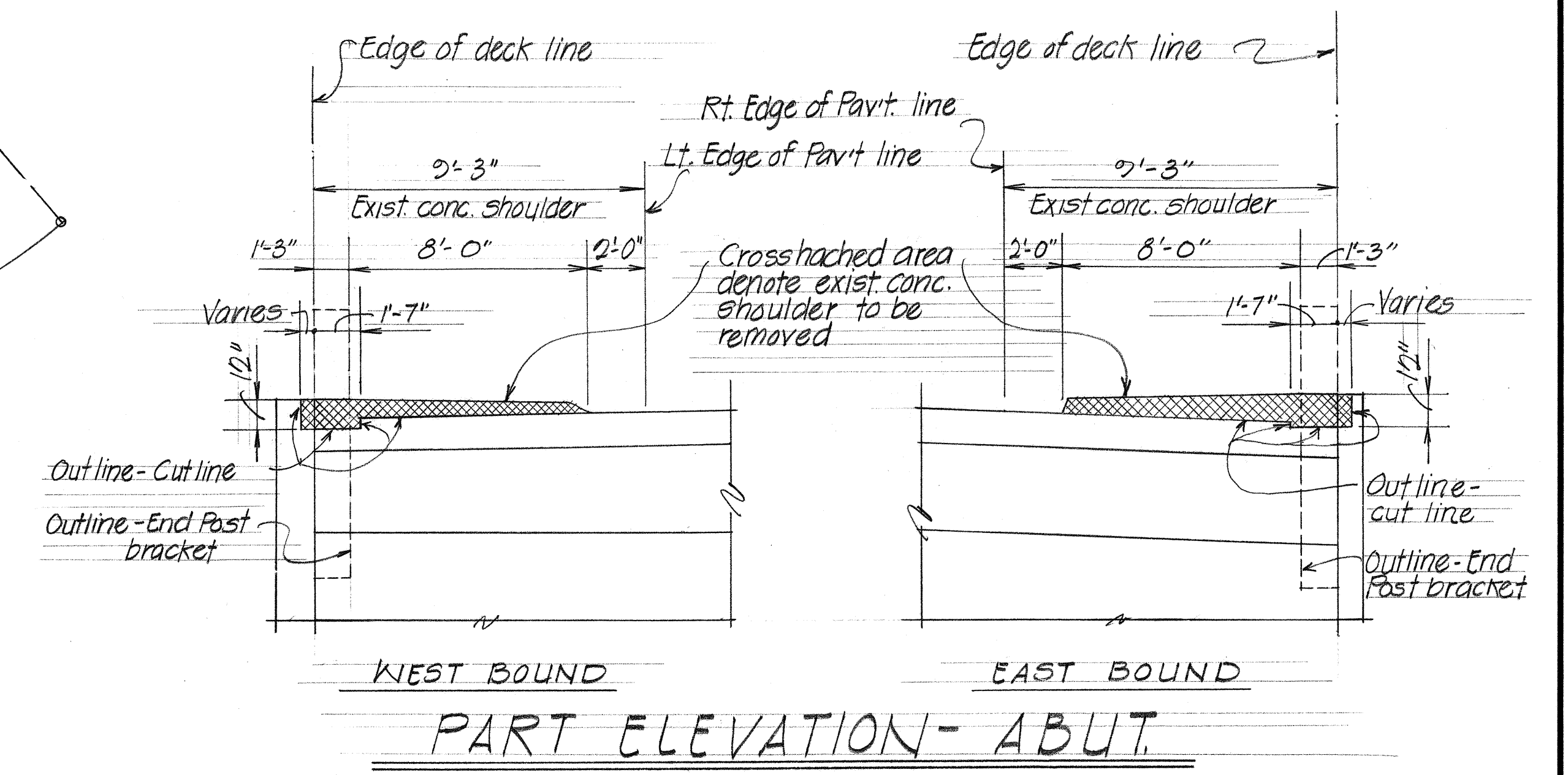
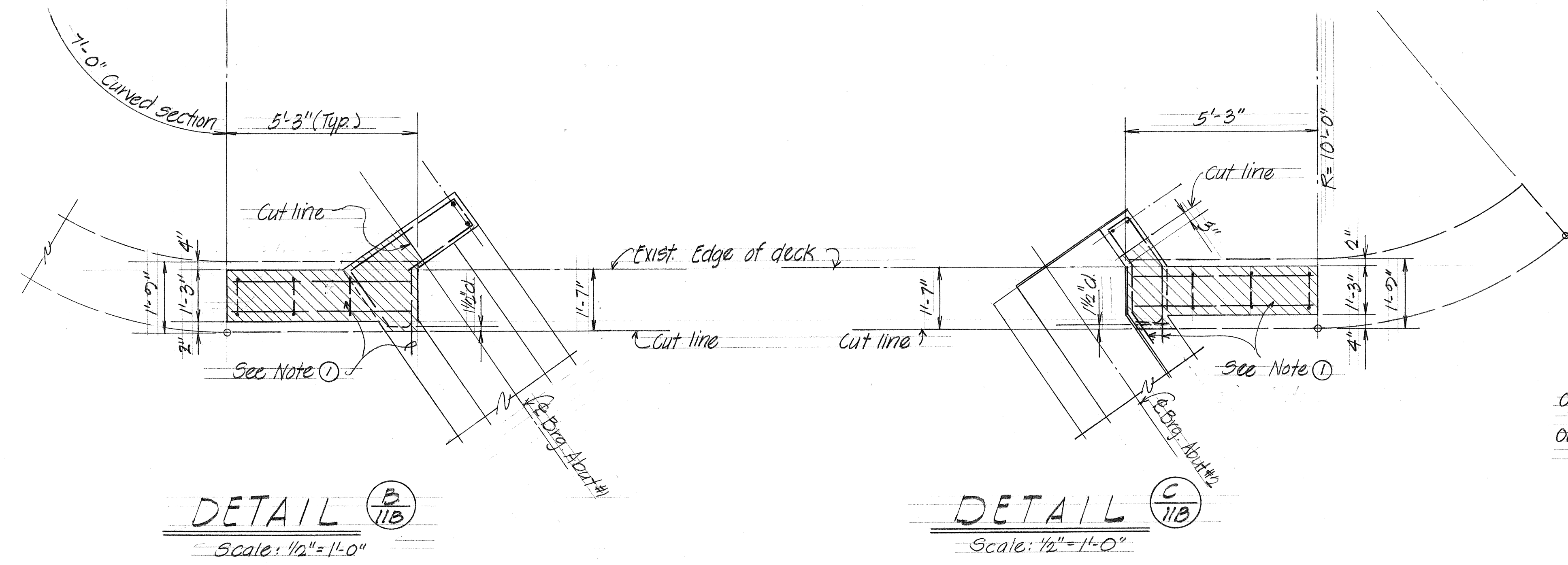
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112)-19	1973	168	170



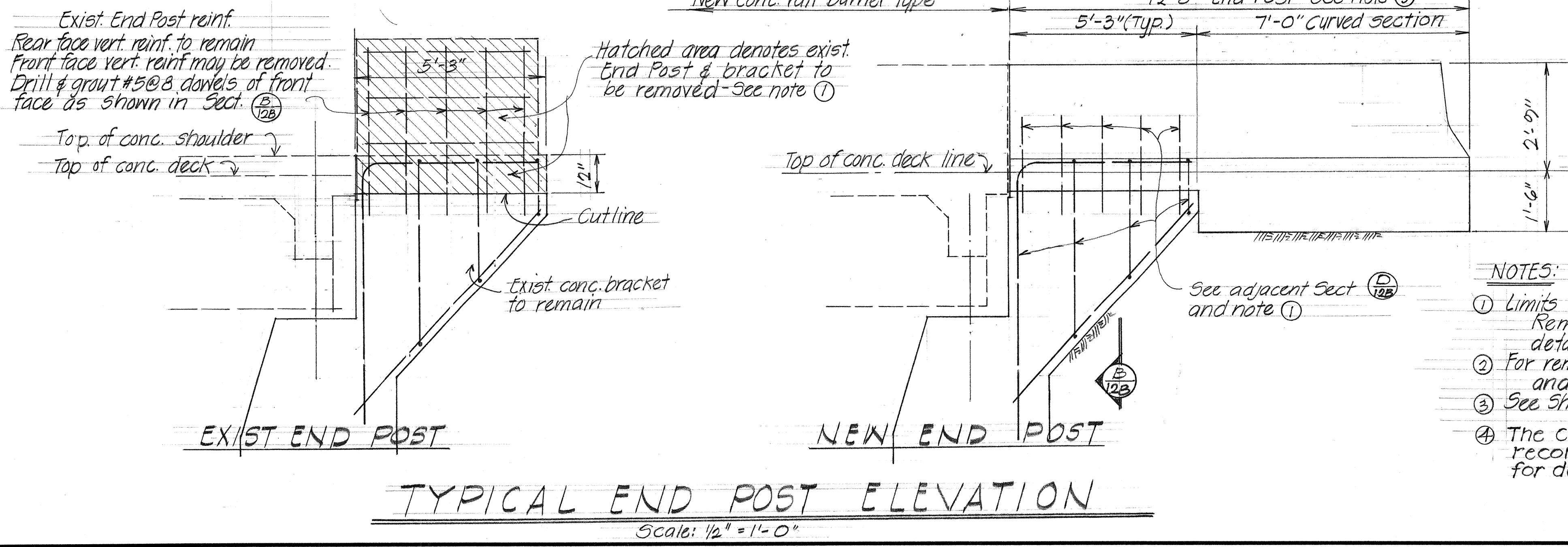
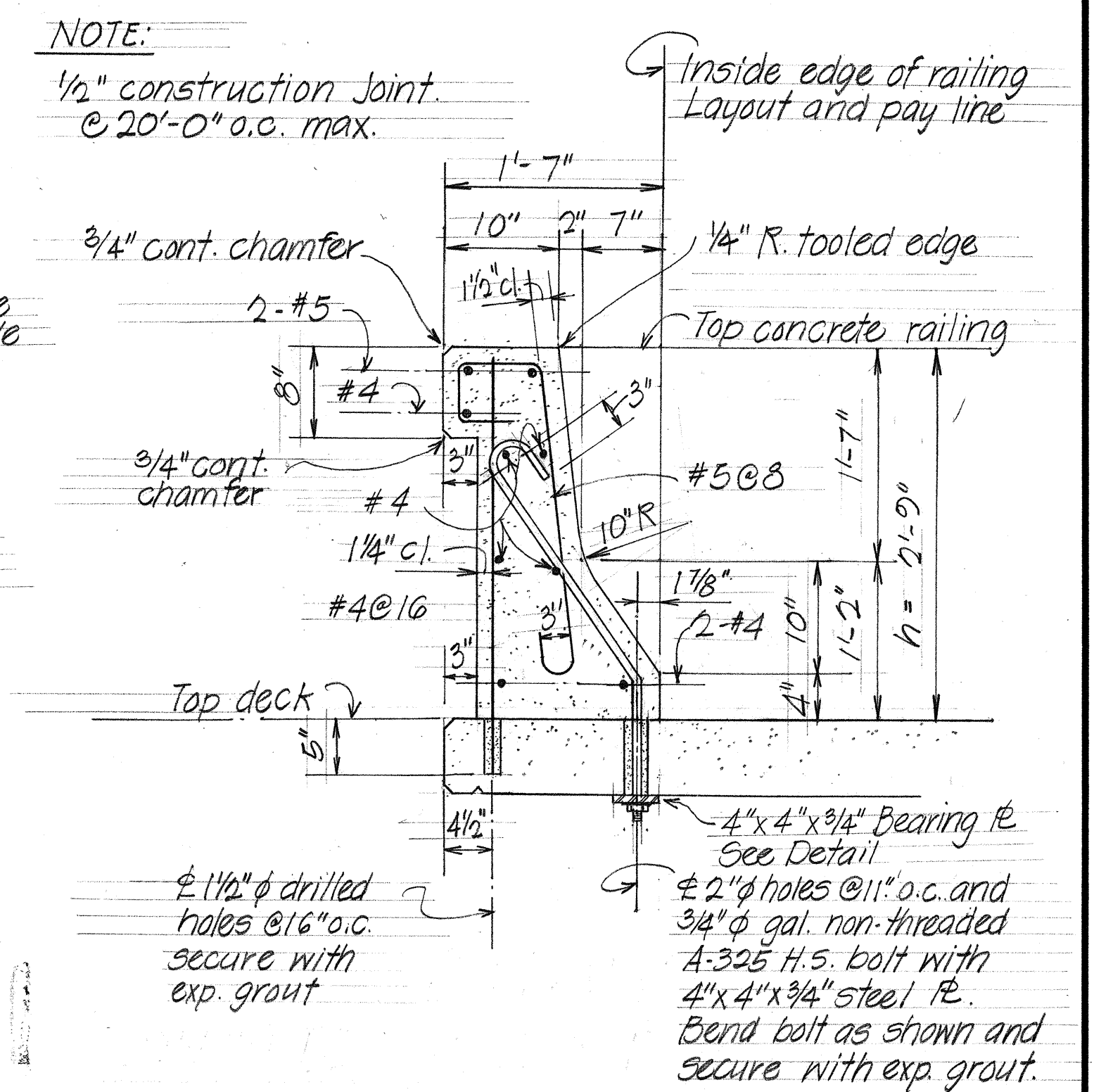
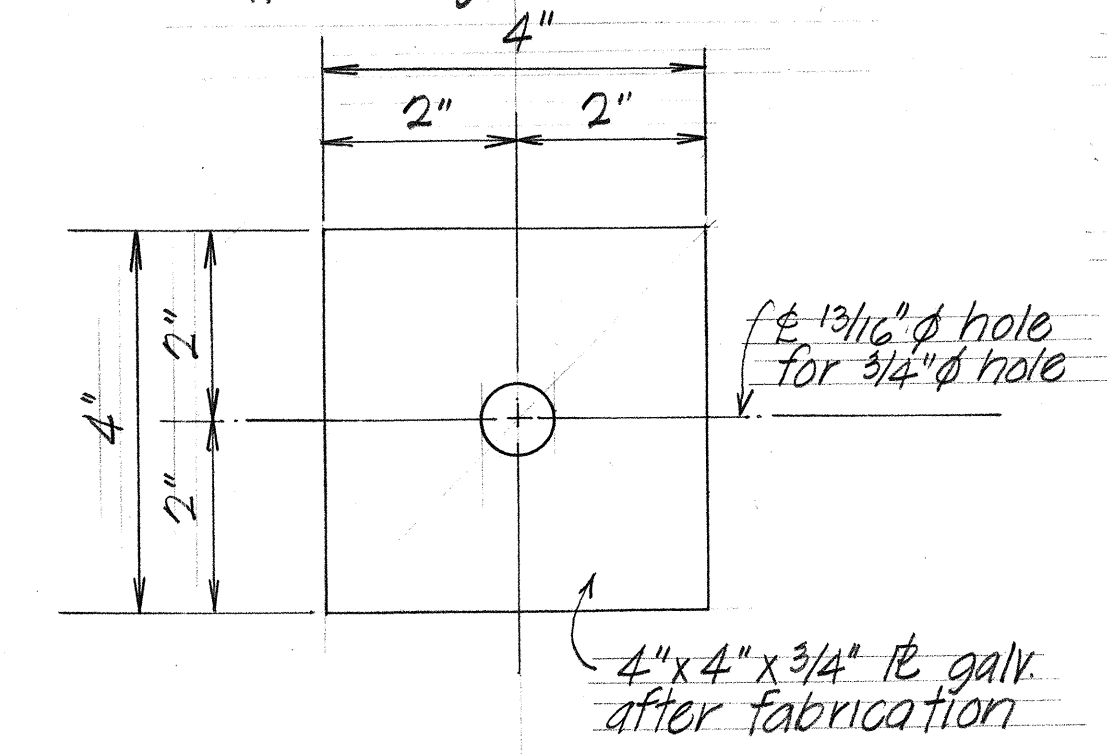
DATE	
SURVEYED BY	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
REPLACEMENT of RAILS
KAPALAMA CANAL BRIDGE
SAFETY IMPROVEMENT ALONG
INTERSTATE H-1
KALIHI STREET TO PALI HIGHWAY
PROJ. NO. I-HI-1(112)-19 DATE 12/73
SHEET No. 108 OF 168 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(112):109	1973	169	176



Note:
3/4" bolts & bearing fl incidental to
conc. barrier type railing

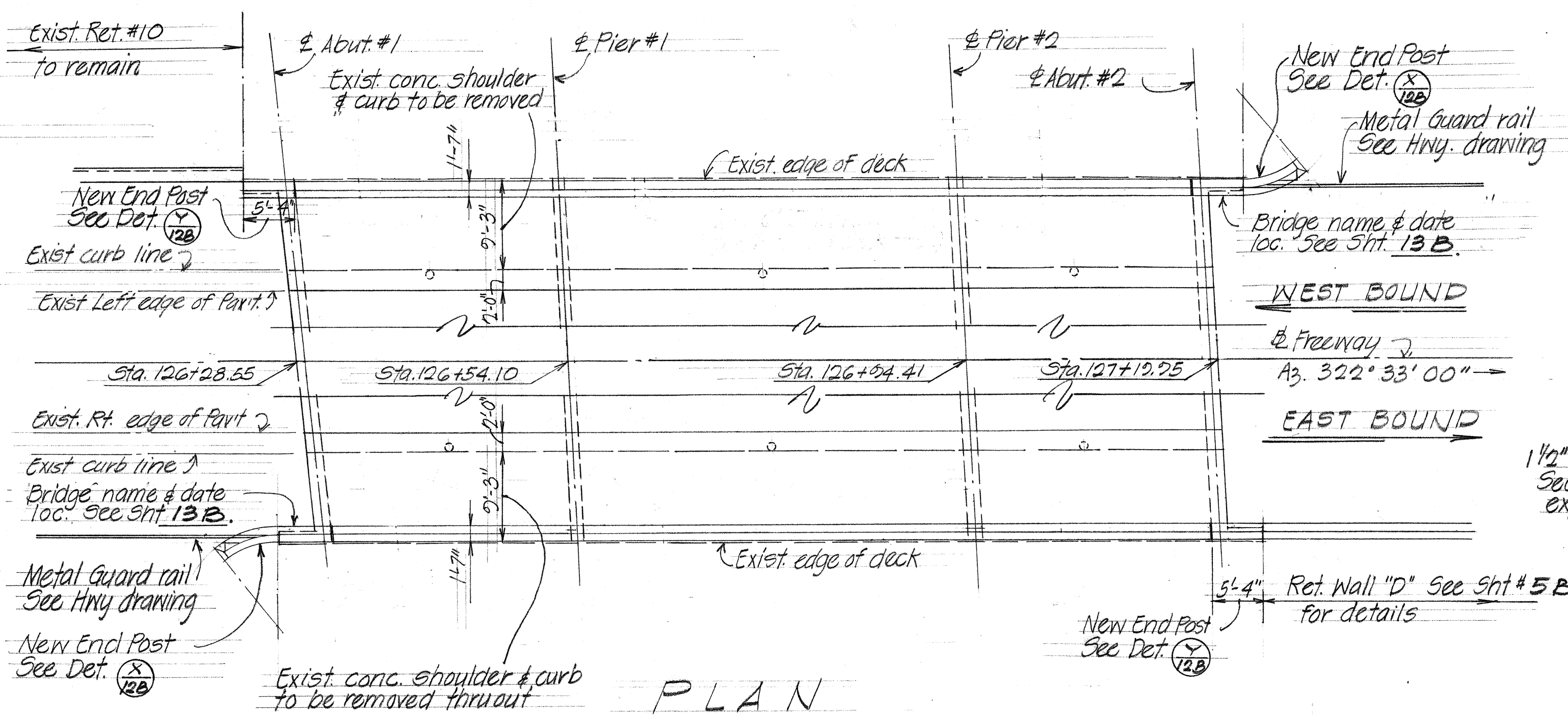


- NOTES:
- ① Limits of removal of existing conc. shown in hatched area. Remove conc. only. All existing exposed reinf. except those noted on detail drawing to remain and cleaned. Bend bars as required.
 - ② For removal of existing conc. saw cut face of existing wall in a straight and clean line to the plane of the outer edge of the reinf.
 - ③ See Sht. 13B for additional curved end post detail and information.
 - ④ The contractor shall erect portable concrete guard rail when reconstructing the bridge exterior railing. See Sheet 39A for details of temporary guard rail.

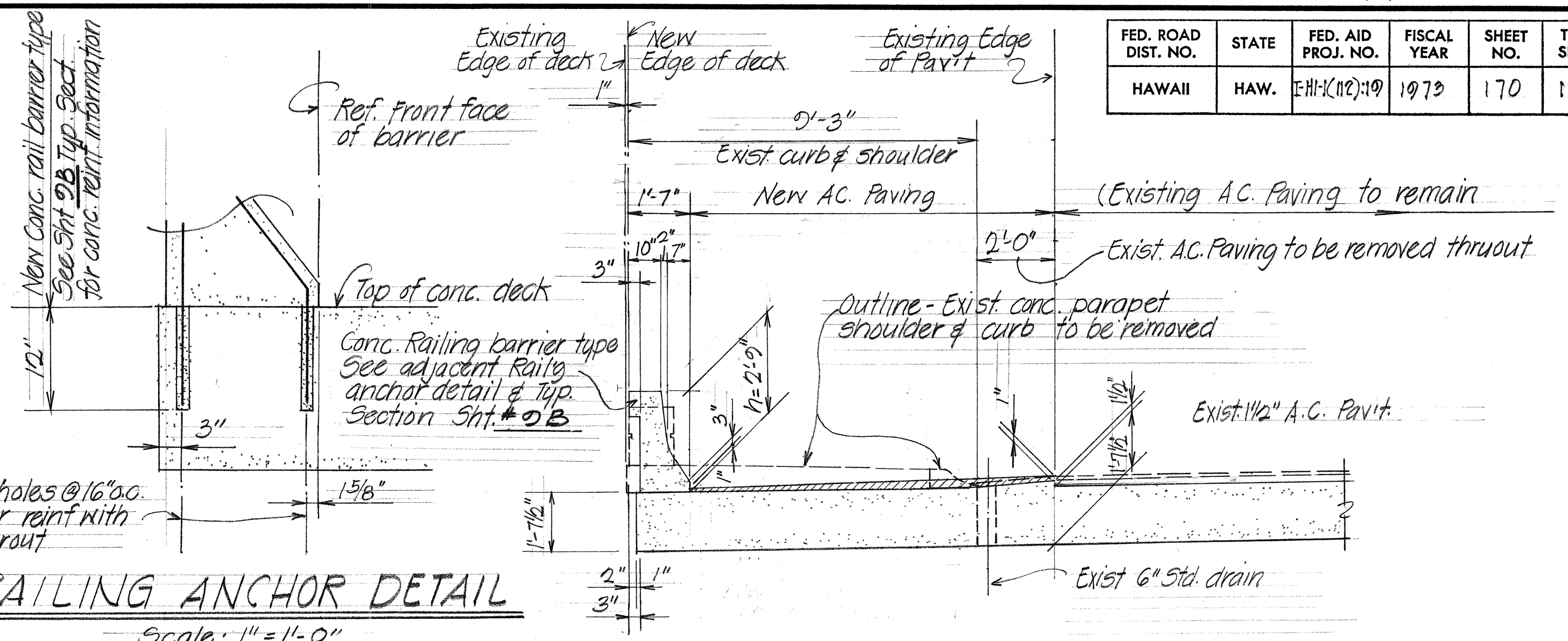
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
REPLACEMENT of RAILS
KAPALAMA CANAL BRIDGE
SAFETY IMPROVEMENT ALONG
INTERSTATE H-1
KALIHI STREET TO FALL HIGHWAY
PROJ. N° I-HI-1(112):109 DATE 1973
SHEET No. 11B OF 16B SHEETS

SURVEY PLOTTED BY	DATE
DESIGNED BY	
TRACED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HA-11(112):10	1973	170	170



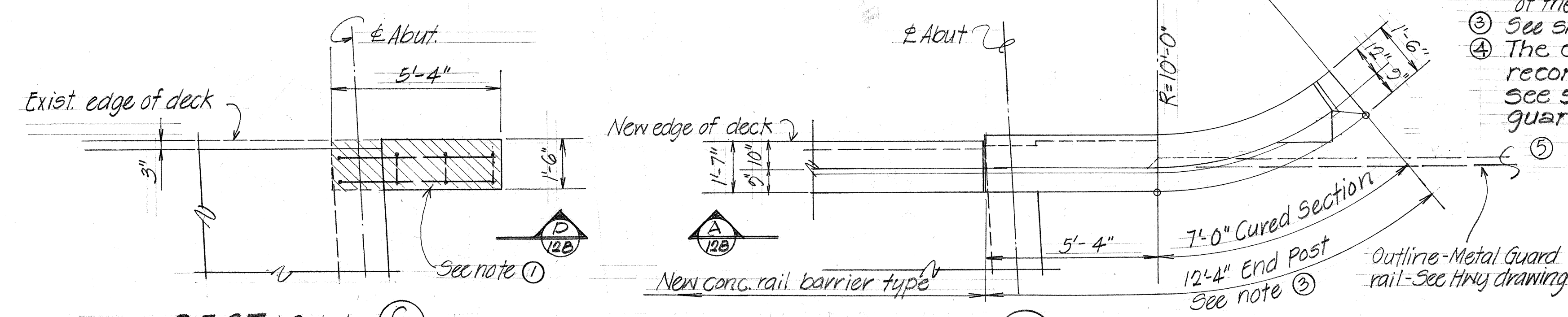
PLAN
Scale: 1" = 10'-0"



TYPICAL-PART DECK SECTION
Scale: 1/2" = 1'-0"

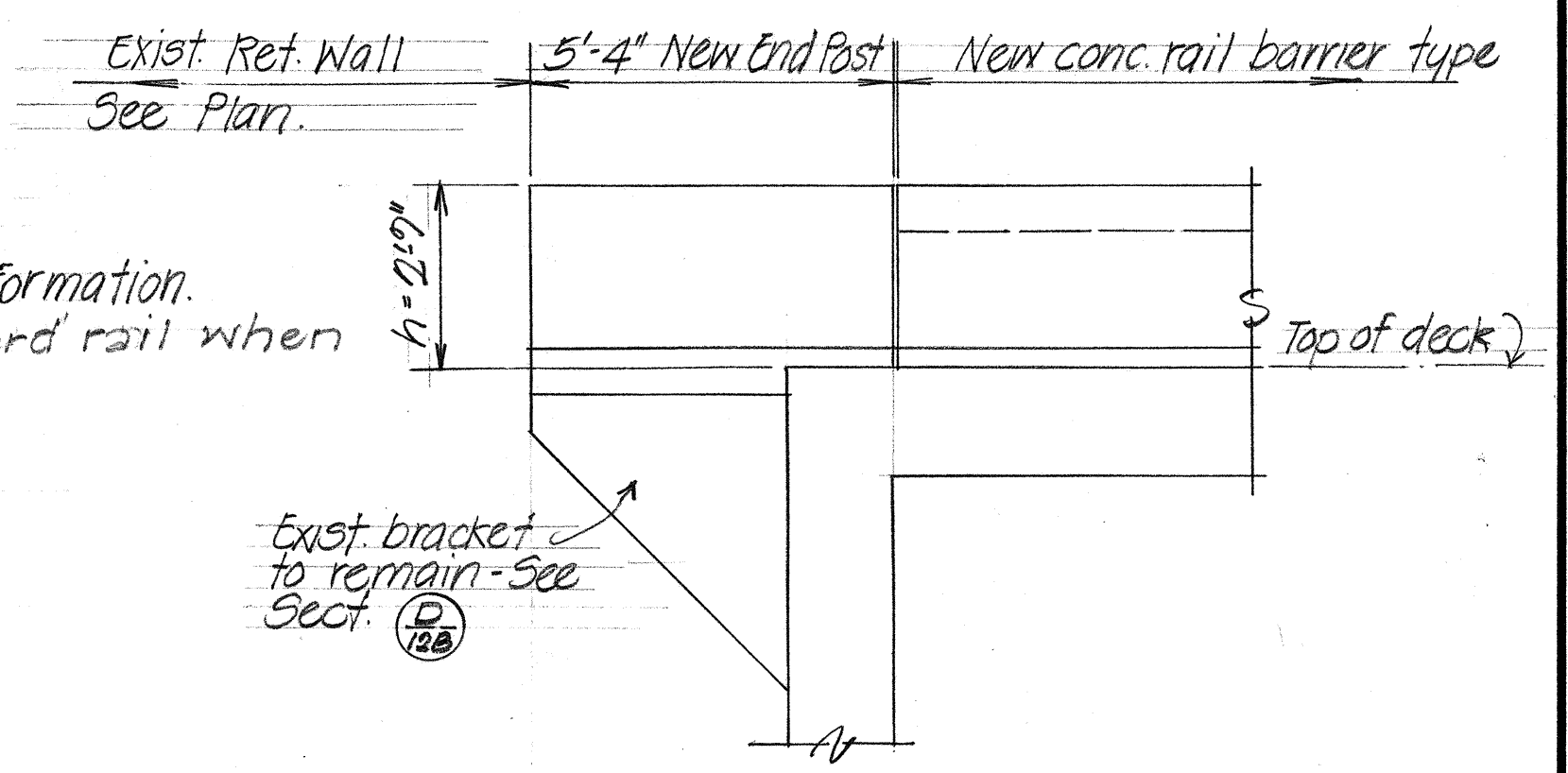
Notes:

- ① Limits of removal of existing conc. show in hatched area. Remove conc. only. All existing exposed reinf. except those noted on detail drawing to remain and cleaned. Bend bars as required.
- ② For removal of existing conc. saw cut faces of existing wall in a straight and clean line to the plane of the outer edge of the reinf.
- ③ See sht. 13B for additional curved end post detail and information.
- ④ The contractor shall erect portable concrete guard rail when reconstructing the bridge exterior railing. See sheet 39A for details of temporary guard rail.
- ⑤ Tack Coat shall be applied on exposed concrete surface prior to A.C. paving.

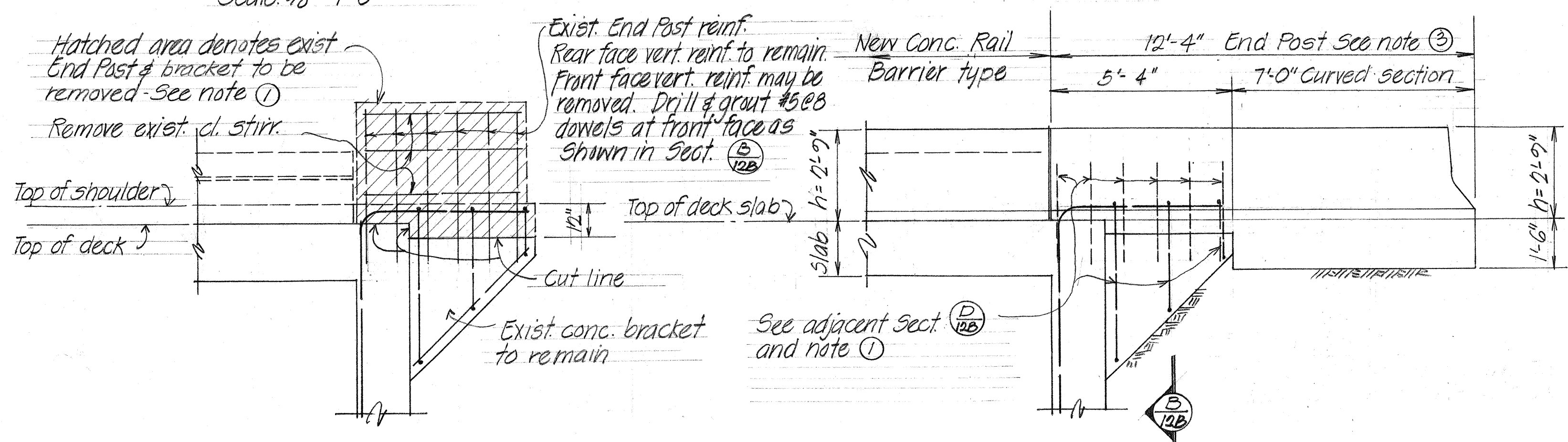


SECTION C-12B
Scale: 3/8" = 1'-0"

DETAIL X-12B

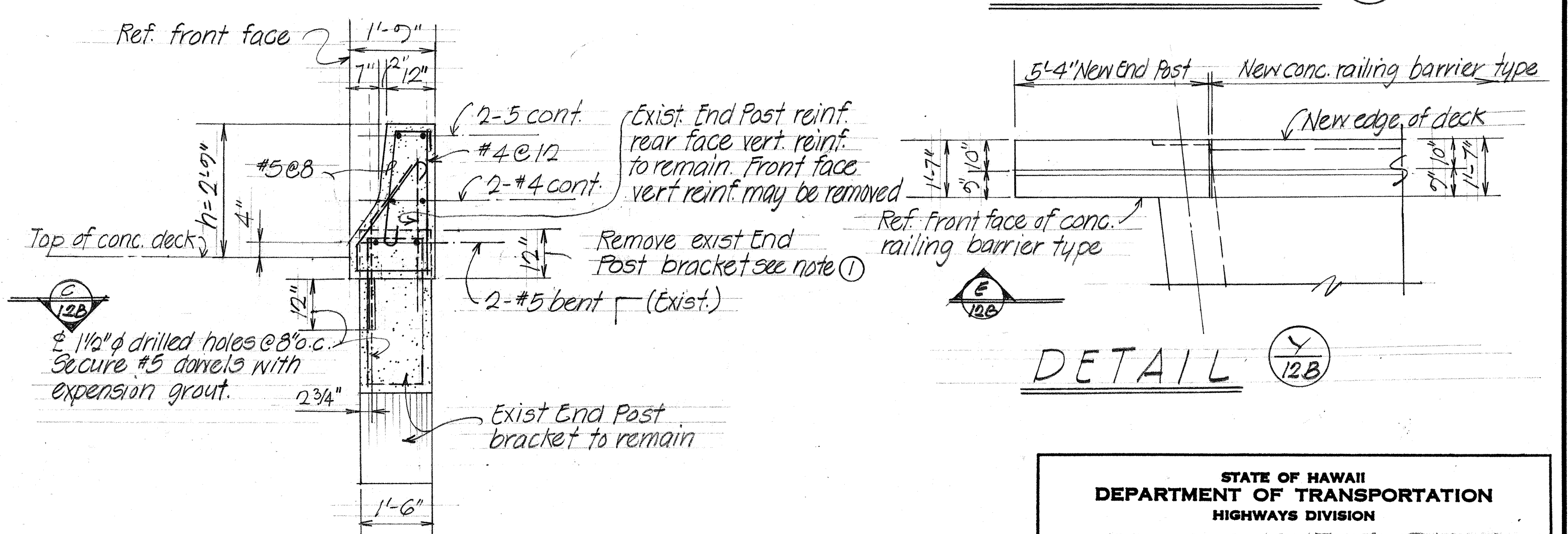


ELEVATION E-12B



SECTION D-12B
Scale: 3/8" = 1'-0"

ELEVATION A-12B



SECTION B-12B
Scale: 1/2" = 1'-0"

DETAIL Y-12B

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
REPLACEMENT of RAILS
NUUANU STREAM BRIDGE
SAFETY IMPROVEMENT ALONG
INTERSTATE H-1
KALIHI STREET TO PALI HIGHWAY
PROJ. NO. I-HI-1(112):10 DATE APRIL 1973
SHEET No. 12B OF 168 SHEETS

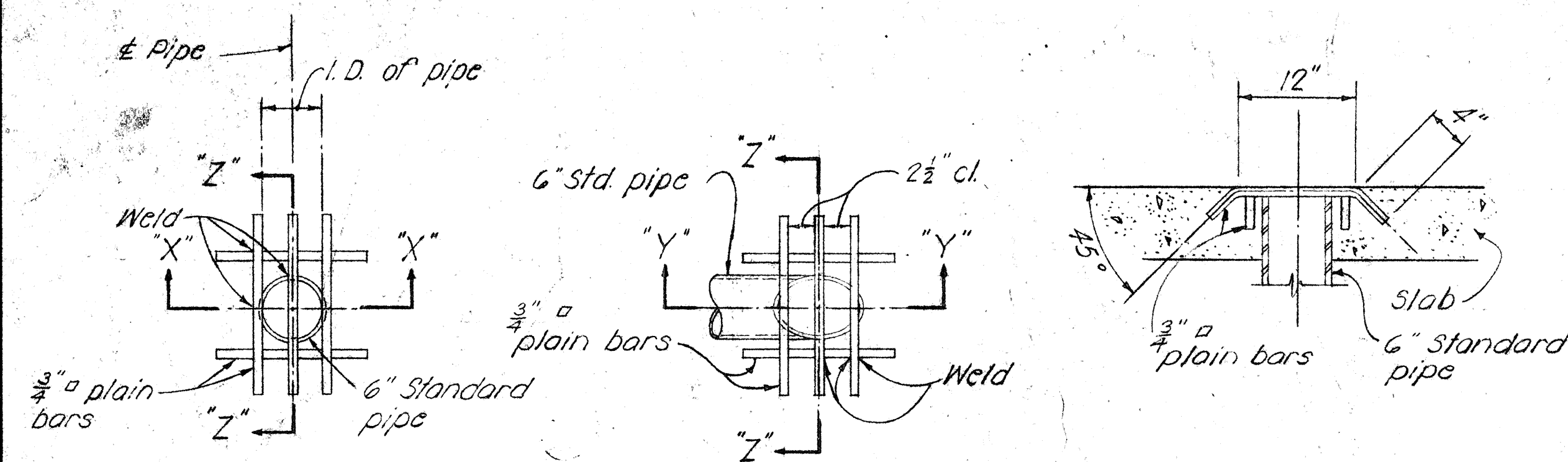
DATE	
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

GENERAL NOTES

- All concrete shall be Class A unless otherwise noted.
- Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
- Clearance for reinforcing bars shall be as follows, unless otherwise noted:
 - $1\frac{1}{2}$ " For stirrups of beams & pier caps.
 - 2" For ties of columns.
 - 2" For formed walls.
 - 3" For footings.
- Minimum spacing between parallel bars shall be $2\frac{1}{2}$ times the diameter of bars, but in no case shall the clear distance between the bars be less than $1\frac{1}{2}$ times the maximum size of the coarse aggregate.
- All dimensions relating to reinforcing are to centers of bars unless otherwise noted.
- Reinforcing bars shall be securely tied at all intersections & lap splices & shall be held in place during pouring to maintain their proper locations as shown on plans.
- Vertical column bars shall be arranged in such a manner as to miss pier cap bars above as directed by the Engineer.
- Except as otherwise noted on drawings, all exterior corners & re-entrant angles in concrete work shall be chamfered $\frac{3}{4}" \times \frac{3}{4}"$.
- Concrete seats receiving steel plates, lead plates or neoprene pads shall be poured monolithically with supporting structures & top of concrete seats shall be finished with a steel trowel to a smooth level surface at the elevation shown on the plans.
- Elastomeric Pads: Bottom of bridge bearing pads shall be secured against displacement with adhesives approved by the Engineer. Pads shall be incidental to concrete and will not be paid for separately.
- Forms for all exposed surfaces of separation structures and surfaces of retaining walls visible from a traveled way or from a populated area shall be plywood except that metal forms may be permitted provided a surface finish satisfactory to the Engineer can be obtained and the use of such forms is approved in writing by the Engineer. Forms for round columns shall be made of materials that will give a smooth finish and true dimensions as given in the plans. Forms for prestressed concrete members shall be either metal or plywood.
- Gothic letters and figures approximating dimensions shown will be acceptable if approved by the Engineer.
- The contractor shall verify the location of all existing utility lines and notify the respective owners before commencing work of excavation or driving of piles.
- Standard Detail Drawings refer to all structures in general, except for modifications as may be required for special conditions. For such modifications refer to the corresponding detailed drawings.

TYPICAL CONCRETE GROOVE DETAIL

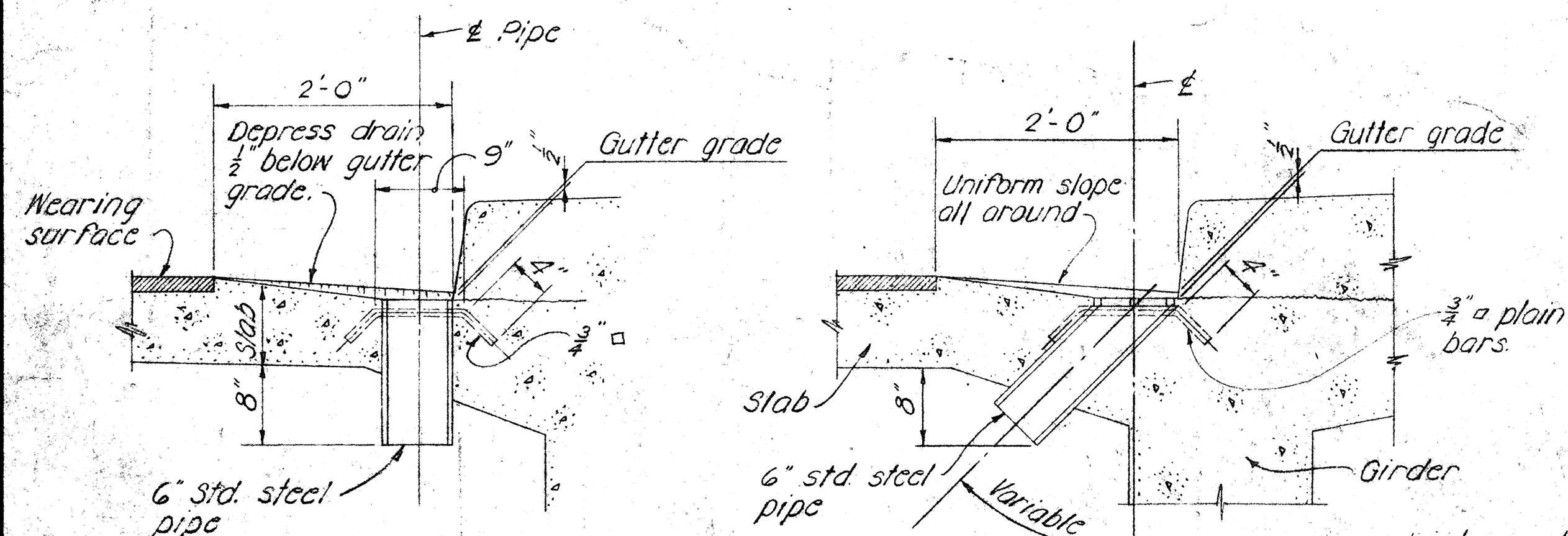
DRIP DETAIL



PLAN

PLAN

SECTION "Z-Z"

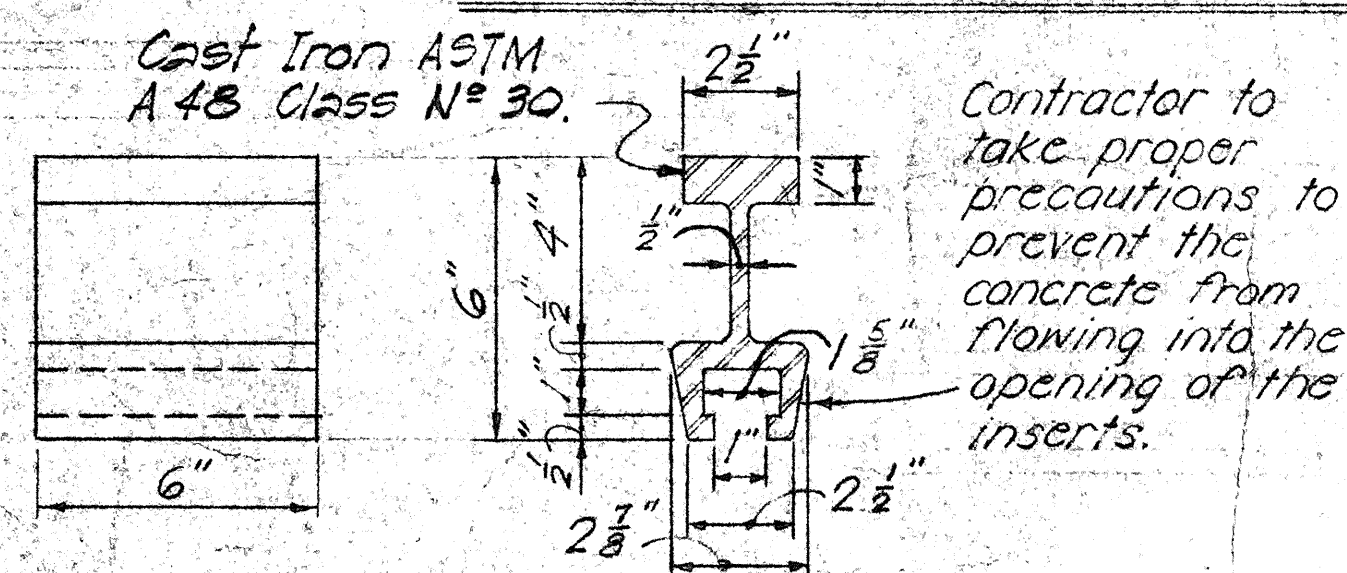


SECTION "X-X"

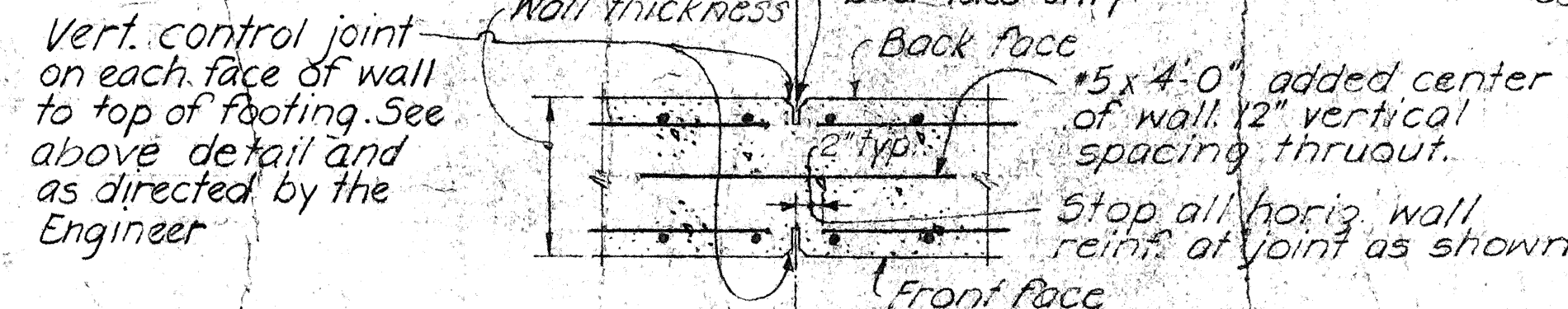
SECTION "Y-Y"

NOTE: Metal drains shall be considered incidental to Class A Concrete in both concrete and steel bridges and will not be paid for separately. Assemblage of grillage and pipe shall be hot-dip galvanized after all welding is completed.

TYPICAL DRAINAGE DETAILS

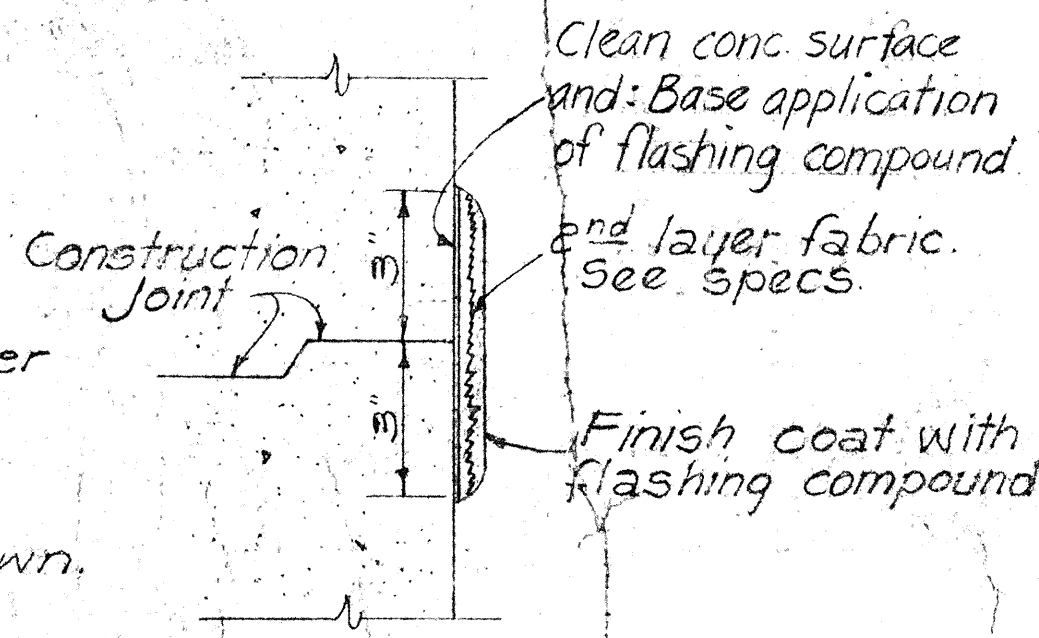


INSERT DETAIL



CONTROL JOINT DETAILS

TYP FLASHING COMPOUND WATERPROOFING DETAIL

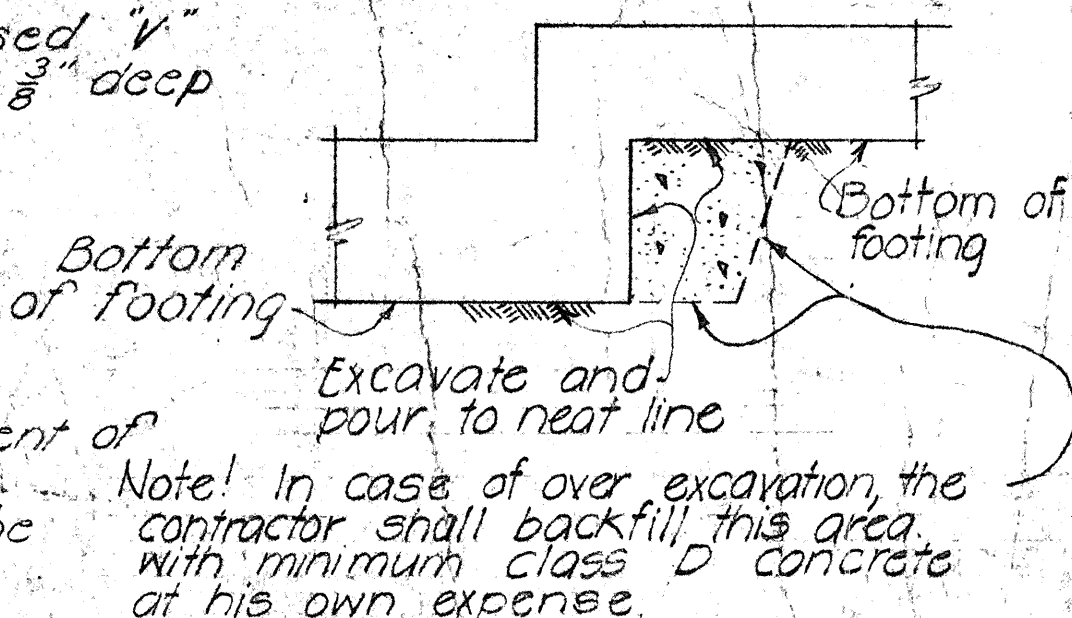


NAME DATE

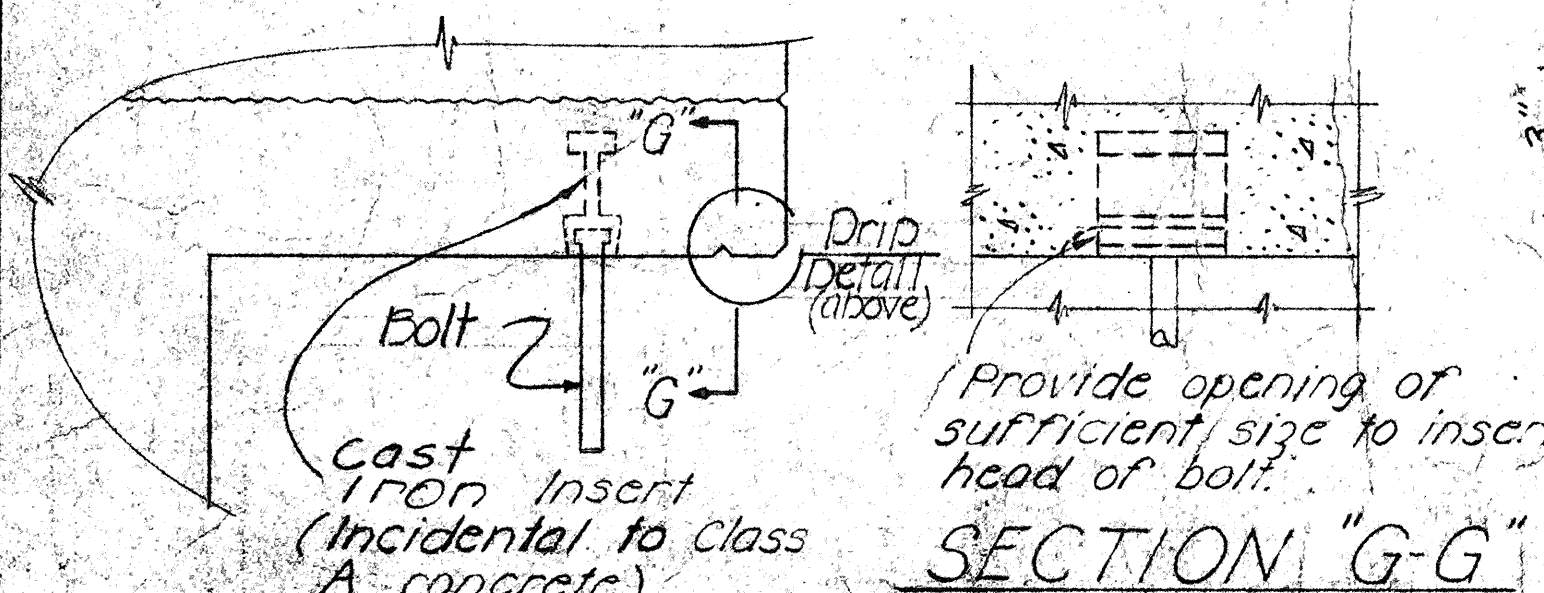
Use correct name of bridge Date of Year built

NOTE: Refer to corresponding detail drawings for placement of such names & dates at end post. Exact details & spacing of letters & figures shall be as directed by the Engineer. See Note #12.

TYPICAL DETAIL OF LETTERS & FIGURES AT CONCRETE END POST



TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP



DETAIL of PIPE HANGERS & INSERTS

SECTION "G-G"

APPROVAL RECOMMENDED:
Paul T. Yamashita
BRIDGE DESIGN ENGINEER
DATE 1-23-79

APPROVED
Paul T. Yamashita
ASSISTANT CHIEF, ENGINEERING
DATE 1-28-79

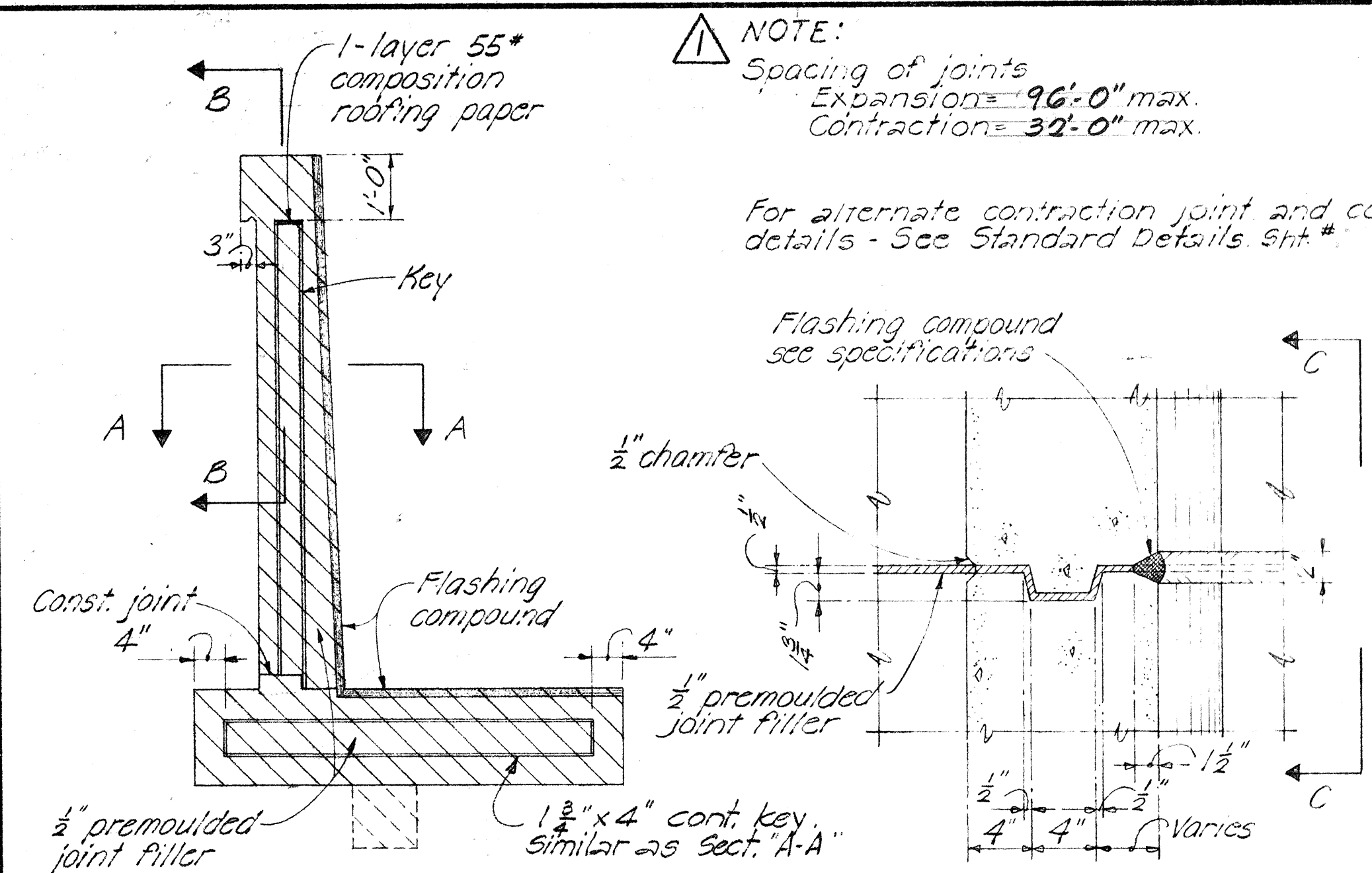
NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
NOTES AND MISCELLANEOUS
DETAILS

Date: October 1969
SHEET No. 148 OF 168 SHEETS DB-100

DATE
DRAWN BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
ORIGINAL PLAN
NOTE BOOK
NO.

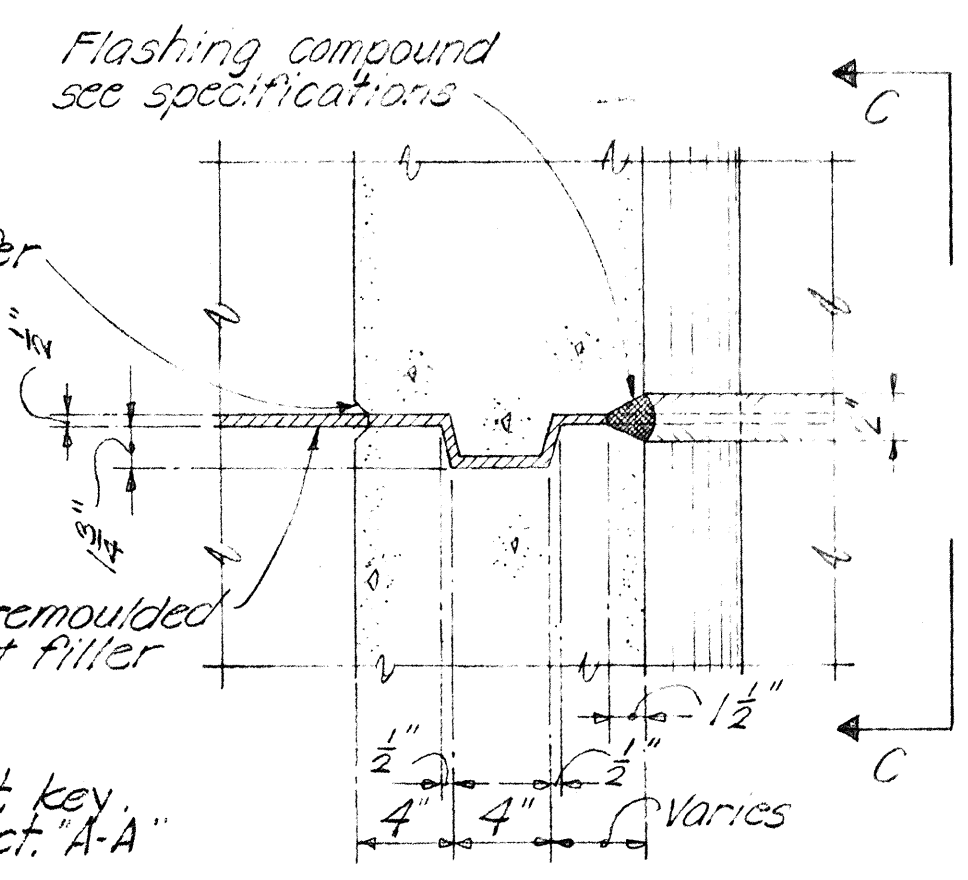
PROJ. ROAD DIST. NO.	STATE	PROJ. AID	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CHP/107/10779	1979	174	176



JOINT ELEVATION

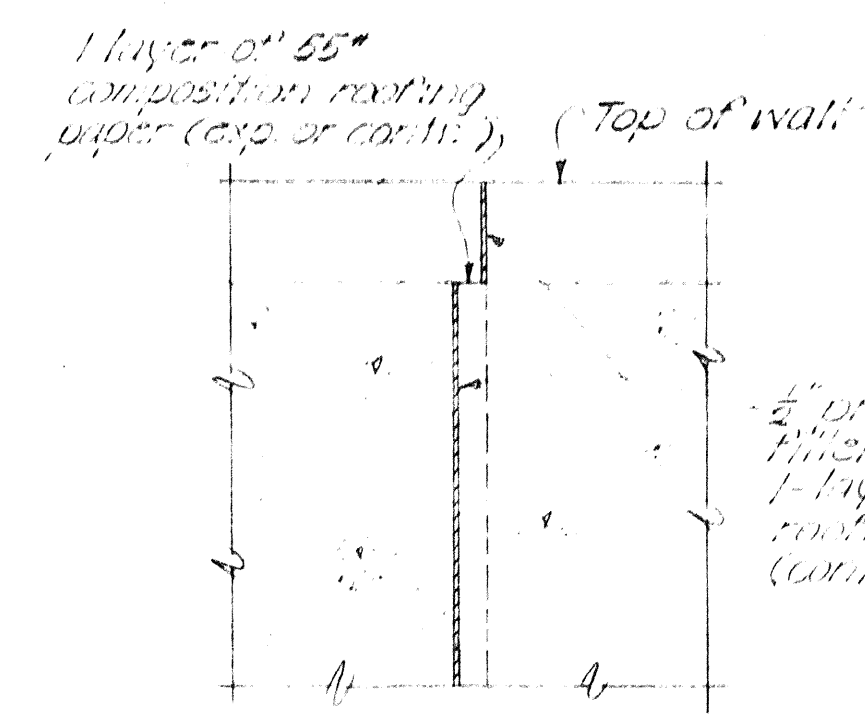
NOTE:
Spacing of joints
Expansion = 96'-0" max.
Contraction = 32'-0" max.

For alternate contraction joint and control joint details - See Standard Details, Sht. #

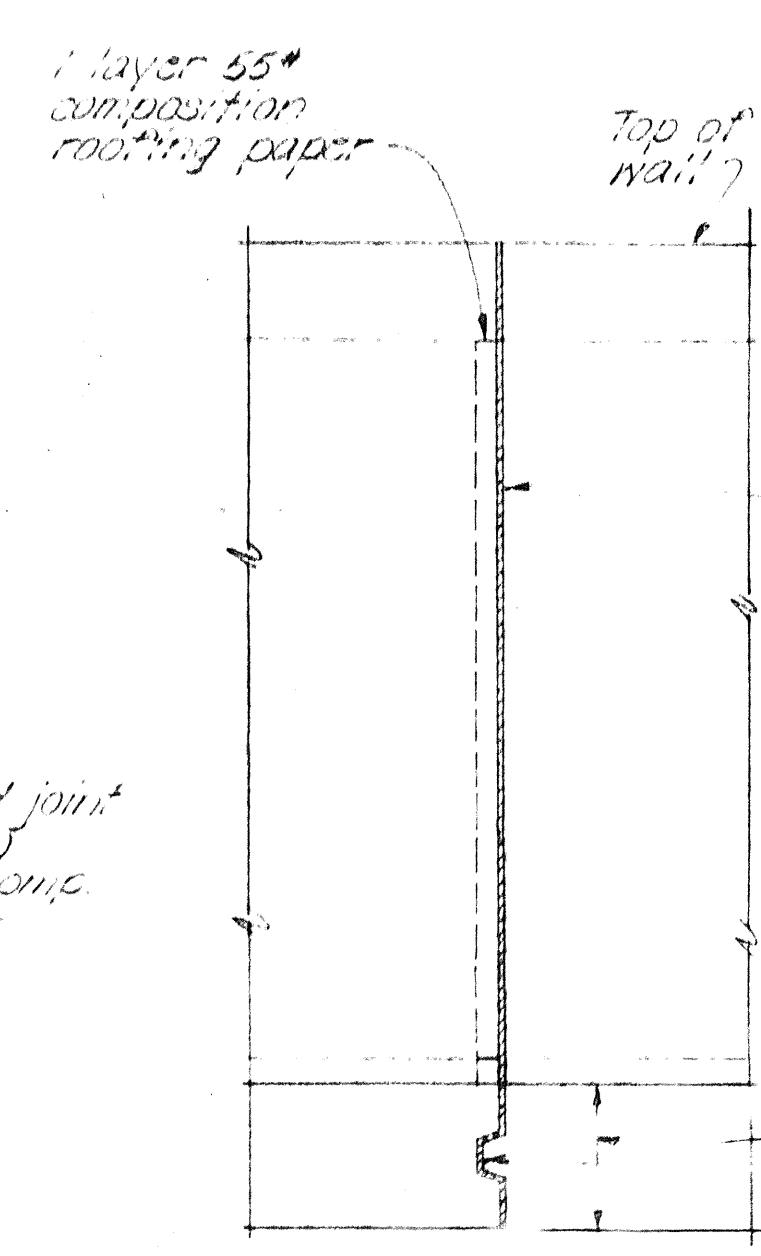


SECTION A-A

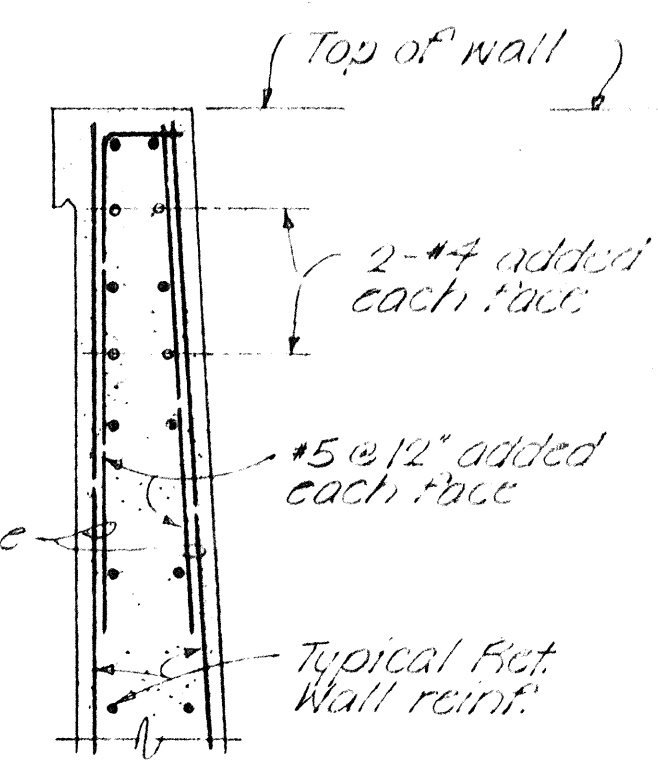
TYPICAL EXPANSION JOINT DETAILS No Scale



SECTION B-B

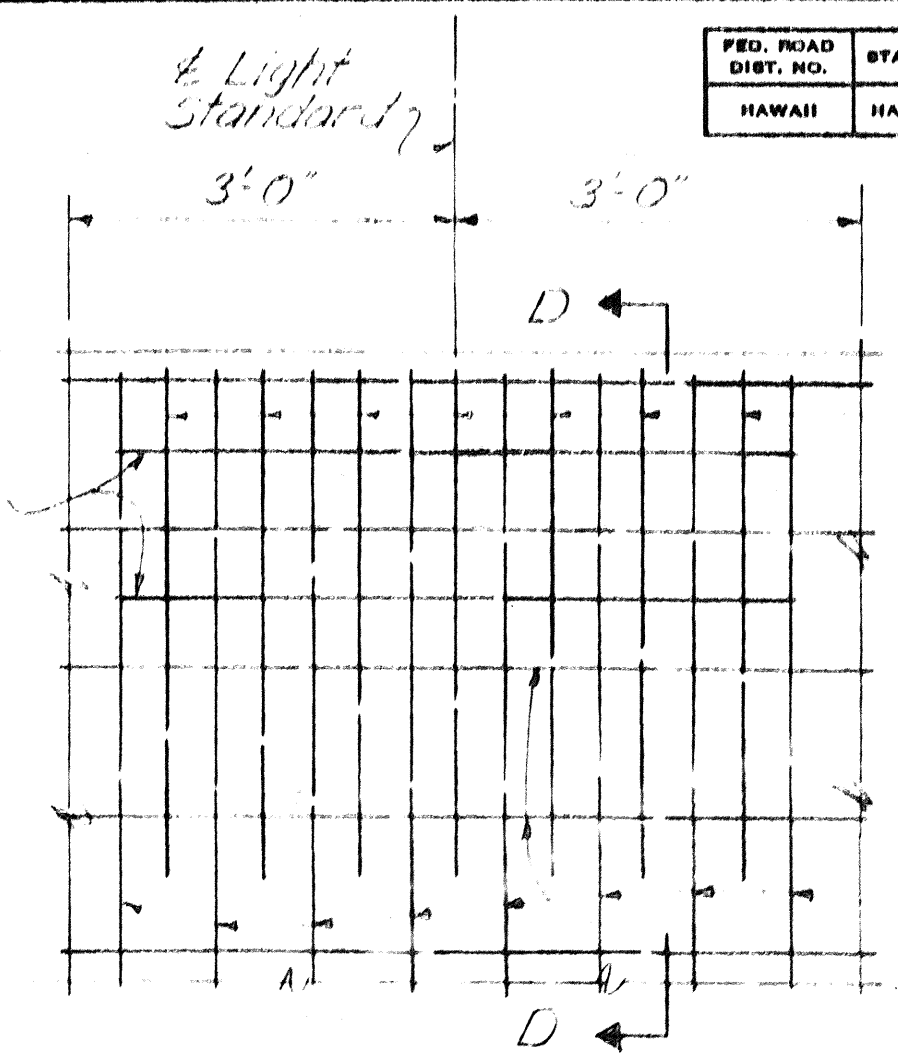


SECTION C-C



SECTION D-D

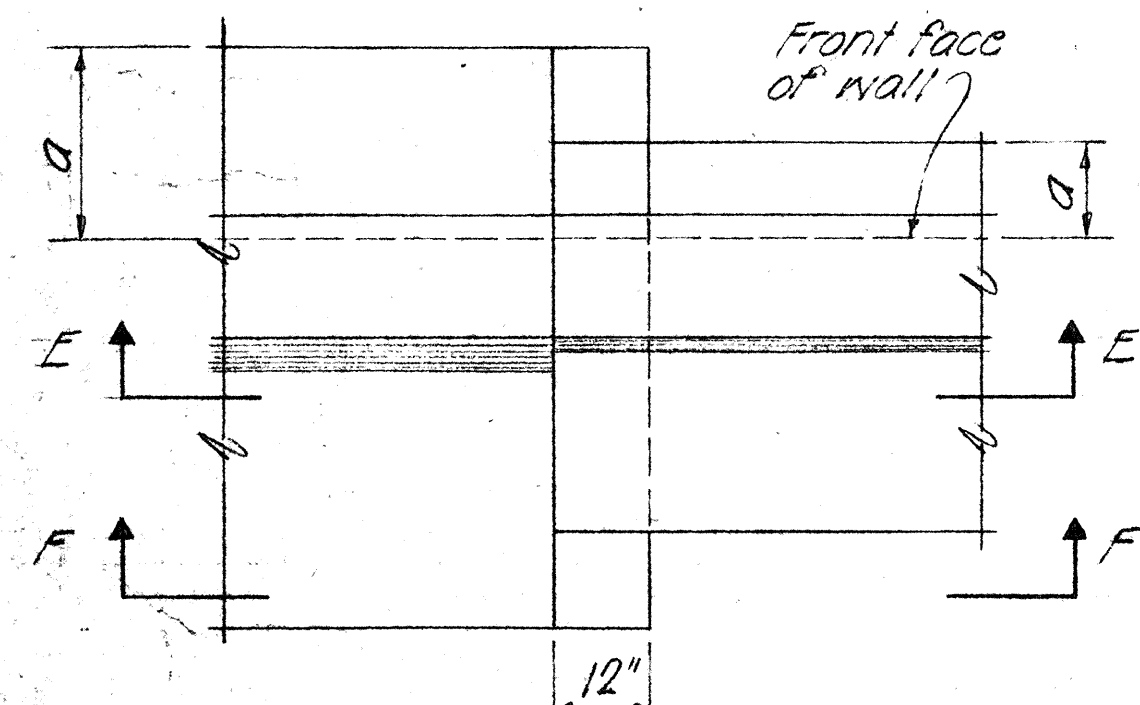
Premoulded filler & key in footing at expansion joint only.



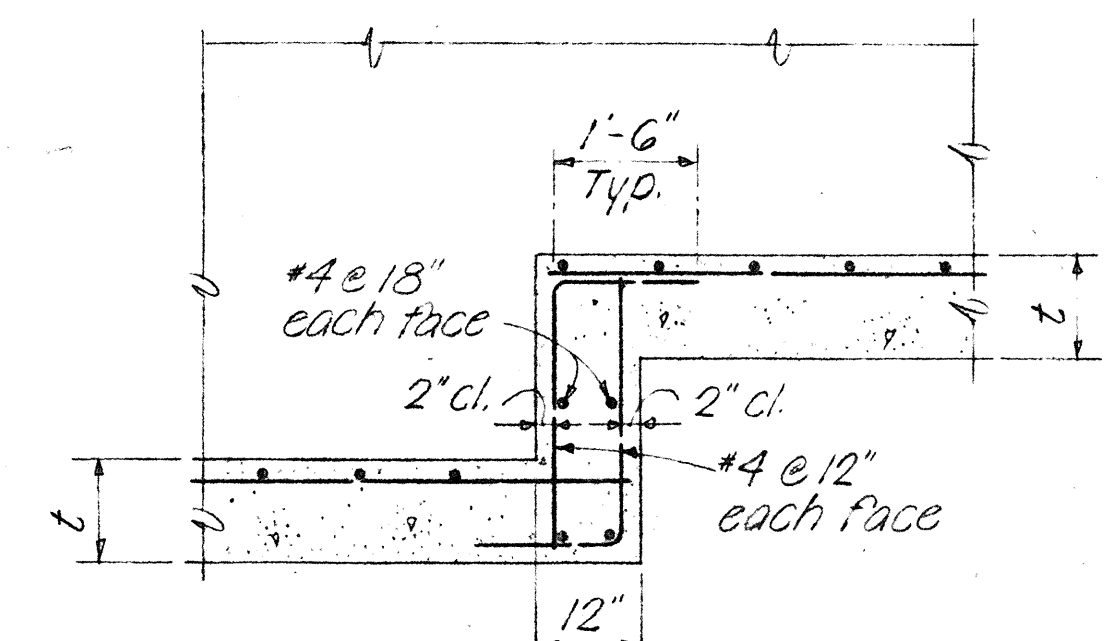
ELEVATION

TYPICAL ADDED REINFORCEMENT AT LIGHT STANDARD BASE No Scale

#5 @ 12" x 6'0" lg. added each face at Light Standard

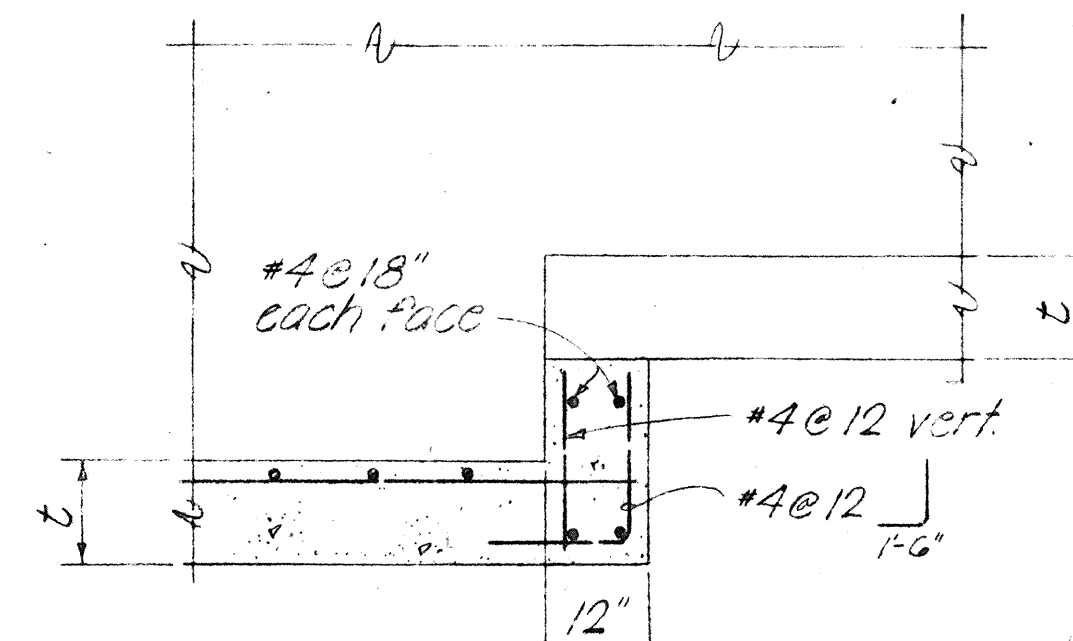


PLAN



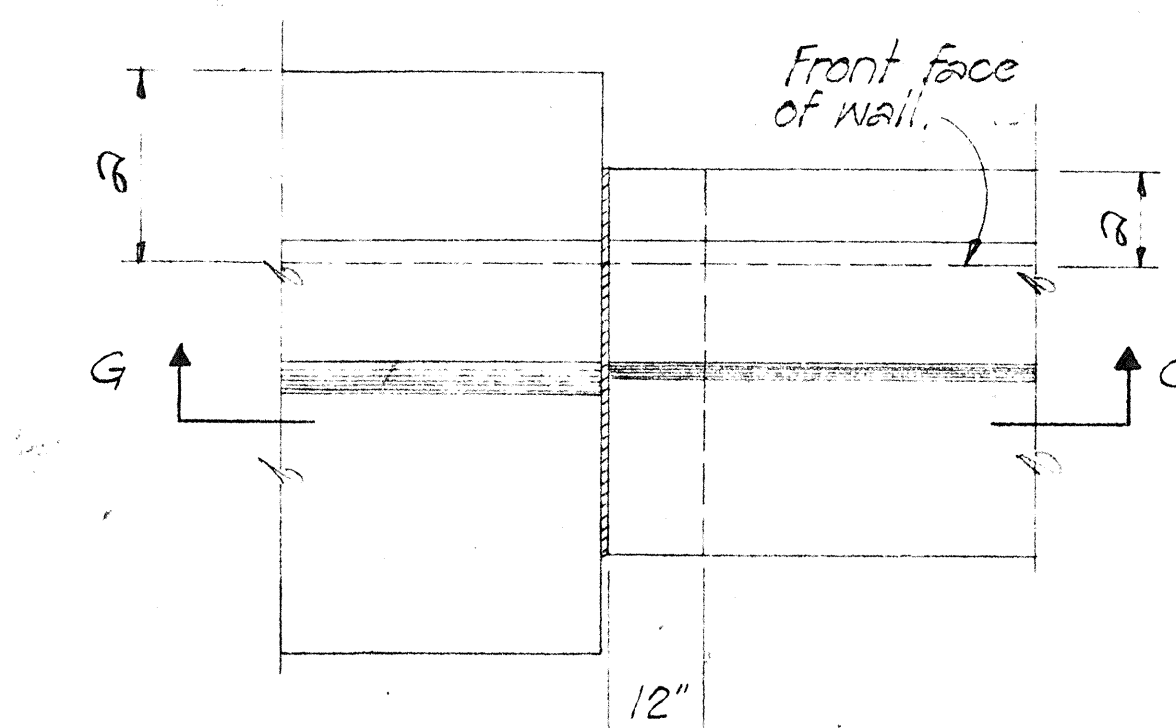
SECTION E-E

AT CONTINUOUS FOOTING

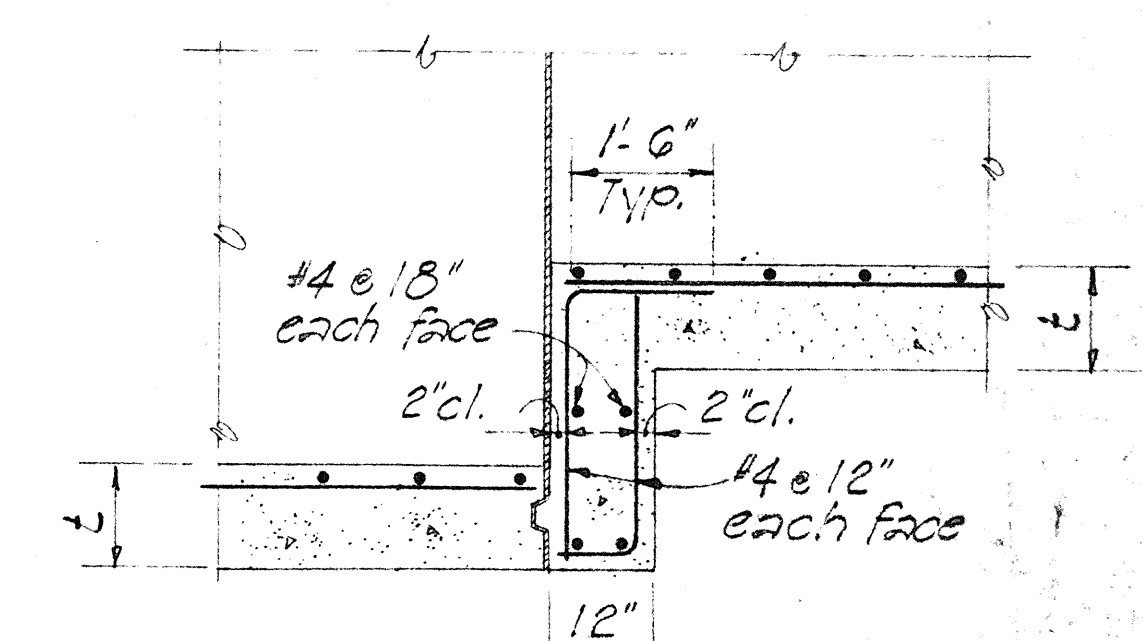


SECTION F-F

TYPICAL FOOTING STEP-UP DETAILS No Scale

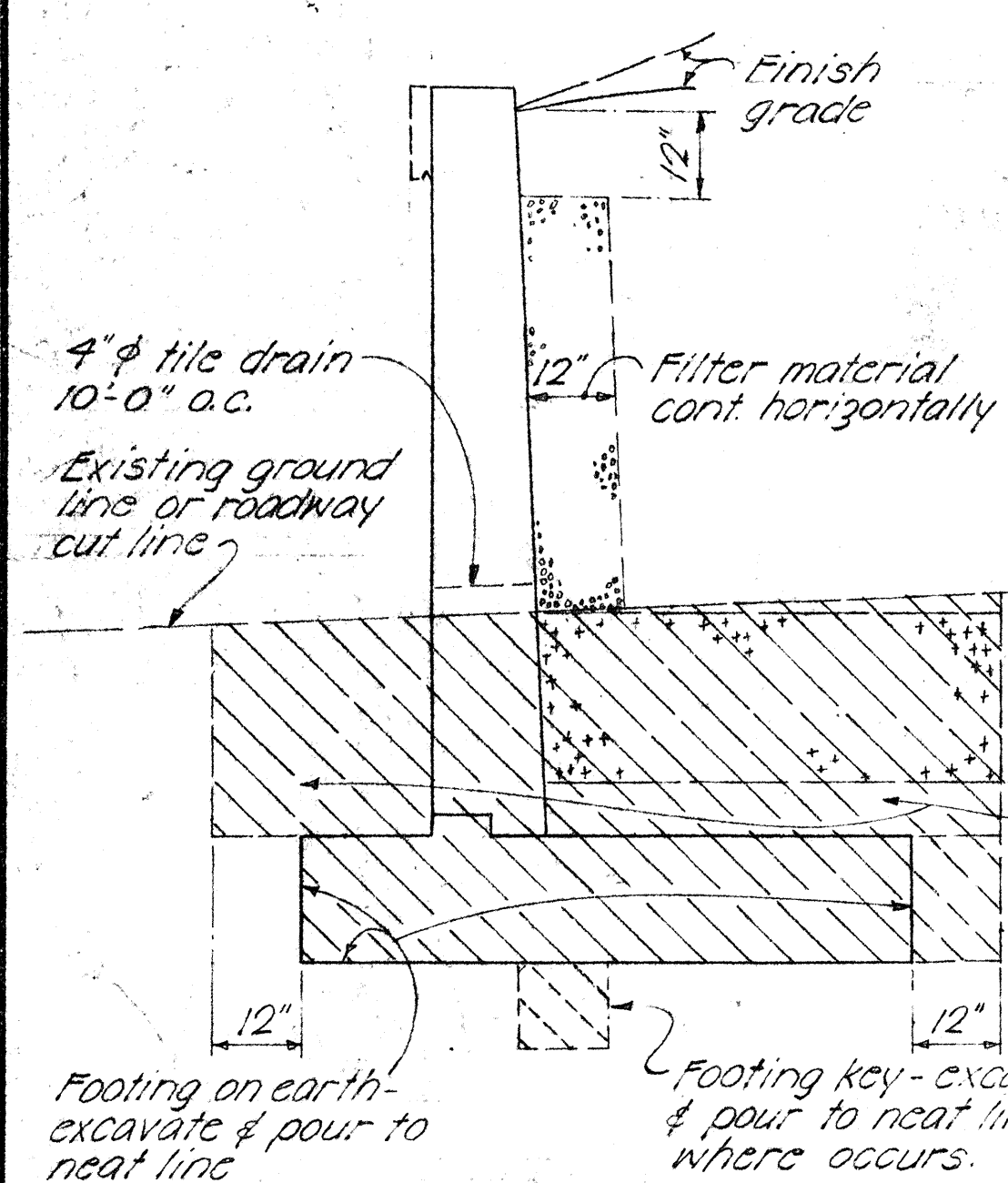


PLAN



SECTION G-G

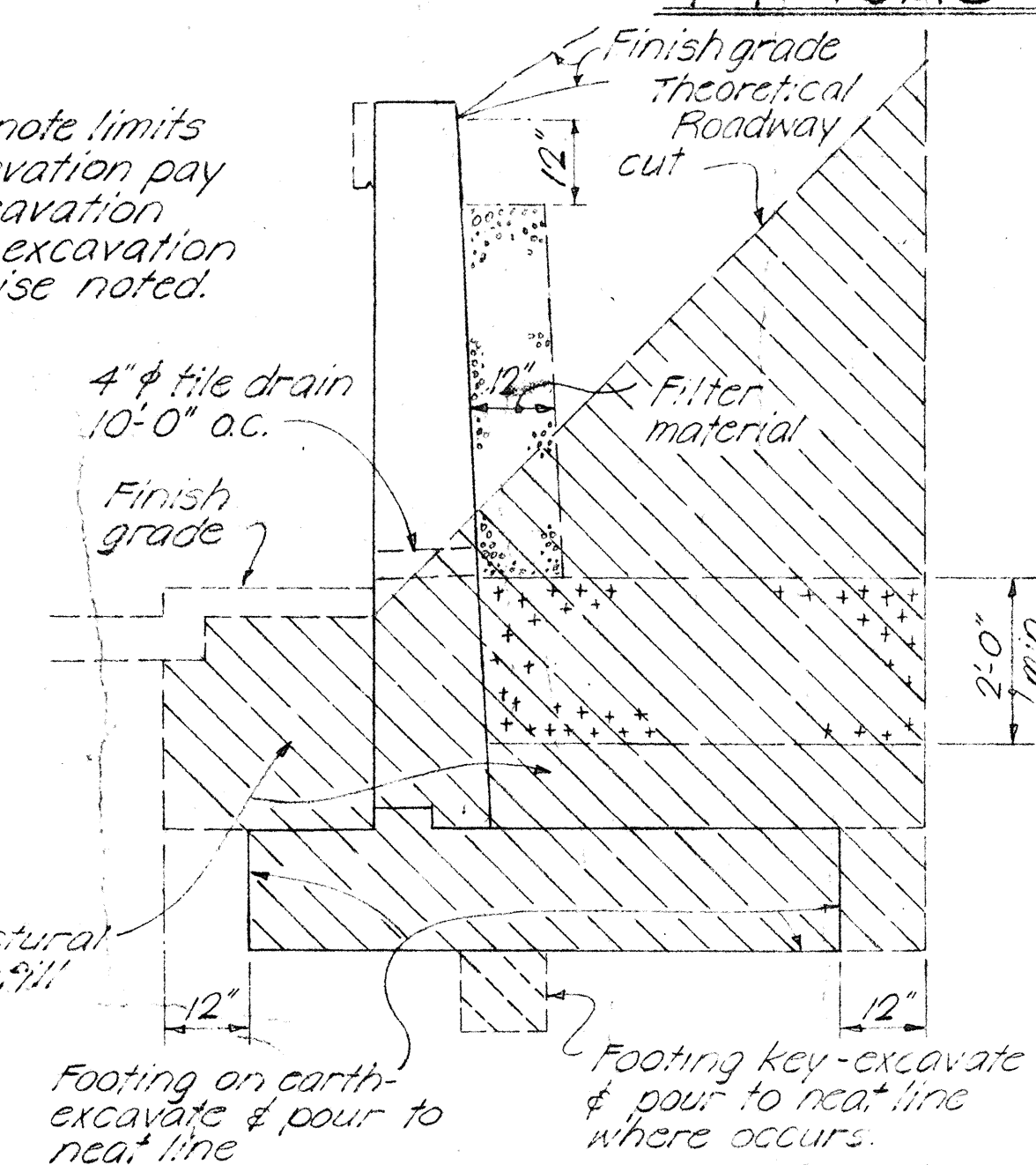
AT EXPANSION JOINT



CASE I

STRUCTURAL EXCAVATION & DRAINAGE DETAILS No Scale

NOTE
Hatched areas denote limits of structural excavation pay line. All other excavation shall be roadway excavation except as otherwise noted.



CASE II

Impervious material as selected by the Engineer incidental to structural excavation. The subgrade upon which filter material is to be placed shall be made as impervious as possible by pneumatic tamping or other approved methods. Impervious material shall be incidental to roadway excavation or imported borrow when used in embankment area.

APPROVAL RECOMMENDED:
Paul T. Yamashita 1-23-79
BRIDGE DESIGN ENGINEER DATE

APPROVED
Paul T. Yamashita 1-28-79
FOR ASSISTANT CHIEF, ENGINEERING DATE

NO	REVISION	APPROVED BY	DATE
1	Change note spacing of joints.	H.T.	2.4.72

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
RETAINING WALL TYPE T-1

SCALE AS NOTED DATE: _____

SHEET No. 168 OF 168 SHEETS DB-207-2

DATE	_____
SURVEY PLATTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
NO.	_____